DOKUZ EYLÜL UNIVERSITY
GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES

DETERMINATION OF SUSTAINABLE NEIGHBORHOOD CRITERIA WITH ANALYTIC HIERARCHY PROCESS (AHP) TO CREATE A BASE FOR A LOCAL CERTIFICATION SYSTEM

by

Fatma İrem YILDIRIM

September, 2024

İZMİR

DETERMINATION OF SUSTAINABLE NEIGHBORHOOD CRITERIA WITH ANALYTIC HIERARCHY PROCESS (AHP) TO CREATE A BASE FOR A LOCAL CERTIFICATION SYSTEM

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We have read the thesis entitled **"DETERMINATION OF SUSTAINABLE NEIGHBORHOOD CRITERIA WITH ANALYTIC HIERARCHY PROCESS (AHP) TO CREATE A BASE FOR A LOCAL CERTIFICATION SYSTEM"** completed by **FATMA İREM YILDIRIM** under supervision of **ASSOC.PROF.DR. GÖZDE EKŞİOĞLU ÇETİNTAHRA** and we certify that in our opinion it is fully adequate, in scope and in quality, as a thesis for the degree of.Master of Science.

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ABSTRACT

With the industrial revolution, uncontrolled population growth, unplanned structuring, rapid industrialization, unconscious use of resources and pollution occurred, and the environment was destroyed in an unprecedented way. With this change in nature, human-environment relations have started to be reconsidered, which has led to the emergence of the concept of "sustainability". For this purpose, some developments have occurred both in academia and in practice in order to ensure economic, ecological and social sustainability. The decisions and policies taken require a multidisciplinary approach to the issue. In the realization of these multidisciplinary approaches, disciplines that deal with the organization of space such as urban planning and architecture play an active role. The reason for this is based on the necessity to search for sustainability in urban areas that destroy nature the most. In this context, settlements are systematically evaluated in terms of their sustainability levels and necessary measures are expected to be taken as a result of these evaluations. Minor to major assessment systems have been created to integrate the concept of sustainability into the city. Additionally, many studies address that sustainable urbanization can be achieved at the neighborhood scale and in the context of local conditions. The studies conducted show that there is no legally grounded, neighborhood-scale system among the evaluation systems in Turkey.

This study, by making an inquiry on the parameters examined by the existing national and international certification systems and the criteria deemed necessary for sustainability in the literature, tries to reveal which parameters should be taken into consideration and their weight ratios in case of establishing a certification system specific to Turkey at the neighborhood scale. For this purpose, a survey form was prepared and was conducted with a total of 32 expert consisting of 16 Karşıyaka Municipality employees and 16 Dokuz Eylül University Faculty of Architecture

academic members. Survey responses were analyzed with the analytical hierarchy process (AHP).

The findings show that the main weighted criteria are (1) resources and energy, (2) environment and land use, and (3) social development. Also, the sub-criteria are ranked according to their importance weights as (1) economic development, (2) education and (3) safety. This result is similar to the certification systems and studies in the literature. Based on this result, it is possible to say that these factors come to the forefront when the impacts of the climate crisis on the neighborhood are evaluated. This study's findings underline the parameters that should be examined in sustainable neighborhood evaluation and recommend that these parameters should be specific to the locality. Therefore, subsequent studies should develop a measurement model of the parameters at the local level.

Keywords: Sustainability, sustainable neighborhood, analytic hierarchy process, sustainable neighborhood assessment system

YEREL BİR SERTİFİKASYON SİSTEMİNE TEMEL OLUŞTURMAK ÜZERE SÜRDÜRÜLEBİLİR MAHALLE KRİTERLERİNİN ANALİTİK HİYERARŞİ SÜRECİ (AHS) YÖNTEMİ İLE BELİRLENMESİ

ÖZ

Sanayi devrimi ile birlikte, kontrolsüz nüfus artışı, plansız yapılanma, hızlı endüstrileşme, kaynaklarının bilinçsiz kullanımı ve kirlilik meydana gelmiş, çevre daha önce görülmemiş bir şekilde tahrip edilmiştir. Doğada meydana gelen bu değişimle birlikte insan-çevre ilişkilerinin yeniden gözden geçirilmeye başlanması, "sürdürülebilirlik" kavramının da ortaya çıkmasına neden olmuştur. Bu amaçla ekonomik, ekolojik ve sosyal sürdürülebilirliğin sağlanabilmesi amacıyla hem akademik hem de uygulamada bazı gelişmeler meydana gelmiştir. Alınan kararlar ve politikalar, konunun çok disiplinli bir yaklaşımla ele alınmasını gerektirmektedir. Bu çok disiplinli yaklaşımların gerçekleştirilebilmesinde şehir planlama ve mimarlık gibi mekan organizasyonunu ele alan disiplinler etkin rol oynamaktadır. Bunun nedeni ise, sürdürülebilirliğin, doğayı en çok tahrip eden kentsel alanlarda aranması gerekliliğine dayanmaktadır. Bu kapsamda yerleşmeler, sürdürülebilirlik düzeyleri açısından sistematik olarak değerlendirilmekte ve gerekli önlemlerin bu değerlendirmeler sonucunda alınması beklenmektdir. Sürdürülebilrilik kavramının kente entegre edilmesi için minorden majöre değerlendirme sistemleri oluşturulmuştur. Buna ek olarak, birçok çalışma sürdürülebilir kentleşmenin mahalle ölçeğinde ve yerel koşullar bağlamında sağlanabileceğini ele almaktadır. Yapılan çalışmalar Türkiye'ye ait değerlendirme sistemleri içerisinde hukuksal zemine oturmuş, mahalle ölçeğinde bir sistemin olmadığını göstermektedir.

Bu çalışma, mevcut ulusal ve uluslararası sertifikasyon sistemlerinin incelediği parametreler ve literatürde sürdürülebilirlik için gerekli görülen kriterler üzerinde bir sorgulama yaparak, mahalle ölçeğinde Türkiye'ye özgü bir sertifikasyon sistemi kurulması durumunda hangi parametrelerin dikkate alınması gerektiğini ve ağırlık oranlarını ortaya koymaya çalışmaktadır. Bu amaçla bir anket formu hazırlanmış ve 16 Karşıyaka Belediyesi çalışanı ve 16 Dokuz Eylül Üniversitesi Mimarlık Fakültesi

öğretim üyesinden oluşan toplam 32 uzmana uygulanmıştır. Anket yanıtları analitik hiyerarşi süreci (AHP) ile analiz edilmiştir.

Bulgular göstermektedir ki ağırlıklı ana kriterler (1) kaynaklar ve enerji, (2) çevre ve arazi kullanımı ve (3) sosyal kalkınma'dır. Ayrıca, alt kriterler önem ağırlıklarına göre (1) ekonomik kalkınma, (2) eğitim ve (3) güvenlik olarak sıralanmıştır. Ortaya çıkan bu sonuç literatürde ortaya konulan sertifikasyon sistemleri ve yapılan çalışmalar ile benzerlik teşkil etmektedir. Bu sonuca dayanarak, iklim krizinin mahalle üzerindeki etkileri değerlendirildiğinde bu etmenlerin ağırlıklı olarak öne çıktığını söylemek mümkündür. Bu çalışmanın bulguları, sürdürülebilir mahalle değerlendirmesinde incelenmesi gereken parametrelerin altını çizmekte ve bu parametrelerin yerele özgü olması gerektiğini önermektedir. Bu nedenle, sonraki çalışmalar yerel düzeyde parametrelerin ölçüm modelini geliştirmelidir.

Anahtar kelimeler: Sürdürülebilirlik, sürdürülebilir mahalle, analitik hiyerarşi süreci, sürdürülebilir mahalle değerlendirme sistemi

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LIST OF SYMBOL

A : Comparison Matrix

W : Eigenvector

N : Number of criteria

w' : Eigenvalue

λ_{max} : Largest Eigenvalue

CI : Consistency Index

RI : Random Index

CR : Consistency Ratio

ABBREVIATIONS

UN	: United Nations
WCS	: World Conservation Strategy
WWF	: World Wildlife Fund
IUCN	: International Union for Conservation of Nature
UNEP	: The United Nations Environment Programme
WCED	: World Commission on Environment and Development
UNCED	: The United Nations Conference on Environment and Development
SDGs	: Sustainable Development Goals
RG	: Official Gazette
NUA	: The New Urban Agenda
WHO	: The World Health Organization
LA21	: Local Agenda 21
MDGs	: Millennium Development Goals
MGI	: McGuinness Institute
ÇŞB	: Ministry of Environment and Urbanization
SBB	: Department of Strategy and Budget
COBACHRE	: The Community-Based Cultural Heritage Resource Management
NSA	: Neighborhood Sustainability Assessment
CASBEE	: Comprehensive Assessment System for Built Environmental Efficiency

LEED	: Leadership in Energy and Environment Design
BREEAM	: Building Research Establishment Environmental Assessment Method
LEED-ND	: LEED Neighborhood Development
USGBC	: The United States Green Building Council
SLL	: Smart Location and Connectivity
NPD	: Neighborhood Pattern and Design
GIB	: Green Infrastructure and Buildings
BRE	: Building Research Establishment
SLE	: Super Low Energy
BCA	: Building and Construction Authority
JSBC	: The Japan Sustainable Building Consortium
IBEC	: The Institute for Building Environment and Energy Conservation
MLIT	: The Ministry of Land, Infrastructure, Transport and Tourism
CASBEE UD	: Comprehensive Assessment System for Built Environment Efficiency for Urban Development
DGNB	: Deutsches Gütesiegel Nachhaltiges Bauen
DGNB NUD	: Deutsches Gütesiegel Nachhaltiges Bauen For New Urban Districts
YeS-TR	: The National Green Certification System
B.E.S.T	: Ecological and Sustainable Design in Buildings
SEEB-TR	: Sustainable Energy Efficient Buildings

ITU	: Istanbul Technical University
E-Government	: E-Devlet
YÖK	: Council of Higher Education
YESU	: The Green Certificate Expert
YESDU	: Green Certificate Evaluation Expert
ÇEDBİK	: Environmentally Friendly Green Buildings Association
YUAM	: The Building Application and Research Center of Mimar Sinan Fine Arts University
MSGSU	: Mimar Sinan Fine Arts University
AHP	: Analytic Hierarchy Process
KSK	: Karşıyaka Municipality
DEU	: Dokuz Eylul University
TSE	: The Turkish Standards Institute
GYB	: Safe Green Building
YSK	: Green Industry Organizations

CHAPTER ONE
INTRODUCTION

With the industrial revolution, uncontrolled population growth, unplanned construction, rapid industrialization, unconscious use of resources and pollution occurred. Thus, the environment has been destroyed in an unprecedented way (Du Pisani, 2006; Grubb, Koch, Thomson, Sullivan & Munson, 2019; Kaplan, 1999; Mebratu, 1998; Robinson, 1993; Sands & Peel, 2012; Talbot, 1980). As a result, multidimensional and profound societal impacts have occurred in environmental, economic and social terms. Social inequalities, poverty, decline in public health, environmental refugeeism, increase in violent acts, and settlements that have lost their local identity have appeared (Bibri & Krogstie, 2017; Carleton & Hsiang, 2016; Haines & Patz, 2004; Islam & Winkel, 2017; Levy & Patz, 2015; Parry, 2007). The climate crisis that emerged with the effects of industrialization has become one of the most fundamental discussion topics in the search for sustainable living spaces (Mensah, 2019).

In this context, it has been revealed that the creation of a sustainable world is realized through the process of harmony between scales and that design and implementation studies, especially at the neighborhood scale, play a key role. Since most of the problems encountered at the macro-urban scale are actually the result of poor planning at the micro-neighborhood level, it is of great importance to integrate sustainable development principles into neighborhood planning. Accordingly, assessment systems have been developed for the integration of sustainability at the neighborhood level. The success of these certification systems in accurately measuring sustainability depends on the criteria they set forth. In determining the criteria, it is important that the certification system takes into account the economic, social and environmental factors of the location where it will be applied.

Although there are considerable sustainability assessment system initiatives at the building scale in Turkey, it has been determined that there are significant deficiencies to be completed at the neighborhood and city scale (Ergönül, et al., 2023; Özçevik, et al., 2018; Yıldız, et al., 2015). The National Green Certification System (YeS-TR), one of the two certification systems in Turkey, covers the settlement scale. The other

is Sustainable Energy Efficient Buildings-Neighborhood (SEEB-TR), which covers the neighborhood scale but remains within the scope of the project. There is not yet an officially defined local certification system at the neighborhood scale in Turkey. In addition, it has been observed that LEED and BREEAM certification systems are frequently used at the building and urban scale in Turkey (Ergönül, et al., 2023; Özçevik, et al., 2018; Yıldız, et al., 2015). **Within the scope of this study, it is targeted to provide a basis for the creation of a locally-specific sustainable neighborhood assessment certification system for Turkey in order to overcome this deficiency. In this direction, it was aimed to determine the evaluation criteria and their importance ranking.** As a result, this research topic, which has not been addressed before in Turkey, has a content that will be useful in a wide range of areas from micro to macro scale, from local to international level on economy, environment and society, especially in ensuring intergenerational climate justice.

This master's thesis, which aims to provide a basis for the creation of a locally-specific sustainable neighborhood assessment certification system for Turkey and to determine the assessment and ranking of criteria, consists of five chapters. The chapters start with an introduction explaining the content of the subject and end with a general evaluation of the studies related to the chapter.

In the second chapter, the conceptual and theoretical pillar of the thesis is established. In this context, the emergence of the concepts of sustainability and sustainable development is examined and their transformations in terms of meaning in the historical process are analyzed. Then, the process of transition of these two concepts from local to global and from idea to action is evaluated. For this purpose, publications written in the late 1960s, the green party movement and local level conventions are discussed. In addition to these international conferences and organizations, are evaluated. The outcomes, agreements and discussions related to these conferences and organizations have an important place in shaping the concept of sustainability and defining sustainable physical spaces. In addition to these, the reflections of the effects of the climate crisis in Turkey, which resonated in the international arena, were also evaluated. In this regard, environmental regulations, nature conservation approaches, sustainable development strategies, international

treaties, laws, decrees with the force of law and regulations that have been realized since the Ottoman period have been evaluated. These regulations have played an important role in making the criteria for sustainable physical space locally specific. Thanks to this, definitions, approaches and criteria related to the concept of sustainable physical space were evaluated. It was revealed that sustainable development occurs through a process of harmony between scales, and for this reason, the necessity of a sustainable neighborhood for a sustainable world was evaluated. Therefore, the global dimension of sustainable neighborhood assessment approaches is discussed, and the internationally developed and widely used assessment systems are examined. In addition, the Turkish dimension of sustainable neighborhood assessment approaches is discussed and the policies and legal regulations in Turkey from the concept of green building to the scale of sustainable urbanization are presented. In the light of these, the scope of a possible local sustainable neighborhood assessment system for Turkey is defined together with its main and sub-criteria.

In the third chapter, the methodology of the study is presented. For the thesis' purpose, the "Analytic Hierarchy Process (AHP)" method was used to determine the order of importance of sustainable neighborhood assessment criteria. Firstly, the history and application principles of the method are examined. The reasons for the preference of the method were elaborated by evaluating similar previous studies on the subject. Then, evaluations regarding the preference of the criteria are given. In the last part, the questionnaire form was introduced and the application stages of the questionnaire were explained. The participant group to which the questionnaire will be applied is introduced and the answers to the first part of the questionnaire are evaluated.

The fourth chapter consists of the statistical results of the study. First of all, the second and third parts of the questionnaire were evaluated. The respondents' knowledge on sustainability, sustainable neighborhoods and sustainability assessment systems were revealed. Then, the evaluations that constitute the last part of the questionnaire, in which the order of importance of the criteria is revealed with

the Analytic Hierarchy Process (AHP) method, are presented. The findings are summarized in a common table at the end of the chapter.

In the fifth chapter, the results of the study and the literature are discussed. The shortcomings of the study are included and suggestions are made for future studies on the subject. Finally, the original value of the thesis is explained.

CHAPTER TWO
SUSTAINABILITY, SUSTAINABLE DEVELOPMENT AND URBAN ENVIRONMENT

For both academic field and policy makers, it's considered that the most important global problem of our time is climate change. From urban areas to ecological environments, the climate crisis which is considered as global warming and cooling is at the heart of the issue. In the face of the climate crisis, sustainable development is being demonstrated to solve this problem, from economy to social life, from the order of urban spaces to individual lifestyle. In this context, this chapter, which constitutes the conceptual and theoretical pillar of the thesis, examines the emergence of sustainable development, and discusses how they have reached their current definitions in the course of history. The steps in the transformation of concepts from idea to action were evaluated from international to local area. These are the conferences, treaties and negotiations that have taken place from the United Nations Stockholm Conference to the Copenhagen Mayors Consensus. In the light of these international events, the reflections of the relevant conferences in Turkey and the sustainable development approaches realized in our country are discussed in terms of laws, by-law, and regulations. The concept of sustainable spatial concept is evaluated and the concept of sustainable neighborhood scale is discussed. In the last part of the chapter, both local and international sustainable neighborhood green certificates are assessed to evaluate the parameters for a sustainable neighborhood.

2.1. Emergence of Sustainability

The Industrial Revolution which began in England in the late 18th century has been described as the greatest revolution in the perspective of the relationship between the economy and the environment that has ever occurred. During this period, the idea that for industrialization, humans need to manage the natural environmental order and transform the environment to maximize economic production became widespread (Du Pisani, 2006; Mohajan, 2019; Worster, 1993). For this reason, the need for raw materials and production have increased rapidly (Mohajan, 2019). As a result, uncontrolled population growth, unplanned structuring, rapid industrialization, unconscious use of resources and pollution have occurred.

Thus, the environment has been destroyed in an unprecedented way since industrial revolution (Du Pisani, 2006; Grubb, Koch, Thomson, Sullivan & Munson, 2019; Kaplan, 1999; Mebratu, 1998; Robinson, 1993; Sands & Peel, 2012; Talbot, 1980).

The theory that natural resources cannot meet the needs of a growing population in the cities was first put forward by Thomas Malthus in “An Essay on the Principle of Population” (1798). Malthus (1798) postulated that human population tends to grow in a geometric progression, while subsistence could grow in only an arithmetic progression. Therefore, population growth is likely to exceed natural resource capacity (Basiago, 1998; Eblen & Eblen, 1994). This assumption has been dismissed in the belief that it can be eliminated through technology (Mensah, 2019). However, in the face of the production, methods and mechanisms at the disposal of humanity, nature's capacity for self-preservation and regeneration has diminished, and environmental degradation in some areas has become almost irreversible (Baykal & Baykal, 2008). Approaches have developed leading to belief that humans cannot exist in this unbalanced production-consumption equation and that this way of life is not essentially "sustainable". With this change in nature, human-environment relations have started to be reconsidered, which has led to the emergence of the concept of "sustainability". Although the concept of sustainability reached its modern definition on a global scale after 1960, there were approaches, concepts and ideas that formed the basis of this definition prior to this date. The word "sustainability", derived from the Latin word "*sustinere*", meaning to protect, support from below, sustain, provide and continue (Harper, 2001; Onions, 1964).

Many environmental problems that are still being discussed today have existed since the dawn of humanity. In ancient Egyptian, Mesopotamian, Greek and Roman civilizations, problems such as deforestation and salinization of soils were the subject of discussion. Also, it’s known that the negative effects of agriculture, forestry and mining on the environment were analyzed by Plato, Strabo and Columella (Columella, 1948; Du Pisani, 2006; Strabo, 1949; Talbot, 1980; Van Zon, 2002). Later, with the development of trade, medieval cities began to emerge. Especially since the tenth century, the revival of trade in Europe increased the need for new transportation networks. This situation led cities began to grow, the balance between

production and consumption began to change (Huberman, 1936). By the end of the 18th century, the destruction of natural areas through logging increased due to mining and shipbuilding activities in Europe, especially in Germany. In 1713, due to the concerns arising from this consumption, some research used the concept of sustainability for the first time by referring to "*the balance between cutting down old trees and replacing them with a sufficient number of young trees*" (Hill, 1993; Pisani, 2006; Van Zon, 2002). According to another approach, sustainability as a notion emerged in the context of renewable resources such as forests or fisheries (Lélé, 1988).

An important development in the concept of sustainability being discussed in an international arena has been the Stockholm Conference (Basiago, 1998). Even though the relationship between environment and development is not a strong theme, there have been changes in the form of economic development (Mebratu, 1998). According to Handl (2012), the phrase "meeting the needs of the present generation while not jeopardizing the ability of future generations to meet their own needs", which is often used to define sustainable development, was the main goal of the Rio Conference and a strong sub-theme in the Stockholm Declaration (p.4). The Declaration states that through rational action, a better environment that meets the needs of both present and future generations can be achieved, and that this requires regular, diligent and determined work (United Nations [UN], 1972). Although the term "sustainable development" was not explicitly used, it found its first international definition at the Stockholm Conference, and the concept was significantly advanced by expanding the theme at the Rio Conference (Grubb et al., 2019; Handl 2012).

The main objective of the World Conservation Strategy (WCS) was stated as "achieving sustainable development through the conservation of living resources", and for the first time, the definition of sustainable development was fully defined in the international arena (Lélé, 1991; World Wildlife Fund [WWF]; 1980). The strategy retained the traditional concept of development as activities that "meet human needs and improve the quality of human life". In addition, it introduced a new understanding of sustainable development that includes social and ecological considerations (Robinson, 1993). Although there are many definitions of the concept

of sustainable development, the most widely quoted use of the concept today is "the process of meeting the needs of the present without sacrificing the ability of future generations to meet their own needs" and was put forward by the Brundtland Commission Report (Schaefer & Crane, 2005; UN, 1987).

Gilman (1992) defines sustainability as "refers to the ability of a society, ecosystem, or any such on-going system to continue functioning into the indefinite future without being forced into decline through the exhaustion or overloading of key resources on which that system depends". Tekeli (2001) defined the concept of sustainability as "a widely accepted moral principle that emerged within the environmental movement and whose content is constantly being redefined in the political process" (p. 729). Ruşen Keleş (1998) defined the concept of sustainability as "an environmentalist world view that aims to ensure economic development without sacrificing the principle of using environmental values and natural resources with rational methods in a way that does not lead to wastefulness, taking into account the rights and benefits of present and future generations" in his Dictionary of Urban Science Terms (p. 112). According to another approach, sustainability is defined as a participatory process that respects all resources such as natural, artificial, social, cultural, scientific, etc. and aims to use these resources in a healthy way (Viederman, 1994). In this context, the concept is related to sociology, anthropology, ecology, business, engineering, technology, health sciences, architecture, urban planning, economy, politics, law and many other disciplines. For this reason, it has a multidisciplinary structure (Bell & Morse, 2003).

As seen in all the definitions given above, it is possible to interpret the concept of sustainability as the protection and continuation of the resources of the system with economic, environmentalist and inclusive approaches for both today and the future, without sacrificing today and ignoring tomorrow. In this context, the definitions of "economy, society and environment" represent the three main components of sustainability. The relationship and balance of these components with each other constitute the basic mechanism of sustainable development (Figure 2.1). Over time, this relation has appeared in its original form or close variants in many studies (Connelly, 2007; Purvis, Mao, & Robinson, 2019). Another scheme derived from

this approach is the "Sustainable Development Triangle" of Munasinghe (1992). In this scheme, a new framework called "*sustainomics*" was adopted and inter-unit relationships and balances were put forward (Munasinghe, 1992, 2009).

Later evolved into Campbell's "planner's triangle", an early figure of space within a triangle, which addresses possible perspectives that urban and regional planners might adopt (Campbell, 1996; Connelly, 2007). In the diagram sustainable development is placed at the center as it may have potential and is characterized as a goal to be achieved.

Figure 2.1 Sustainable development (Created by the author using Bell & Morse, 2003; Connelly, 2007; Munasinghe, 1992, 2009; Serageldin, 1993; Wu, 2013)

To summarize, although it also has an economic aspect, the concept of sustainability has been at the center of environmental-human debates since its emergence. While population growth continues at a rapid pace, the amount of natural resources to meet human needs and desires is not increasing at the same rate, so it is argued that the importance of sustainable development is increasing day by day (Mensah, 2019). For this reason, these discussions, which started on a local scale, found their place in the international arena in the 20th century (Grubb et al., 2019). In this context, another important issue to be addressed in the transition of the concept of sustainability from idea to action is its global dimension.

2.2. Global Dimensions of Sustainability

With Great Britain's transition to machine-based production in the late 18th century, production capacity increased and the transportation of people and goods accelerated. With the concentration of production and labor in the centers, cities began to grow and rural-urban migration increased. Changing production relations and social structure radically altered rural and urban spatial organization. As a result, environmental problems began to signal themselves; inadequate regulations on waste management, increased pollution of limited water resources by sewage, problems in access to clean air or sunlight, and many other problems emerged. During this period, typhus and smallpox epidemics began to spread, and mortality rates increased rapidly with the emergence of cholera due to contaminated water resources. With rapid urbanization and developing trade routes, epidemics spread rapidly (Gallion, 1950; Hall, Hall, & Tewdwr-Jones, 2019). In 1842, Edwin Chadwick published a report revealing the link between the increasing labor population and the unfavorable living conditions in cities and these epidemics (Chadwick, 1843; Peterson, 2003). In 1854, British physician John Snow concluded that the main source of the cholera epidemic was urban infrastructure as a result of his studies in London (Koch, 2004; Parkes, 2013; Snow, 1849). Again in this period, the Royal Commission on the Health of Towns published reports to find solutions to urban health problems and these reports were among the documents that laid the foundations of modern urban planning (Hall, et al., 2019).

Another international initiative was the first International Conference for the Protection of Nature, held in Bern in 1913, at which the Commission for the Protection of Nature was established for the first time. During the First World War, a halt in international work was observed, and after the war, the second International Conference for the Protection of Nature was held in Paris in 1923. The 1930s were predominantly consisted of studies on the conservation of plant and animal species (International Union for the Conservation of Nature [IUCN], 1988; Ross, 2015; Sarasin, trans. 1911).

The "*Green Revolution*" began in Mexico in the 1940s with innovations in agricultural practices to meet the need for food arising from the rapid increase in the

world population (Evenson & Gollin, 2003; Patel 2013; Pingali, 2012). In 1962, Rachel Louise Carson wrote her work "*Silent Spring*". This work, which made a great impact especially in the western world, focused on the increasing use of pesticides and their environmental damage through the Green Revolution. In this way, her book became an important turning point in the field of "environment" (Carson, 1962). In 1968, "*The Population Bomb*" was written by Paul Ehrlich. The book dealt with the relationship between rapid population growth and environmental problems, especially ecosystem degradation and depletion of natural resources (Ehrlich, 1968). G. Hardin's "*The Tragedy of Commons*", B. Commoner's "*Science and Survival*" and H. Odum's "*Environment, Power and Society*" are also valuable works that shed light on the ecology movement that was written towards the end of the 1960s and became widespread. These works have been scientific and educational tools of the change in the environmental protection movement that was observed in the world in the late 1960s (Araral, 2014; Buck, 1985; Commoner, 1966; McCormick, 1991; Odum, 2007; Rome, 2003).

After the emergence of the "Wave of Economic Growth" in the 1950s which swept the world, the "Wave of Education and Training" in the 1960s gave way to the "Wave of Environmental Protection" in the 1970s (Binswanger, Bonus, & Timmermann, 1981). While the discussions on environmental protection in the 60s were mostly centered on the human-nature relationship, away from the intense interest of the public, the 70s was a period in which solutions were proposed rather than identifying the problem. At this point, the understanding of "nature conservation", which gained momentum in the late 1960s, was replaced by "ecological approach models" in 1970. In this framework, the second generation of works include the "*The Limits to Growth*" Report published by the Club of Rome, E. Goldsmith's "*A Blueprint for Survival*", B. Ward and R. Dubos' book "*Only One Earth*", E.F. Schumacher's "*Small Is Beautiful*", F. Schumacher's "*A Guide for the Perplexed*" (Du Pisani, 2006; Goldsmith, Allen, Allaby, Davoll, & Lawrence, 1972; Meadows, Meadows, Randers, & Behrens, 2018). In particular, "The Limits to Growth" report was the turning point of this movement. The report published by the Club of Rome in 1972 contains warnings about the consequences of humanity approaching and exceeding global ecological limits (Beder, 2013; Du Pisani, 2006;

Kaplan, 1999; Meadows & Randers, 2012; Mebratu, 1998; Purvis et al., 2019). In these years, when the environmental movement transformed into a more holistic approach in a short time, the first "Green Party" was founded in New Zealand in 1972, triggering similar initiatives in the UK, Germany, France and other countries in the following years. This process had a great impact on the western world until the 1990s (Downes, 2000; Kriesi, Koopmans, Duyvendak & Giugni, 1992).

In 1971, the "Man and the Biosphere Programme" (MAB) was launched at the UNESCO General Assembly. At the conference, many experts came together and carried out an international research program on man and the biosphere. This conference also shed light on the United Nations Stockholm Conference in 1972 (Bridgewater, 2016). From another perspective, the MAB Program is also considered an early experiment in the movement of international scientific cooperation towards an intergovernmental environmental arena (Ishwaran, 2012).

Another international activity is the Ramsar Convention, which was adopted in 1971 and Turkey joined the convention in 1994. The convention deals with the protection of waterfowl, which are particularly dependent on wetlands, and their protection and management (Gardner & Davidson, 2011).

The concept of sustainability has been defined in many different ways and its boundaries have been drawn until it reached its modern meaning, which has been used on a global scale since the world has existed. In line with the above, the steps in the evolution of the concept of sustainability are brought together in Figure 2.2 by considering the time relationship.

Figure 2.2 Emergence of the concept of sustainability (Created by the author using sources: De Bont, Schleper, & Schouwenburg, 2017; Du Pisani, 2006; IUCN, 1988)

All the above-mentioned studies in the evolution of the concept of sustainability from idea to action show that as environmental problems grew and deepened, the borderless nature of the problems was realized and thus, national and international efforts were made to solve the problem (Grubb et al., 2019; Najam & Cleveland, 2005). In general terms, the publications, green party movement and conventions written in the late 1960s led to an awakening in the world. It paved the way for many political movements, international organizations and congresses that followed. At this point, the United Nations Stockholm Conference, World Conservation Strategy Report, Our Common Future (Brundtland) Report, Rio Conference, Habitat I Summit, Habitat II Summit, Johannesburg Summit, Rio +20 Summit, Agenda 2030, Habitat III, Copenhagen Mayors Consensus, Kyoto Protocol and Paris Agreement

outputs and discussions, which are important milestones in the evolution of sustainability thinking, are important developments that need to be examined.

In 1968, the Swedish Government issued a call and proposed to organize a conference on the grounds that human-induced degradation of the natural environment was occurring and could only be solved through international cooperation. The United Nations Conference on the Human Environment was held in Stockholm on June 5-16, 1972 (UN, 2012). The Stockholm Conference serves as a guide for the protection and improvement of the environment, prevention of damage and promotion of environmental protection in the global dimension of sustainability. In this context, the detection and control of pollutants with international dimensions and the effects of action recommendations on international organizations are the main agenda items of the conference (Grubb et al., 2019; Handl, 2012; UN, 1972).

The Stockholm Declaration was the first global summit to address the relationship between environment and human beings by setting forth the principle that human beings have the fundamental right to liberty, equality and an environment conducive to dignity and well-being. In this context, the Stockholm Conference, which addressed the concept of "right to the environment" for the first time in the international arena, became a turning point in international environmental law, global climate-environment policies and the green movement (Bacon, 1975; Kaplan, 1999; Pallemaerts, 2014; Purvis, et al., 2019; Sands & Peel, 2012; UN, 1972). As a result, it served as a catalyst for other global environmental agreements and paved the way for the 1992 Rio Declaration (Kaplan, 1999; Pallemaerts, 2014).

The Stockholm Conference brought together the governments of both developing and developed countries for the first time in the international arena on the axis of the relationship between development and the environment. Originally the conference tried to promote North-South dialogue (Roe, 2008; Strong, 1977). At the conference, it was argued that environmental degradation was political in nature and that the main dynamics of international politics, such as the Cold War, the arms race, war and peace debates, and the oil crisis, were related to environmental degradation in the conjuncture of the period (UN, 1972). On the axis of these, the main issue to be addressed by developing countries was seen as underdevelopment, poverty and

related environmental factors. Developing countries' interest in the environment increased rapidly after they recognized that development directly affects the environment, either positively or negatively (Sanderson, & Redford, 2003; Strong, 1977). This increasingly strong role of developing countries in the United Nations Environment Programme paved the way for non-governmental organizations that previously did not have access to the UN system and led to the birth of many organizations (Grubb et al., 2019; Strong, 1977). The United Nations Environment Programme (UNEP) is considered one of the most important outcomes of the Stockholm Conference (Hierlmeier, 2001). Its structure was defined as to increase international cooperation on the environment, to advise on environmental policies and to provide guidance and cooperation on environmental issues within the UN. In a sense, it is aimed to be the ecological conscience of the world and the center of gravity of the environmental movement (Bacon, 1975; Kaplan, 1999; United Nations Environment Programme [UNEP], 1975; Sands & Peel, 2012; Wakefield, 1982).

The World Conservation Strategy (WCS), another important step in the global dimension of sustainability, was published in 1980 through IUCN, UNEP and WWF. It was the first influential document that bridged the relationship between conservation and development that had been discussed throughout the 1970s (IUCN et al., 1980; Robinson, 1993; Roe, 2008). In this sense, conservation and development are considered as a mutually interdependent process. The strategy addressed issues such as the conservation of biodiversity, the sustainable use of species and ecosystems, and the maintenance of basic ecological processes, emphasizing the integration of conservation with development (Eidsvik, 1980; IUCN et al., 1980; Robinson, 1993; Talbot, 1980). At the same time, the strategy established the first linkages between poverty and ecological impacts, an important milestone in the debate on environmental protection and poverty (IUCN et al., 1980; Roe, 2008).

Another important document on sustainability was published by the World Commission on Environment and Development (WCED) in 1987 under the title of "Our Common Future" (UN, 1987). The concept of “sustainable development” was first defined in this report, also known as the Brundtland Report, thus reaching the

most common modern definition used today (Pezzoli, 1997; Redclift, 2005; Schaefer & Crane, 2005; Serageldin, 1993; UN, 1987). Prepared at a time when the resource-need balance was shaken and economic problems, especially the oil-related debt crisis, were on the agenda, the report, unlike the Stockholm Declaration, addressed the relationship between development and the environment in reverse, and associated the deteriorating environmental situation with global macroeconomic conditions. Unlike previous studies, the report advocated development in order to reduce poverty and the environmental degradation that developed as a result. In this context, resources, environment, politics and economy are considered in relation to each other and solutions are offered (Burton, 1987; Grubb et al., 2019; Holden, Linnerud, & Banister, 2014; Keeble, 1988; UN, 1987).

The United Nations Conference on Environment and Development (UNCED) was held in Rio de Janeiro in 1992, exactly 20 years after the Stockholm Conference (UN, 1992). The contribution of the conference, also known as the Earth Summit, to international environmental policies can be summarized in two important points (Von Weizsaecker, 1992). The first of these is that the conference is the most attended meeting of the United Nations. In this respect, the Rio Summit revealed that sustainable development can be achieved in a global partnership, and prioritized the participation qualities of non-governmental organizations (Kaplan, 1999; Pezzoli, 1997; Redclift, 2005; Wirth, 1995). The importance of participation was re-emphasized with Agenda 21, and an action plan covering both industrialized and developing countries was put forward. In this sense, duties and responsibilities have been imposed on all states, regardless of the level of development, and it is aimed to use resources in a way that can be left to future generations (Grubb et al., 2019; Kaplan, 1999; Pezzoli, 1997; Wirth, 1995). The second important contribution of the Rio Conference was that it effectively brought up issues such as technology, foreign trade, traffic, and energy policies (Kaplan, 1999; UN, 1992).

The main purpose of Habitat I, which took place in Vancouver in 1976, is a sustainable urbanization model that is in accordance with human fundamental rights, addressed with a global partnership. The chapter of Agenda 21 on promoting the development of sustainable human settlements provided an important basis for this

goal (UN, 1976). The United Nations Conference on Human Settlements II was held by the United Nations in 1996 and was hosted in Istanbul, Turkey. At the Habitat II Summit, the two main goals that stood out were "adequate housing for all" and "sustainable human settlements" (UN, 1996). Along these lines, sector-based development interventions have been adopted, which mainly target the housing problem. In addition, determining the place of individuals in the city through democracy, strengthening local governments and participation were also discussed (Birch, 2016; Cohen, 2016; Parnell, 2016; Tekeli, 1996; Tekeli, & Keleş, 2015).

The World Summit on Sustainable Development was held in Johannesburg in 2002 (UN, 2002). The meeting is also known as Rio+10 and aims to evaluate Agenda 21 (Potschin & Haines-Young, 2006). The aim of the Johannesburg Summit is not only to question Agenda 21, but also to create an action plan that will operationalize commitments and implementation mechanisms. In this direction, an implementation plan has been created in which the actions of enterprises, companies, non-governmental organizations and international organizations are defined. Consequently, the framework for how to implement the agreed assumptions on sustainable development was drawn. However, due to the slow progress of the meeting and the lack of consensus on the objectives, the intended result could not be achieved (Najam et al., 2002; UN, 2002; Von Frantzius, 2004). The Report of the World Summit on Sustainable Development, which is another important outcome of the summit, stated: "Recognizing the importance of building human solidarity, we urge the promotion of dialogue and cooperation among the world's civilizations and peoples, irrespective of race, disabilities, religion, language, culture or tradition" (UN, 2002, p. 3). In this context, the global partnership, which started with the Brundtland Report and gained momentum with the Rio Summit, continued to be nurtured by participants from all groups (Najam et al., 2002; Potschin & Haines-Young, 2006; UN, 2002; Von Frantzius, 2004).

Another sustainability summit, the United Nations Summit on Sustainable Development, was held in New York in 2015. At that summit, "The 2030 Agenda for Sustainable Development" was adopted, following the United Nations Millennium Declaration adopted in 2000. The 2030 Agenda for Sustainable Development

consists of 17 main goals and 169 sub-targets (Figure 2.3). While each of these goals is crucial, Sustainable Development Goals (SDGs) 3,6,7,9 and 11 are the ones that need to be addressed specifically in the context of sustainable neighborhoods. (UN, 2015b).

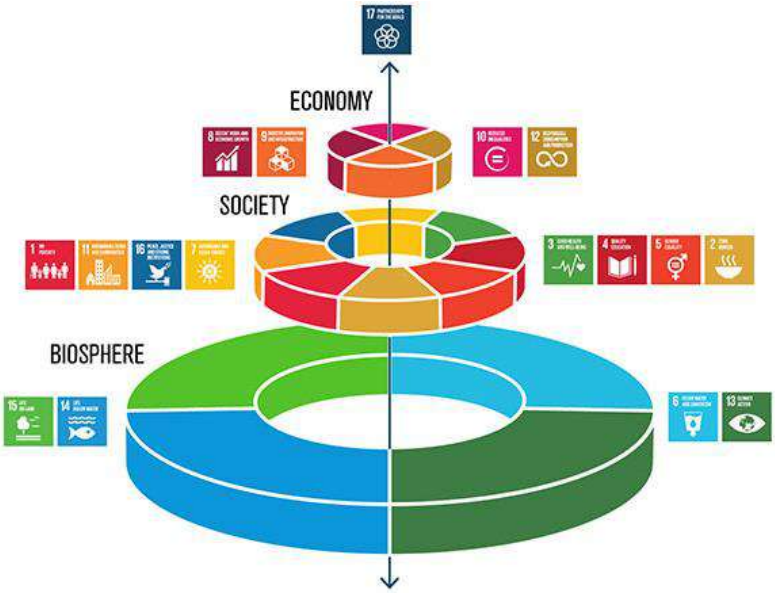


Figure 2.3 The SDG, wedding cake model (Obrecht, et al., 2021)

In the SDG 3, the aim is to promote healthy living for people of all ages. To this purpose, it is aimed to reduce maternal and newborns mortality, infectious and non-communicable diseases, especially AIDS, and substance abuse. In this context, it is targeted that health services for all can be improved and made accessible (UN, 2015b).

SDG 6, aims to ensure that everyone has access to safe water by 2030. It aims to protect, improve and manage water resources. International cooperation is expected to be increased, especially for disadvantaged groups to have access to safe water (UN, 2015b).

SDG 7 aims to ensure access to sustainable modern energy for all by 2030. To this end, it aims to increase the share of renewable, clean and affordable energy sources (UN, 2015b).

In the SDG 9, the context of infrastructure, industrialization and innovation; more inclusive, sustainable and resilient activities are targeted with approaches that consider environmental impacts in the medium and long term. It has been demonstrated that the short-term expenses incurred for this purpose will result in long-term savings (Halkos & Gkampoura, 2021; Obrecht, et al., 2021; UN, 2015b).

In the SDG 11, the main goal is to make cities and human settlements inclusive, safe, resilient and sustainable. In line with this goal, 10 subheadings are presented and these subheadings are set out in Figure 2.4 (UN, 2015b).

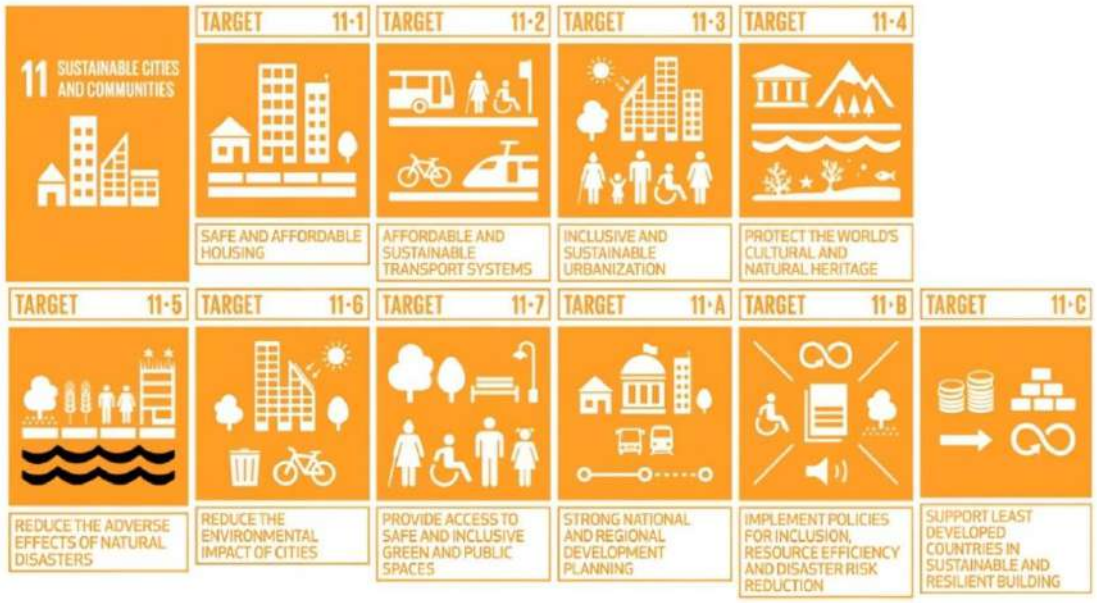


Figure 2.4 Sustainable development goal 11 (Created by the author using UN, 2015 source)

With the rapid growth of the world's population, the need for sustainable urbanization that will provide safe, affordable and durable housing for everyone is becoming more apparent. SDG 11, which was created for this purpose, is an important step for many countries considering the place of the future urban population in the total population (Flood, 1997; Halkos, & Gkampoura, 2021; Obrecht, et al., 2021; UN, 2015b). However, the biggest shortcoming of SDG 11 is data access, as it targets directly at the urban level. While official statistics are generally more easily available at the national level, they are more difficult to collect

at the city or regional level. The interaction between global, national and especially local scales is the most fundamental point for SDG 11, so the relationship between administrative units is another prominent element (Biermann, Kanie, & Kim, 2017; Janoušková, Hák & Moldan, 2018; Koch, & Krellenberg, 2018; Simon, et al., 2016; Tosun & Leininger, 2017).

Two months after the summit, the Paris Agreement was signed at the Paris Conference on Climate Change also known as COP21 in 2015, and was approved by the Presidential Decree in Turkey in 2021 (Official Gazette [RG], 2021, Turkish Ministry of Foreign Affairs, 2022; UN, 2015a). The two main topics of the conference are limiting the temperature increase to 2 °C compared to the pre-industrial period and the amount of funds that developed countries will provide to developing countries. In this context, the lack of any legally binding aims and the absence of a mandatory amount of the targets are the shortcomings of this agreement (Milman, 2015; Rhodes, 2016; Savaresi, 2016; Schleussner, et al., 2016). The UN Climate Change Conference, in which Turkey also participated, was held in Dubai in its most recent form in 2023. At the conference, also known as COP28, a roadmap for the transition away from fossil fuels was approved, funds for loss and damage reduction were adopted, plans for the protection of the global food and water system were carried out, support steps for developing countries were discussed, and the energy transition was evaluated (Arora, 2024; Jiang, et al., 2024; UN News, 2023).

Habitat III took place in Quito in 2016 and hosted participants from many units, including civil society organizations, local government, academics, foundations, women, youth groups, trade unions and the private sector. The meeting, also known as the UN Conference on Housing and Sustainable Urban Development, focused on combating inequalities and poverty, sustainable urbanization, the creation of a new urban agenda and the evaluation of previous studies. The New Urban Agenda (NUA), includes the definition of sustainable urbanization; job creation, livelihood opportunities and improving the quality of life. In this way, it re-underlined the goal of sustainable cities and communities in SDG 11 (UN, 2016a, 2016b). However, the fact that the NUA does not determine the order of importance among its 150 items,

does not provide financial mechanisms and implementation tools are important shortcomings of this this document (Revi, 2016).

The Copenhagen Mayors' Consensus was organized by The World Health Organization (WHO) in 2018. The consensus is based on the United Nations 2030 Sustainable Development Goals and the European policy framework and strategy entitled Health 2020. Approaches to improve health and well-being, which are considered as one of the prerequisites for a sustainable society, in cities and urban areas were put forward. Within the framework of the Consensus, urban design is addressed with an egalitarian, inclusive and healthy city approach. It has been committed to adopt approaches where the materials and application methods used in the design and construction of urban areas are the healthiest, most cost-effective, most practical and most accessible. An urban approach that takes air and water quality into consideration, develops a waste policy, has sustainable transportation and infrastructure was adopted. In addition to these, an approach that consumes as much energy as it produces and prioritizes people and our world was put forward (World Health Organization [WHO], 2018).

Kyoto protocol was adopted in 1997 and Turkey became a party to it in 2009 (RG, 2009). The Protocol aims to reduce the greenhouse gas emissions of developed countries by at least 5% in the period 2008-2012 compared to 1990 levels (UN, 1998). The Protocol has been found economically inefficient and politically unworkable due to its strict targets despite uncertainties about climate change, exclusion of major developing countries, implementation and adaptation problems, the withdrawal of the United States from the agreement in 2001, focus on carbon in consumption rather than production, lack of technological innovations, limited scope and lack of long-term commitments (Böhringer, 2003; Helm, 2008; McKibbin & Wilcoxen, 2002; Nordhaus, 2006; Rosen, 2015).

The concepts of sustainability and sustainable development have been the main theme of many conferences and treaties since the Stockholm Conference. The conferences and treaties mentioned above are classified in Table 2.1 in terms of their articles on the relationship between sustainability and the city. In Figure 2.5, they are brought together by considering the time relationship.

Table 2.1 Clauses about sustainability and the city

CONFERENCES AND AGREEMENTS	MAIN TARGET	DATE	LOCATION
United Nations Conference On The Human Environment (UN, 2012a)	Awareness of environmental rights, the relationship between development and environment in industrialized and developing countries, establishment of UNEP	5-16 June 1972	Stockholm
The World Conservation Strategy (IUCN et al., 1980)	The bridge between environmental protection and development, preserve genetic diversity, ensure the sustainable utilization of species and ecosystems	1980	X
Our Common Future (UN, 1987)	Strengthening global cooperation and increasing engagement, linking the deteriorating environmental situation to global macroeconomic conditions	1987	X
United Nations Conference On Environment And Development (UN, 1992)	United nations framework convention on climate change, Agenda 21, global partnership	3-14 June 1992	Rio de Jenario
United Nations Conference On Human Settlements: Habitat I (UN, 1976)	Addressing sustainable urbanization through global partnership	31 May-11 June 1976	Vancouver
United Nations Conference on Human Settlements: Habitat II (UN, 1996)	Adequate housing for all, viable human settlements in a changing world	3-14 June 1996	Istanbul
World Summit On Sustainable Development (UN, 2002)	Recognizing the importance of building human solidarity, poverty eradication and sustainable development confronting all humanity	26 August-4 September 2002	Johannesburg

Table 2.1 Clauses about sustainability and the city -*continues*

CONFERENCES AND AGREEMENTS	MAIN TARGET	DATE	LOCATION
United Nations Conference On Sustainable Development (UN, 2012b)	Green economic policies, strengthening sustainable development, combating poverty, policies to eliminate inequalities, the importance of participation	20-22 June 2012	Rio de Janeiro
United Nations Summit On Sustainable Development (UN, 2015b)	By 2030, providing basic housing services, sustainable transportation, inclusive and sustainable urbanization, sustainable urban transformation, accessible green spaces for all individuals	25-27 September 2015	New York
UN Conference On Housing And Sustainable Urban Development: Habitat III (UN, 2016a, 2016b)	Combating inequalities and poverty in the context of sustainable development, sustainable urbanization, creating a new urban agenda	17-20 October 2016	Quito
Copenhagen Consensus of Mayors (WHO, 2018)	Urban design addressed with an equitable, inclusive and healthy city approach	13 February 2018	Copenhagen
The Kyoto Protocol (UN, 1998)	Limit and reduce greenhouse gases (GHG) emissions in accordance with agreed individual targets	11 December 1997	Kyoto
The Paris Agreement (UN, 2015a)	The increase in the global average temperature to well below 2°C above pre-industrial levels	12 December 2015	Paris

At this point, it is possible to say that Local Agenda 21 (LA21) practices have had a significant impact on local governance and have encouraged many local initiatives that are focused on sustainable development, when the relationship between objectives and implementation from the Rio Summit in 1992 to the Rio+20 Summit

in 2012 is evaluated. On the other hand, it has also been found that LA21 practices are far from fitting the intended ideal model and progress in terms of participation has been limited, as LA21 is very ambitious, demanding and innovative compared to conventional local governance practices (Barrutia, Echebarria, Paredes, Hartmann, & Apaolaza, 2015).

Another issue that should be considered when addressing the goal rationality of conferences is the Millennium Development Goals (MDGs) adopted at the Millennium Summit in 2000. In this context, it was found that progress on the MDG environmental targets was uneven across countries, regions and issues, with European countries generally outperforming the Rio targets, and Middle Eastern and North African countries underperforming (Hsu, Lloyd, & Emerson 2013). This may be attributed to the fact that data accessibility, timeliness and reliability in the evaluation of implementation reports on the MDGs are inadequate, especially in less developed countries (Attaran, 2006; Dar & Khan, 2011; Easterly, 2009; Flood, 1997; Reddy, & Heuty, 2008; Sachs, 2012), targets are presented as general objectives rather than concrete policy changes and therefore lack clarity, and economic, social and environmental aspects are not included in the targets (Fukuda-Parr, 2006; Gil-Gonzalez, Ruiz-Cantero & Alvarez-Dardet, 2009; Waage et al. , 2010), short-term plans overriding long-term goals (Bond, 2006; Van Norren, 2012; Waage et al., 2010), and rapid solutions leading to uncoordination (Klopp, & Petretta, 2017; Fehling, Nelson, & Venkatapuram, 2013; Maxwell, 2003). As a result, all of the above-mentioned studies have revealed the gap between aims and practices.

Another important topic to be addressed is the SDGs in the 2030 Agenda for Sustainable Development. The SDGs differ from the MDGs that preceded them in that they are more inclusive, have clearer boundaries for targets with economic, social and environmental dimensions, include advanced data systems and evaluate development together with the economy. The logic of the sustainable city, which was put forward with Habitat II and generally focused on housing, was abandoned and the idea of the sustainable city, which includes the obligation of universal sustainable development covering the entire north and south, was adopted with the SDGs (Klopp, & Petretta, 2017; Koch, & Krellenberg, 2018; Parnell, 2016).

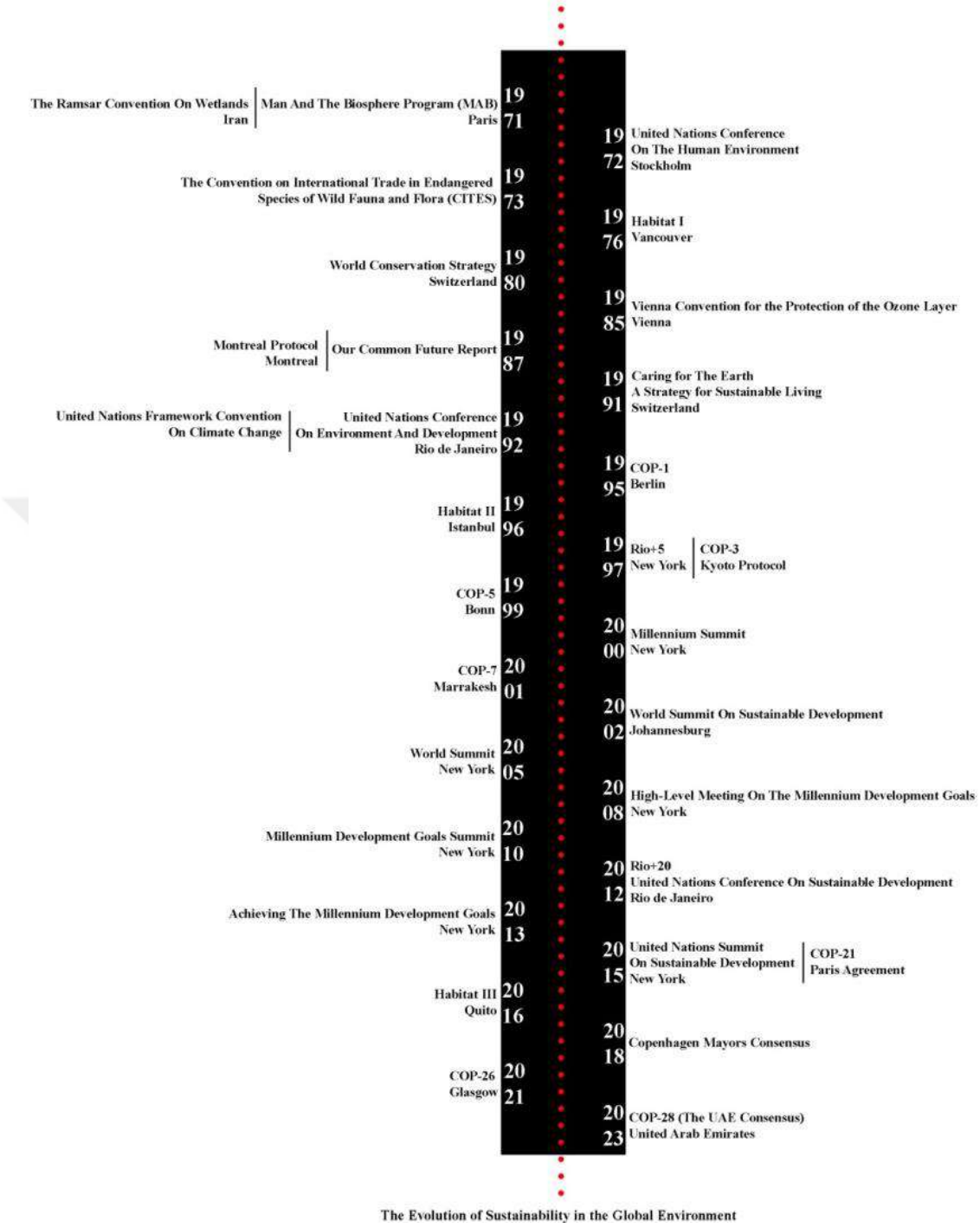


Figure 2.5 The evolution of sustainability in the global environment (Created by the author using sources from Harrison, 2021; McGuinness Institute [MGI], 2024)

In summary, in the light of all these conferences and agreements on the concept of sustainability and sustainable development, it is seen that global awareness should be developed first to solve environmental problems. The economic and technical

support relationship between developed and developing countries has been one of the most debated issues in the above conferences and treaties. In conjunction, it is aimed to include all segments of society in the process within the framework of their independent roles, responsibilities and social cooperation to establish a governance pillar and thus to increase participation. Added to that, preservation of peace, equality and environmental justice are other widely discussed issues. Improving education on a global scale, raising environmental awareness and each country doing its part are common solutions to the process (UN, 1972, 1975, 1976, 1987, 1992, 1996, 2002, 2012, 2015a, 2015b). An important piece of information that this whole process has taught is that the policy decisions taken must be localized and reflected in the urban space. It can be understood that urban design is an important tool for this.

In order to address the reflections of the above-mentioned common solutions in Turkey, it is necessary to evaluate the sustainable development approaches put forward in our country.

2.3. Sustainable Development Approaches in Turkey

The roots of environmental regulations in Turkey can be traced back to the Ottoman period. The initiatives taken during the reign of Sultan Mehmet the Conqueror regarding the protection of green areas and the cleaning and control of the Golden Horn, the measures taken against deforestation during the reigns of Suleiman the Magnificent, Selim II and Abdul Hamid II, the protection of resources, especially water, and the regulations on air pollution are considered as the first examples of the subject. In addition to these, "The Forest Regulation", which also deals with environmental protection, came into force in 1869 and "The Ebniye Law" (Building and Roads Law) in 1882 (Özcan, 2006; Şengün, 2015).

From the proclamation of the Republic until the adoption of the 1961 Constitution, environmental protection awareness and ecological sensitivity gradually gained a foothold both on an international scale and in Turkey, and an effective environmental policy was tried to be established (Çolakoğlu, 2010). The Municipality Law No. 1580, The Public Hygiene Law No. 1593 and The Zoning

Law No. 6785 are important steps taken in this process. Article 15 of The Municipality Law No. 1580, which came into force in 1930, explains the duties of the municipality and assigns important duties to local governments regarding the cleaning and regulation of the environment (RG, 1930). The Law No. 1593 on Public Health and Hygiene, adopted in the same year, set forth regulations on human health and included measures for the cleanliness and regulation of the environment. Special provincial and village administrations, municipalities and the Ministry of Health were assigned to carry out these measures (RG, 1930). In order to solve the problem of rapid urbanization caused by increasing industrialization, the Zoning Law No. 6785 was adopted in 1956 (RG, 1956; Şen, 1995). With this law, municipalities were assigned to make zoning plans and planned urbanization was targeted (RG, 1956). Following this step, The Ministry of Zoning and Settlement was established in 1958 with Law No. 7116 and authorized to plan villages, towns, cities and regions (Ministry of Environment and Urbanization [ÇŞB], 2022).

Article 49 of the 1961 Constitution of The Republic of Turkey states that "The State has the duty to ensure that everyone can live in good physical and mental health and receive medical care." The relationship between human health and clean environment is included in this article. In this respect, the right to environment is considered within the scope of the "right to health" (Çolakoğlu, 2010). In 1966, the Slum Law No. 775 was adopted, aiming to prevent unplanned urbanization and environmental degradation (RG, 1966). With the Law No. 1380 on Fisheries adopted in 1971, the process regarding the production of fishery products was regulated in the light of environmental protection awareness (RG, 1971).

Up to 1970, the above-mentioned laws and provisions were implemented by the relevant ministries or institutions, and environmental studies progressed in a disorganized and discrete manner (Özdemir, 1988). After 1970, increasing sustainable development approaches in the global arena and growing awareness of environmental problems had an impact in Turkey, and the principles and decisions taken at the 1972 Stockholm Conference were an important turning point in this sense (Altunbaş, 2003). Accordingly, the "Coordination Board for Environmental Problems" was established in 1973 as the first independent organization related to the

environment in Turkey. In 1974, it became the "Environment Coordination Board" by another decision taken (ÇŞB, 2022). Later on, Prime Ministry Environment Organization was established in 1978 with The Council of Ministers Decree 16041. The main objective in the establishment of this organization was to determine and plan Turkey's national and international environmental policy. At the same time, the main objective of this organization was to ensure the integration between the ministries along with the relevant institutions in the implementation of the projects and plans created for this purpose. It was later elevated to the level of Undersecretariat with a decision taken (ÇŞB, 2022; RG, 1978).

Article 56 of the Constitution of the Republic of Turkey adopted in 1982 states that "Everyone has the right to live in a healthy and balanced environment. It is the duty of the State and citizens to improve the environment, protect environmental health and prevent environmental pollution." With this article, which directly includes the right to the environment, environmental protection and development was included in our constitution for the first time. At the same time, the participation of both individuals and public institutions was underlined. The need for an environmental legislation that includes the principles of implementation arose with this article (Budak, 2000; Çolakoğlu, 2010; Demiral & Evin, 2014).

For this purpose, The Environmental Law No. 2872 was adopted on August 9, 1983. In Article 1 of the Law, the protection as well as improvement of the environment, management of land and natural resources, protection of historical or natural riches are addressed. An approach covering the present and future generations was also included (RG, 1983). In 2006, the purpose of our national environmental policy was defined by the regulations of The Environmental Law No. 5491. In the late 1980s, the effects of the international acceptance of the concept of sustainability were included in the definition (Keleş, 2023; RG, 2006). The purpose of the law is stated in Article 1 as to ensure the protection of the environment, which is the common asset of all living things, in line with the principles of sustainable environment and sustainable development (RG, 2006). With the Environmental Law, the public, local administrations, non-governmental organizations and professional organizations were included in the subject with a holistic approach. The importance

of participation was reasserted, the principle of sustainable development was taken as a basis in the decision-making process and the use of green technologies was stipulated for waste. Again, with the regulation adopted in 2006, education planning was made in order to raise environmental awareness, and it was taken as a principle to broadcast programs on radio and television on the importance of the environment and raising environmental awareness (Keleş, 2023; RG, 2006). In 2023, with the Ministry of Environment, Urbanization and Climate Change's Communiqué on the Recycling Participation Fee Amounts to be Collected Pursuant to the Environmental Law No. 2872 published in the Official Gazette No. 32414, the Environmental Law took its current form (RG, 2023).

In the late 1980s, the reflections of the globally accepted concept of sustainability found a place in the Zoning Law No. 3194, which entered into force in 1985. In 1956, with the Zoning Law No. 6785, the authority to make plans started to be delegated to local governments. In the following period, with the Zoning Law No. 3194, the integrated realization of sustainable urbanization was set as the main objective. In this context, zoning planning started to be carried out as a system, and all regions within and outside the scope of the plan were considered as a whole. It was aimed to accelerate the procedures carried out with increased powers in municipalities and governorships. However, as a result of our country's inability to adequately follow the advancing concepts of strategic spatial planning and sustainable integrated urban structuring in the world, the planned target could not be fully achieved. For this reason, the relations between the units were revised in order to establish the relationship between plans, projects, urban vision and perspective and to carry out inspections regarding the implementation of the zoning law (Kayahan, 2019).

Until the 1980s, organizations established to protect the law could only operate to a limited extent in respect of their authority, staff and facilities, and a holistic public organization could not be fully established (Şen, 1995; Şengün, 2015). For this purpose, the Prime Ministry Undersecretariat of Environment was transformed into the General Directorate of Environment in 1984 in order to implement the Environmental Law, but it was raised to the level of Undersecretariat again in 1989

with the Decree Law No. 389. Subsequently, it was aimed to elevate environmental management to the level of a ministry, and the Ministry of Environment was established on August 9, 1991 with the Decree Law No. 443 (RG, 1991). With this decision, the Undersecretariat of Environment was closed down by transferring its duties and authorities to the Ministry of Environment (ÇŞB, 2022; RG, 1991). It is possible to evaluate the establishment of the Ministry of Environment as a significant progress in terms of strengthening environmental policies and environmental protection approaches.

The Ministry of Environment and the Ministry of Forestry were merged in 2003 and forest and environmental management was centralized. In 2007, the General Directorate of State Hydraulic Works joined the Ministry of Environment and Forestry. In 2011, with the Decree Law No. 636, the Ministry of Environment, Forestry and Urbanization was established, and one month after this decision, a new Decree Law separated environmental management again. Departments were separated The Ministry of Forestry and Water between The Ministry of Environment and Urbanization (RG, 2011). The environmental wing of the Ministry of Environment and Forestry and the Ministry of Public Works and Settlement formed the Ministry of Environment and Urbanization. On October 29, 2021, with the Presidential Decree No. 85, it was renamed as the Ministry of Environment, Urbanization and Climate Change (ÇŞB, 2022).

Another important issue to be considered when evaluating sustainable development approaches and environmental policies in Turkey is the five-year development plans prepared by The State Planning Organization. Just before the 1961 Constitution came into force, the State Planning Organization was established on 30 September 1960 with Law No. 91. With this organization, the planned progress of economic, social and cultural development was aimed and development plans were prepared for this purpose. Environmental problems, which were not included in the first two development plans, were addressed for the first time in the Third Five-Year Development Plan covering 1973-1977 after the 1972 Stockholm Conference (Altunbaş, 2003; Şen, 1995). Until the Fifth Five-Year Development Plan, environmental problems were generally addressed through environmental

health. With the fifth five-year plan, which coincided with the periods of increasing urbanization, the importance given to the environment increased for the first time and preventive policies regarding environmental problems started to be developed (Güleç & Sürmeli, 2015). In the light of the 1992 Rio Conference's global impacts, the Sixth, Seventh and Eighth Five-Year Development Plans aimed to implement environmental policies in line with the principles adopted by the United Nations and the European Union (Altunbaş, 2003). Until 2024, in other development plans, the widespread use of smart technology and the principle of sustainable development were pursued as environmental policies (Çelikyay, 2021). In its current form, the Twelfth Development Plan for the years 2024-2028 was adopted by Law No. 1396. While defining the vision of the development plan, "an environmentally sensitive Turkey" was emphasized and sustainable development principles were taken as basis (Presidency of the Republic of Turkey, Department of Strategy and Budget [SBB], 2023).

The laws, conventions and regulations in the context of sustainable development approaches in Turkey discussed above are listed in Table 2.2 based on the year of publication in the Official Gazette.

Table 2.2 Table of laws and regulations regarding sustainable development in Turkey (Created by the author using the sources Çelikyay, 2021; Özmehmet, 2005; Yücel and Babuş, 2005)

NAME OF THE REGULATION	ACCEPTANCE		LEGAL GAZETTE		KEYWORDS
	DATE	NO	DATE	NO	
General Public Health Law	24.04.1930	1593	6.05.1930	1489	Regulations on human health, measures for the cleanliness and regulation of the environment
Forestry Law	31.08.1956	6831	8.09.1956	9402	Determination and management of the qualities of the forest concept
Law On Groundwater	16.12.1960	167	23.12.1960	10688	Determination of groundwater operation areas, defining the powers of the General Directorate of State Hydraulic Works
The Constitution	9.07.1961	334	20.07.1961	10859	Article 49: “The State has the duty to ensure that everyone can live in physical and mental health and receive medical care.”
Slums Law	20.07.1966	775	30.07.1966	12362	Regulations on the prevention of unplanned urbanization and environmental degradation

Table 2.2 Table of laws and regulations regarding sustainable development in Turkey (Created by the author using the sources Çelikyay, 2021; Özmehmet, 2005; Yücel and Babuş, 2005) -*continues*

NAME OF THE REGULATION	ACCEPTANCE		LEGAL GAZETTE		KEYWORDS
	DATE	NO	DATE	NO	
International Convention For The Protection Of Birds (Paris, 1902)	1.12.1966	797	17.12.1966	12480	Regulations on the protection of migratory bird species, especially which are in danger of extinction
Law On Fisheries	22.03.1971	1380	4.04.1971	13799	Regulation and supervision of fishing activities
The Convention For The Protection Of The Mediterranean Sea Against Pollution (Barcelona, 1976)	7.12.1980	8-2067	12.06.1981	17368	Protecting and improving the marine environment in the Mediterranean Region
The Constitution	18.10.1982	2709	20.10.1982	17844	Article 56/2: "It is the duty of the state and citizens to improve the natural environment, and to prevent environmental pollution."
Convention Concerning The Protection Of The World Cultural And Natural Heritage (Paris, 1972)	23.05.1982	8-4788	14.02.1983	17959	Determining the principles for the protection of the world cultural and natural heritage
Law On The Protection Of Cultural And Natural Heritage	21.07.1983	2863	23.07.1983	18113	Definition of movable and immovable cultural and natural assets, determination of regulations for their protection, determination of the qualifications and duties of the decision-making organization
Environmental Law	9.08.1983	2872	11.08.1983	18132	To ensure the protection of the environment in line with the principles of sustainable environment and sustainable development
National Parks Law	9.08.1983	2873	11.08.1983	18132	Identification, protection and management of parks with national and international values
Bosphorus Law	18.11.1983	2960	22.11.1983	18229	Protection and development of the values of Istanbul Bosphorus area, determination of zoning legislation
Convention On The Conservation Of European Wildlife And Natural Habitats (Bern, 1979)	9.01.1984	84-7601	20.02.1984	18318	Sustainability of wild flora and fauna

Table 2.2 Table of laws and regulations regarding sustainable development in Turkey (Created by the author using the sources Çelikyay, 2021; Özmehmet, 2005; Yücel and Babuş, 2005) *-continues*

NAME OF THE REGULATION	ACCEPTANCE		LEGAL GAZETTE		KEYWORDS
	DATE	NO	DATE	NO	
Zoning Law	3.05.1985	3194	9.05.1985	18749	Arrangement of settlements and constructions in accordance with the plan, science, health and environmental conditions
By-Law On The Protection Of Air Quality	X	X	2.11.1986	19269	Prevention, reduction and control of air pollution, regulation of emissions from motor vehicles
Protocol For The Protection Of The Mediterranean Sea Against Pollution From Land-Based Sources (Athens, 1980)	18.02.1987	87/11520	18.03.1987	19404	Preventing indirect pollution from pipes discharging into the sea, rivers, canals and other waterways, including underground waterways
By-Law On The Water Pollution Control	X	X	4.09.1988	19919	Protection of groundwater and surface water resources potential, determination and supervision of principles regarding wastewater discharge and infrastructure facilities
Convention For The Protection Of The Architectural Heritage Of Europe (Granada, 1985)	13.04.1989	3534	20.04.1989	20145	Conservation of architectural heritage based on sustainable approaches and dissemination of this conservation
Coastal Law	4.04.1990	3621	17.04.1990	20495	Protection of coastlines and determination of their use in the public interest
Montreal Protocol On Substances That Deplete The Ozone Layer	6.06.1990	3656	8.09.1990	20629	United Nations Environment Program's World Determination of obligations regarding the ozone layer based on the Ozone Layer Action Plan
Vienna Convention For The Protection Of The Ozone Layer	6.06.1990	3655	8.09.1990	20629	Determination of obligations regarding the protection of the ozone layer based on the Vienna Convention
By-Law On The Solid Waste Control	X	X	14.03.1991	20814	Management of municipal solid wastes, plant wastes, coarse solid wastes, industrial and commercial solid wastes that are not hazardous wastes but have the characteristics of municipal solid wastes

Table 2.2 Table of laws and regulations regarding sustainable development in Turkey (Created by the author using the sources Çelikyay, 2021; Özmehmet, 2005; Yücel and Babuş, 2005) -*continues*

NAME OF THE REGULATION	ACCEPTANCE		LEGAL GAZETTE		KEYWORDS
	DATE	NO	DATE	NO	
By-Law On The Environmental Impact Assessment	X	X	7.02.1993	21489	Rules, control and supervision of the Environmental Impact Assessment (EIA) process
Ramsar Convention (Ramsar, 1971)	28.12.1993	3958	30.12.1993	21804	Determining regulations for protecting waterbirds and wetlands
The Convention On The Protection Of The Black Sea Against Pollution (Bucharest, 1992)	7.12.1993	3937	6.03.1994	21869	Prevention, mitigation and control of marine and coastal pollution in the Black Sea basin
Basel Convention On The Control Of Transboundary Movements Of Hazardous Wastes And Their Disposal	28.12.1993	3957	15.05.1994	21935	Reduction, disposal, transportation, and management of hazardous waste
National Reforestation and Erosion Control Mobilization Law	23.07.1995	4122	26.07.1995	22355	Establishing the balance between soil, water and plants, developing the forest area
Convention On International Trade In Endangered Species Of Wild Fauna And Flora (CITES) (Washington, 1973)	27.09.1994	4041	20.06.1996	22672	Regulations on trade in live and dead specimens of wild animal and plant species
Convention on Biological Diversity (Rio, 1992)	29.08.1996	4177	27.12.1996	22860	Regulations on the sustainability of biodiversity
United Nations Convention To Combat Desertification	11.02.1998	4340	14.02.1998	23258	Scaling up the fight against desertification globally through sustainable development
By-Law On The Afforestation	X	X	23.02.1998	23267	Regulations on afforestation and natural disasters
Pasture Law	25.02.1998	4342	28.02.1998	23272	Increasing the productivity of pastures, pastures, winter pastures and publicly owned grasslands and meadows, controlling

Table 2.2 Table of laws and regulations regarding sustainable development in Turkey (Created by the author using the sources Çelikyay, 2021; Özmehmet, 2005; Yücel and Babuş, 2005) -*continues*

NAME OF THE REGULATION	ACCEPTANCE		LEGAL GAZETTE		KEYWORDS
	DATE	NO	DATE	NO	
European Convention On The Protection Of The Archaeological Heritage (Valetta, 1997)	5.08.1999	4434	13.10.1999	23845	Determination of regulations for the protection of archaeological heritage
By-Law On The Control of Soil Pollution	X	X	10.12.2001	24609	Determining regulations for the prevention of soil pollution based on sustainable development, managing the use of sewage sludge and compost in soil
By-Law On The Environmental Inspection	X	X	5.01.2002	24631	Determination of the nature of the inspections related to the implementation of the Environmental Law, the qualifications of the inspector, the regulations on administrative sanctions
Land Hunting Law	1.07.2003	4915	11.07.2003	25165	Conservation, development and management of hunting and wildlife in accordance with the principle of sustainability
The European Landscape Convention (Florence, 2000)	X	X	27.07.2003	25181	Landscape conservation, management, development and planning
United Nations Framework Convention on Climate Change	16.10.2003	4990	18.12.2003	25320	Reducing and regulating greenhouse gas emissions and determining obligations to combat climate change and its impacts
By-Law On The Control of Excavation Soil, Construction and Demolition Wastes	X	X	18.03.2004	25406	Management of excavated soil, construction and demolition waste
Metropolitan Municipality Law	10.07.2004	5216	23.07.2004	25531	Regulations on metropolitan municipality management, planning of sustainable transportation and public transportation services, protection of the environment in accordance with the principle of sustainable development, water management, determination of regulations on natural disaster

Table 2.2 Table of laws and regulations regarding sustainable development in Turkey (Created by the author using the sources Çelikyay, 2021; Özmehmet, 2005; Yücel and Babuş, 2005) -*continues*

NAME OF THE REGULATION	ACCEPTANCE		LEGAL GAZETTE		KEYWORDS
	DATE	NO	DATE	NO	
Law on Special Provincial Administration	22.02.2005	5302	4.03.2005	25745	Special Provincial Administration structure, bicycle paths, zoning and landscaping regulations, solid waste disposal, planning of noise barriers, protection of agricultural areas
Law On The Utilization Of Renewable Energy Resources For Electricity Generation	10.05.2005	5346	18.05.2005	25819	Expanding the use of renewable energy resources for electricity generation, determining the regulations regarding their use
Soil Conservation And Land Use Law	3.07.2005	5403	19.07.2005	25880	Conservation of soil, classification of agricultural lands and determination of their qualities on the basis of sustainable development
Municipality Law	3.07.2005	5393	13.07.2005	25874	Regulations on municipal structure, regulations on public transportation, disposal of solid waste
By-Law On The Urban Wastewater Treatment	X	X	8.01.2006	26047	Collection, treatment, discharge and inspection of municipal and certain industrial wastewater discharged into sewerage systems
Agriculture Law	18.04.2006	5488	25.04.2006	26149	Development and supervision of agriculture and rural areas
Law on Amendments to the Environmental Law	26.04.2006	5491	13.05.2006	26167	Amending the Environmental Law No. 2872 in line with the UN environment and development criteria and incorporating sustainable environment and sustainable development principles into the law
Energy Efficiency Law	18.04.2007	5627	02.05.2007	26510	Effective and efficient use of energy, taking the principle of sustainable energy as a basis
By-Law On The Metropolitan Municipalities Coordination Centers	X	X	15.06.2006	26199	Determination of the principles regarding the work of the Infrastructure Coordination Center and Transportation Coordination Center established within the Metropolitan Municipality

Table 2.2 Table of laws and regulations regarding sustainable development in Turkey (Created by the author using the sources Çelikyay, 2021; Özmehmet, 2005; Yücel and Babuş, 2005) -*continues*

NAME OF THE REGULATION	ACCEPTANCE		LEGAL GAZETTE		KEYWORDS
	DATE	NO	DATE	NO	
By-Law On The Fire Protection Of Buildings	X	X	19.12.2007	26735	Fire protection of buildings, determination of measures and organization to be taken before and during fire
By-Law On The Thermal Insulation In Buildings	X	X	9.10.2008	27019	Reducing heat losses in buildings and energy management
By-Law On The Building Energy Performance	X	X	5.12.2008	27075	Evaluation and classification of all energy uses of the building, determination of performance criteria and application principles
Kyoto Protocol	5.02.2009	5836	13.05.2009	27227	Improving energy efficiency, reducing and regulating greenhouse gases, sustainable agriculture and afforestation, new and renewable forms of energy and increasing efficiency
By-Law On The Restoration of Lands Degraded by Mining Activities to Nature	X	X	23.01.2010	27471	Regulations on the recovery of the natural structure degraded as a result of mining activities
By-Law On The Landfilling of Wastes	X	X	26.03.2010	27533	Reducing environmental pollution that may occur during the disposal of wastes by landfill method, management of landfill facilities
By-Law On The Good Agricultural Practices	X	X	7.12.2010	27778	Determining and auditing the qualifications of good agricultural practices based on sustainable development
By-Law On The Fluorinated Greenhouse Gases	X	X	29.06.2011	31881	Mitigation and control of fluorinated greenhouse gases under the Montreal Protocol
By-Law On The General Lighting	X	X	27.07.2013	28720	Determination of lighting obligations, prevention of light pollution
By-Law On The Certification and Support of Renewable Energy Sources	X	X	1.10.2013	28782	Granting Renewable Energy Resource Certificates, regulating the establishment and functioning of the YEK Support Mechanism
By-Law On The Monitoring of Greenhouse Gas Emissions	X	X	17.05.2014	29003	Mitigation and control of greenhouse gas emissions

Table 2.2 Table of laws and regulations regarding sustainable development in Turkey (Created by the author using the sources Çelikyay, 2021; Özmehmet, 2005; Yücel and Babuş, 2005) -*continues*

NAME OF THE REGULATION	ACCEPTANCE		LEGAL GAZETTE		KEYWORDS
	DATE	NO	DATE	NO	
By-Law On The Spatial Plans Construction	X	X	14.06.2014	29030	Determining the making and implementation of spatial plans to create sustainable environments
By-Law On The Waste Management	X	X	2.04.2015	29314	Regulating the process from waste generation to disposal, improving waste management
By-Law On The Renewable Energy Resource Areas	X	X	9.10.2016	29852	Principles regarding the utilization of renewable energy resources, management of areas, electric energy generation facilities to be established and sale of electric energy
By-Law On The Waste Water Collection and Disposal Systems	X	X	6.01.2017	29940	Regulations on the planning, design, construction and operation of wastewater collection and disposal systems
By-Law On The Control of Medical Waste	X	X	25.01.2017	29959	Management of the process from generation to disposal of medical waste
By-Law On The Substances that Deplete the Ozone Layer	X	X	7.04.2017	30031	Use, disposal, recovery and management of ozone depleting substances covered by the Montreal Protocol
By-Law On The Stormwater Collection, Storage and Discharge Systems	X	X	23.06.2017	30105	Collection, storage, discharge and inspection of stormwater
By-Law On The Planned Areas Zoning	X	X	3.07.2017	30113	Regulation and supervision of building and construction in accordance with sustainable environmental conditions
By-Law On The Parking	X	X	22.02.2018	30340	Determining the need for parking in buildings and facilities
By-Law On The Turkey Building Earthquake	X	X	18.03.2018	30364	Earthquake-related design, construction, retrofitting and management of all buildings
By-Law On The Environmental Labeling	X	X	19.10.2018	30570	Promoting sustainable products or services, creating and managing an environmental labeling system
By-Law On The Principles and Procedures for Increasing Energy Efficiency in Transportation	X	X	2.05.2019	30762	Increasing energy efficiency in transportation vehicles, expanding public transportation and smart transportation systems, developing sustainable transportation infrastructures

Table 2.2 Table of laws and regulations regarding sustainable development in Turkey (Created by the author using the sources Çelikyay, 2021; Özmehmet, 2005; Yücel and Babuş, 2005) -*continues*

NAME OF THE REGULATION	ACCEPTANCE		LEGAL GAZETTE		KEYWORDS
	DATE	NO	DATE	NO	
By-Law On The Flood and Sediment Control	X	X	3.05.2019	30763	Determination of basic hydraulic design criteria of bridges, culverts and engineering structures designed for flood and sediment control, regulation and control of river beds and adjacent areas
By-Law On The Zero Waste	X	X	12.07.2019	30829	Establishment, development, evaluation and control of zero waste management system
By-Law On The Bicycle Lanes	X	X	12.12.2019	30976	Regulation and supervision of bicycle lanes and determination of their relationship with other roads
Law on the Establishment of the Turkish Environment Agency (TUÇA)	24.12.2020	7261	30.12.2020	31350	Establishment, management, supervision, activities and determination of revenues of the Turkish Environment Agency
By-Law On The Control of Packaging Waste	X	X	26.06.2021	31523	Determination of regulations on the production of packaging, prevention of packaging waste generation, management of packaging waste that cannot be prevented
Green Certification Regulation for Buildings and Settlements	X	X	12.06.2022	31864	Establishment and supervision of a green certification system for buildings and settlements
By-Law On The Environmental Noise Control	X	X	30.11.2022	32029	Mitigation, control and management of environmental noise

In summary, there are many regulations on sustainable development and environmental policies in Turkey, both nationally and internationally, especially Environment Law. The nature of international treaties is finalized in the last paragraph of Article 90 of the 1982 Constitution of the Republic of Turkey with the statement "International treaties duly put into force have the force of law." The sanctions in case of non-compliance with these laws are formulated in the "Crimes against the Environment" section of the Turkish Penal Code.

When it comes to the implementation of environmental regulations in our country, deficiencies regarding the purpose-rationality are discussed (Altunbaş, 2003; Keleş & Tunçer, 2022). According to Keleş (2023), the balance between discourse and action can be disrupted within a short period (p.29). Supporting educational tools to raise the level of culture and increase environmental awareness is an important key to solving this problem. In this context, raising environmental awareness is possible through lifelong, effective and comprehensive environmental education. Again, in this context, non-governmental organizations, local governments, central government, professional organizations in the nature of public institutions have important duties and participation is an important concept (Çolakoğlu, 2010; Kaplan, 1999; Keleş & Tunçer, 2022). As mentioned in the previous section, it is also necessary for sustainability to reflect the policies taken to the local level. However, in the laws of the Republic of Turkey, the regulations that will be reduced to urban space are quite limited. In addition, there is no regulation dedicated to the importance of urban design as claimed in the international community.

2.4. Sustainable Physical Space

The UN estimates that 68% of the world's population is expected to live in urban areas by 2050 (UN, 2018). Today, cities are the leading consumers of resources, consuming approximately 70% of the world's resources, raising concerns for the future. For this reason, they are at the center of sustainability discussions and are shown as the source of environmental problems (Alberti, et al., 2007; Beatley & Manning, 2013; Bibri & Krogstie, 2017; Jabareen, 2006; Newman & Jennings, 2012).

Rapid and unplanned urbanization since the industrial revolution has led to air and water pollution, degradation of agricultural lands, biodiversity crisis, irregular land use, unplanned traffic system, intensive energy consumption, increasing greenhouse gas levels and outdated infrastructure systems (Arnold & Gibbons, 1996; Beatley & Manning, 2013; Bibri & Krogstie, 2017; Grimm, Grove, Pickett, & Redman, 2008; Jabareen, 2006; McDonnell, & Pickett, 1990; Steffen, Grinevald, Crutzen & McNeill, 2011; Vitousek, D'antonio, Loope, Rejmanek, & Westbrooks, 1997). These have resulted in profound and multidimensional societal impacts in environmental,

economic and social terms. Social inequalities, poverty, decline in public health, environmental refugeeism, increase in violent acts, and settlements that have lost their local identity have emerged (Bibri & Krogstie, 2017; Carleton & Hsiang, 2016; Haines & Patz, 2004; Islam & Winkel, 2017; Levy & Patz, 2015; Parry, 2007).

As a result, urbanization which can be defined as a dynamic clustering of people, buildings, infrastructures and resources, places a huge burden on urban systems. This situation poses significant challenges for the functioning, regulation, organization, functions and services of urban life (Bibri & Krogstie, 2017; Cohen, 2006). For this reason, many discussions and studies have been carried out to find answers to the problems caused by rapid urbanization and to evaluate the sustainability of existing urban forms (Bulkeley & Betsill, 2005; Höjer & Wangel, 2015; Simon, 2016). It has been revealed that cities need a long-term sustainable approach in order to cope with these changing and differentiating structuring conditions. At this point, the concept of a "sustainable city" emerged (Bulkeley & Betsill, 2005; Newman & Jennings, 2012).

According to Egger (2006), “the sustainable city model manifests itself in numerous different forms depending on the history, culture, economic base, climate, geography and politics of the region” (p. 1239). According to another approach, the key attributes of a sustainable city are equal access to basic services, beauty in art and architecture, creativity to optimize human potential, resource efficiency and minimal environmental impact, ease of contact, dynamism, integrated and compact communities, and variety. Furthermore, it is urban planning that involves citizens in decision-making at all levels (Rogers, 2008). Haughton and Hunter (1994), define a sustainable city as “a city where its people and businesses continually strive to improve their natural, built and cultural environment at the neighborhood and regional level, and at the same time work in two ways that always support the global goal of sustainable development” (p. 27). According to Hodson and Marvin (2014), the most commonly used definition is “a vision of the city that is able to meet the needs of the present without compromising the ability of future generations to meet their own needs” (p. iii). At the heart of this perspective there are two fundamental ideas: cities should respond to societal demands, particularly those of disadvantaged

populations, while at the same time not exceeding the Earth's capacity to meet these demands (Hodson & Marvin, 2014). According to Burnett (2007), neither cities nor city buildings are sustainable, but they can make a major contribution to global environmental sustainability (p. 36).

Although sustainable cities are an area of urban planning and policy that is almost universally targeted, the meaning of this goal in practice is not clearly defined. As mentioned earlier, there are many definitions of this concept (Angelo & Wachsmuth, 2020; Blassingame, 1998; Bulkeley & Betsill, 2005; Colldahl, Frey & Kelemen, 2013; Hassan & Lee, 2015). The reason why there is no single definition of the concept of sustainable city is that different communities have different value judgments and sociocultural backgrounds with changing economic, environmental and social conditions. Therefore, a uniform system will not be sufficient to determine a sustainable city model. In order to determine urban sustainability, it is necessary to identify measurable indicators specific to each city and customize them according to the needs and priorities of the people. Although the selection and application of indicators may vary according to each city's circumstances and objectives, certain key sustainability indicators such as waste management, water management, energy efficiency and access to public transportation are important for every city (Basiago, 1998; Camagni, Capello & Nijkamp, 1998; Healey & Williams, 1993; Maclaren, 1996).

However, cities are not isolated systems, so they cannot be considered sustainable on their own. Parts of the urban system such as neighborhoods, transportation systems, economy, etc. and the correlations between these parts are the main mechanisms that constitute the sustainability of the city. For this reason, it is not possible to talk about the sustainability as a whole unless the parts of the component are sustainable (Choguill, 2008; Egger, 2006). Neighborhoods act as cornerstones that bring together the architectural, cultural and economic systems of cities (Sharifi & Murayama, 2013). In this context, the mentioned city and neighborhood relationship is presented in Figure 2.6 within the sustainable world goal.

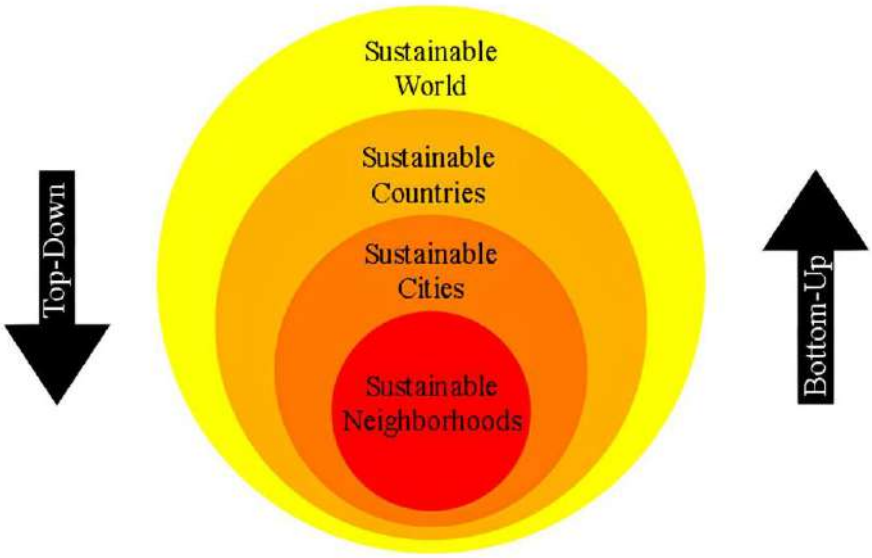


Figure 2.6 The use of top-down and bottom-up method for sustainable urban development (Hamedani & Huber, 2012)

Figure 2.6 shows that sustainable development is achieved through a process of inter-scale adaptation, and that design and implementation efforts play a key role, especially at the neighborhood scale. Since many of the problems encountered at the macro-urban scale are in fact the result of poor planning at the micro-neighborhood level, it is crucial to integrate sustainable development principles into neighborhood planning. Accordingly, there are various initiatives for the integration of sustainability at the neighborhood level (Dehghanmongabadi, Hoşkara & Shirkhanloo, 2014). Within this framework, in order to measure sustainability at the neighborhood scale, the social, economic and environmental criteria set out in the literature need to be addressed.

When examining the social aspect of sustainability, the main criteria to address are cultural heritage identity, social participation, social cohesion, safety, and inclusive design. Keitumetse (2013) analyzed cultural heritage management and sustainability through The Community-Based Cultural Heritage Resource Management (COBACHREM) method. With the mentioned study, cultural heritage knowledge and cultural heritage tourism were considered within the scope of sustainability in the light of the parameters of local communities (Keitumetse, 2013).

In another study, social and cultural sustainability criteria and indicators were put forward. In this context, social participation, democratic civil society, equity as equal rights, education, health and safety are the main criterions (Axelsson, et al., 2013). Comstock (2010) evaluated neighborhood attachment through a survey. Neighborhood relations, perceived safety and collective community stand out as the main social criteria for sustainable neighborhoods (Comstock, 2010). As a result of the studies, it is seen that the criteria generally put forward in the social pillar of sustainability are; revitalizing the center with mixed-use neighborhoods thus increasing security, easy access to other public facilities especially public institutions, adopting a self-sufficient neighborhood structure, enabling social interaction, prioritizing inclusive design, developing cultural heritage identity, increasing participation, ensuring equality and supporting education (Barton, 2002; Cloutier, Berejnoi, Russell, Morrison & Ross, 2018; Engel-Yan, Kennedy, Saiz & Pressnail, 2005; Luederitz, Lang & Von Wehrden, 2013; Shirley & Moughtin, 2006).

A study by Algert, Baameur and Renvall (2014) demonstrated the potential economic savings that residents can achieve through community gardens. In addition to the economic impacts, they suggested that social relations can also be positively affected by the use of shared space (Algert, et al., 2014). Blair, Giesecke and Sherman (1991) reached similar conclusions in a parallel study conducted with 151 gardeners in Philadelphia, Pennsylvania (Blair, Giesecke & Sherman, 1991). Voicu and Been (2008) found that the quality and amenities of the community garden significantly affect the value of nearby property (Voicu & Been, 2008). Studies show that the main objectives of economy-related criteria are to increase job opportunities through mixed-use neighborhoods, social networking, promotion of organic food and farmers markets, and diversification of housing typologies for all income groups (Algert, et al., 2014; Barton, 2002; Cloutier, et al., 2018; Luederitz, et al., 2013).

On the environmental side of sustainable neighborhoods, water management, protection of the ecological value of the land, public open spaces, transportation, waste management, energy management and sustainable buildings are the main criteria to be considered. Within this scope, Churchill and Baetz (1999) put forward a series of strategies in their conceptual model for sustainable neighborhood design.

These strategies include the promotion of alternative transportation systems, the development of shared common greenhouse areas, wastewater treatment policies and the promotion of green buildings. In addition, a neo-traditional neighborhood type with mixed land use and connected street grid pattern was proposed (Churchill & Baetz, 1999). Teed, Condon, Muir and Midgley (2005) have presented sustainable urban landscapes neighborhood pattern typologies. The evaluation criteria in this context are walkability, vehicle kilometers traveled, affordability housing, mix effective permeable area, land use mix, and density (Teed, Condon, Muir & Midgley, 2005). In a study on energy, transport and pollution interaction; the relationship between buildings and roads, traffic calming, traffic-related pollution and noise, and transportation costs were identified as the main topics (Shirley & Moughtin, 2006). In an another study, the economic and ecological impacts of traveling with personalized vehicles were analyzed. In this respect, the effects of environmental pollution caused by carbon dioxide and nitrogen oxides were revealed (Stead, 2013). The study by Engel-Yan and others (2005) assessed infrastructure interactions. The main criteria considered in the mentioned study within the scope of sustainable neighborhoods are green building, wastewater and stormwater management, mixed-use land, transportation network (Engel-Yan, et al., 2005). All these studies show that the main objectives in environmental criteria are; conservation of biodiversity, promotion of common agricultural areas, wastewater management, stormwater use, accessible and inclusive planning of public open spaces, promotion of renewable energy use, design of settlements resistant to natural disasters, increase of green buildings, protection of ecological values of settlements and realization of appropriate planning, reduction of transportation carbon emissions, promotion of public transportation and cycling (Al-Hagla, 2008; Barton, 2002; Cloutier, et al. , 2018; Engel-Yan, et al., 2005; Luederitz, et al., 2013; Shirley & Moughtin, 2006).

In summary, given the increasing impacts of the climate crisis, research focusing on the sustainable neighborhood model is growing day by day. In this regard, neighborhoods as the fundamental unit of the city, consisting of the harmony, activities and social interactions between people, other inhabitants, buildings, the spaces between these buildings, the services provided, and all these wide range of elements, should be sustainable for all groups of people and living things. In

addition, sustainable neighborhood planning should adopt long-term, adaptive and clear directional approaches (Cloutier, et al., 2018; Cole, 2010; Dehghanmongabadi, et al., 2014; Engel-Yan, et al., 2005; Luederitz, et al., 2013; Sharifi & Murayama, 2013).

The criteria in the literature on the evaluation of the concept of sustainable neighborhoods and the criteria put forward by the studies conducted were discussed earlier. These criteria, which are evaluated separately under main headings, have evolved into sustainable neighborhood assessment certification systems by becoming more systematic over time with the increasing awareness of the environmental crisis by countries. In this respect, addressing these certification systems is important in evaluating the concept of sustainable neighborhoods.

2.5. Global Dimension of Sustainable Neighborhood Assessment Approaches

Since the early 21st century, planners have taken many initiatives to improve the quality of life in neighborhoods, therefore neighborhood planning has a long history (Rohe and Gates, 1985). However, it was not until 2006 that tools were developed to assess sustainability at the neighborhood scale. These assessment tools have been used by many countries, particularly developed countries, to measure their success in approaching sustainable development goals (Sharifi & Murayama, 2013). With the development of neighborhood-scale assessment systems, not only individual buildings, but also the spaces between these buildings, the services provided, the residents, other living beings, and the harmony, activities, and social interactions between all these wide-ranging elements are assessed (Cole, 2010; Deakin, 2011; Hurley & Horne, 2006; Reith & Orova, 2015). Neighborhood Sustainability Assessment (NSA) tools are considered as the latest generation of assessment tools (Sharifi & Murayama, 2013).

Sustainable neighborhood certification systems emerged with the introduction of CASBEE (Comprehensive Assessment System for Built Environmental Efficiency) Urban Development in 2006, and the tools developed by LEED (Leadership in Energy and Environment Design) and BREEAM (Building Research Establishment Environmental Assessment Method) followed this system. In this context, LEED

ND, BREEAM Communities, BCA Green Mark for Districts, CASBEE UD, and DGNB UD assessment systems, which are frequently used in the world, are examined below.

2.5.1. LEED ND

LEED, one of the most widely used green certification systems in the world, was developed in the United States in 1998. Initially developed for the commercial building industry, other certifications of different scales and qualities have been added to this certification system over the years. One of these, LEED Neighborhood Development (LEED ND), was developed through a four-year study conducted in partnership with The United States Green Building Council (USGBC) and Congress for the New Urbanism, and published in 2009 (Hurley & Horne, 2006; LEED ND, 2018). It was finalized with the LEED v4 for ND version that published in 2018. LEED ND covers projects at the neighborhood scale that are 75% built and at any stage of planning and design, or projects at the neighborhood scale that have been completed or are about to be completed within the last three years. In order for the project to be evaluated, there must be at least two livable buildings within the project and it must not be larger than 1500 acres (LEED ND, 2018).

LEED certification systems aim to achieve seven main goals: (1) reversing the effects of climate change, (2) improving occupant health and well-being, (3) improving water management, (4) protecting biodiversity and ecosystem services, (5) promoting renewable and sustainable material sources, (6) building a green economy, and (7) ensuring community health, justice and equality. These goals constitute the basic criteria for all LEED certifications. In the case of LEED ND certification, 11 criteria under the titles of Smart Location and Connectivity (SLL), Neighborhood Pattern and Design (NPD) and Green Infrastructure and Buildings (GIB) are specified as prerequisites. Table 2.3 shows all the criteria for the assessment and their weights within the certification system. LEED-ND addresses the buildings, infrastructure and landscape that make up the neighborhood, as well as site selection, design and construction elements that relate the neighborhood to its local and regional context (LEED ND, 2018; Sharifi & Murayama, 2013).

The process begins when the project owner selects the evaluation system and registers the project in the system, and the project undergoes a preliminary review once these pre-requisites are met. After the preliminary review and technical recommendations are provided, the final review is carried out and the final score and certification level of the project are determined at this stage (LEED ND, 2018). Figure 2.7 shows the scoring method for the rating system.

2.5.2. BREEAM Communities

BREEAM was developed by the Building Research Establishment (BRE) in the UK in 1990 and is the first known green certification system (Haapio, 2012). It was initially created at the building scale and later certificates of different scales and qualities were developed. One of these is BREEAM Communities, which covers the assessment and certification of designs and plans for neighborhood-scale or larger new development and renovation projects. Created in 2009, the certificate was updated and finalized in 2012 with the version named SD202 - 1.2:2012.

BREEAM Communities does not cover the post-construction process. Unlike other certification systems, the standard assessment guide is only suitable for assessing projects in England, Scotland, Wales and Northern Ireland. It is emphasized that it needs to go through a special evaluation process to be used in other countries. This situation reveals the importance of context in the evaluation process (BREEAM Communities Technical Manual, 2017).

In this certification system, the process progresses by applying a three-step evaluation method. The first of these is the fulfillment of mandatory criteria. These include; consultation plan, demographic needs and priorities, flood risk assessment, existing buildings and infrastructure, ecology strategy. The second is development planning, where the aim is to assess were the units will be located and the likely relationship of users to the units. In the second stage, the consultation and participation criterion is mandatory. All of the criteria and their weights for BREEAM Communities are given in Table 2.3. The third and final step involves the detailed design of infrastructure, transportation and the built environment. After the completion of these steps, the certification level is determined with the rating system

of BREEAM Communities in Figure 2.7 (BREEAM Communities Technical Manual, 2017; Lin & Shih, 2018).

2.5.3. BCA Green Mark For Districts

Singapore has developed the Green Mark Assessment System in line with the "80-80-80 in 2030" plan put forward in 2005. In this context, the main targets are to convert 80% of the buildings in Singapore to green by 2030 according to the gross floor area, to design 80% Super Low Energy (SLE) buildings in new development projects, and to achieve 80% improvement in energy efficiency for green buildings. In line with these goals, Green Mark for Districts was developed by the Building and Construction Authority (BCA) in 2009. In 2018, with the publication of BCA Green Mark for Districts Version 2.1, the certification system was updated and can be used for mixed-use, residential, commercial, industrial zones and lands of at least 20 ha in size. It is stated that the certification criteria are based on Singapore's local climate and weather conditions, and it is emphasized that regulations are required to apply to other countries (Building and Construction Authority [BCA], 2006; BCA Green Mark For Districts, 2018).

The certification process starts with the approval of the application and preliminary assessment. It continues with the evaluation of the project's design and implementation process for compliance with the BCA Green Mark for Districts criteria and is completed with the information and audit process. In the first stage of the evaluation process, a minimum score of 10 points under the heading "energy-related requirements" and then a minimum score of 50 points under the heading "other green requirements" are specified as prerequisites. All criteria and their weights are given in Table 2.3. At this stage, the official application for certification is made with the data showing that the criteria are met and the process ends with the issuance of certificates to the applications that are found to be eligible. The scoring system for the process is presented in Figure 2.7 (BCA, 2006; BCA Green Mark For Districts, 2018).

2.5.4. CASBEE UD

The CASBEE certification system started to be developed in Japan in 2001 as part of a private sector, government and academic project, and it differs from other certification systems. The Japan Sustainable Building Consortium (JSBC), The Institute for Building Environment and Energy Conservation (IBEC), with the support of the Ministry of Land, Infrastructure, Transport and Tourism (MLIT). The CASBEE certification family currently has 20 certification tools ranging from building scale to city scale. One of these is CASBEE for Urban Development (CASBEE UD), which covers the block/zone scale. Developed in 2006, the 2014 version of the CASBEE UD certificate is currently used (CASBEE, 2023; CASBEE for UD Technical Manual, 2014).

CASBEE UD is basically designed to serve 4 main purposes: (1) comprehensive assessment of the environmental performance of a single block or a group of blocks; (2) introduction and assessment of the application of methods to reduce carbon emissions in buildings and at urban/local scale; (3) clarification of the application impact of environmental assessment methods not only for the buildings that make up the project but also for future groups of buildings, and (4) contribution to improving the comprehensive environmental performance of urban and regional redevelopment through block/district scale projects (CASBEE for UD Technical Manual, 2014).

In the CASBEE for UD certification system, the environmental effectiveness of the neighborhood is calculated by dividing the environmental quality within the project area (QUD) by the environmental load outside the project area (LUD), a very different assessment methodology from other certification systems. Again, unlike other systems, there are no mandatory criteria in the certificate application process and all criteria and their weights for CASBEE UD are given in Table 2.3 The methodology for the scoring system is given in Figure 2.7 (CASBEE for UD Technical Manual, 2014).

2.5.5. DGNB NUD

The German Sustainable Building Council (DGNB) is a non-profit association and was founded in 2007. DGNB has 6 main certification systems covering different

scales. Under the heading of District Development, there are 5 different schemes with minor changes between them: (1) urban districts, (2) business districts, (3) commercial areas, (4) industrial sites, and (5) event areas. DGNB New Urban Districts (DGNB NUD) is the system covering the scale of urban districts. Created in 2012, the current 2020 version of the DGNB NUD certification system is used (DGNB System Districts Criteria Set, 2020).

There are prerequisites for the certificate to be used as an assessment tool. The prerequisites are that the gross land area must be at least 2 hectares, the housing share must be between 10 and 90 percent, the district must consist of at least 2 parcels and contain various structures, have relevant infrastructure in public or publicly accessible areas, and there must be no objection by the owners of the area at all stages of certification. In addition, a minimum score of 10 points for biodiversity, 15 points for urban climate, 5 points for social and commercial, 5 points for infrastructure and 15 points for participation are required. All criteria and weight percentages of the DGNB NUD certification system are presented in Table 2.3 and the scoring method is presented in Figure 2.7 (DGNB System Districts Criteria Set, 2020).

The development of urban districts takes place over a long period of time with frequent changes of ownership. For this reason, there are 3 different conditions for the validity of the DGNB NUD certificate after it has been obtained, which distinguishes it from other certification systems. A preliminary certificate with a validity of 3 years is issued for applications at the urban development plan level, a planning/development certificate with a validity of 5 years is issued for applications where at least 20% of the infrastructure is completed and contracts are in place, and an indefinite District certificate is issued for applications for districts that are at least 75% complete (DGNB System Districts Criteria Set, 2020).

The criteria and weighting percentages of globally used neighborhood assessment systems are presented in Table 2.3. The most critical point in comparing these tools with each other is to identify the common main headings and weights. Each certification system has its own main headings, criteria and classification method. However, in order to compare these systems, each sub-criteria has been classified

according to its description and evaluation method, and as a result, common main headings have been created. In this way, the weight, meaning and importance of the criteria became comparable (Gibson, Hassan, Tansey, & Whitelaw, 2013; Sharifi & Murayama, 2013). These main headings are: (1) environment and land-use, (2) economic development, (3) transport, (4) social development, (5) design and management, (6) resources and energy and (7) innovation.

As seen in Table 2.3, the top heading of Environment and Land-Use refers to nature, biodiversity, water management, and land-use scopes. Economic Development heading refers to employment, new job, remote work; Transport refers to public transport, pedestrian and cycle path, private cars, and parking scopes. Social Development heading mentions quality of life, social infrastructure, urban context; Design and Management heading refers to design principles, heat islands, policy and governance extensions. Eventually, Resources and Energy heading refers to waste management, material use, conservation, non-renewable and renewable energy.

The criteria and their weights in evaluation systems are usually subjective. In this context, since the criteria are developed through experts, citizens have not been sufficiently involved in the process, and the concept of participation, which is the basis of sustainable development, has not been adequately reflected here (Deakin, 2011; Lin & Shih, 2018; Rametsteiner, Pülzl, Alkan-Olsson, & Frederiksen, 2011; Reith & Orova, 2015; Sharifi & Murayama, 2013). In addition, there is a significant implementation problem in assessment systems. Approaches that are mostly on paper and far from practice stand out as the main problem (Rametsteiner, et al., 2011; Sharifi & Murayama, 2013).

Table 2.3 In NSA Main Categories and Criterias (Created by the author using the following sources BCA Green Mark For Districts, 2018; BREEAM Communities Technical Manual, 2017; CASBEE for UD Technical Manual, 2014; DGNB System Districts Criteria Set, 2020; Ergönül, et al., 2023; LEED ND, 2018; Lin & Shih, 2018; Reith & Orova, 2015; Sharifi & Murayama, 2013; Yıldız, Yılmaz, Kıvrak & Gültekin, 2015)

CATEGORIES	SCOPE	LEED ND		BREEAM Communities		DGNB UD		CASBEE UD		BCA Green Mark for Districts	
		Criterias	%	Criterias	%	Criterias	%	Criterias	%	Criterias	%
ENVIRONMENT AND LAND USE	Nature, Biodiversity, Water Management, Land Use	Smart Location, Imperiled Species and Ecological Communities Conservation, Wetland and Water Body Conservation, Agricultural Land Conservation, Floodplain Avoidance, Preferred Locations, Brownfield Remediation, Steep Slope Protection, Site Design for Habitat or Wetland and Water Body Conservation, Restoration of Habitat or Wetlands and Water Bodies, Long-Term Conservation Management of Habitat or Wetlands and Water Bodies, Compact Development, Access to Civic and Public Space, Access to Recreation Facilities, Tree-Lined and Shaded Streetscapes, Rainwater Management, Solar Orientation, Wastewater Management, Light Pollution Reduction	29	Utilities, Noise pollution, Microclimate, Adapting to climate change, Light pollution, Water strategy, Ecology strategy, Land use, Water pollution, Enhancement of ecological value, Landscape, Rainwater harvesting	23	Life-Cycle Assessment, Urban Climate, Water Cycle Systems, Land Use, Biodiversity, Thermal Comfort In Open Space, Open Space, Urban Design, Noise, Exhaust And Light Emission	31,3	Water Resources, Greenery, Biodiversity, CO_2 Emissions Of Green Sector	21	Site Planning and Building Orientation, Water Efficient Fittings for Infrastructure and Public Amenities, Stormwater Management, Alternative Water Sources, Water Efficient Landscaping, Water Efficiency Management, Green Urban Design Guidelines, Green Buildings Within District, Light Pollution, Reduction Environmental Planning	53

Table 2.3 In NSA Main Categories and Criterias (Created by the author using the following sources BCA Green Mark For Districts, 2018; BREEAM Communities Technical Manual, 2017; CASBEE for UD Technical Manual, 2014; DGNB System Districts Criteria Set, 2020; Ergönül, et al., 2023; LEED ND, 2018; Lin & Shih, 2018; Reith & Orova, 2015; Sharifi & Murayama, 2013; Yıldız, Yılmaz, Kıvrak & Gültekin, 2015) -*continues*

CATEGORIES	SCOPE	LEED ND		BREEAM Communities		DGNB UD		CASBEE UD		BCA Green Mark for Districts	
		Criterias	%	Criterias	%	Criterias	%	Criterias	%	Criterias	%
ECONOMIC DEVELOPMENT	Employment, New Job, Remote Work	Housing and Jobs Proximity, Housing Types and Affordability	9,1	Economic impact, Training and skills	15	Life-Cycle Costs, Resilience And Adaptability, Land Use Efficiency, Value Stability, Workplace Comfort	20	Economic Development	10	Green Lease	1,1
TRANSPORT	Public Transport, Pedestrian And Cycle Path, Private Cars, Parking	Access to Quality Transit, Bicycle Facilities, Walkable Streets, Reduced Parking Footprint, Transit Facilities, Transportation Demand Management	20	Local parking, Delivery of services, facilities and amenities, Transport carbon emissions, Transport assessment, Cycling network, Access to public transport, Cycling facilities, Public transport facilities, Safe and appealing streets	20	Mobility Infrastructure - Motorised Transportation, Mobility Infrastructure - Pedestrians And Cyclists	11,2	Convenience, Traffic, Urban Structure, CO_2 Emissions From Traffic Sector	10	Green Transport Within District	5,9

Table 2.3 In NSA Main Categories and Criterias (Created by the author using the following sources BCA Green Mark For Districts, 2018; BREEAM Communities Technical Manual, 2017; CASBEE for UD Technical Manual, 2014; DGNB System Districts Criteria Set, 2020; Ergönül, et al., 2023; LEED ND, 2018; Lin & Shih, 2018; Reith & Orova, 2015; Sharifi & Murayama, 2013; Yıldız, Yılmaz, Kıvrak & Gültekin, 2015) -*continues*

CATEGORIES	SCOPE	LEED ND		BREEAM Communities		DGNB UD		CASBEE UD		BCA Green Mark for Districts	
		Criterias	%	Criterias	%	Criterias	%	Criterias	%	Criterias	%
SOCIAL DEVELOPMENT	Quality of Life, Social Infrastructure, Urban Context	Connected and Open Community, Mixed-Use Neighborhoods, Visitability and Universal Design, Community Outreach and Involvement, Local Food Production, Neighborhood Schools, Historic Resource Prevention and Adaptive Reuse	14	Demographic needs and priorities, Housing provision, Public realm, Green infrastructure, Local vernacular, Inclusive design	13	Social And Functional Mix, Social And commercial Infrastructure, Smart Infrastructure, Barrier-Free Design	10,9	Health, Welfare and Education, Culture, Population, Information System	31	Public Awareness, Education and Community Involvement, Intelligent Infrastructure	4,8
DESIGN AND MANAGEMENT	Design Principles, Heat Islands, Policy and Governance	Heat Island Reduction, Regional Priority	4,5	Consultation plan, Consultation and engagement, Design review, Community management of facilities, Flood risk assessment, Flood risk management	13	Integrated Planning, Participation, Project Management, Governance, Safety Concepts, Quality Assurance And Monitoring	18,3	Security/Safety, Compliance, Area Management, Environmental Risks	14	Stakeholder Engagement, Feedback and Evaluation, Safe Environment	4,8

Table 2.3 In NSA Main Categories and Criterias (Created by the author using the following sources BCA Green Mark For Districts, 2018; BREEAM Communities Technical Manual, 2017; CASBEE for UD Technical Manual, 2014; DGNB System Districts Criteria Set, 2020; Ergönül, et al., 2023; LEED ND, 2018; Lin & Shih, 2018; Reith & Orova, 2015; Sharifi & Murayama, 2013; Yıldız, Yılmaz, Kıvrak & Gültekin, 2015) -*continues*

CATEGORIES	SCOPE	LEED ND		BREEAM Communities		DGNB UD		CASBEE UD		BCA Green Mark for Districts	
		Criterias	%	Criterias	%	Criterias	%	Criterias	%	Criterias	%
RESOURCES AND ENERGY	Waste Management, Material Use, Conservation, Non-Renewables And Renewables Energy	Certified Green Building, Minimum Building Energy Performance, Indoor Water Use Reduction, Construction Activity Pollution Prevention, Certified Green Buildings, Optimize Building Energy Performance, Indoor Water Use Reduction, Outdoor Water Use Reduction, Building Reuse, Minimized Site Disturbance, Renewable Energy Production, District Heating and Cooling, Infrastructure Energy Efficiency, Recycled and Refused Infrastructure, Solid Waste Management	18	Energy strategy, Existing buildings and infrastructure, Sustainable buildings, Low impact materials, Resource efficiency	16	Pollutants And Hazardous Substances, Construction Site/Construction Process, Energy Infrastructure, Resource Management	8,3	Resources Recycling, Environmentally Friendly Buildings, Energy System, CO_2 Emissions From Building Sector	14	Energy Efficiency for Infrastructure and Public Amenities, On-site Energy Generation, Energy Management System, Minimise Energy Consumption During Off-Peak Hours, Minimise Cut and Fill in Earthworks, Sustainable Construction for Infrastructure and Public Amenities, Sustainable Products for Infrastructure and Public Amenities, Waste Management	28
INNOVATION		Innovation, LEED® Accredited Professional	5,5							Other Green Features and Innovation	2,7
TOTAL			100		100		100		100		100

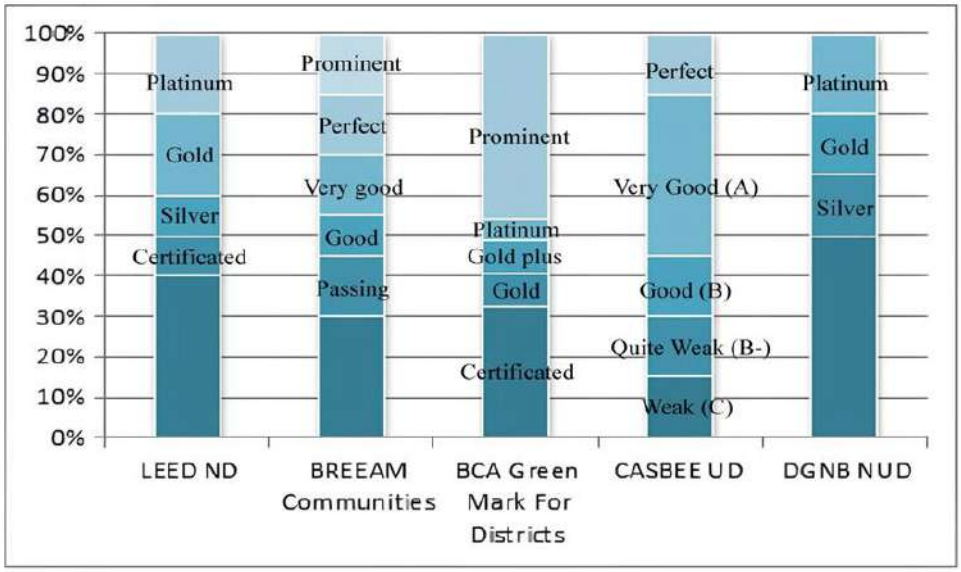


Figure 2.7 Scoring in NSA Tools (Created by the author using the following sources BCA Green Mark For Districts, 2018; BREEAM Communities Technical Manual, 2017; CASBEE for UD Technical Manual, 2014; DGNB System Districts Criteria Set, 2020; LEED ND, 2018)

Evaluation systems have defined certificate types such as silver, gold and platinum to classify projects according to their score, and these certificate types are presented in Figure 2.7 However, the fact that the certificate can be accessed immediately according to the score obtained has made it necessary to stipulate certain main criteria. For LEED ND certification, 11 criteria are mandatory and are also included in the scoring (LEED ND, 2018). Likewise, for the BREEAM Communities certificate, 5 main criteria are mandatory and included in the scoring (BREEAM Communities Technical Manual, 2017). Unlike LEED ND, the criteria stipulated in the BREEAM Communities certificate are considered as the first step of the evaluation and are also required to pass to the next step (BREEAM Communities Technical Manual, 2017). For the BCA Green Mark For Districts certificate, direct criteria are not mandatory, 10 points from the energy main heading and 50 points from the other green requirements heading are determined as mandatory (BCA Green Mark For Districts, 2018). Similar to the BCA Green Mark For Districts certificate, the DGNB NUD certificate also requires minimum points for certain topics (DGNB System Districts Criteria Set, 2020). Unlike all these certification systems, the

CASBEE UD system does not include any mandatory criteria. Although this is basically stated as the CASBEE UD scoring system being different from other systems, it becomes disadvantageous in terms of evaluation (CASBEE for UD Technical Manual, 2014).

The determination of criteria and their weighting ratios in certification systems are generally shaped according to local conditions and determined subjectively. In all these certification systems, except for CASBEE UD, the main heading of environment and land-use stands out predominantly. In CASBEE UD, the main topic of social development ranks first. When all certification systems are considered in general, the weighted rankings are (1) environment and land-use, (2) resources and energy, (3) social development, (4) transport, (5) economic development, (6) design and management and (7) innovation. Based on the prominence of environment and land-use in the certification systems, it is possible to say that urban design and planning approaches are very important for sustainable neighborhood design.

In summary, the main purpose of these assessment systems is to create a tool for measuring sustainability regards on that data can be evaluated if it can be measured. In this context, assessment systems are used to determine environmental, social and economic needs from building scale to neighborhood scale and to transform data into information. Table 2.3 compares 5 main assessment systems that are frequently used on a global scale and concludes that the main factor in shaping the criteria is local conditions. Certification systems are shaped according to population density, urban development, energy need, climate, social and economic environments (Khatibzada, 2020; Sharifi & Murayama, 2013). For this reason, the increasing energy need in our country, which is dependent on foreign energy, the increasing environmental damage caused by rapid urbanization and the decreasing quality of life constitute the main factors that need to be addressed for the place-specific certification system to be created. The certification system, which is created as a reflection of planning policies and a representative brand value in developed countries, does not yet exist in Turkey. Generally, LEED and BREEAM certification systems are widely used at the building and neighborhood level. As seen in the BREEAM certificate, developing a certificate that can be used in all areas may cause igonoring the characteristics of the local, and

therefore it is necessary to develop a system specific to the location. Otherwise, the requirements of a sustainable settlement and the problematic areas to be identified may be overlooked. In this context, there is a need for a locally specific neighborhood assessment system for Turkey. In this direction, it is necessary to address the evaluation systems that have been put forward at other scales in our country (Ergönül, et al., 2023; Özçevik, et al., 2018; Yıldız, et al., 2015).

2.6. Dimensions of Sustainable Neighborhood Assessment Approaches in Turkey

There is no green certificate system on sustainable neighborhoods scale that specifically developed for our country and made mandatory by the state. However, there are some policies and legal regulations that can be evaluated within the scope of sustainable buildings and can somehow guide spatial developments.

- In 2001, "Building Inspection Law No. 4708" was adopted (RG, 2001).
- In 2007, "5627 Energy Efficiency Law" was adopted (RG, 2007).
- In 2008, "By-Law on Energy Performance in Buildings" was adopted and with Article 4, it was decided to issue "Energy Identity Certificate" to be given to existing and new buildings. Lighting energy consumption, energy efficiency and air conditioning system were defined and the principles of architectural applications related to them were determined (RG, 2008).
- In 2010, "KENTGES Integrated Urban Development Strategy and Action Plan (2010-2023)" was adopted. Under the heading of new phenomena in urbanization, climate change, sustainable urban form and energy efficiency were addressed. Principles and values related to sustainable urbanization and settlements have been determined, and relevant institutions and their actions to achieve the targets set have been specified. By this means, the objectives, plans and practices determined for sustainable urbanization were brought together with a supervisory system and the necessity of an institutional structure was revealed (RG, 2010).
- In 2012, the "Climate Change Action Plan" covering the period 2011-2023 was published. With this plan, it was made compulsory to obtain "Energy

Identity Certificate" for all buildings until 2017 and to implement the "Regulation on Energy Performance in Buildings" and other energy efficiency regulations (ÇŞB, 2012).

- In 2012, "Energy Efficiency Strategy Document" was established (RG, 2012).
- In 2014, "By-Law on Certification of Sustainable Green Buildings and Sustainable Settlements" was published (RG, 2014).
- In 2017, the "By-Law on Green Certificate for Buildings and Settlements" was published. With the publication of this regulation, the "By-Law on the Certification of Sustainable Green Buildings and Sustainable Settlements" adopted in 2014 was repealed (RG, 2017).
- In 2021, the "Communiqué on Green Certificate Implementation for Buildings and Settlements" entered into force (RG, 2021).
- In 2022, the "By-Law on Amending the Regulation on Energy Performance in Buildings" was published in the Official Gazette (RG, 2022).

In Turkey, as in other countries, the concept of sustainability has started to gain importance as a result of environmental problems and energy needs, and concrete practices have started since 2008 (Erdede & Bektaş, 2018). In addition to these policies and legal regulations, there are also initiatives regarding certification systems for measuring sustainability in Turkey. These are the National Green Certification System (YeS-TR), Ecological and Sustainable Design in Buildings (B.E.S.T) Certificate and Sustainable Energy Efficient Buildings (SEEB-TR) Certificate.

2.6.1. National Green Certification System (YeS-TR)

The "Protocol for the Preparation of the Basic Assessment Guide for Sustainable Green Buildings and Settlements and the Establishment of the Big Data Management Model in Preparation for the National Operating System", which constitutes the preliminary pillar of the YeS-TR Certificate, was signed between the Ministry of Environment, Urbanization and Climate Change and Istanbul Technical University (ITU) in 2016 (Özçevik, et al., 2018). In 2017, after the "Regulation on Green Certificates for Buildings and Settlements" entered into force, the National Green

Certification System (YeS-TR) software was completed and many units such as E-Devlet (E-Government), Council of Higher Education (YÖK), Finance and Tax System, Address Registration System were integrated and an audit pillar was provided (Şantiye Magazine, 2021). The creation of the certification system was realized with the participation of experts from many universities and ministries. The participatory approach was adopted as a principle with the cooperation of the Ministry, universities, private sector and non-governmental organizations (Özçevik, et al., 2018). In the YeS-TR Certificate system, there are two different types of certification systems that evaluate building and settlement scales. Considering this, it is seen that the relationships between scales are evaluated.

The first certificate type of the YeS-TR Certificate system is the "Green Certificate - Building" certificate. There are two types of categories in Green Certificate - Building as for existing buildings and new buildings. Both categories include residential, office, education, health buildings, hotels, shopping and trade centers, cultural and sports buildings, entertainment buildings, dormitories, nursing homes, infrastructure and transportation facilities, data centers, etc. There are six assessment modules for the building category. These are; integrated building design, construction and management, building material and life cycle assessment, indoor environmental quality, energy use and efficiency, water and waste management, innovation. With this certificate; it is aimed to design and manage the project with the participation of all stakeholders, to adopt approaches that take into account human health and comfort in interior spaces, to be based on environmentally friendly material selection, to adopt energy efficient approaches, to consider innovative design approaches, to plan effective water use and waste management (ÇŞB, 2018).

Another YeS-TR Certificate system is the "Green Certificate - Settlement" certificate. It differs from the first certificate in terms of scale and covers settlements no smaller than the zoning island scale. In Green Certificate - Settlement, there are two types of categories as for existing settlements if it is within the built-up area or new settlements if it is within the development area. The evaluation categories are regional and neighborhood profile, sustainable land use, ecology and disaster management, transportation and mobility, urban design, social and economic

sustainability and innovation, as indicated in Table 2.4. The lilac colored criteria in Table 2.4 are mandatory and the others are scored with a credit system. With this certificate; supporting the sustainable development of medium and small-scale cities, establishing the correct connection between the governance, planning and financial units of the project, ensuring integrity between scales, adopting energy-efficient approaches, protecting ecological values, planning infrastructure and superstructure activities in the light of urban disaster management, improving transportation quality by adopting pedestrian-priority transportation, adopting flexible, sustainable and place-specific identity approaches in all urban design interventions, adopting social and economic sustainability, and considering innovative design approaches (ÇŞB, 2018).

Table 2.4 Yes_Tr settlement criterias (Created by the author using the source ÇŞB, 2018)

TITLE		CRITERIA	REFERENCE OF CRITERIA
Regional And Nearby Profile	Areal, Local And Regional Data	Determination Of Project Area Boundaries	Implementation zoning plan at 1/1000 scale, current zoning status, use of current aerial photographs of the project area and relevant legislation
		Evaluation Of The Project Area Within The Region And Its Surroundings	Current upper and lower scale plans and reports, Zoning Law and related legislation
		Evaluation Of The Project Area's Place In The Planning Stage	Relevant upper and lower scale plans and reports, approved current zoning status document
	Project Data	Project Sustainable Development Report	Information on the ownership and zoning plan of the project area, project sustainable development program, information on the management unit to which the project area is affiliated
		Project Participation And Communication Plan	The provisions of the legislation to which the project refers and which are relevant for ensuring participation, and the principles of participation and communication set out in the guidelines apply

Table 2.4 Yes_Tr settlement criterias (Created by the author using the source ÇŞB, 2018) -*continues*

TITLE		CRITERIA	REFERENCE OF CRITERIA
Sustainable Land Use, Ecology and Disaster Management	Planning and Ecological Value Existence	A 'High Scale Natural, Historical and Cultural Environmental Protection Decisions Report' for the area/region in which the project is located has been prepared	The Zoning Law specifies the scale and hierarchy between plans, and in this systematic, the decisions taken in the transitions between scales should be accurately reflected in the decision and implementation processes at a lower scale
		Preparation of 'Ecological Value Inventory' Report in the Project Area	The relevant legislation that protects natural values and includes the principles of utilization, mainly the Forest Law, Soil Conservation and Land Use Law, Pasture Law, Regulation on the Procedures and Principles Regarding the Identification, Registration and Approval of Protected Areas, Coastal Law
		Preparation of a 'Biodiversity Conservation and Development Report' in the Project Area	Relevant legislation, mainly the Law on the Protection of Cultural and Natural Heritage, the Law on National Parks, and the Law on Land Hunting, which are based on the protection of nature and wildlife
	Sustainable Location Selection and Energy Effective Planning	Preparation of a 'Settlement Suitability Survey and Assessment Report' for the project area	Law on Soil Conservation and Land Use, Forestry Law, Law on Protection against Flood Waters and Flooding, Regulation on Protection of Wetlands, as well as legislation on sustainable land use
		'Sustainable Land Survey and Assessment Report' for the project area has been prepared	Soil Conservation and Land Use Law, Zoning Law, Regulations on Geological Surveys for Zoning Plans, Spatial Plans Construction Regulation and legislation on land use based on the principle of sustainability
		Use of Renewable Energy in the Planning Area	Although there is no legislation directly related to the criterion, the "Law on the Utilization of Renewable Energy Resources for Electricity Generation" can be given as an example among the incentive laws and regulations.
		Preferring Habitable Area According to Insolation Status	Zoning Law and related legislation

Table 2.4 Yes_Tr settlement criterias (Created by the author using the source ÇŞB, 2018) -*continues*

TITLE		CRITERIA	REFERENCE OF CRITERIA
Sustainable Land Use, Ecology and Disaster Management	Sustainable Urban Development and Land Use	Project site selection	Municipality Law, Law on the Transformation of Areas Under Disaster Risk, Law on the Renewal, Preservation and Utilization of Historic and Cultural Immovable Assets that have been worn out and related legislation
		Increasing the ratio of open and green areas	Establishment of an 'Urban Open Space and Green System' and proof of an increase of more than 30% in the amount of open space and green space in the region through the system is required to receive credit based on this criterion
	Disaster Resilience	Preparation of Disaster Risk Report and Settlement Disaster Management Plan	Law on the organization and duties of the disaster and emergency management presidency and related legislation
		Determination of Gathering Area and Necessary Facilities in Case of Disaster within the Scope of Disaster Management Plan of the Project Area	
	Environmental Management and Infrastructure Planning	Use of Rainwater Collection System	Environmental Law No. 2872, water pollution control regulation, urban wastewater treatment regulation and related legislation
		Wastewater Management and Reuse of Treated Wastewater	
		Ensuring Separate Accumulation, Collection and Management of Waste	

Table 2.4 Yes_Tr settlement criterias (Created by the author using the source ÇŞB, 2018) -*continues*

TITLE		CRITERIA	REFERENCE OF CRITERIA
Transportation and Mobility	Accessibility and Functional Connectivity	Preparation of a report including existing and proposed functions and access distances	Zoning Law and related legislation, Accessibility legislation and standards
		Preferring areas with high accessibility and served by different environmentally friendly transportation systems	
		Development of proposed transportation networks suitable for the land texture	Zoning Law and related legislation
		Ensuring that the access distances between public transportation stops and functions are appropriate and the relationship of the project area with the public transportation system is established	
		Establishing the relationship of the project area with existing transportation corridors and main transportation connections	Master Development Plan, Implementation Development Plan
		Ensuring and Increasing Access to Green/Open Spaces	Zoning Law and related legislation
		The project area should include integrated uses and support opportunities to work from home	X

Table 2.4 Yes_Tr settlement criterias (Created by the author using the source ÇŞB, 2018) -*continues*

TITLE		CRITERIA	REFERENCE OF CRITERIA
Transportation and Mobility	Sustainable and Alternative Transportation Systems	Developing strategies to ensure the compatibility of urban infrastructure with public transportation and to increase its convenience/efficiency	Regulation on principles and procedures for ıncreasing energy efficiency in transportation
		Encouraging the use of public transportation by providing safe and comfortable transportation opportunities	
		Encouraging/supporting the use of bicycles	Regulation on bicycle lanes
		Reducing dependence on the automobile promoting activities and strengthening walking access	Zoning Law, TS 12576, Urban Roads - Streets, Avenues, Squares and Structures for the Disabled and Elderly Design Rules for Precautions and Markings and related legislation
	Transportation Quality	Transportation/travel distances and travel preparation of a transportation quality report on reducing transportation times	Zoning Law and related legislation, TS 12576, Urban Roads - Design Rules for Streets, Streets, Squares and Structural Measures and Signs for the Disabled and Elderly
		Designing Safe, Attractive, Comfortable and Walkable Streets and using barrier-free design principles in the design of public transportation systems and connections, bicycle and pedestrian paths	
		Safe, accessible and adequate bicycle parking areas and additional service facilities for Bicycle Networks	Regulation on bicycle lanes
		Quality, safe and understandable design of the signalization required for cycling	

Table 2.4 Yes_Tr settlement criterias (Created by the author using the source ÇŞB, 2018) -*continues*

TITLE		CRITERIA	REFERENCE OF CRITERIA
Transportation and Mobility	Adaptation to Climate Change	Development of environmentally friendly high quality transportation modules and routes	Regulation on Principles and Procedures for Increasing Energy Efficiency in Transportation
		Designs that Adapt to Climate Change	Transportation and Mobility Design Guide
		Development of alternatives to reduce carbon emissions	
		Establishment of rainwater collection systems	
		Use of non-motorized and/or electric vehicles improved opportunities	
		Control and pricing of parking lots	
Urban Design	Process and Project Design	Active participation and design critique during project preparation, design and implementation	Project Engagement Plan
		The project is in harmony with the local identity and has created its own language	Spatial Plans Construction Regulation, Directive on the Preparation and Evaluation of Urban Design Projects to be Approved by the Ministry of Environment, Urbanization and Climate Change and related legislation
		The design takes into account and incorporates historical heritage and culture	Law on the Protection of Cultural and Natural Assets, Law on the Renovation, Protection and Utilization of Historic and Cultural Immovable Assets that are worn out and related legislation

Table 2.4 Yes_Tr settlement criterias (Created by the author using the source ÇŞB, 2018) -*continues*

TITLE		CRITERIA	REFERENCE OF CRITERIA
Urban Design	Circulatory System	Safe, attractive, comfortable, barrier-free and walkable street designs	Spatial Plans Construction Regulation, Accessibility legislation and standards and related legislation, TS 12576, Urban Roads - Design Rules of Streets, Streets, Squares and Structural Measures and Signs for Disabled and Elderly People and related legislation
		Supported compact development	1-3 credits are given according to the ratio of Residential Density and Non-Residential Area Density
		Support for public transportation and bicycle use	New stops should be constructed, and improvements should be made to existing stops as deemed necessary, Stops should be designed to be protected from rain and wind; necessary lighting, seating, route and tariff information should be provided. (1 credit) Bicycle lanes should be designed according to the requirements set out in UHA 02 K2. (New Settlement: 4 credits, Existing Settlement: 2 credits)
	Public and Open Spaces	Provision of comfortable, living and accessible public spaces	Spatial Plans Making Regulation and related legislation
		Provision of high quality, accessible green spaces	
		Supporting urban agriculture with community gardens	Option 1. Gardens and farms (3 credits) Option 2. Community supported agriculture (3 credits) Option 3.
	Services and Facilities	Designing mixed-use neighborhoods	At least 50% of the inhabitants of the project area should have access to one of at least 4 different types of uses (food retail, large-scale retail, services, municipal and community activities) within a walking distance of 400 meters.
		Provision of highly accessible services and facilities	Credit is given according to the "Demographic Needs and Priorities" section of the Strategic Plan Report

Table 2.4 Yes_Tr settlement criterias (Created by the author using the source ÇŞB, 2018) -*continues*

TITLE		CRITERIA	REFERENCE OF CRITERIA
Urban Design	Structures	Utilization of existing buildings and infrastructure	Law on the Protection of Cultural and Natural Assets, Law on the Renovation, Protection and Utilization of Historic and Cultural Immovable Assets that are worn out and related legislation
		The buildings in the area have green building certificates	Must be green certified from YeS-TR system
		Housing according to the diversity index diversity in types provided	Diversity in housing types should be ensured. Accordingly, planned and existing dwellings in the project should have a minimum Simpson Diversity Index of 0.5.
	Environment	Designs that take microclimate into consideration	Credit is given according to the microclimate study and report on the field subject to the certificate
		Designs that adapt to climate change	Credit is given according to the Biotope Area Coefficient (BAK) spreadsheet prepared for the project
		Reduced heat island effect	ASTM E1980 - 11, Standard Practice for Calculation of Solar Reflectance Index of Horizontal and Low Slope Opaque Surfaces, Cool Roof Rating Council Standard (CRRC-1), Local equivalent test methodologies
		Reduced noise pollution	Strategic noise maps, acoustic reports and action plans must comply with the Regulation on Environmental Noise Assessment and Management
		Lighting to reduce light pollution	Light and Lighting-Lighting of Workplaces-Part 2: Outdoor workplaces. TS EN 12464-2. General Directorate of Turkish Electricity Distribution Corporation (TEDAŞ). (2013). Technical Specification for LED Light Source Road Lighting Fixtures, TEDAŞ.
		Selection of the least polluting materials in the open space	Life Cycle Assessment (LCA) Report prepared in line with the methods specified in YeS_TR Green Certificate Building-YMD 01 K1 and approved by third parties

Table 2.4 Yes_Tr settlement criterias (Created by the author using the source ÇŞB, 2018) -*continues*

TITLE		CRITERIA	REFERENCE OF CRITERIA
Social and Economic Sustainability	Social and Economic Welfare	Adhering to demographic needs and priorities	Strategic Plan Report
		Accessibility of public services	Municipal Law, Metropolitan Municipality Law, Special Provincial Administration Law, Regulation on the Procedures and Principles to be followed in the Delivery of Public Services, other relevant legislation
		Increasing vocational training and skills	Strategic plan evaluation report, reports, indicators and documents including demographic and economic structure analysis
		Contributing to social development	Strategic Plan Report
		Increasing employment opportunities	
		Increasing return on investment	Social Impact Analysis
		Increase in land values	Increase in "Land and Land Square Meter Values" announced by the Revenue Administration (New settlement: 3 credits, existing settlement: 2 credits) Expected increase in real estate market report (New settlement: 3 credits, existing settlement: 2 credits)
		Use of incentive programs	Application to the incentive program (New settlement: 2 credits, existing settlement: 2 credits) Utilization of the incentive program (New settlement: 4 credits, existing settlement: 3 credits)

Table 2.4 Yes_Tr settlement criterias (Created by the author using the source ÇŞB, 2018) -*continues*

TITLE		CRITERIA	REFERENCE OF CRITERIA
Social and Economic Sustainability	Socio-Cultural Quality	Ensuring/increasing local mobility	Increased number of visitors to the project area (New settlement: 4 credits, existing settlement: 4 credits) Increased time spent visiting the area (New settlement: 4 credits, existing settlement: 4 credits) Increased number of return visits (New settlement: 2 credits, existing settlement: 2 credits)
		Promoting healthy and active living	Smoke-free public spaces (New development: 6 credits, existing development: 4 credits) Development that encourages movement and walking (New development: 6 credits, existing development: 4 credits) Innovative approaches in recreation areas (New development: 4 credits, existing development: 4 credits) Elderly-friendly service delivery planning (New development: 4 credits, existing development: 4 credits)
		Supporting local production and local products promoting the use of	Urban gardens (New settlement: 4 credits, existing settlement: 8 credits) Hobby gardens (New settlement: 3 credits, existing settlement: 6 credits)
Inovation_ Settlement	Engineering and Design Solutions that Improve Quality of Life	Innovation - Providing practices that are not included in the existing certification requirements but have innovative value in green settlement certification	Settlement Categorical Innovation Report
		Improvement and Participation - Providing improvements that increase the 'quality of life' of neighborhood/city users with innovative applications to be developed and ensuring that the solutions offered can be used by stakeholders	Island/Neighborhood/City Quality of Life Report

Table 2.4 Yes_Tr settlement criterias (Created by the author using the source ÇŞB, 2018) -*continues*

TITLE		CRITERIA	REFERENCE OF CRITERIA
Inovation_ Settlement	Improved Monitoring and Evaluation System	Monitoring and Evaluation - Including 'monitoring, measurement and evaluation' solutions based on information technologies in energy and water consumption and the results are monitored by stakeholders	Continuous Monitoring and Evaluation System Report

In 2021, the "Communiqué on Green Certificate Implementation for Buildings and Settlements" entered into force. With this communiqué, the qualifications of The Green Certificate Expert (YESU), Green Certificate Evaluation Expert (YESDU), training units, green certificate commission and evaluation organization were set out, and the procedures and principles regarding evaluation guidelines and audits were determined (Erdede & Bektaş, 2018; RG, 2021).

2.6.2. Ecological and Sustainable Design in Buildings (B.E.S.T)

The Ecological and Sustainable Design in Buildings (B.E.S.T) certificate, the first version of the Environmentally Friendly Green Buildings Association (ÇEDBİK) in 2015. It is divided into two as residential and commercial buildings (Environmentally Friendly Green Buildings Association [ÇEDBİK], 2019; ÇEDBİK, 2020). The B.E.S.T - Residential Certificate Guide, Version 2.0 which was published in August 2019, consists of nine main topics. These are; integrated green project management, land use, water use, energy use, health and comfort, material and resource use, residential life, operation and maintenance, innovation (ÇEDBİK, 2019).

B.E.S.T - Commercial Buildings Certificate Guide was published as 2020 Version 1.0 in its most up-to-date version. Likewise, it consists of 9 main headings, but instead of the heading "living in residential buildings", the heading "living in commercial buildings" is used (ÇEDBİK, 2020). Both certification systems were developed by taking international certification systems such as LEED, BREEAM,

DGNB etc. In addition, more than 100 academics, non-governmental organizations and sector representatives played an active role in the development of the certificate (ÇEDBİK, 2019; ÇEDBİK, 2020). Since it is a certification system developed specifically for Turkey, both certificates address the building scale.

2.6.3. Sustainable Energy Efficient Buildings/ Neighborhood (SEEB – TR)

The National Green Building Certification System "SEEB-TR" was developed in 2014 through the Building Application and Research Center (YUAM) of Mimar Sinan Fine Arts University (MSGSU). The building-scale certification system, which forms the basis for the development of a sustainable neighborhood assessment system, consists of 13 main criteria including energy, water efficiency, material use, comfort and health, land use, waste management, project and construction management, operation and maintenance, pollution, adaptation, fire and disaster safety, design and innovation. The certification system covers existing, renovated and newly constructed buildings (Ergönül, et al., 2023).

SEEB-TR Neighborhood was published in 2020 within the framework of the TUBITAK Research Project titled "Developing a Sustainable Evaluation System at the Neighborhood Scale" (Ergönül, et al., 2019). SEEB-TR Neighborhood consists of 5 main criteria and 20 sub-criteria addressing energy, water, material use, community and environment. Each main topic and sub-criteria are discussed in Table 2.5 together with the references of the criteria (Ergönül, Olgun & Tekin, 2020).

Table 2.5 SEEB-TR neighborhood criterias (Created by the author using the source ÇŞB, 2018)

TITLE	CRITERIA	REFERENCE OF CRITERIA
Energy	Energy Efficiency	Building Energy Performance Regulation, TS 825 Thermal Insulation Rules in Buildings
	Energy Demand	
	Energy Distribution	
	Energy Monitoring and Management	
	Outdoor Lighting	
	Renewable Energy	
	Heat Island Effect	
Water	Water Consumption	By-Law On The Planned Areas Zoning, By-Law On The Rainwater Collection, Storage and Discharge Systems, By-Law On The Wastewater Collection and Disposal Systems
	Rainwater Consumption	
	Wastewater Use	
Material Usage	Use of Local Materials	By-Law On The Environmental Label
	Use of Certified Materials	
	Economical Material Use	
	Sustainable Material Use	
Society	Security	By-Law On The Building Earthquake In Turkey, By-Law On The Fire Protection of Buildings, Basic Legislation on Disasters and Emergencies, Flood Legislation
	Social Participation	
	Developing Cultural and Heritage Identity	

Table 2.5 SEEB-TR neighborhood criterias (Created by the author using the source ÇŞB, 2018) - *continues*

TITLE	CRITERIA		REFERENCE OF CRITERIA
Environment	Land Use and Ecology	Adoption of Mixed Use Principle	By-Law On The Planned Areas Zoning, By-Law On The Spatial Plans Construction, Soil Protection and Land Use Law
		Protection and Development of the Ecological Value of the Land	
		Biodiversity Development	
		Reducing the Heat Island Effect	
		Establishing the Land-Urban Landscape Relationship	
	Transport	Traffic Pattern Development	By-Law On The Planned Areas Zoning, By-Law On The UKOME, By-Law On The Parking
		Vehicle Parking	
	Waste Management	Waste Management Under Construction	By-Law On The Waste Management, By-Law On The Excavation Soil, By-Law On The Construction and Demolition Waste Control, By-Law On The Solid Waste Control, By-Law On The Packaging Waste Control, By-Law On The End-of-Life Tires Control, By-Law On The Hazardous Waste Control, By-Law On The Waste Oil Control,By-Law On The Medical Waste Control, By-Law On The Waste Batteries and Accumulators Control, By-Law On The Waste Storage, By-Law On The Waste Vegetable Oil Control
		Waste Management in Use Phase	

The scope and objectives of these main headings are as follows;

Energy: In order to minimize energy consumption; prioritizing renewable energy sources, monitoring energy use in enterprises and raising public awareness on energy use are the main objectives. It is a prerequisite that at least half of the buildings in the

settlement comply with the TS 825 calculation method and heat conservation regulation.

Water: In order to reduce water consumption, the main objectives are to prefer water-saving systems and infrastructure in buildings, to create alternative water sources, and to provide wastewater and stormwater management. The prerequisites are that the equipment and materials used within the scope of the project have the necessary quality control certificates, that appropriate infrastructure is developed for wastewater and stormwater management, and that the local waterway is separated from other pollutants.

Material Use: The materials used should be sustainable, local, certified, durable and economical. It is a prerequisite that the material used has CE certificate.

Community: Adopting preventive approaches against disasters and crimes, ensuring community safety, protecting historical and cultural values, improving environmental quality, encouraging participation are the main objectives. It is a prerequisite for this heading that the project area has a gathering area suitable for all kinds of disasters.

Environment: Finding waste management, protecting and improving biodiversity, targeting mixed use, prioritizing pedestrian and bicycle paths, protecting the natural structure of the land, developing public transportation systems, planning sustainable transportation, prioritizing parking lots for electric vehicles are the main objectives (Ergönül, et al., 2020).

To summarize; LEED and BREEAM certification systems are frequently used at the building and urban scale in Turkey, but there is no officially defined local certification system yet. In this context, although there are considerable initiatives at the building scale, there is still a gap to be filled at the neighborhood and city scale (Ergönül, et al., 2023; Özçevik, et al., 2018; Yıldız, et al., 2015). In the light of the literature evaluated up to this point, the main headings and sub-items created for a possible local certification system at the neighborhood scale are presented in Table 2.6.

Table 2.6 Neighborhood criterias in Turkey

CATEGORIES	SCOPE	CRITERIA	RELEVANT CERTIFICATE SYSTEM	RELEVANT REGULATION	RELEVANT LAW	RELEVANT INTERNATIONAL CONVENTION
ENVIRONMENT AND LAND USE	Nature, Biodiversity, Water Management, Land Use	Water Management	SEEB-TR, YeS-TR, Breeam Communities, Casbbee UD, BCA Greenmark For Districts, PCRS For Estidama, Greenstar Communities, Leed ND, DGNB UD	By-Law On The Planned Areas Zoning, By-Law On The Water Pollution Control, By-Law On The Flood and Sediment Control	Environmental Law No. 2872, Law on Groundwater, Metropolitan Municipality Law, Special Provincial Administration Law	The Convention For The Protection Of The Mediterranean Sea Against Pollution (Barcelona, 1976), The Convention On The Protection Of The Black Sea Against Pollution (Bucharest, 1992), United Nations Convention to Combat Desertification, Protocol For The Protection Of The Mediterranean Sea Against Pollution From Land-Based Sources (Athens, 1980)
		Waste Water Management	SEEB-TR, YeS-TR, Leed ND, Casbbee UD, BCA Greenmark For Districts, PCRS For Estidama, DGNB NUD, Greenstar Communities, Breeam Communities	By-Law On The Water Pollution Control, By-Law On The Urban Wastewater Treatment, By-Law On The Waste Water Collection and Disposal Systems, By-Law On The Stormwater Collection, By-Law On The Storage and Discharge Systems, By-Law On The Solid Waste Control	Environmental Law No. 2872, Metropolitan Municipality Law	X

Table 2.6 Neighborhood criterias in Turkey -*continues*

CATEGORIES	SCOPE	CRITERIA	RELEVANT CERTIFICATE SYSTEM	RELEVANT REGULATION	RELEVANT LAW	RELEVANT INTERNATIONAL CONVENTION
ENVIRONMENT AND LAND USE	Nature, Biodiversity, Water Management, Land Use	Rainwater Management	SEEB-TR, YeS-TR, Leed ND, Casbbee UD, BCA Greenmark For Districts, PCRS For Estidama, DGNB NUD, Greenstar Communities, Breeam Communities	By-Law On The Planned Areas Zoning, By-Law On The Water Pollution Control, By-Law On The Stormwater Collection, Storage and Discharge Systems, By-Law On The Urban Wastewater Treatment	Environmental Law No. 2872, Metropolitan Municipality Law	X
		Protection and Development of Agricultural Areas	YeS-TR, SEEB-TR, PCRS For Estidama, Leed ND, Greenstar Communities	By-Law On The Making Spatial Plans, By-Law On The Good Agricultural Practices, By-Law On The Control of Soil Pollution	Law on Agriculture, Law on Metropolitan Municipality, Law on Special Provincial Administration, Law on Soil Conservation and Land Use	The Kyoto Protocool
		Protecting and Enhancing the Ecological Value of Land	YeS-TR, SEEB-TR, Leed ND, Breeam Communities, BCA Greenmark For Districts, DGNB NUD, PCRS For Estidama, Casbbee UD, Greenstar Communities	By-Law On The Planned Areas Zoning, By-Law On The Spatial Plans Construction, By-Law On The Restoration of Lands Degraded by Mining Activities, By-Law On The Afforestation	Environmental Law No. 2872, Forestry Law, Soil Conservation and Land Use Law, Pasture Law, Coastal Law, Bosphorus Law, Metropolitan Municipality Law, National Forestation and Erosion Control Mobilization Law, Special Provincial Administration Law	European Convention On The Protection Of The Archaeological Heritage (Valetta, 1997), Ramsar Convention (Ramsar, 1971), The Kyoto Protocool

Table 2.6 Neighborhood criterias in Turkey -*continues*

CATEGORIES	SCOPE	CRITERIA	RELEVANT CERTIFICATE SYSTEM	RELEVANT REGULATION	RELEVANT LAW	RELEVANT INTERNATIONAL CONVENTION
ENVIRONMENT AND LAND USE	Nature, Biodiversity, Water Management, Land Use	Conservation and Development of Biodiversity	YeS-TR, SEEB-TR, Leed ND, DGNB NUD, PCRS For Estidama, Casbbee UD, Greenstar Communities	By-Law On The Reforestation	Environmental Law No. 2872, Law on the Protection of Cultural and Natural Heritage, National Parks Law, Land Hunting Law, Fisheries Law, National Mobilization Law on Afforestation and Erosion Control	Ramsar Convention (Ramsar, 1971), nternational Convention For The Protection Of Birds (Paris, 1902), Convention On The Conservation Of European Wildlife And Natural Habitats (Bern, 1979), Convention On International Trade In Endangered Species Of Wild Fauna And Flora (CITES) (Washington, 1973), Convention on Biological Diversity (Rio, 1992)
		Establishment of Land-Urban Landscape Relationship	YeS-TR, SEEB-TR, Leed ND, Breeam Communities, BCA Greenmark For Districts, DGNB NUD, PCRS For Estidama, Casbbee UD, Greenstar Communities	By-Law On The Spatial Plans Construction	Metropolitan Municipality Law	The European Landscape Convention (Florence, 2000)
		Public Open Space Development	YeS-TR, SEEB-TR, DGNB NUD, BCA Greenmark For Districts, Leed ND			

Table 2.6 Neighborhood criterias in Turkey -*continues*

CATEGORIES	SCOPE	CRITERIA	RELEVANT CERTIFICATE SYSTEM	RELEVANT REGULATION	RELEVANT LAW	RELEVANT INTERNATIONAL CONVENTION
ENVIRONMENT AND LAND USE	Nature, Biodiversity, Water Management, Land Use	Noise Pollution	YeS-TR, Breeam Communities, DGNB NUD	By-Law On The Environmental Noise Control	Environmental Law No. 2872, Zoning Law, Special Provincial Administration Law	X
		Light Pollution	YeS-TR, Leed ND, Breeam Communities, BCA Greenmark For Districts, DGNB NUD, Greenstar Communities	By-Law On The General Lighting	X	
ECONOMIC DEVELOPMENT	Employment, Remote Work, Value Stability	Economic Development	YeS-TR, Leed ND, Breeam Communities, BCA Greenmark For Districts, DGNB NUD, Casbbee UD	X	X	X
		Increasing Investment Profitability	Leed ND, YeS-TR, Breeam Communities, PCRS For Estidama, Greenstar Communities			
TRANSPORT	Public Transport, Pedestrian And Cycle Path, Private Cars, Parking	Developing a Parking Strategy	SEEB-TR, YeS-TR, Leed ND, Breeam Communities, BCA Green Mark for Districts	By-Law On The Planned Areas Zoning, By-Law On The Metropolitan Municipalities Coordination Centers, By-Law On The Parking	Zoning Law, Metropolitan Municipality Law	X

Table 2.6 Neighborhood criterias in Turkey -*continues*

CATEGORIES	SCOPE	CRITERIA	RELEVANT CERTIFICATE SYSTEM	RELEVANT REGULATION	RELEVANT LAW	RELEVANT INTERNATIONAL CONVENTION
TRANSPORT	Public Transport, Pedestrian And Cycle Path, Private Cars, Parking	Improving Traffic Pattern	SEEB-TR, Leed ND, YeS-TR, Breeam Communities, BCA Green Mark for Districts, PCRS For Estidama, Casbbee UD, Greenstar Communities, DGNB UD	By-Law On The Planned Areas Zoning, By-Law On The Metropolitan Municipalities Coordination Centers, By-Law On The Parking, By-Law On The Bicycle Roads	Metropolitan Municipality Law	X
		Increasing/Regulating Bicycle Networks	YeS-TR, Leed ND, Breeam Communities, BCA Greenmark For Districts, DGNB NUD, PCRS For Estidama, Greenstar Communities	By-Law On The Bicycle Roads	Zoning Law, Special Provincial Administration Law, Metropolitan Municipality Law	
		Increasing Walkability	SEEB-TR, YeS-TR, Leed ND, Breeam Communities, Casbbee UD, BCA Greenmark For Districts, PCRS For Estidama, Greenstar Communities, DGNB NUD	TS 12576-City Roads-Design Rules and Related Legislation for Streets, Streets, Squares and Structural Measures and Markings for Disabled and Elderly People, Republic of Turkey Ministry of Environment, Urbanization and Climate Change Implementation Guide for Measures for the Protection of Vulnerable Road Users	Zoning Law, Special Provincial Administration Law	
		Strategy for Public Transportation Vehicles	SEEB-TR, YeS-TR, Leed ND, Breeam Communities, Casbbee UD, BCA Greenmark For Districts, PCRS For Estidama, Greenstar Communities, DGNB NUD	By-Law On The Principles and Procedures for Increasing Energy Efficiency in Transportation, By-Law On The Metropolitan Municipalities Coordination Centers	Metropolitan Municipality Law, Municipality Law	

Table 2.6 Neighborhood criterias in Turkey -*continues*

CATEGORIES	SCOPE	CRITERIA	RELEVANT CERTIFICATE SYSTEM	RELEVANT REGULATION	RELEVANT LAW	RELEVANT INTERNATIONAL CONVENTION
TRANSPORT	Public Transport, Pedestrian And Cycle Path, Private Cars, Parking	Reducing Transportation Carbon Emissions	SEEB-TR, YeS-TR, Breeam Communities, Casbbee UD, PCRS For Estidama, Greenstar Communities	By-Law On The Protection of Air Quality	X	Vienna Convention For The Protection Of The Ozone Layer, The Kyoto Protocool
		Preferring areas with high accessibility and served by environmentally friendly mixed transportation systems	SEEB-TR, YeS-TR, Leed ND, Breeam Communities, BCA Greenmark For Districts, PCRS For Estidama, Greenstar Communities, DGNB NUD	By-Law On The Planned Areas Zoning	Zoning Law, Metropolitan Municipality Law	X
		Developing Urban Infrastructure Strategies for Optimal Public Transport Use	YeS-TR, Leed ND, Breeam Communities, Casbbee UD, BCA Greenmark For Districts, PCRS For Estidama, Greenstar Communities, DGNB NUD	By-Law On The Planned Areas Zoning, By-Law On The Metropolitan Municipalities Coordination Centers	Metropolitan Municipality Law	
SOCIAL DEVELOPMENT	Quality of Life, Social Infrastructure, Urban Context	Public Participation	SEEB-TR, YeS-TR, Leed ND, Breeam Communities, BCA Greenmark For Districts, DGNB NUD, PCRS For Estidama, Casbbee UD, Greenstar Communities	X	X	X

Table 2.6 Neighborhood criterias in Turkey -*continues*

CATEGORIES	SCOPE	CRITERIA	RELEVANT CERTIFICATE SYSTEM	RELEVANT REGULATION	RELEVANT LAW	RELEVANT INTERNATIONAL CONVENTION
SOCIAL DEVELOPMENT	Quality of Life, Social Infrastructure, Urban Context	Education	Leed ND, Breeam Communities, BCA Greenmark For Districts, Casbbee UD	X	X	X
		Inclusive Design	Leed ND, Breeam Communities, BCA Greenmark For Districts, DGNB NUD, Greenstar Communities, PCRS For Estidama			
		Enhancing Cultural and Heritage Identity	SEEB-TR, YeS-TR, Leed ND, Breeam Communities, Greenmark For Districts, DGNB NUD, PCRS For Estidama, Casbbee UD, Greenstar Communities	By-Law On The Spatial Plans Construction, Directive on the Preparation and Evaluation of Urban Design Projects to be Approved by the Ministry of Environment, Urbanization and Climate Change and Related Legislation	Metropolitan Municipality Law	
DESIGN AND MANAGEMENT	Design Principles, Heat Islands, Policy and Governance	Safety	SEEB-TR, YeS-TR, Leed ND, Breeam Communities, BCA Greenmark For Districts, DGNB NUD, PCRS For Estidama, Casbbee UD, Greenstar Communities	By-Law On The Building Earthquake in Turkey, By-Law On The Fire Protection of Buildings, Basic Legislation on Disasters and Emergencies, By-Law On The Afforestation, By-Law On The Flood and Sediment Control	Law on Metropolitan Municipality, Law on Organization and Duties of Disaster and Emergency Management Presidency, Law on Civil Defense, Law on Transformation of Areas Under Disaster Risk	X

Table 2.6 Neighborhood criterias in Turkey -*continues*

CATEGORIES	SCOPE	CRITERIA	RELEVANT CERTIFICATE SYSTEM	RELEVANT REGULATION	RELEVANT LAW	RELEVANT INTERNATIONAL CONVENTION
DESIGN AND MANAGEMENT	Design Principles, Heat Islands, Policy and Governance	Accessibility of Public Services	SEEB-TR, YeS-TR, Leed ND, Breeam Communities, BCA Greenmark For Districts, DGNB NUD, PCRS For Estidama, Casbbee UD, Greenstar Communities	By-Law On The Procedures and Principles to be followed in the Delivery of Public Services	Municipality Law, Metropolitan Municipality Law, Special Provincial Administration Law	X
		Reducing The Urban Heat Island Effect	YeS-TR, SEEB-TR, Leed ND, BCA Greenmark For Districts, PCRS For Estidama, Casbbee UD, Greenstar Communities, Leed ND	By-Law On The Building Energy Performance, By-Law On The Thermal Insulation in Buildings	X	
RESOURCES AND ENERGY	Waste Management, Material Use, Conservation, Non-Renewables And Renewables Energy	Waste Management During Construction	Leed ND, SEEB-TR, Casbbee UD, Greenmark For Districts, PCRS For Estidama, Greenstar Communities, DGNB NUD	By-Law On The Waste Management, By-Law On The Control of Excavation Soil, Construction and Demolition Wastes, By-Law On The Control of Solid Wastes, By-Law On The Control of Packaging Wastes, By-Law On The Landfilling of Wastes	Environmental Law No. 2872, Metropolitan Municipality Law	X

Table 2.6 Neighborhood criterias in Turkey -*continues*

CATEGORIES	SCOPE	CRITERIA	RELEVANT CERTIFICATE SYSTEM	RELEVANT REGULATION	RELEVANT LAW	RELEVANT INTERNATIONAL CONVENTION
RESOURCES AND ENERGY	Waste Management, Material Use, Conservation, Non-Renewables And Renewables Energy	Waste Management in Use Phase	SEEB-TR, Leed ND, Breeam Communities, Casbbee UD, Greenmark For Districts, PCRS For Estidama, Greenstar Communities, DGNB NUD	By-Law On The Waste Management, By-Law On The Control of Excavation Soil, Construction and Demolition Wastes, By-Law On The Control of Solid Wastes, By-Law On The Control of Packaging Wastes, By-Law On The Landfilling of Wastes	Environmental Law No. 2872, Metropolitan Municipality Law	X
		Renewable Energy	YeS-TR, SEEB-TR, Leed ND, Breeam Communities, Greenmark For Districts, DGNB NUD, PCRS For Estidama, Casbbee UD, Greenstar Communities	By-Law On The Certification and Support of Renewable Energy Resources, By-Law On The Renewable Energy Resource Areas	Environmental Law No. 2872, Law on the Utilization of Renewable Energy Resources for Electricity Generation, Energy Efficiency Law	The Kyoto Protocool
		Energy Efficiency	SEEB-TR, YeS-TR, Leed ND, Breeam Communities, Casbbee UD, Greenmark For Districts, PCRS For Estidama, Greenstar Communities, DGNB NUD	By-Law On The Building Energy Performance, By-Law On The Thermal Insulation in Buildings, By-Law On The Principles and Procedures for Increasing Energy Efficiency in Transportation		

Table 2.6 Neighborhood criterias in Turkey -*continues*

CATEGORIES	SCOPE	CRITERIA	RELEVANT CERTIFICATE SYSTEM	RELEVANT REGULATION	RELEVANT LAW	RELEVANT INTERNATIONAL CONVENTION
RESOURCES AND ENERGY	Waste Management, Material Use, Conservation, Non-Renewables And Renewables Energy	Green Infrastructure	YeS-TR, Leed ND, Breeam Communities, Casbbee UD, Greenmark For Districts, PCRS For Estidama, Greenstar Communities, DGNB NUD	By-Law On The Making Spatial Plans	Environmental Law No. 2872	X
		Sustainable Buildings	YeS-TR, SEEB-TR, Leed ND, Breeam Communities, Greenmark For Districts, PCRS For Estidama, Greenstar Communities, CASBEE UD	By-Law On The Fire Protection of Buildings, By-Law On The Earthquake in Turkey, By-Law On The Zero Waste , By-Law On The Planned Areas Zoning, By-Law On The Building Energy Performance , By-Law On The Thermal Insulation in Buildings, By-Law On The Green Certificate for Buildings and Settlements	Environmental Law No. 2872, Zoning Law	The Granada Convention, 1985
		Use of Local Materials	SEEB-TR, Casbbee UD, PCRS For Estidama	By-Law On The Environmental Labeling	X	X
		Use of Sustainable Materials	YeS-TR, SEEB-TR, Breeam Communities, Leed ND, Greenmark For Districts, PCRS For Estidama, Greenstar Communities, DGNB UD, CASBEE UD			

Table 2.6 Neighborhood criterias in Turkey -*continues*

CATEGORIES	SCOPE	CRITERIA	RELEVANT CERTIFICATE SYSTEM	RELEVANT REGULATION	RELEVANT LAW	RELEVANT INTERNATIONAL CONVENTION
RESOURCES AND ENERGY	Waste Management, Material Use, Conservation, Non-Renewables And Renewables Energy	Use of Certified Materials	SEEB-TR, PCRS For Estidama	By-Law On The Environmental Labeling	X	X
		Economic Material Use	SEEB-TR, DGNB NUD			
INNOVATION	Innovative Applications and Technological Developments		SEEB-TR, YeS-TR, LEED ND, BCA Green Mark for Districts	X	X	X

The scope and source literature on the main topics of the certificate system are set out in Table 2.6. The scope of the sub-topics is as follows;

Environment and land use

Water Management: This criteria is aimed at using alternative water resources, to create green infrastructure, to ensure water hygiene, to adopt a water efficient design approach, to prevent water losses in open green areas, landscaping and agriculture (Burkhard, Deletic & Craig, 2000; Hellström, Jeppsson, & Kärrman, 2000; Karol & Brunner, 2009; Larsen & Gujer, 1997; Qasim, 2017).

Waste Water Management: Collection, treatment and reuse of wastewater such as gray water, black water, etc. is the main objective. In this context, the establishment of common treatment facilities and the increase of wastewater in accordance with the regulations are the required qualities (Burkhard, Deletic & Craig, 2000; Hellström, Jeppsson, & Kärrman, 2000; Qasim, 2017).

Rainwater Management: The main objective is to develop systems and projects for the collection, storage and distribution of rainwater. In this context, designing water-efficient landscapes, discharging rainwater in a way that feeds groundwater and reducing the amount of rainwater discharge are the required qualities (Burkhard, Deletic & Craig, 2000; Cettner, Ashley, Hedström, & Viklander, 2014; Chen, Samuelson & Tong, 2016; Ergönül, et al., 2020; Hellström, Jeppsson, & Kärrman, 2000).

Protection and Development of Agricultural Areas: Intensive agricultural practices, deforestation practices, pollution of the soil through intensive use of pesticides and reduction of soil fertility, and agricultural activities that will jeopardize biodiversity are approaches that should be avoided. In this context, it is aimed to protect and develop agricultural areas by promoting sustainable agricultural practices (Aznar-Sánchez, Piquer-Rodríguez, Velasco-Muñoz & Manzano-Agugliaro, 2019; Cunningham, et al., 2013; Foucher, et al., 2014; Maxwell, Fuller, Brooks & Watson, 2016).

Protecting and Enhancing the Ecological Value of the Land: The main objective is to assess and protect the design site, its surroundings, its relationships and microclimate before design. In this context, the minimization of landfill, preference for native plants in landscape design, remediation of contaminated land, and habitat protection are desirable qualities (DeFries, Hansen, Turner, Reid, & Liu, 2007; Ergönül, et al., 2020).

Conservation and Development of Biodiversity: Increasing awareness of natural resources, animals, plants and landscapes, protecting habitats, adopting approaches to increase biodiversity, protecting endangered species, considering migration routes in design, reducing light pollution are the main objectives (Bellard, Bertelsmeier, Leadley, Thuiller & Courchamp, 2012; Ergönül, et al., 2020; Hölker, Wolter, Perkin & Tockner, 2010; Longcore & Rich, 2004; O'Riordan & Stoll-Kleemann, 2002).

Establishing the Land-Urban Landscape Relationship: Preserving the landscape character and reflecting the landscape, view, and silhouette features of the land in the design (Ergönül, et al., 2020; Watson & Adams, 2010).

Public Open Space Development: It is aimed to provide opportunities for sports activities involving all users, increase public health, support both physical and psychological development of users, and increase interaction between different groups (Koohsari, et al., 2015; Pretty, Peacock, Sellens & Griffin, 2005; Thompson, 2002, 2011).

Noise Pollution: It is aimed to reduce noise pollution caused by traffic, industrial facilities and urban density. In this context, analyzing and measuring noise pollution and urban planning, shaping the traffic pattern accordingly, and conducting afforestation works to reduce noise pollution are the qualities sought (Goines & Hagler, 2007; Knoflacher, 2006; Morillas, Gozalo, González, Moraga & Vílchez-Gómez, 2018).

Light Pollution: Light pollution is caused by the upward propagation and scattering of light back to the earth. In this context, increasing population and the use of light sources increase light pollution, threaten biodiversity, and lead to the depletion of energy resources. Light pollution is also closely related to air pollution,

so the aim is to reduce both simultaneously (Hölker, et al., 2010; Kosai & Isobe, 1991; Longcore & Rich, 2004; Narisada & Schreuder, 2013).

Economic development

Economic Development: Provision and promotion of local job opportunities, including initiatives to create jobs and reduce unemployment, ensuring equal opportunities for all groups of individuals, risk assessment and management are the main objectives of this criterion (Dietz, Daly & O'Neill, 2013; Karol & Brunner, 2009; Luederitz, et al., 2013; Sharifi & Murayama, 2013).

Increasing Investment Profitability: Increasing sustainability in settlements aims to improve living conditions. In line with this goal, improved living conditions positively affect investment profitability (Algert, et al., 2014; Bolitzer & Netusil, 2000; Hobden, Laughton & Morgan, 2004; Tranel & Handlin Jr, 2006; Voicu & Been, 2008).

Transport

Developing a Parking Strategy: The main objective is to adopt approaches that are based on sustainability principles and minimize the amount of hard surface and planting ratio. Car charging units for vehicles powered by alternative energy sources and bicycle parks are required (Kirschner & Lanzendorf, 2020; Knoflacher, 2006; Vashisth, Kumar, & Sharma, 2018).

Improving the Traffic Pattern: In the development of the traffic pattern, sustainable, pedestrian-friendly, universal design principles, road safety, mitigating the heat island effect, and mixed-use compact development are adopted. In addition, approaches that encourage the use of public transportation, walking and cycling are desirable qualities (Gouda & Masoumi, 2017; Knoflacher, 2006; Ogryzek, Adamska-Kmieć & Klimach, 2020; Vashisth, Kumar, & Sharma, 2018).

Increasing/Regulating Bicycle Networks: With this sub-heading, it is aimed to develop a suitable, safe and efficient street network for bicycle transportation. In this context, it is aimed to create accessible spaces through bicycle road connections, thus reducing carbon emissions, improving public health, reducing traffic congestion, and

saving energy (Brand, Goodman & Ogilvie, 2014; Cervero, Sarmiento, Jacoby, Gomez & Neiman, 2009; Dehghanmongabadi, et al., 2014; Vashisth, Kumar, & Sharma, 2018; Zahabi, Chang, Miranda-Moreno & Patterson, 2016).

Increasing Walkability: This criterion aims to reduce vehicular traffic congestion, improve the local economy, save energy, reduce transportation carbon emissions, increase safety through vibrant street life, and improve public health (Brand, et al., 2014; Cervero, et al., 2009; Dehghanmongabadi, et al., 2014; Singh, 2016; Stanislav & Chin, 2019; Talen & Koschinsky, 2011, 2013; Vashisth, Kumar, & Sharma, 2018).

Strategy for Public Transportation: The main objective is to adopt innovative, sustainable and accessible approaches to public transportation systems. The locations of public transport stops should be accessible, linked to bicycle networks, and meet universal design principles (Gouda & Masoumi, 2017; Griškevičiūtė-Gečienė & Griškevičienė, 2016; Ogryzek, Adamska-Kmieć & Klimach, 2020; Vashisth, Kumar, & Sharma, 2018).

Reducing Transportation Carbon Emissions: The main objective is to promote carbon emission reduction by reducing the use of petroleum-based products. In this direction, it is important to expand the use of public transportation and cycling (Leung, Caramanna & Maroto-Valer, 2014; Solaymani, 2019; Vashisth, Kumar, & Sharma, 2018).

Preferring Areas with High Accessibility and Served by Environmentally Friendly Mixed Transportation Systems: The main objective in this selection of design areas is to prefer areas that are already connected to transportation systems and have high accessibility (Ogryzek, Adamska-Kmieć & Klimach, 2020).

Development of Urban Infrastructure Strategies for Optimal Public Transport Use: This criterion includes the development of sustainable and innovative infrastructure systems for the systematic functioning of all public transport units, including underground, surface and overwater (Gouda & Masoumi, 2017; Griškevičiūtė-Gečienė & Griškevičienė, 2016; Ogryzek, Adamska-Kmieć & Klimach, 2020).

Social development

Public Participation: The main objective is to raise public participation, awareness and information at all stages of sustainable neighborhood development processes. In this way, it is aimed to increase the awareness about sustainabilty to society (Doelle & Sinclair, 2006; Holden, 2011; Kasemir, 2003).

Education: In order to create sustainable neighborhoods, first of all, the community's awareness of environmental protection and sustainability should be raised. For this purpose, it is aimed to establish units in the neighborhoods for sustainability training, and to plan and monitor the training to be suitable for all age groups (Bogner, 1998; Otto & Pensini, 2017).

Inclusive Design: The main goal is to take into account all norms that are considered "disadvantages" in society and include them in the design. It is aimed to realize these approaches planned in design in practice (Clarkson, Coleman, Keates & Lebbon, 2013; Greco, 2020; Heylighen, 2008).

Enhancing Cultural and Heritage Identity: Developing and protecting the historical and cultural values in the region, developing appropriate projects in this context and supporting them with public participation (Gražulevičiūtė, 2006; Nocca, 2017; Pereira Roders & Van Oers, 2011).

Design and management

Safety: Ensuring safe living conditions is the main objective for this criterion. In line with this objective, taking precautions for all kinds of disasters, crimes and accidents, realizing the necessary planning and establishing management strategies are the required qualities. In this direction, qualified assembly areas should be available and these areas should have all kinds of communication, water and electricity infrastructure. Providing training to individuals on security and disaster issues, day/night lighting and camera systems are other required qualities (Ergönül, et al., 2020; Gardiner, 1979; Loukaitou-Sideris, 2006).

Accessibility of Public Services: In order to prevent urban sprawl, high density development is an important step in planning a sustainable neighborhood. In this

context, locating public services in accessible and, if possible, central locations provides many social, economic and environmental benefits. In particular, it is vital that health, safety and public buildings are quickly accessible for everyone. The accessibility of green spaces, public transportation, cultural and sports facilities are other qualities (Dehghanmongabadi, et al., 2014; Macke, Sarate & de Atayde Moschen, 2019; Stanislav & Chin, 2019).

Reducing The Urban Heat Island Effect: The heat island effect is the situation where the urban air temperature is higher than the surrounding rural environment as a result of increased construction (Oke, 1987; Rizwan, Dennis & Chunho, 2008; Santamouris, 2001). In order to mitigate this effect, increasing the amount of green space and water features, improving the microclimate and selecting high albedo surfaces are the main qualities sought (Deilami, Kamruzzaman & Liu, 2018; Kleerekoper, Van Esch & Salcedo, 2012).

Resources and energy

Waste Management During Construction: It covers the reduction, storage, recycling and/or disposal of waste that may be generated during construction. Therefore, the long-term planning and provision of appropriate recycling mechanisms, should take place thus minimizing resource and energy consumption as it is the main objective (Gertsakis & Lewis, 2003; Seadon, 2010).

Waste Management in the Use Phase: It covers the reduction, storage, recycling and/or disposal of waste that may be generated during use. In this context, the long-term planning and provision of appropriate recycling mechanisms, thus minimizing resource and energy consumption is the main objective (Gertsakis & Lewis, 2003; Seadon, 2010).

Renewable Energy: It is aimed to encourage the use of renewable energy sources. In particular, the use of wind energy, which has the lowest greenhouse gas emissions and the lowest water consumption demand, which is of primary importance (Dincer, 2000; Evans, Strezov & Evans, 2009; Owusu & Asumadu-Sarkodie, 2016).

Energy Efficiency: Planning, organizing and controlling the amount of energy to be used is the main objective of this principle. In this context, it is aimed to minimize the energy/benefit ratio and increase energy efficiency for all design elements (Abulfotuh, 2007; Ergönül, et al., 2020; Rosen, 1996).

Green Infrastructure: In this criterion, the main objective is to promote green infrastructure instead of gray infrastructure. Green infrastructure is defined as an integrated network that includes natural and semi-natural areas (Naumann, Davis, Kaphengst, Pieterse & Rayment, 2011). They are preferred because they have lower capital, maintenance and operating costs compared to gray infrastructure systems and have lower environmental impacts, especially carbon emissions (Benedict & McMahon, 2006; Cettner, et al., 2014; Lafortezza, Davies, Sanesi & Konijnendijk, 2013; Pakzad & Osmond, 2016).

Sustainable Buildings: This criterion addresses the smart layout of buildings and green building systems. In this context, the main qualities sought are that the buildings should be located in such a way that they consume less energy and minimize undesirable factors such as noise and wind, and have at least one of the green building certification systems (Hafez, et al., 2023; Häkkinen, & Belloni, 2011; John, Clements-Croome & Jeronimidis, 2005; Vierra, 2016).

Use of Local Materials: The main objectives are to revitalize the local economy and, if possible, to use materials close to the design area. In this way, it is aimed to reduce the environmental impacts of transportation (Calkins, 2008; Ergönül, et al., 2020; Khatib, 2016).

Use of Sustainable Materials: The main objective is to encourage the use of economical, long-lasting, durable, smart and local materials (Calkins, 2008; Ergönül, et al., 2020; Khatib, 2016; Olivetti & Cullen, 2018).

Use of Certified Materials: It is aimed to ensure the production, selection and use of materials with reduced environmental impacts in all kinds of building materials, and to prefer certified products for this purpose (Ergönül, et al., 2020; RG, 2018)

Economic Material Use: The main objective is to use available, recycled, waste or local materials (Calkins, 2008; Ergönül, et al., 2020; Khatib, 2016).

Innovation

Innovation and technology add value to all the main topics mentioned a variety of ways. Some of these values include the use of renewable, green and innovative technologies in energy, the use of digital technologies in infrastructure services, the implementation of smart agriculture with innovative agricultural techniques, increasing community cohesion through digital platforms, providing environmental education, and strengthening solidarity and social ties (Evans, et al., 2019; Sharifi & Murayama, 2013).

To summarize, all the criteria subject to the research are supported by laws, decrees and regulations in Turkey, international treaties and conferences, international certification systems and certification systems in Turkey. In addition, each criterion is explained in terms of scope, purpose and objectives through existing studies in the literature. All these criteria were selected based on the scientific background as well as Turkey's geographical, socio-cultural and economic conditions. The criteria are intended to form the basis for a sustainable neighborhood certification system in Turkey.

CHAPTER THREE
METHODOLOGY

As seen in the previous section, for a sustainable development, it is important that policies and targets are localized and therefore some regulations are introduced in urban areas. Green certification systems are frequently used to control the regulations to be made in urban areas. There are some green certification systems in the world and in our country. However, as mentioned in previous studies, in order to create a successful sustainable neighborhood, it is necessary to develop certificates suitable for the characteristics of that place. In our country, it can be seen that there are no unique certification systems developed for sustainable neighborhoods. In this thesis, it is aimed to evaluate the criteria put forward as a basis for the creation of a locally-specific sustainable neighborhood assessment certificate system with the "Analytic Hierarchy Process (AHP)" and to determine the importance ranking of the criteria. For this purpose, in this section, firstly the history and application principles of the "Analytic Hierarchy Process (AHP)" technique are examined. Then, the selection of the parameters to be examined in the AHP to be applied in the study and the determination of the main criteria and sub-criteria from these parameters are explained. Afterwards, it was explained how these criteria were evaluated with the AHP method by taking expert opinion as a result of face-to-face interviews with Izmir Karşıyaka Municipality Sustainability Office unit and Dokuz Eylül University Faculty of Architecture faculty members. The questionnaire form developed for this purpose and the application process of this form are also explained in this section. At the end of the chapter, statistical data about the volunteers participating in the study are shared. The survey applied within the scope of the thesis was approved by the ethics committee decision numbered E-59347747-659-995230 and dated 16.05.2024 (Appendix-1).

3.1. Analytic Hierarchy Process - AHP

The main criteria for assessing the concept of sustainable neighborhoods and the sub-parameters related to these main criteria are presented in the previous section and in Table 2.6. The prioritization of these criteria is important as a basis for the creation of a locally specific sustainable neighborhood assessment certification

system. In this way, a more systematic decision-making process can be realized, the best alternatives can be identified (Saaty, 2008, 2010), the relationships between the criteria can be revealed, and the priority problems can be addressed in light of local conditions.

Prioritization of criteria can also be expressed as a multi-criteria decision making problem (Halıcıoğlu, 2005). Decision-making is a phenomenon that usually provides logical/scientific foundations and is based on the creative process of formulating the decision problem (Harker, 1989). In this context, Saaty (2010) put forward a mathematical theory of the synthesis of impulses in the brain. With this theory, he emphasized that the working principle of decision-making mechanisms is mathematical, analytical and systematic (Saaty, 2010). According to Fülöp (2005), the decision-making process is evaluated in 8 steps: (1) Defining the problem clearly and briefly, (2) Identifying the requirements for solving the problem, (3) Setting goals, (4) Presenting alternatives and evaluating them in the light of the requirements, (5) Identifying and grouping the criteria, (6) Choosing the decision-making method, (7) Evaluating the alternatives according to the criteria, (8) Validating the solution according to the problem (Fülöp, 2005, p. 1).

There are many factors affecting a decision, such as the criteria set forth in making a decision and the relationships between these criteria. In this context, it is necessary to correctly classify the relationships between criteria, determine priorities and create a systematic decision-making process. For this purpose, there is a need for a method that takes into account multiple criteria in decision-making problems, measures the consistency in the preference of these criteria, and through these, puts the decision-making process into a mathematical, analytical and systematic process (Halıcıoğlu, 2005).

The Analytic Hierarchy Process (AHP) merhod is developed by Thomas L. Saaty in the 1970s (Harker, 1989; Saaty, 2012; Zahedi, 1986). The AHP method enables individuals or a group to evaluate the factors related to any problem and calculate the relative importance of these factors. It also allows decision makers to create a hierarchical order to evaluate the criteria. In this way, it facilitates decision-making processes in solving complex problems and ensures consistent decisions. In this

context, importance weights are obtained by making measurements by assigning numerical values to the criteria, regardless of quantitative and qualitative, in the light of personal judgments. Then, the consistency of decision makers regarding the values reached is measured. Finally, these values are synthesized to reach the best alternative in the whole structure (Saaty, 2001; Vargas, 1990).

The main reasons for the preference of this method are that AHP is suitable for comparing all quantitative and qualitative information together, the criteria can be evaluated hierarchically, it allows group participation in the decision-making process, and it allows measuring the consistency of judgments. In addition, adopting a systematic approach during the evaluation of criteria with pairwise comparison matrices and enabling the transformation of personal judgments, knowledge and experiences into numerical data are other reasons for preference (Saaty, 2012; Vargas, 1990).

In the application of AHP, the criteria determined for the solution of the problem are ranked in a hierarchical order in relation to a main objective. The location of the criteria, sub-criteria and alternatives within this hierarchical system is presented in Figure 3.1 (Vargas, 1990; Saaty, 2012).

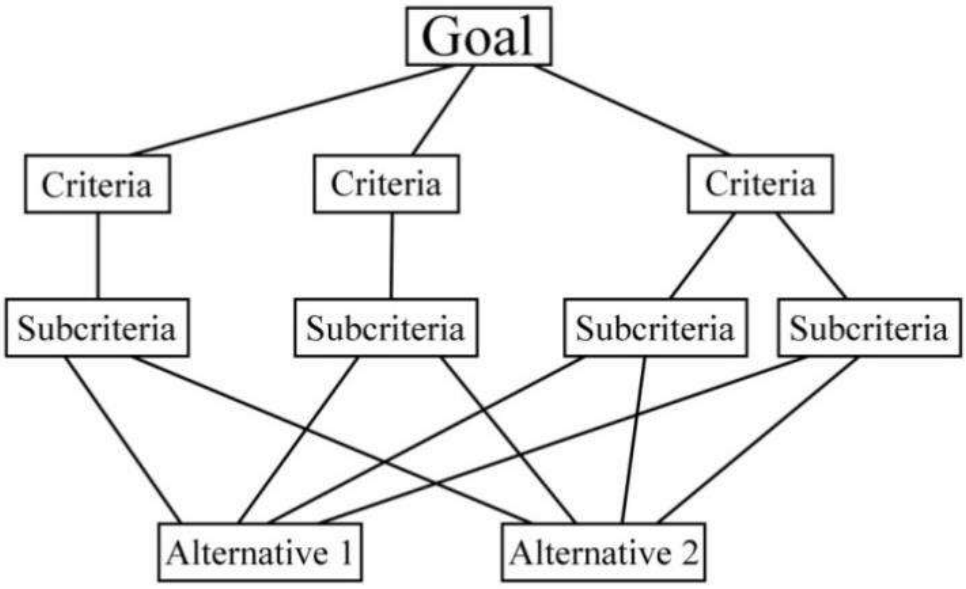


Figure 3.1 The hierarchical structure of the analytical hierarchy process method (Created by the author using the source Saaty, 2008, 2012; Wind & Saaty, 1980)

AHP consists of three basic principles: (1) hierarchy formation, (2) prioritization, and (3) logical consistency (Saaty, 2012). It is possible to explain these three basic principles in three stages.

In the first stage, the components are categorized by dividing them into parts. Since each element in the hierarchy is interrelated, the effect of a change in one element on the whole system can be seen. In this way, complex systems can be more easily perceived and systematically analyzed. Therefore, the decision-making process can be simplified and accelerated. Moreover, the method allows for the simultaneous comparison of quantitative and qualitative elements and is holistic and flexible in this respect. The first unit of the hierarchical structure is the main objective. All of the criteria related to this objective are prioritized in a hierarchical order according to their importance in achieving the objective. At this point, it should be noted that items at the same level should be independent of each other. In this way, grouping of similar items can be realized (Brunelli, 2014; Vargas, 1990; Saaty, 2001, 2012). The number of levels of ranking varies depending on the complexity and detail of the problem.

In the second stage, each criterion in the hierarchy is rated according to its level of importance in order to determine priorities. By making these comparisons, judgments, knowledge and experiences are transformed into numerical data in absolute number scale. For this purpose, a pairwise comparison matrix is used to determine the degree of importance of two items relative to each other. “Saty's 1-9 number scale” is used to make the decision. The scale is a finite set of positive real numbers. In this context, a_{ij}, represents the relationship between i and j, and the mathematical equivalent of relationships is presented in Table 3.1 (Donegan, Dodd, & McMaster, 1992; Saaty, 2012).

In addition, Moisiadis (1999) argued that more consistent results can be obtained by using a scale of 1-3 or 1-5 (p. 204-211). He revealed that it is difficult to distinguish the degree of importance in the 1-9 scale, and that clearer choices can be made according to this complexity with 1-3 or 1-5 scales (Moisiadis, 1999).

Table 3.1 Saty's relative indice (Created by the author using the source Donegan, Dodd, & McMaster, 1992; Saaty, 2008, 2012; Wind & Saaty, 1980)

Value of a_{ij}	Relative importance of issues i and j
1	i and j of equal importance
3	i slightly more important than j
5	i more important than j
7	i a lot more important than j
9	i overwhelmingly more important than j
2,4,6,8	Intermediate values between the two adjacent judgments

The weights of the criteria determined through the pairwise comparison matrix are presented in the "Comparison Matrix (A)" in Table 3.2 K1, K2, ...Kn in the matrix represent the criteria. a_{ij} shows the relationship between criteria K_i and K_j, which are evaluated in accordance with the scale. If the value in cell K_{ij} of the matrix is a_{ij}, the value of cell K_{ji} is $1/a_{ij}$. Therefore, the cells that intersect the same criteria and form the diagonal of the matrix have a value of "1" and represent equal importance. This matrix in Table 3.2 has n*n elements. Therefore, the number of comparisons to be made is calculated as $\frac{n.(n-1)}{2}$ (Brunelli, 2014; Harker, 1989; Saaty, 1987, 2008, 2010, 2012; Wind & Saaty, 1980).

Table 3.2 Comparision matrix (Created by the author using the source Brunelli, 2014; Harker, 1989; Saaty, 1987, 2008, 2010, 2012; Wind & Saaty, 1980)

A =

	$\boldsymbol{K_1}$	$\boldsymbol{K_2}$	**…**	$\boldsymbol{K_n}$
$\boldsymbol{K_1}$	**1**	a_{12}	…	a_{1n}
$\boldsymbol{K_2}$	$1/a_{12}$	**1**	…	a_{2n}
…	…	…	**1**	…
$\boldsymbol{K_n}$	$1/a_{1n}$	$1/a_{2n}$	…	**1**

After the comparison matrix is presented, each element in the matrix is normalized with the formula $a_{ij}{}' = \frac{a_{ij}}{\sum_{i=1}^{n} a_{ij}}$. For this, each column is summed within itself, then each cell is divided by the sum in its column. In this way, the "Normalized Comparison Matrix" is created. It should be noted that the sum of the columns created in the normalized comparison matrix must be equal to "1".

Then, the "Eigenvector (w)" is generated, which is used to reveal the dominance of one criterion over another criterion. Eigenvector is calculated using the formula $w_i = \frac{\sum_{i=1}^{n} a_{ij'}}{n}$ (n= number of criteria). The eigenvector is obtained by averaging the rows in the normalized comparison matrix. It should be noted that the sum of the values in the column of the eigenvector must be equal to "1". Thanks to the eigenvector, the importance weights of the decision variables are revealed. The weighted criteria chosen by decision makers are determined at this stage (Donegan, Dodd, & McMaster, 1992; Harker, 1989; Saaty, 1987, 2001; Schoner & Wedley, 1989; Wind & Saaty, 1980).

In order to calculate the logical consistency, which is the third and last step, it is first necessary to reach the "Eigenvalue (w')" value. Eigenvalue is calculated with

the formula w'= Aw = $\begin{bmatrix} w_1' \\ w_2' \\ \vdots \\ w_n' \end{bmatrix}$. In this context, the eigenvalue is obtained from the matrix product of the normalized comparison matrix and the eigenvector.

After this, the "Largest Eigenvalue (λ_{max})" should be found in order to measure consistency. Largest Eigenvalue is calculated by the formula ise λ_{max}= $\frac{1}{n}\left(\frac{w_1'}{w_1}+\frac{w_2'}{w_2}+\cdots+\frac{w_n'}{w_n}\right)$ and is expected to be equal to or greater than the number of criteria (n). In this context, the largest eigenvalue (λ_{max}) is obtained by dividing the eigenvalue (w') matrix by the eigenvector (w) matrix and then dividing by the number of criteria (n) (Harker, 1989; Saaty, 1987, 2001; Schoner & Wedley, 1989; Wind & Saaty, 1980).

"Consistency Index (CI)" is reached with the largest eigenvalue value. In this context, the consistency index can be reached by subtracting the number of criteria (n) from the largest eigenvalue value and dividing it by the number of criteria minus 1 and formulated as CI = $\frac{\lambda_{max}-n}{n-1}$. The Consistency Ratio (CR) is then measured by comparing the consistency index with the Random Index (RI) given in Table 3.3. The Random Index (RI) values developed and tested by Wharton Business School and Oak Ridge Laboratories for matrices with up to 15 criteria (n) are shown in Table 3.3.

Table 3.3 Random Index (RI) (Created by the author using the source Halıcıoğlu, 2005; Saaty, 1987, 2012)

Number of Criteria (n)	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
Random Index (RI)	0	0	0,58	0,90	1,12	1,24	1,32	1,41	1,45	1,49	1,51	1,48	1,56	1,57	1,59

In Table 3.3, n is again the number of criteria and RI is the corresponding random index. In this context, the consistency ratio is calculated as CR= $\frac{CI}{RI}$. The consistency level of the CR value is;

CR ≤ 0.10 Consistent

CR > 0.10 is expressed as Inconsistent. In this context, a CR less than 0.10 indicates that decision makers' judgments are consistent. In cases where this ratio is greater than 0.10, judgments are considered inconsistent (Halıcıoğlu, 2005; Harker, 1989; Saaty, 1987, 2001; Schoner & Wedley, 1989; Wind & Saaty, 1980).

As mentioned above, the AHP method has been preferred in many studies due to its features such as facilitating multi-criteria decision-making processes, measuring the consistency of the decisions taken, evaluating quantitative and qualitative criteria at the same time, allowing the opinions of more than one decision maker and ranking all criteria hierarchically. It has been preferred especially in fields of study such as sustainability, which involve different disciplines, where quantitative and qualitative evaluations are required at the same time and more than one expert opinion is needed. One of these studies is a research conducted by Mosadeghi, Warnken, Tomlinson and Mirfenderesk in Dubai, which aims to determine the weights of planning elements for sustainable urban transformation with AHP (Mosadeghi, Warnken, Tomlinson & Mirfenderesk, 2022). Another research is the evaluation of strategic spatial planning processes with AHP in Lyon and Copenhagen urban areas (Palka, Oliveira, Pagliarin, & Hersperger, 2021). Another study that addresses sustainability through AHP is a study on sustainable urban transportation planning in Mersin (Ghorbanzadeh, Moslem, Blaschke, & Duleba, 2018). There are many studies, especially these studies, that prefer the AHP method in the evaluation of sustainability and spatial planning processes. Therefore, in this thesis, the AHP method was preferred in the evaluation of sustainable neighborhood criteria.

3.2. Determination of Criteria

In order to determine the criteria for sustainable neighborhoods by the participants, firstly, a literature review was conducted in which conceptual and theoretical information was presented (See Chapter 2). The documents examined to determine the parameters are BCA Green Mark For Districts, BREEAM Communities, CASBEE for UD, DGNB System Districts, LEED ND, National Green Certification System (YeS-TR), Ecological and Sustainable Design in Buildings (B.E.S.T) Certificate and Sustainable Energy Efficient Buildings (SEEB-TR) Certificate and are presented in Table 2.6 in the previous section.

In this context, internationally established and widely used sustainable neighborhood certification systems are included. For this reason, LEED ND, BREEAM Communities, DGNB UD, CASBEE UD and BCA Green Mark for Districts evaluation systems were analyzed. With the development of neighborhood-scale assessment systems, the harmony, activity and social interactions between not only individual buildings, but also the spaces between these buildings, the services provided, the residents, other living beings and all these wide range of elements are evaluated (Cole, 2010; Deakin, 2011; Hurley & Horne, 2006; Reith & Orova, 2015). Certification systems were evaluated in light of their locally specific impacts. In order to be able to compare the systems, each sub-criterion was categorized according to its description and evaluation method, resulting in common main headings. In this way, the weight, meaning and importance of the criteria became comparable (Gibson, Hassan, Tansey, & Whitelaw, 2013; Sharifi & Murayama, 2013). These certification systems, in terms of their definition, scope and references, served as a source for determining the criteria for a sustainable neighborhood assessment certification system specific to Turkey.

In the last step of the literature review, policies and legal regulations in Turkey from the concept of green building to the scale of sustainable urbanization are presented. In addition to these, certification systems and initiatives in Turkey have been evaluated. In this context, the National Green Certification System (YeS-TR), Ecological and Sustainable Design in Buildings Certificate (B.E.S.T) and Sustainable Energy Efficient Buildings Certificate (SEEB-Tr) developed in Turkey for measuring

sustainability are evaluated. In addition to these, it was observed that LEED and BREEAM certification systems are frequently used at the building and urban scale in Turkey. As a result of this evaluation, it was determined that although there are considerable initiatives at the building scale, there are significant deficiencies that need to be completed at the neighborhood and city scale (Ergönül, et al., 2023; Özçevik, et al., 2018; Yıldız, et al., 2015). Yes-Tr, which is one of the two certification systems different from the building scale, covers the settlement scale. The other is SEEB-Tr, which covers the neighborhood scale but remains within the scope of the project. There is not yet an officially defined local certification system at the neighborhood scale. Within the scope of this study, in the light of the above-mentioned literature review, a questionnaire survey was conducted in which the AHP method was applied in order to identify the approaches of institutions and experts in order to develop sustainable neighborhood criteria specific to the local conditions of our country. The criteria evaluated in the survey are as shown in Table 3.4.

Table 3.4 Summary of neighborhood criteria in Turkey

CATEGORIES	SCOPE	CRITERIA
ENVIRONMENT AND LAND USE	Nature, Biodiversity, Water Management, Land Use	Water Management, Waste Water Management, Rainwater Management, Protection and Development of Agricultural Areas, Protecting and Enhancing the Ecological Value of Land, Biodiversity Conservation and Development, Establishment of Land-Urban Landscape Relationship, Public Open Space Development, Noise Pollution, Light Pollution
ECONOMIC DEVELOPMENT	Employment, Remote Work, Value Stability	Economic Development, Increasing Investment Profitability
TRANSPORT	Public Transport, Pedestrian And Cycle Path, Private Cars, Parking	Developing a Parking Strategy, Improving Traffic Pattern, Increasing/Regulating Bicycle Networks, Increasing Walkability, Strategy for Public Transportation Vehicles, Reducing Transportation Carbon Emissions, Preferring areas with high accessibility and served by environmentally friendly mixed transportation systems, Developing Urban Infrastructure Strategies for Optimal Public Transport Use
SOCIAL DEVELOPMENT	Quality of Life, Social Infrastructure, Urban Context	Community Engagement, Education, Inclusive Design, Enhancing Cultural and Heritage Identity
DESIGN AND MANAGEMENT	Design Principles, Heat Islands, Policy and Governance	Security, Accessibility of Public Services, Reducing the Heat Island Effect
RESOURCES AND ENERGY	Waste Management, Material Use, Conservation, Non-Renewables And Renewables Energy	Waste Management During Construction, Waste Management in Use Phase, Renewable Energy, Energy Efficiency, Green Infrastructure, Sustainable Buildings, Local Material Usage, Sustainable Material Use, Certified Material Usage, Economic Material Usage
INNOVATION	Innovative Applications and Technological Developments	

3.3. Survey Form Content and Survey Process

3.3.1. Content of the Survey

The questionnaire form applied to the participants who volunteered for the study consists of four sections (Appendix-2). The first section (A. General Information) includes questions about the gender, occupation, unit of employment, number of years of employment in that unit, and the sustainability-related projects in which the participants volunteered for the study.

The second part of the questionnaire (B. Sustainability and Certification) assessed the participants' level of knowledge about sustainability and certification systems. For this reason, the question (1) “How do you find your level of knowledge about the concept of sustainability?” was questioned using a 5-point Likert scale. Then (2) “What are the 3 words, concepts or ideas that come to your mind when you think of sustainability?” and (3) “What are the 3 words, concepts or ideas that come to your mind when you think of sustainable neighborhoods?” Finally, (4) “Which green certification system(s) do you have information about?”. The question was asked and it was expected to mark the certification system(s) about which information was available.

In the third part of the questionnaire (C. Spatial Assessment), questions were asked to determine the awareness of the city of Izmir regarding the practices in which sustainability approaches are/can be reflected. In this context, projects titled sustainable neighborhoods, priority targets, problems and potentials were questioned.

In the last part of the questionnaire (D. Determining the Importance Ranking of the Criteria), the tables for the evaluation of the sustainable neighborhood criteria presented in Table 3.4 with the AHP method were presented to the participants. In this way, the weight ratios of the criteria were calculated and the order of importance was determined using the Analytic Hierarchy Process method.

3.3.2. Implementation of the Survey

After the preparation of the questionnaire form, the criteria included in the questionnaire were evaluated by taking expert opinions as a result of face-to-face

interviews with İzmir Karşıyaka Municipality Sustainability Office and Dokuz Eylül University Faculty of Architecture faculty members. The scope, purpose and classification of the criteria in accordance with the focal points and the main headings were discussed.

The survey was conducted on a voluntary basis, and the "Informed participant consent form" created with the approval of the Ethics Committee of DEU E-59347747-659-995230 and the name, surname and signature data were obtained from the participants. The survey was conducted through face-to-face interviews with each participant. Before starting the survey, information about the systematics of the survey was given. For this purpose, firstly, information about the purpose and scope of each criterion was given. Then, it was explained to the participants how these criteria would be evaluated through the pairwise comparison matrix. In the light of this information, the questionnaire was expected to be answered.

The survey was completed between 27.05.2024 and 29.05.2024. The first day of the study was conducted at İzmir Karşıyaka Municipality, the second day at Dokuz Eylül University Faculty of Architecture, Department of Architecture and the third day at Dokuz Eylül University Faculty of Architecture, Department of City and Regional Planning. The survey was conducted face-to-face and interview times ranged from 20 to 40 minutes.

3.3.3. Participants

Although there is no definite limit set in the AHP method literature for the number of experts to participate in the survey study, this number is generally determined subjectively in the studies. For this reason, studies are carried out with different numbers of experts, as seen in the studies previously conducted with the AHP method and given as an example above (See Section 3.1). For example, 15 municipality officials, 13 university professors, and 10 engineers took part in the study conducted in Dubai to determine the weights of planning elements for sustainable urban transformation (Mosadeghi, Warnken, Tomlinson & Mirfenderesk, 2022). In another study, the evaluation of spatial planning processes in Lyon and Copenhagen urban areas, 17 expert opinions were taken (Palka, Oliveira, Pagliarin,

& Hersperger, 2021). In the sustainable urban transportation planning research conducted in Mersin, 17 expert opinions were also used (Ghorbanzadeh, Moslem, Blaschke, & Duleba, 2018).

In the light of these data, the questionnaire was applied to two groups. The first group consists of 16 people, including 2 people from each department of Izmir Karşıyaka Municipality's Zoning and Urbanization, Urban Design, Plan and Project, Urban Transformation, Public Works, Transportation Services, Environmental Protection and Control and Climate Change and Zero Waste Directorates. The second group is a group of 16 academicians from Dokuz Eylül University Faculty of Architecture, consisting of 8 architects, 7 urban planners and 1 landscape architect. In total, 32 people were surveyed.

The first group of the survey consists of the participants in İzmir Karşıyaka Municipality and 11 women and 5 men participated in the survey. 3 of the participants were urban planners and 3 were architects. The specialties of the other participants are Industrial Engineer, Construction Engineer, Chemist, Financial Affairs/Real Estate Specialist, Environmental Engineer, Environmental Engineer, Biologist, Landscape Architect, Urban Design Expert, Construction Technician and Data Processor. 7 of the 16 respondents have been working in Karşıyaka Municipality for 1 to 5 years, 2 for 6 to 10 years, 6 for 11 to 20 years and 1 for more than 20 years.

Of the 16 participants in Karşıyaka Municipality, 4 of them had previously managed sustainability-related projects. The projects managed are LEED certified kindergarten building project, Bostanlı Above Ground Project, Emre Zeybek Park Project, Atakent Parking Lot Project and Solar Field Project. Except for the LEED certified kindergarten building project, the others have been implemented by Karşıyaka Municipality.

In the second group of the study, 11 women and 5 men from Dokuz Eylül University Faculty of Architecture participated in the survey. Seven of the participants were urban planners, 1 landscape architect and 8 architects. Of the 16 participants, 1 has been working at Dokuz Eylül University Faculty of Architecture

for 1 to 5 years, 3 for 6 to 10 years, 4 for 11 to 20 years, and 8 for more than 20 years. 4 of the 16 participants have conducted studies on sustainability before. 1 of these is a TÜBİTAK project and the others are publications realized within the framework of academic research.

Therefore, the participant group of the study consists of experts and academics who have been involved in sustainability-related projects and have conducted research on the subject. Karşıyaka Municipality hosts one of the few sustainability offices in our country and is a local government that carries out studies in the field of sustainability. Dokuz Eylül University is one of the most established institutions in our country and has many faculty members that involved sustainability projects. These factors also played an important role in the preference of the participants from these institutions and the city of Izmir as a study area.

The next section presents the statistical findings based on the survey conducted with the participants.

CHAPTER FOUR
STATISTICAL FINDINGS

4.1. Participants' Knowledge on Sustainability

The questionnaire administered within the scope of the study first assessed the participants' knowledge of sustainability, sustainable neighborhoods and sustainable neighborhood assessment systems. For this purpose, in the second part of the questionnaire (B. Sustainability and Certification); (1) “How do you find your level of knowledge about the concept of sustainability?” (2) “What are the 3 words, concepts or ideas that come to mind when you think of sustainability?” (3) “What are the 3 words, concepts or ideas that come to mind when you think of sustainable neighborhoods?” (4) “Which green certification system(s) do you have information about?” questions were asked.

The participants were expected to answer the question “How do you find your level of knowledge about the concept of sustainability?”, which constitutes the 1st question of section B and the 6th question of the questionnaire, with a 5-point Likert scale consisting of (1) Very good, (2) Good, (3) Undecided, (4) Insufficient and (5) Very Inadequate options. Of the 32 participants, 15.6% answered very good, 34.4% answered good, 21.9% undecided, 25% insufficient and 3.1% very inadequate. Based on this, it is possible to say that the participants generally found their level of knowledge about the concept of sustainability to be average. When the two participant groups are evaluated separately, 6.3% of the 16 participants in İzmir Karşıyaka Municipality answered the question as very good, 31.3% as good, 25% as undecided and 37.5% as insufficient. On the other hand, 16 participants from Dokuz Eylul University Faculty of Architecture answered 25% very good, 37,5% good, 18,75% undecided, 12,5% insufficient and 6,25% very inadequate. As a result, the respondents at Dokuz Eylül University Faculty of Architecture have a better level of knowledge about the concept of sustainability than the respondents at İzmir Karşıyaka Municipality.

Question 2 of Part B and Question 7 of the questionnaire is “What are the 3 words, concepts or ideas that come to your mind when you think of sustainability?”.

The responses to this open-ended question were categorized as (1) environment and land use, (2) economic development, (3) transport, (4) social development, (5) design and management, (6) resources and energy, (7) innovation and (8) others. The distribution of responses by category is as shown in Table 4.1. Table 4.2 shows the frequency of the answers given over the categories.

Table 4.1 Categorization of open-ended responses to the question "What are the 3 words, concepts or ideas that come to mind when you think of sustainability?"

CATEGORIES	OPEN-ENDED ANSWERS
DESIGN AND MANAGEMENT	environment-society-economy balance resilience flexible design smart degrowth
ECONOMIC DEVELOPMENT	circular economy economic economy economy-ecology balance
ENVIRONMENT AND LAND USE	environment nature nature-based solutions collaborative design with natüre ecology ecological environment ecological solutions ecosystem protection nature fresh air built environment-natural environment livable environment sustenance green space

Table 4.2 Categorization of open-ended responses to the question “What are the 3 words, concepts or ideas that come to mind when you think of sustainability?” -*continues*

RESOURCES AND ENERGY	smart building the right material transformation energy energy efficiency energy saving and transformation energy efficiency evaluating the old recycling sun solar field source effective use of resources conservation-use balance zero waste savings renewable energy
SOCIAL DEVELOPMENT	conscious community education inclusiveness social justice social equality society social
TRANSPORT	low carbon footprint accessibility carbon emissions transportation

Table 4.3 Categorization of open-ended responses to the question “What are the 3 words, concepts or ideas that come to mind when you think of sustainability?” -*continues*

OTHERS	adaptation brutland report ongoing ensuring continuation continuity circularity conversion world event passing on to the future the future future generations climate change climate crisis capacity to be able to live on your own comfort our common future rio conference efficiency regeneration green

Table 4.4 Percentages of the answers to the question ”What are the 3 words, concepts or ideas that come to your mind when you think of sustainability?”

CATEGORIES	**TOTAL**	**DEU**	**KSK**
	Percentage (Frequency)	**Percentage (Frequency)**	**Percentage (Frequency)**
DESIGN AND MANAGEMENT	4,4% (n=4)	6,7% (n=3)	2,2% (n=1)
ECONOMIC DEVELOPMENT	5,5% (n=5)	6,7% (n=3)	4,3% (n=2)
ENVIRONMENT AND LAND USE	24,2% (n=22)	26,7% (n=12)	21,7% (n=10)

Table 4.5 Percentages of the answers to the question ”What are the 3 words, concepts or ideas that come to your mind when you think of sustainability?” *-continues*

RESOURCES AND ENERGY	26,4% (n=24)	20% (n=9)	32,6% (n=15)
SOCIAL DEVELOPMENT	7,7% (n=7)	6,7% (n=3)	8,7% (n=4)
TRANSPORT	4,4% (n=4)	6,7% (n=3)	2,2% (n=1)
OTHERS	27,5% (n=25)	26,7% (n=12)	28,3% (n=13)

As shown in Table 4.2, when the answers given by all participants regarding sustainability are evaluated, the words in the categories of (1) others, (2) resources and energy and (3) environment and land use are dominant respectively. When the two participant groups are evaluated separately, the categories are (1) resources and energy, (2) others and (3) environment and land use according to the answers given by 16 participants in Karşıyaka Municipality. On the other hand, according to the answers of 16 participants from Dokuz Eylul University Faculty of Architecture, the categories (1) others and (1) environment and land use are equal and (2) resources and energy are dominant.

In light of these, although the order of importance changes, the dominant categories for each evaluation group are resources and energy, others and environment and land use. Many factors (sustainability consciousness, education, awareness, etc.) have an impact on the predominance of these categories. However, the study shows that the answers given to the open-ended question are repeated within the predominant categories. Based on this, it is possible to say that the words, concepts or ideas that come to mind when it comes to sustainability are similar or even the same. For this reason, it is possible to interpret that the participants have similar education, culture and awareness on the basis of sustainability.

The 3rd question of Section B and the 8th question of the survey is “What are the 3 words, concepts or ideas that come to mind when you think of a sustainable neighborhood?”. The responses to this open-ended question were categorized as (1) environment and land use, (2) economic development, (3) transport, (4) social

development, (5) design and management, (6) resources and energy, (7) innovation and (8) others. The distribution of the responses according to the categories is as shown in Table 4.3. Table 4.4 shows the frequency of the answers given over the categories.

Table 4.6 Categorization of open-ended answers to the question "What are the 3 words, concepts or ideas that come to your mind when you think of sustainable neighborhoods?"

CATEGORIES	OPEN-ENDED ANSWERS
DESIGN AND MANAGEMENT	green infrastructure pedestrian-animal oriented reduced heat island effect trustworthy
ECONOMIC DEVELOPMENT	circular economy economy economic economic life employment
ENVIRONMENT AND LAND USE	clean environment clean streets compatible with the land ecological sensitivity ecology environmentally friendly design green area green areas integration with natüre land use mixed land use mixed use natüre noise open green areas planned parking and common areas shade streets wastewater management

Table 4.7 Categorization of open-ended answers to the question "What are the 3 words, concepts or ideas that come to your mind when you think of sustainable neighborhoods?" -*continues*

RESOURCES AND ENERGY	infrastructure creation waste transformation waste transformation energy energy efficiency energy efficiency continuity of energies resource management self-generating energy self-sufficient (energetic) recycling sustainable buildings renewable energy green infrastructure
SOCIAL DEVELOPMENT	informed citizen protection of values education identity neighborhood sharing society society-based approaches social participation covering all segments of society production cooperation local specificity local specificity
TRANSPORT	bicycle networks accessible accessibility sustainable transportation systems public transportation advantage pedestrian Access walkability

Table 4.8 Categorization of open-ended answers to the question "What are the 3 words, concepts or ideas that come to your mind when you think of sustainable neighborhoods?" *-continues*

INNOVATION	innovation
OTHERS	non-use of vehicles liveliness continuity need human self-sufficiency possibility continuity clean children clean life livability green sufficient

Table 4.9 The percentage of responses to the question "What are the 3 words, concepts or ideas that come to mind when you think of a sustainable neighborhood?"

CATEGORIES	**TOTAL**	**DEU**	**KSK**
	Percentage (Frequency)	**Percentage (Frequency)**	**Percentage (Frequency)**
DESIGN AND MANAGEMENT	4,7% (n=4)	4,7% (n=2)	4,8% (n=2)
ECONOMIC DEVELOPMENT	5,9% (n=5)	7% (n=3)	4,8% (n=2)
ENVIRONMENT AND LAND USE	23,5% (n=20)	25,6% (n=11)	21,4% (n=9)
RESOURCES AND ENERGY	20% (n=17)	11,6% (n=5)	28,6% (n=12)
SOCIAL DEVELOPMENT	16,5% (n=14)	18,6% (n=8)	14,3% (n=6)
TRANSPORT	9,4% (n=8)	11,6% (n=5)	7,1% (n=3)
INNOVATION	1,2% (n=1)	2,3% (n=1)	-
OTHERS	18,8% (n=16)	18,6% (n=8)	19% (n=8)

As shown in Table 4.4, when the answers given by all participants regarding sustainable neighborhoods are evaluated, the words in the categories of (1) environment and land use, (2) resources and energy and (3) others are dominant respectively. When the two participant groups are evaluated separately, the categories are (1) resources and energy, (2) environment and land use and (3) others according to the answers given by the 16 participants in İzmir Karşıyaka Municipality. On the other hand, according to the answers of 16 participants from Dokuz Eylül University Faculty of Architecture, the categories (1) environment and land use, (2) others and (2) social development are equally weighted.

In the light of the answers given, it is seen that the categories of environment and land use, others, resources and energy and social development are dominant. Unlike the previous question, the weights of the categories varied in this question. The preference of the social development category by the participants from Dokuz Eylül University Faculty of Architecture indicates that the view of sustainable neighborhood differs between the two groups. On the other hand, repeated words show that this distinction is only made within certain headings.

In the last question of the section and the 9th question of the questionnaire, the participants were asked "Which green certification system(s) do you have information about?". Out of 16 respondents in Izmir Karşıyaka Municipality, 3 of them do not have information about the assessment systems. The systems that 13 of the participants have information about are presented in Table 4.5. Accordingly, the participants are most knowledgeable about the Turkish Standards Institute (TSE) - Safe Green Building (GYB) and Green Industry Organizations (YSK) Certificates systems. This is followed by LEED ND (Leadership in Energy and Environmental Design for Neighborhood Development) and LEED BD+C (Building Design and Construction) certification systems. A total of 21 markings were made by 16 participants. For this reason, it is possible to say that the knowledge on certification systems is not at a sufficient level.

The same question was asked to 16 participants from Dokuz Eylül University Faculty of Architecture. 3 of the participants had no knowledge about evaluation systems. The systems that 13 of the participants have knowledge about are also

presented in Table 4.5. In this direction, the participants have knowledge about LEED BD+C (Building Design and Construction) certification system in the first place. This is followed by Turkish Standards Institute (TSE) - Safe Green Building (GYB) and Green Industry Organizations (YSK) Certificates systems and LEED ND (Leadership in Energy and Environmental Design for Neighborhood Development) certification systems. A total of 38 markings were made by 16 participants. Therefore, it is possible to say that the level of knowledge on certification systems is sufficient and higher than the participants in Karşıyaka Municipality.

In addition, although the ranking of the certification systems changes, the weighted certification systems are the same for both groups. The reason for this can be shown as the widespread use of LEED certification system in our country and the awareness of local certificates such as Turkish Standards Institute (TSE).

Table 4.10 Number of answers to the question "Which green certification system(s) do you have information about?"

Which green certification system(s) do you have information about?	**Karşıyaka Municipality**	**DEU Academic Members**
LEED ND (Leadership in Energy and Environmental Design for Neighborhood Development)	6	7
LEED BD+C (Building Design and Construction)	5	8
LEED for Cities	4	3
BREEAM Communities (Building Research Establishment Environmental Assessment Method - Communities)	1	3
BREEAM New Construction	-	4
BREEAM Infrastructure	-	2

Table 4.11 Number of answers to the question "Which green certification system(s) do you have information about?" -*continues*

DGNB NUD (The German Sustainable Building Council - New Urban District)	-	-
DGNB System for New Construction	-	-
CASBEE UD (Comprehensive Assessment System for Built Environment Efficiency for Urban Development)	1	-
CASBEE for Housing Units	1	1
CASBEE for Cities	1	-
BCA Green Mark For Districts (Building and Construction Authority Greenmark for Districts)	1	-
BCA Green Mark for Infrastructure	1	-
BCA Green Mark For New & Existing Buildings	2	
PCRS For Estidama (Pearl Community Rating System for Estidama)	-	-
QSAS (Global Sustainability Assessment System/Quatar Sustainability Assesment System Neighborhood)	-	-
Green Star Communities	-	-
B.E.S.T. - Housing (Ecological and Sustainable Design in Buildings)	4	-
B.E.S.T - Commercial Buildings Certificate	3	-

Table 4.12 Number of answers to the question “Which green certification system(s) do you have information about?” -*continues*

YeS_TR Green Certificate - Settlement	2	1
YeS_TR Green Certificate – Building	3	1
SEEB-TR - Neighbourhood (Sustainable Energy Efficient Buildings – Neighbourhood)	2	1
Turkish Standards Institute (TSE) - Safe Green Building (GYB) and Green Industry Organizations (YSK) Certificates	7	7
Other(specify)	-	-

In the third part of the questionnaire (C. Spatial Assessment); (1) Which projects do you find successful under the title of sustainable neighborhoods in Izmir? (2) What is the spatial arrangement that should be made first in your district to create a sustainable neighborhood? (3) What are the most important spatial problems of your district for a sustainable neighborhood? (4) What are the most important spatial potentials of your district for a sustainable neighborhood? Questions were asked. All questions in this section are open-ended.

Question 1 of Section C and Question 10 of the questionnaire is “Which projects do you find successful under the title of sustainable neighborhoods in Izmir?”. Of the 16 participants in İzmir Karşıyaka Municipality, 6 answered the question. Only 2 of the answers given were project-based and were “Atakent Parking Lot Project”. On the other hand, the same question was asked to 16 participants at Dokuz Eylül University Faculty of Architecture, but only 2 participants responded. The answers given by all participants to this question were evaluated but did not constitute an input to the study since no specific project was specified and no project-based explanation was made.

The 2nd question of section C and the 11th question of the questionnaire is “What is the spatial arrangement that should be made first in your district to create a sustainable neighborhood?”. The responses to this open-ended question were categorized as (1) environment and land use, (2) economic development, (3) transportation, (4) social development, (5) design and management, (6) resources and energy, (7) innovation and (8) others. The distribution of the responses according to the categories is as shown in Table 4.6. Table 4.7 shows the frequency of the answers given over the categories.

Table 4.13 Categorization of open-ended answers to the question “What is the primary spatial arrangement that needs to be made in your district to create a sustainable neighborhood?”

CATEGORIES	OPEN-ENDED ANSWERS
DESIGN AND MANAGEMENT	earthquake resistant buildings increasing public spaces urban transformation headman's office initiating planning strategies in line with sustainability standards
ECONOMIC DEVELOPMENT	-
ENVIRONMENT AND LAND USE	open green spaces active green areas spatial regulation of animals designing common areas in housing with care for each other arid landscape, vegetative design space-appropriate design water management stormwater and wastewater arrangements in new buildings green area works green areas increasing green areas collection of rainwater on roads

Table 4.14 Categorization of open-ended answers to the question “What is the primary spatial arrangement that needs to be made in your district to create a sustainable neighborhood?” *-continues*

RESOURCES AND ENERGY	waste management improving waste management energy efficiency in buildings energy efficiency recycling recycling and sorting solar energy increasing the use of solar energy use of solar panels paying attention to energy efficiency and long-lasting use of materials use of renewable energy sources integration of walkable areas with green infrastructure
SOCIAL DEVELOPMENT	-
TRANSPORT	bIncreasing motorcycle and pedestrian roads arrangement of bicycle lanes ensuring safe accessibility Traffic transportation transportation facilities pedestrian-bicycle path arrangements pedestrianization roads increasing walkability
OTHERS	spatial arrangements with a spatial design strategy that optimizes social/economic requirements in favor of natural thresholds

Table 4.15. The percentage of responses to the question “What is the spatial arrangement that needs to be made first in your district to create a sustainable neighborhood?”

CATEGORIES	TOTAL	DEU	KSK
	Percentage (Frequency)	Percentage (Frequency)	Percentage (Frequency)
DESIGN AND MANAGEMENT	11,6% (n=5)	4,8% (n=1)	18,2% (n=4)
ECONOMIC DEVELOPMENT	-	-	-
ENVIRONMENT AND LAND USE	30,2% (n=13)	28,6% (n=6)	31,8% (n=7)
RESOURCES AND ENERGY	30,2% (n=13)	38,1% (n=8)	22,7% (n=5)
SOCIAL DEVELOPMENT	-	-	-
TRANSPORT	25,6% (n=11)	23,8% (n=5)	27,3% (n=6)
INNOVATION	-	-	-
OTHERS	2,3% (n=1)	4,8% (n=1)	-

As shown in Table 4.7, when the answers given by all participants regarding the arrangements that need to be made to create a sustainable neighborhood are evaluated, the words in the categories (1) environment and land use and (1) resources and energy are equal, respectively, and (2) transport are dominant. When the two participant groups are evaluated separately, the categories are (1) environment and land use, (2) transport and (3) resources and energy according to the answers given by 16 participants in Karşıyaka Municipality. On the other hand, according to the responses of 16 participants from Dokuz Eylul University Faculty of Architecture, the categories (1) resources and energy, (2) environment and land use and (3) transport are dominant.

Although the order of importance changes, the dominant categories for each evaluation group are by far resources and energy, environment and land use and transport. When repeated words are examined, the environment and land use category for sustainable neighborhoods is dominated by regulations that specifically

address open green spaces. Izmir's topography and climate is a primary factor in this result. For this reason, it is important to consider local climate, topography, vegetation, etc. in determining the criteria for sustainable neighborhood assessment certification systems. When the answers in the resources and energy category are analyzed, the use of renewable energy sources, especially the sun, which we come across predominantly, again shows the importance of topography and climate values. For the Transport category, the development and improvement of sustainable transportation networks is the first spatial arrangement that needs to be made.

Question 3 of section C and question 12 of the questionnaire is “What are the most important spatial problems of your district for a sustainable neighborhood?”. The responses to this open-ended question were categorized as (1) environment and land use, (2) economic development, (3) transportation, (4) social development, (5) design and management, (6) resources and energy, (7) innovation and (8) others. The distribution of the responses according to the categories is as shown in Table 4.8. Table 4.9 shows the frequency of the answers given over the categories.

Table 4.16 Categorization of open-ended answers to the question “What are the most important spatial problems of your district for a sustainable neighborhood?”

CATEGORIES	OPEN-ENDED ANSWERS
DESIGN AND MANAGEMENT	irregular urban transformation urban transformation unplanned urban transformation projects are not implemented correctly spaces produced with an approach that prioritizes social/economic needs above all else transportation insufficient public space
ECONOMIC DEVELOPMENT	economic

Table 4.17 Categorization of open-ended answers to the question “What are the most important spatial problems of your district for a sustainable neighborhood?” *-continues*

ENVIRONMENT AND LAND USE	insufficient open green space concrete dense low biodiversity parking lots and open spaces cramped plots mixing of rain and waste water densely built up green space arrangements green areas insufficient green space dense construction high density development
RESOURCES AND ENERGY	Infrastructure waste waste management gardenless structures buildings energy energy efficiency
SOCIAL DEVELOPMENT	Unconsciousness immigration and settlement pattern lack of neighborhood organization
TRANSPORT	inadequate parking-bicycle-pedestrian path pavement deficiencies parking lot lack of parking lot vehicle traffic-oriented approach traffic transportation lack of pedestrian and bicycle path systems pedestrian paths insufficiently wide transportation networks roads

Table 4.18 Categorization of open-ended answers to the question “What are the most important spatial problems of your district for a sustainable neighborhood?” *-continues*

OTHERS	Neglect rent pressure density

Table 4.19 Ratios of the answers to the question “What are the most important spatial problems of your district for a sustainable neighborhood?”

CATEGORIES	**TOTAL**	**DEU**	**KSK**
	Percentage (Frequency)	**Percentage (Frequency)**	**Percentage (Frequency)**
DESIGN AND MANAGEMENT	14,8% (n=8)	14,8% (n=4)	14,8% (n=4)
ECONOMIC DEVELOPMENT	1,9% (n=1)	-	3,7% (n=1)
ENVIRONMENT AND LAND USE	37% (n=20)	37% (n=10)	37% (n=10)
RESOURCES AND ENERGY	14,8% (n=8)	14,8% (n=4)	14,8% (n=4)
SOCIAL DEVELOPMENT	5,6% (n=3)	-	11,1% (n=3)
TRANSPORT	20,4% (n=11)	29,6% (n=8)	11,1% (n=3)
INNOVATION	-	-	-
OTHERS	5,6% (n=3)	3,7% (n=1)	7,4% (n=2)

As shown in Table 4.9, when the answers given by all respondents regarding the most important spatial problems of Karsiyaka for creating a sustainable neighborhood are evaluated, the words in these categories are dominated by (1) environment and land use, (2) transport and (3) resources and energy and (3) design and management, respectively. When the two participant groups are evaluated separately, according to the answers given by the 16 participants in Karşıyaka Municipality, the categories are (1) environment and land use, (2) resources and energy and (2) design and management. On the other hand, according to the answers

of 16 participants from Dokuz Eylul University Faculty of Architecture, the categories of (1) environment and land use, (2) transport, (3) resources and energy and (3) design and management are equal.

For each group, the environment and land use category was by far the most important spatial problem. Specifically, dense construction and the resulting inadequate open green spaces are two prominent responses in this category. In the transport category, the irregular traffic network and parking problems are the answers that reveal the importance of planning. In the design and management category, unplanned urban regeneration is the primary response. In light of these responses, it is possible to say that urban design and planning strategies are one of the most fundamental factors in creating a sustainable neighborhood.

The last question of section C and the 13th question of the survey is “What are the most important spatial potentials of your district for a sustainable neighborhood?”. The responses to this open-ended question were categorized as (1) environment and land use, (2) economic development, (3) transport, (4) social development, (5) design and management, (6) resources and energy, (7) innovation and (8) others. The distribution of the responses according to the categories is as shown in Table 4.10. Table 4.11 shows the frequency of the answers given over the categories.

Table 4.20 Categorization of open-ended answers to the question “What are the most important spatial potentials of your district for a sustainable neighborhood?”

CATEGORIES	OPEN-ENDED ANSWERS
DESIGN AND MANAGEMENT	presence of public spaces opening public spaces to the public urban transformation public spaces and structures in urban transformation projects not to sacrifice green areas within the parcel to urban transformation Paying attention to sustainability criteria in newly built areas or urban transformation areas
ECONOMIC DEVELOPMENT	-

Table 4.21 Categorization of open-ended answers to the question “What are the most important spatial potentials of your district for a sustainable neighborhood?” *-continues*

ENVIRONMENT AND LAND USE	spaces with open space vegetation presence of large green spaces being by the sea natural conditions presence of excess idle space climatic data urban agriculture urban forests can be made location suitable for ges coastline coastline arrangements topography green areas green corridors
RESOURCES AND ENERGY	energy solar energy solar potential sources wind wind potential
SOCIAL DEVELOPMENT	conscious human density public awareness and education neighborhood texture university campus, presence of academics and students
TRANSPORT	public transportation ease of access to public transportation
OTHERS	space for alternatives in development areas is very too many children's playgrounds yamanlar and sancaklı villages density

Table 4.22 The percentage of answers given to the question “What are the most important spatial potentials of your district for a sustainable neighborhood?”

CATEGORIES	TOTAL	DEU	KSK
	Percentage (Frequency)	Percentage (Frequency)	Percentage (Frequency)
DESIGN AND MANAGEMENT	15,8% (n=6)	22,2% (n=4)	10% (n=2)
ECONOMIC DEVELOPMENT	-	-	-
ENVIRONMENT AND LAND USE	39,5% (n=15)	33,3% (n=6)	45% (n=9)
RESOURCES AND ENERGY	18,4% (n=7)	11,1% (n=2)	25% (n=5)
SOCIAL DEVELOPMENT	10,5% (n=4)	11,1% (n=2)	10% (n=2)
TRANSPORT	5,3% (n=2)	5,6% (n=1)	5% (n=1)
INNOVATION	-	-	-
OTHERS	-	-	-

As shown in Table 4.11, when the answers given by all participants regarding the most important spatial potentials of your district to create a sustainable neighborhood are evaluated, the words in the categories of (1) environment and land use, (2) resources and energy and (3) design and management are dominant respectively. When the two participant groups are evaluated separately, according to the answers given by the 16 participants in İzmir Karşıyaka Municipality, the categories (1) environment and land use, (2) resources and energy, (3) design and management and (3) social development are equally ranked. On the other hand, according to the answers of 16 participants from Dokuz Eylül University Faculty of Architecture, the categories of (1) environment and land use, (2) design and management, (3) resources and energy and (3) social development are equally dominant.

The environment and land use category was by far the most important spatial potential again, as in the spatial problem question. Izmir's unique topography, vegetation and climate characteristics were the primary potentials that emerged. In

the resources and energy category, the potential for the use of solar and wind energy resources was also mentioned as a potential. In the design and management category, as in the question of spatial problems, urban transformation was given as a potential answer. In the light of all these, in an evaluation system where sustainable neighborhood criteria will be put forward, the primary factors again appear as planning strategies and local uniqueness. However, it should be reminded that the respondents are experts in space organization disciplines. In other words, it should be taken into account that the high rate of the Environment and land use category in the creation of sustainable spaces may be due to the respondent profile and the results should be interpreted accordingly. Finally, in the social development category, attention was drawn to the already existing community of conscious people and the importance of awareness and education on sustainability was underlined.

4.2. Determining the Ranking of the Criteria via AHP Results

In the last part of the survey (D. Determining the Importance Ranking of Criteria), the criteria identified for the sustainable neighborhood assessment certification system were analyzed using the Analytic Hierarchy Process (AHP) method. In the first step of the method, 7 main criteria and 37 sub-criteria were hierarchically classified as shown in Figure 4.1.

Following this step, a comparison matrix (A) was created for each criterion group at each level of the hierarchical classification. When comparing the criteria in the comparison matrices, the evaluation scale in Table 4.12 was used. Firstly, comparison matrix groups were formed for the main criteria at Level 2 as shown in Table 4.13, then for the sub-criteria at Level 3 as shown in Table 4.15, Table 4.17, Table 4.19, Table 4.21, Table 4.23 and Table 4.25.

Table 4.23 Scale used in comparison matrix

4	**3**	**2**	**1**	**1/2**	**1/3**	**1/4**
Very Important	Fairly Important	Slightly Important	Equal	Unimportant	Negligibly Important	Not At All Important

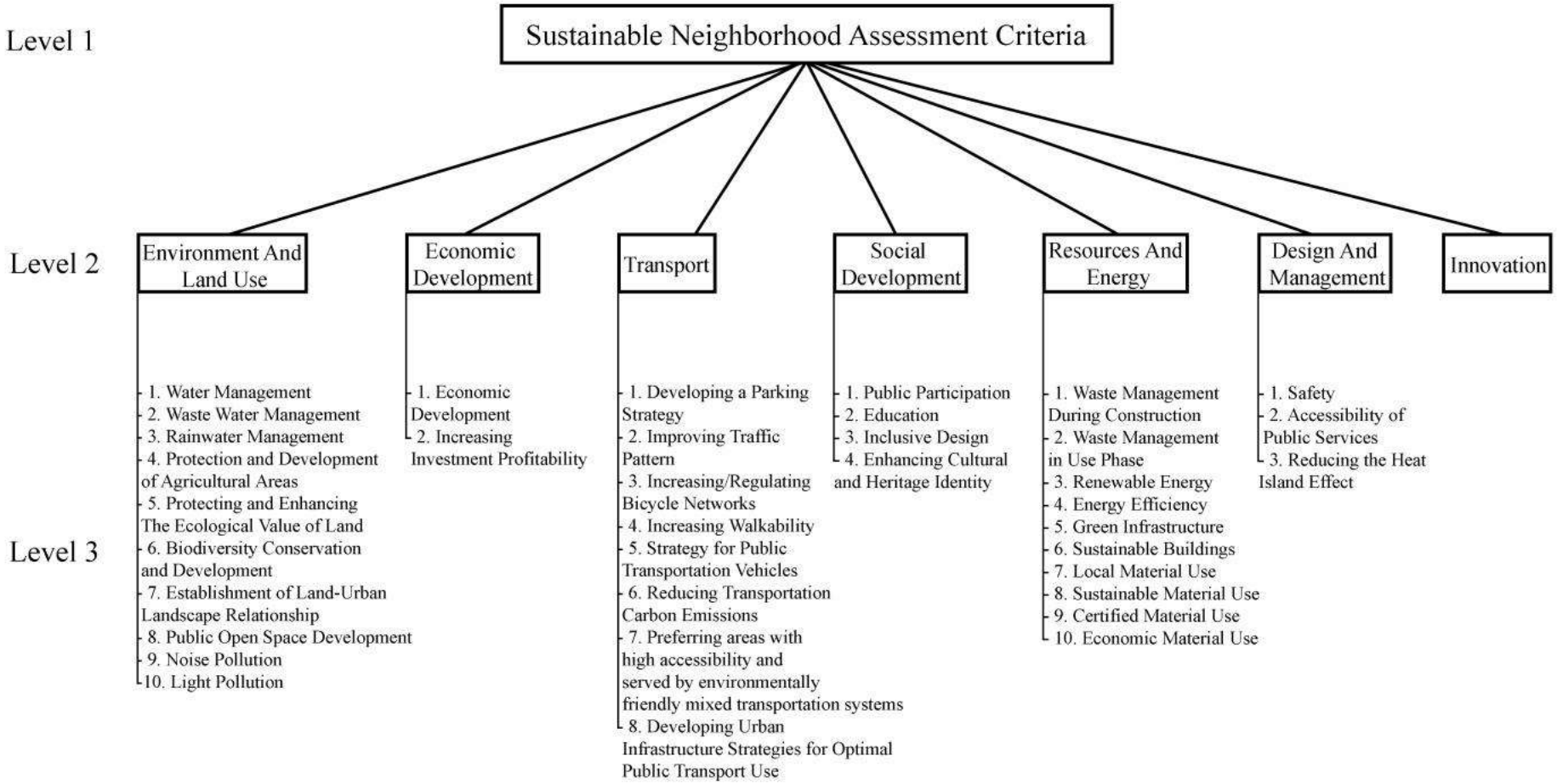


Figure 4.1 Sustainable neighborhood assessment criteria

After the comparison matrix groups were created, a normalized comparison matrix was created to make the data here comparable. The eigenvector (w) was obtained by averaging the rows in the normalized comparison matrix. The importance weights of the decision variables (Σ=1) were determined through the eigenvector. The importance weights of the decision variables are indicated in the tables as primary importance-red, secondary importance-blue and tertiary importance-green respectively. The normalized comparison matrix of the main criteria at Level 2 is given in Table 4.14, and the normalized comparison matrix of the sub-criteria at Level 3 are given in Table 4.16, Table 4.18, Table 4.20, Table 4.22, Table 4.24 and Table 4.26.

After reaching the importance weights of the criteria, the consistency of the decisions taken was evaluated separately for each matrix. The consistency evaluation of the main criteria at Level 2 is presented in Figure 4.2, and the consistency evaluation of the sub-criteria at Level 3 is presented in Figure 4.3, Figure 4.4, Figure 4.5, Figure 4.6 and Figure 4.7. For this purpose, the eigenvalue (w') value was obtained by performing matrix multiplication between the comparison matrix and the eigenvector. Then, the largest eigenvalue (λ_{max}) was obtained by dividing all the elements of the eigenvalue matrix by the elements of the eigenvector matrix and then dividing by the number of criteria (n). The closeness of the largest eigenvalue value to the number of criteria gives us information about the consistency ratio of the matrix. In order to check the consistency through the largest eigenvalue, the consistency index (CI) was calculated according to the following formula.

$$CI = \frac{\lambda_{max} - n}{n-1}$$

The consistency ratio (CR) value was then determined according to the formula $CR = \frac{CI}{RI}$. At this stage, the random index (RI) values in Table 3.3 (see Section 3.1) were used. The consistency of the decisions taken in the comparison matrix was determined by checking whether the consistency ratio value obtained was less than 0.10 or 10%. In this context, the consistency level of the consistency ratio value is expressed as CR ≤ 0.10 “Consistent” or CR > 0.10 Inconsistent. In addition, there is

no inconsistency in matrices where the number of criteria is “2”. Therefore, they were not included in the consistency calculation.

The answers given by both groups of participants were analyzed in terms of their consistency within the framework of the AHP method. In the first group of the study, 7 of the questionnaires of 16 participants in İzmir Karşıyaka Municipality were consistent and 9 were inconsistent. In the second group of 16 participants from Dokuz Eylül University Faculty of Architecture, 6 of the questionnaires were consistent and 10 were inconsistent. At this stage, the inconsistent questionnaires were not included in the process at the point of determining the order of importance of the criteria and a total of 13 questionnaires were taken into consideration. Both groups were first evaluated separately within the framework of the consistent questionnaires. Then, their geometric averages were taken to arrive at the total importance ranking of the criteria. A summary of the comparisons for all criteria is presented in Table 4.27. The calculations in which both groups are evaluated separately are given in Appendix-3, Appendix-4, Appendix-5, Appendix-6, Appendix-7, Appendix-8, Appendix-9, Appendix-10, Appendix-11, Appendix-12, Appendix-13, Appendix-14, Appendix-15, Appendix-16, Appendix-17, Appendix-18, Appendix-19, Appendix-20, Appendix-21, Appendix-22, Appendix-23, Appendix-24, Appendix-25, Appendix-26, Appendix-27, Appendix-28, Appendix-29, Appendix-30.

Table 4.24 Comparison matrix of criteria in level 2 for participants

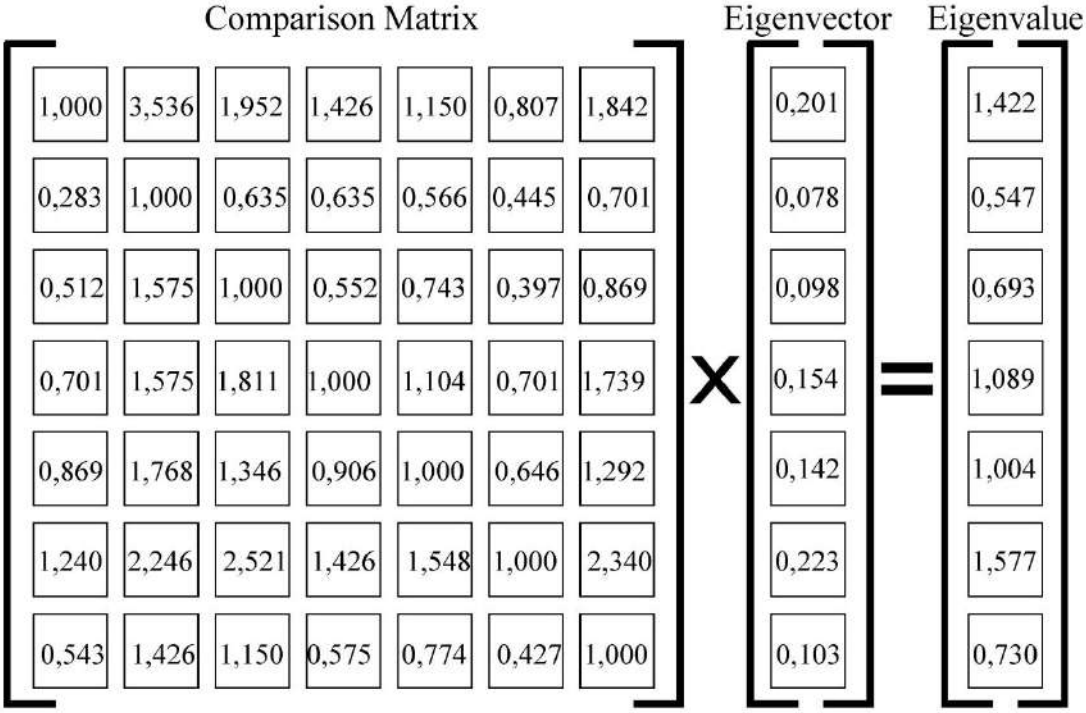
Comparison Matrix							
MAIN CRITERIA	**Environment And Land Use**	**Economic Development**	**Transport**	**Social Development**	**Design And Management**	**Resources And Energy**	**Innovation**
Environment And Land Use	**1,00**	3,54	1,95	1,43	1,15	0,81	1,84
Economic Development	0,28	**1,00**	0,64	0,64	0,57	0,45	0,70
Transport	0,51	1,57	**1,00**	0,55	0,74	0,40	0,87
Social Development	0,70	1,57	1,81	**1,00**	1,10	0,70	1,74
Design And Management	0,87	1,77	1,35	0,91	**1,00**	0,65	1,29
Resources And Energy	1,24	2,25	2,52	1,43	1,55	**1,00**	2,34
Innovation	0,54	1,43	1,15	0,58	0,77	0,43	**1,00**
TOTAL	**5,1**	**13,1**	**10,4**	**6,5**	**6,9**	**4,4**	**9,8**

Table 4.25 Normalized comparison matrix of criteria in level 2 for participants

Normalized Comparison Matrix								Eigenvector
MAIN CRITERIA	**Environment And Land Use**	**Economic Development**	**Transport**	**Social Development**	**Design And Management**	**Resources And Energy**	**Innovation**	
Environment And Land Use	0,19	0,27	0,19	0,22	0,17	0,18	0,19	**0,20**
Economic Development	0,05	0,08	0,06	0,10	0,08	0,10	0,07	0,08
Transport	0,10	0,12	0,10	0,08	0,11	0,09	0,09	0,10
Social Development	0,14	0,12	0,17	0,15	0,16	0,16	0,18	**0,15**
Design And Management	0,17	0,13	0,13	0,14	0,15	0,15	0,13	0,14
Resources And Energy	0,24	0,17	0,24	0,22	0,22	0,23	0,24	**0,22**
Innovation	0,11	0,11	0,11	0,09	0,11	0,10	0,10	0,10
TOTAL	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**

The main criteria at Level 2 for sustainable neighborhood assessment criteria are (1) environment and land use, (2) economic development, (3) transport, (4) social development, (5) design and management, (6) resources and energy and (7) innovation. A comparison of the responses of all respondents shows that the order of importance of the main topics is (1) resources and energy, (2) environment and land use and (3) social development and is presented in Table 4.14. The consistency calculation for these decisions was performed as shown in Figure 4.2. For the consistency value, "CR $0.01 \leq 0.10$" was found. Therefore, the choices made are considered consistent.

1. Multiplying eigenvector with comparison matrix



2. Dividing all elements of eigenvalue matrix into elements of eigenvector matrix respectively

1,422 / 0,201 = 7,074
0,547 / 0,078 = 7,012
0,693 / 0,098 = 7,071
1,089 / 0,154 = 7,071
1,004 / 0,142 = 7.070
1,577 / 0,223 = 7,071
0,730 / 0,103 = 7,087

3. Calculation of largest eigenvalue (λmax), consistency index (CI) and consistency ratio (CR) values and consistency

λmax = (7,074 + 7,012 + 7,071 + 7,071 + 7.070 + 7,071+7,087) / 7
λmax = 7,065
CI = (λmax - n) / (n-1)
CI = (7,065 - 7) / (7-1)
CI = 0,010
CR = CI / RI
RI value is taken from Table 3.3.
CR = 0,010 / 1,32
CR = 0,01
0.01 ≤ 0.10 judgments are **consistent.** ✔

Figure 4.2 Calculating consistency for main criteria

Table 4.26 Comparison matrix of criteria in environment and land use for participants

Comparison Matrix										
ENVIRONMENT AND LAND USE	**Water Management**	**Waste Water Management**	**Rainwater Management**	**Protection and Development of Agricultural Areas**	**Protecting and Enhancing the Ecological Value of Land**	**Biodiversity Conservation and Development**	**Establishment of Land-Urban Landscape Relationship**	**Public Open Space Development**	**Noise Pollution**	**Light Pollution**
Water Management	**1,00**	0,85	0,94	0,77	0,50	0,51	1,92	1,84	3,20	4,38
Waste Water Management	1,17	**1,00**	1,22	0,77	0,60	0,73	2,16	2,52	2,97	3,28
Rainwater Management	1,06	0,82	**1,00**	0,60	0,53	0,58	1,10	1,17	1,84	2,38
Protection and Development of Agricultural Areas	1,29	1,29	1,67	**1,00**	0,91	0,77	3,07	3,75	3,07	3,97
Protecting and Enhancing the Ecological Value of Land	1,99	1,67	1,87	1,10	**1,00**	1,06	2,42	2,48	4,21	4,72
Biodiversity Conservation and Development	1,95	1,37	1,74	1,29	0,94	**1,00**	3,90	3,84	3,97	4,38
Establishment of Land-Urban Landscape Relationship	0,52	0,46	0,91	0,33	0,41	0,26	**1,00**	2,12	2,48	2,74
Public Open Space Development	0,54	0,40	0,85	0,27	0,40	0,26	0,47	**1,00**	2,21	3,54
Noise Pollution	0,31	0,34	0,54	0,33	0,24	0,25	0,40	0,45	**1,00**	1,57
Light Pollution	0,23	0,30	0,42	0,25	0,21	0,37	0,37	0,28	0,64	**1,00**
TOTAL	**10,06**	**8,51**	**11,17**	**6,71**	**5,75**	**5,79**	**16,82**	**19,45**	**25,59**	**31,97**

Table 4.27 Normalized comparison matrix of criteria in environment and land use for participants

Normalized Comparison Matrix											Eigenvector
ENVIRONMENT AND LAND USE	**Water Management**	**Waste Water Management**	**Rainwater Management**	**Protection and Development of Agricultural Areas**	**Protecting and Enhancing the Ecological Value of Land**	**Conservation and Development of Biodiversity**	**Establishing the Land-Urban Landscape Relationship**	**Public Open Space Development**	**Noise Pollution**	**Light Pollution**	
Water Management	0,10	0,10	0,08	0,12	0,09	0,09	0,11	0,09	0,13	0,14	0,10
Waste Water Management	0,12	0,12	0,11	0,12	0,10	0,13	0,13	0,13	0,12	0,10	0,12
Rainwater Management	0,11	0,10	0,09	0,09	0,09	0,10	0,07	0,06	0,07	0,07	0,08
Protection and Development of Agricultural Areas	0,13	0,15	0,15	0,15	0,16	0,13	0,18	0,19	0,12	0,12	**0,15**
Protecting and Enhancing the Ecological Value of Land	0,20	0,20	0,17	0,16	0,17	0,18	0,14	0,13	0,16	0,15	**0,17**
Conservation and Development of Biodiversity	0,19	0,16	0,16	0,19	0,16	0,17	0,23	0,20	0,16	0,14	**0,18**
Establishing the Land-Urban Landscape Relationship	0,05	0,05	0,08	0,05	0,07	0,04	0,06	0,11	0,10	0,09	0,07
Public Open Space Development	0,05	0,05	0,08	0,04	0,07	0,05	0,03	0,05	0,09	0,11	0,06
Noise Pollution	0,03	0,04	0,05	0,05	0,04	0,04	0,02	0,02	0,04	0,05	0,04
Light Pollution	0,02	0,04	0,04	0,04	0,04	0,06	0,02	0,01	0,02	0,03	0,03
TOTAL	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**

The sub-criteria for environment and land use, the first main heading of the sustainable neighborhood assessment criteria, are (1) water management, (2) waste water management, (3) rainwater management, (4) protection and development of agricultural areas, (5) protecting and enhancing the ecological value of the land, (6) conservation and development of biodiversity, (7) establishing the land-urban landscape relationship, (8) public open space development, (9) noise pollution and (10) light pollution. Table 4.16 shows the order of importance of the main headings as (1) conservation and development of biodiversity, (2) protecting and enhancing the ecological value of the land and (3) protection and development of agricultural areas. The consistency calculation for these decisions was performed as shown in Figure 4.3. For the consistency value, "CR 0.02 ≤ 0.10" was found. Therefore, the choices made are considered consistent.

1. Multiplying eigenvector with comparison matrix

Comparison Matrix											Eigenvector	Eigenvalue
1,000	0,855	0,944	0,774	0,504	0,512	1,919	1,842	3,203	4,384		0,105	1,088
1,170	1,000	1,219	0,774	0,599	0,731	2,155	2,521	2,972	3,281		0,117	1,213
1,060	0,820	1,000	0,599	0,534	0,575	1,104	1,170	1,842	2,380		0,085	0,868
1,292	1,292	1,669	1,000	0,906	0,774	3,074	3,747	3,074	3,970		0,149	1,556
1,985	1,669	1,873	1,104	1,000	1,060	2,420	2,479	4,207	4,724	X	0,167	1,717
1,952	1,369	1,739	1,292	0,944	1,000	3,904	3,839	3,970	4,384		0,176	1,842
0,521	0,464	0,906	0,325	0,413	0,256	1,000	2,119	2,479	2,737		0,070	0,732
0,543	0,397	0,855	0,267	0,403	0,260	0,472	1,000	2,208	3,536		0,061	0,623
0,312	0,336	0,543	0,325	0,238	0,252	0,403	0,453	1,000	1,575		0,039	0,396
0,228	0,305	0,420	0,252	0,212	0,365	0,365	0,283	0,635	1,000		0,033	0,332

2. Dividing all elements of eigenvalue matrix into elements of eigenvector matrix respectively

1,088 / 0,105 = 10,361
1,213 / 0,117 = 10,367
0,868 / 0,085 = 10,211
1,556 / 0,149 = 10,442
1,717 / 0,167 = 10,281
1,842 / 0,176 = 10,465
0,732 / 0,070 = 10,457
0,623 / 0,061 = 10,213
0,396 / 0,039 = 10,153
0,332 / 0,033 = 10,060

3. Calculation of largest eigenvalue (λmax), consistency index (CI) and consistency ratio (CR) values and consistency

λmax = (10,361 + 10,367 + 10,211 + 10,442 + 10,281 + 10,465 + 10,457 + 10,213 + 10,153 + 10,060) / 10
λmax = 10,334
CI = (λmax - n) / (n-1)
CI = (10,334 - 10) / (10-1)
CI = 0,037
CR = CI / RI
RI value is taken from Table 3.3.
CR = 0,037 / 1,49
CR = 0,02
0.02 ≤ 0.10 judgments are **consistent.** ✔

Figure 4.3 Calculating consistency for environment and land use criteria

Table 4.28 Comparison matrix of criteria in transport for participants

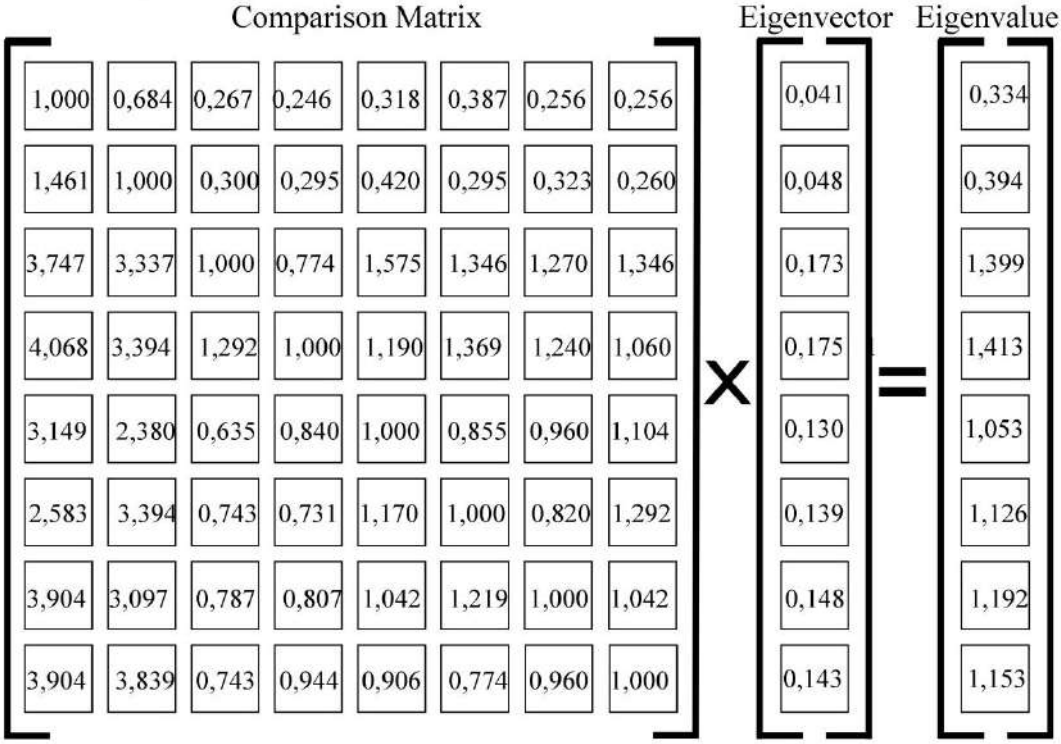
Comparison Matrix								
TRANSPORT	**Developing a Parking Strategy**	**Improving Traffic Pattern**	**Increasing/ Regulating Bicycle Networks**	**Increasing Walkability**	**Strategy for Public Transportation Vehicles**	**Reducing Transportation Carbon Emissions**	**Preferring areas with high accessibility and served by environmentally friendly mixed transportation systems**	**Developing Urban Infrastructure Strategies for Optimal Public Transport Use**
Developing a Parking Strategy	**1,00**	0,68	0,27	0,25	0,32	0,39	0,26	0,26
Improving Traffic Pattern	1,46	**1,00**	0,30	0,29	0,42	0,29	0,32	0,26
Increasing/Regulating Bicycle Networks	3,75	3,34	**1,00**	0,77	1,57	1,35	1,27	1,35
Increasing Walkability	4,07	3,39	1,29	**1,00**	1,19	1,37	1,24	1,06
Strategy for Public Transportation Vehicles	3,15	2,38	0,64	0,84	**1,00**	0,85	0,96	1,10
Reducing Transportation Carbon Emissions	2,58	3,39	0,74	0,73	1,17	**1,00**	0,82	1,29
Preferring areas with high accessibility and served by environmentally friendly mixed transportation systems	3,90	3,10	0,79	0,81	1,04	1,22	**1,00**	1,04
Developing Urban Infrastructure Strategies for Optimal Public Transport Use	3,90	3,84	0,74	0,94	0,91	0,77	0,96	**1,00**
TOTAL	**23,82**	**21,12**	**5,77**	**5,64**	**7,62**	**7,24**	**6,83**	**7,36**

Table 4.29 Normalized comparison matrix of criteria in transport for participants

Normalized Comparison Matrix									
TRANSPORT	**Developing a Parking Strategy**	**Improving Traffic Pattern**	**Increasing /Regulating Bicycle Networks**	**Increasing Walkability**	**Strategy for Public Transportation Vehicles**	**Reducing Transportation Carbon Emissions**	**Preferring areas with high accessibility and served by environmentally friendly mixed transportation systems**	**development of urban ınfrastructure strategies for optimal public transport use**	**Eigenvector**
Developing a Parking Strategy	0,04	0,03	0,05	0,04	0,04	0,05	0,04	0,03	0,04
Improving Traffic Pattern	0,06	0,05	0,05	0,05	0,06	0,04	0,05	0,04	0,05
Increasing/Regulating Bicycle Networks	0,16	0,16	0,17	0,14	0,21	0,19	0,19	0,18	**0,17**
Increasing Walkability	0,17	0,16	0,22	0,18	0,16	0,19	0,18	0,14	**0,18**
Strategy for Public Transportation Vehicles	0,13	0,11	0,11	0,15	0,13	0,12	0,14	0,15	0,13
Reducing Transportation Carbon Emissions	0,11	0,16	0,13	0,13	0,15	0,14	0,12	0,18	0,14
Preferring areas with high accessibility and served by environmentally friendly mixed transportation systems	0,16	0,15	0,14	0,14	0,14	0,17	0,15	0,14	**0,15**
development of urban ınfrastructure strategies for optimal public transport use	0,16	0,18	0,13	0,17	0,12	0,11	0,14	0,14	0,14
TOTAL	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**

The sub-criteria for transport, the second main heading of the sustainable neighborhood assessment criteria, are (1) developing a parking strategy, (2) improving the traffic pattern, (3) increasing/regulating bicycle networks, (4) increasing walkability, (5) strategy for public transportation, (6) reducing transportation carbon emissions, (7) preferring areas with high accessibility and served by environmentally friendly mixed transportation systems and (8) development of urban infrastructure strategies for optimal public transport use. Table 4.18 shows the order of importance of the main topics as (1) increasing walkability, (2) increasing/regulating bicycle networks and (3) preferring areas with high accessibility and served by environmentally friendly mixed transportation systems. The consistency calculation for these decisions was performed as shown in Figure 4.4. For the consistency value, "CR 0.01 ≤ 0.10" is obtained. Therefore, the choices made are considered consistent.

1. Multiplying eigenvector with comparison matrix



2. Dividing all elements of eigenvalue matrix into elements of eigenvector matrix respectively

0,334 / 0,041 = 8,146
0,394 / 0,048 = 8,208
1,399 / 0,173 = 8,086
1,413 / 0,175 = 8,074
1,053 / 0,130 = 8,100
1,126 / 0,139 = 8,100
1,192 / 0,148 = 8,054
1,153 / 0,143 = 8,062

3. Calculation of largest eigenvalue (λmax), consistency index (CI) and consistency ratio (CR) values and consistency

λmax = (8,146 + 8,208 + 8,086 + 8,074 + 8,100 + 8,100 + 8,054 + 8,062) / 8
λmax = 8,073
CI = (λmax - n) / (n-1)
CI = (8,073 - 8) / (8-1)
CI = 0,010
CR = CI / RI
RI value is taken from Table 3.3.
CR = 0,010 / 1,41
CR = 0,01
0.01 ≤ 0.10 judgments are **consistent.** ✔

Figure 4.4 Calculating consistency for transport criteria

Table 4.30 Comparison matrix of criteria in economic development for participants

Comparison Matrix		
ECONOMIC DEVELOPMENT	**Economic Development**	**Increasing Investment Profitability**
Economic Development	**1,00**	2,21
Increasing Investment Profitability	0,45	**1,00**
TOTAL	**1,45**	**3,21**

Table 4.31 Normalized comparison matrix of criteria in economic development for participants

Normalized Comparison Matrix			Eigenvector
ECONOMIC DEVELOPMENT	**Economic Development**	**Increasing Investment Profitability**	
Economic Development	0,69	0,69	**0,69**
Increasing Investment Profitability	0,31	0,31	0,31
TOTAL	**1**	**1**	**1**

The sub-criteria for economic development, the third main heading of the sustainable neighborhood assessment criteria, are (1) economic development and (2) increasing investment profitability. As a result of the comparison made in line with the answers given by all participants, the order of importance of the main headings was calculated as (1) economic development and (2) increasing investment profitability and is given in Table 4.20. Since there is no inconsistency in matrices where the number of criteria is “2”, no consistency calculation was made.

Table 4.32 Comparison matrix of criteria in social development for participants

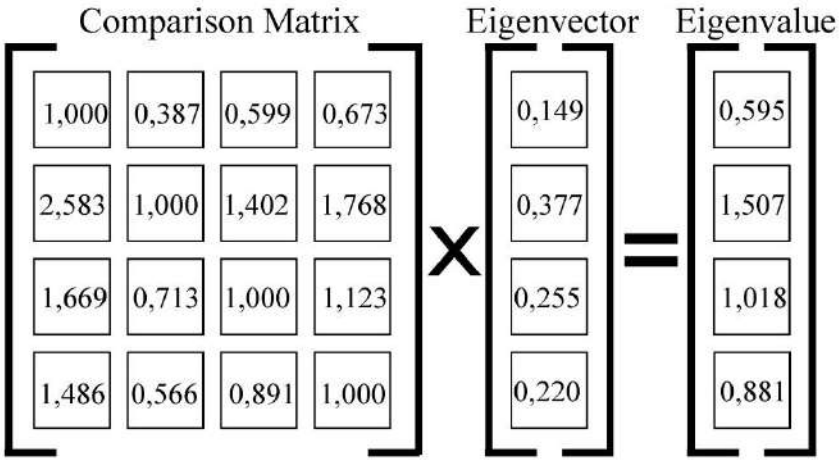
Comparison Matrix				
SOCIAL DEVELOPMENT	**Public Participation**	**Education**	**Inclusive Design**	**Enhancing Cultural and Heritage Identity**
Public Participation	**1,00**	0,39	0,60	0,67
Education	2,58	**1,00**	1,40	1,77
Inclusive Design	1,67	0,71	**1,00**	1,12
Enhancing Cultural and Heritage Identity	1,49	0,57	0,89	**1,00**
TOTAL	**6,74**	**2,67**	**3,89**	**4,56**

Table 4.33 Normalized comparison matrix of criteria in social development for participants

Normalized Comparison Matrix					Eigenvector
SOCIAL DEVELOPMENT	**Public Participation**	**Education**	**Inclusive Design**	**Enhancing Cultural and Heritage Identity**	
Public Participation	0,15	0,15	0,15	0,15	0,15
Education	0,38	0,38	0,36	0,39	**0,38**
Inclusive Design	0,25	0,27	0,26	0,25	**0,25**
Enhancing Cultural and Heritage Identity	0,22	0,21	0,23	0,22	**0,22**
TOTAL	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**

The sub-criteria for social development, the fourth main heading of the sustainable neighborhood assessment criteria, are (1) public participation, (2) education, (3) inclusive design and (4) enhancing cultural and heritage identity. As a result of the comparison based on the answers given by all participants, the order of importance of the main topics is calculated as (1) education, (2) inclusive design and (3) enhancing cultural and heritage identity and is shown in Table 4.22. The consistency calculation for these decisions was performed as shown in Figure 4.5. For the consistency value, "CR 0.00 ≤ 0.10" was obtained. Therefore, the choices made are considered consistent.

1. Multiplying eigenvector with comparison matrix



2. Dividing all elements of eigenvalue matrix into elements of eigenvector matrix respectively

0,595 / 0,149 = 3,993
1,507 / 0,377= 3,997
1,018 / 0,255 = 3,992
0,881 / 0,220 = 4,004

3. Calculation of largest eigenvalue (λmax), consistency index (CI) and consistency ratio (CR) values and consistency

λmax = (3,993 + 3,997 + 3,992 + 4,004) / 4
λmax = 4,001
CI = (λmax - n) / (n-1)
CI = (4,001 - 4) / (4-1)
CI = 0,001
CR = CI / RI
RI value is taken from Table 3.3.
CR = 0,001 / 0,9
CR = 0,00
0.00 ≤ 0.10 judgments are **consistent.** ✔

Figure 4.5 Calculating consistency for social development criteria

Table 4.34 Comparison matrix of criteria in design and management for participants

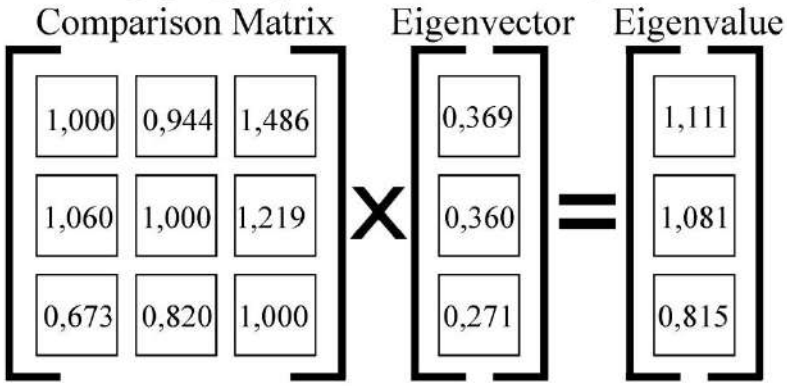
Comparison Matrix			
DESIGN AND MANAGEMENT	**Safety**	**Accessibility of Public Services**	**Reducing the Heat Island Effect**
Safety	**1,00**	0,94	1,49
Accessibility of Public Services	1,06	**1,00**	1,22
Reducing the Heat Island Effect	0,67	0,82	**1,00**
TOTAL	**2,73**	**2,76**	**3,71**

Table 4.35 Normalized comparison matrix of criteria in design and management for participants

Normalized Comparison Matrix				Eigenvector
DESIGN AND MANAGEMENT	**Safety**	**Accessibility of Public Services**	**Reducing The Urban Heat Island Effect**	
Safety	0,37	0,34	0,40	**0,37**
Accessibility of Public Services	0,39	0,36	0,33	**0,36**
Reducing The Urban Heat Island Effect	0,25	0,30	0,27	**0,27**
TOTAL	**1,00**	**1,00**	**1,00**	**1,00**

The sub-criteria for design and management, the fifth main heading of the sustainable neighborhood assessment criteria, are (1) safety, (2) accessibility of public services, and (3) reducing the urban heat island effect. As a result of the comparison made in line with the answers given by all participants, the order of importance of the main headings was calculated as (1) safety, (2) accessibility of public services and (3) reducing the urban heat island effect and is given in table 4.24. The consistency calculation for these decisions was performed as shown in Figure 4.6. For the consistency value, "CR 0.01 ≤ 0.10" is obtained. Therefore, the choices made are considered consistent.

1. Multiplying eigenvector with comparison matrix



2. Dividing all elements of eigenvalue matrix into elements of eigenvector matrix respectively

1,111 / 0,369 = 3,010
1,081/ 0,360= 3,002
0,815 / 0,271 = 3,007

3. Calculation of largest eigenvalue (λmax), consistency index (CI) and consistency ratio (CR) values and consistency

λmax = (3,010 + 3,002 + 3,007) / 3
λmax = 3,007
CI = (λmax - n) / (n-1)
CI = (3,007 - 3) / (3-1)
CI = 0,004
CR = CI / RI
RI value is taken from Table 3.3.
CR = 0,004 / 0,58
CR = 0,01
0.01 ≤ 0.10 judgments are **consistent.** ✔

Figure 4.6 Calculating consistency for design and management criteria

Table 4.36 Comparison matrix of criteria in resources and energy for participants

Comparison Matrix										
RESOURCES AND ENERGY	**Waste Management During Construction**	**Waste Management in Use Phase**	**Renewable Energy**	**Energy Efficiency**	**Green Infrastructure**	**Sustainable Buildings**	**Local Material Use**	**Sustainable Material Use**	**Certified Material Use**	**Economic Material Use**
Waste Management During Construction	**1,00**	0,91	0,54	0,46	0,66	0,40	1,10	0,58	1,22	1,81
Waste Management in Use Phase	1,10	**1,00**	0,58	0,61	0,47	0,52	1,24	0,82	1,17	1,37
Renewable Energy	1,84	1,74	**1,00**	0,96	1,10	1,22	1,95	1,22	2,85	3,26
Energy Efficiency	2,16	1,64	1,04	**1,00**	1,51	1,24	2,16	1,84	2,90	3,81
Green Infrastructure	1,51	2,12	0,91	0,66	**1,00**	0,91	1,67	0,96	2,34	2,90
Sustainable Buildings	2,48	1,92	0,82	0,81	1,10	**1,00**	2,07	1,00	2,34	3,02
Local Material Use	0,91	0,81	0,51	0,46	0,60	0,48	**1,00**	0,46	1,35	1,57
Sustainable Material Use	1,74	1,22	0,82	0,54	1,04	1,00	2,16	**1,00**	3,02	3,68
Certified Material Use	0,82	0,85	0,35	0,34	0,43	0,43	0,74	0,33	**1,00**	1,35
Economic Material Use	0,55	0,73	0,31	0,26	0,34	0,33	0,27	0,27	0,74	**1,00**
TOTAL	**14,11**	**12,93**	**6,88**	**6,12**	**8,27**	**7,53**	**14,36**	**8,48**	**18,93**	**23,78**

Table 4.37 Normalized comparison matrix of criteria in resources and energy for participants

Normalized Comparison Matrix											Eigenvector
RESOURCES AND ENERGY	**Waste Management During Construction**	**Waste Management in Use Phase**	**Renewable Energy**	**Energy Efficiency**	**Green Infrastructure**	**Sustainable Buildings**	**Use of Local Materials**	**Use of Sustainable Materials**	**Use of Certified Materials**	**Economic Material Use**	
Waste Management During Construction	0,07	0,07	0,08	0,08	0,08	0,05	0,08	0,07	0,06	0,08	0,07
Waste Management in Use Phase	0,08	0,08	0,08	0,10	0,06	0,07	0,09	0,10	0,06	0,06	0,08
Renewable Energy	0,13	0,13	0,15	0,16	0,13	0,16	0,14	0,14	0,15	0,14	**0,14**
Energy Efficiency	0,15	0,13	0,15	0,16	0,18	0,16	0,15	0,22	0,15	0,16	**0,16**
Green Infrastructure	0,11	0,16	0,13	0,11	0,12	0,12	0,12	0,11	0,12	0,12	0,12
Sustainable Buildings	0,18	0,15	0,12	0,13	0,13	0,13	0,14	0,12	0,12	0,13	**0,14**
Use of Local Materials	0,06	0,06	0,07	0,08	0,07	0,06	0,07	0,05	0,07	0,07	0,07
Use of Sustainable Materials	0,12	0,09	0,12	0,09	0,13	0,13	0,15	0,12	0,16	0,15	**0,13**
Use of Certified Materials	0,06	0,07	0,05	0,06	0,05	0,06	0,05	0,04	0,05	0,06	0,05
Economic Material Use	0,04	0,06	0,04	0,04	0,04	0,04	0,02	0,03	0,04	0,04	0,04
TOTAL	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**

The sub-criteria for resources and energy, the last and sixth main heading of the sustainable neighborhood assessment criteria, are (1) waste management during construction, (2) waste management in the use phase, (3) renewable energy, (4) energy efficiency, (5) green infrastructure, (6) sustainable buildings, (7) use of local materials, (8) use of sustainable materials, (9) use of certified materials and (10) economic material use. As a result of the comparison made in line with the answers given by all participants, the order of importance of the main topics was calculated as (1) energy efficiency, (2) sustainable buildings and (2) renewable energy being equal and (3) use of sustainable materials and is presented in Table 4.26. The consistency calculation for these decisions was performed as shown in Figure 4.7. For the consistency value, "CR 0.00 ≤ 0.10" was obtained. Therefore, the choices made are considered consistent.

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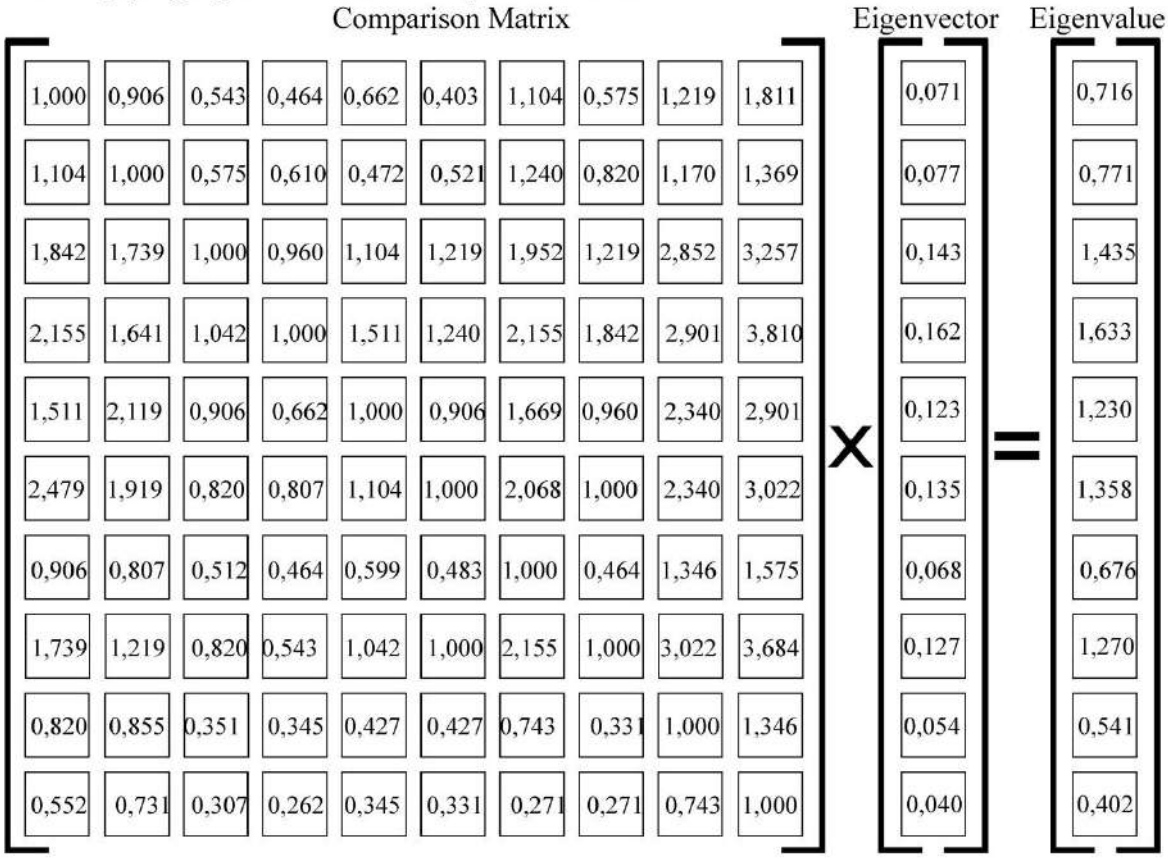
1. Multiplying eigenvector with comparison matrix



2. Dividing all elements of eigenvalue matrix into elements of eigenvector matrix respectively

0,716 / 0,071 = 10,084
0,771 / 0,077 = 10,012
1,435 / 0,143 = 10,160
1,633 / 0,162 = 10,080
1,230 / 0,123 = 10
1,358 / 0,135 = 10,059
0,676 / 0,068 = 9,941
1,270 / 0,127 = 10
0,541/ 0,054 = 10,018
0,402/ 0,040 = 10,050

3. Calculation of largest eigenvalue (λmax), consistency index (CI) and consistency ratio (CR) values and consistency

λmax = (10,084 + 10,012 + 10,160 + 10,080 + 10 +10,059 + 9,941 + 10 + 10,018 + 10,050) / 10
λmax = 10,040
CI = (λmax - n) / (n-1)
CI = (10,028 - 10) / (10-1)
CI = 0,004
CR = CI / RI
RI value is taken from Table 3.3.
CR = 0,004 / 1,49
CR = 0,00
0.00 ≤ 0.10 judgments are **consistent.** ✔

Figure 4.7 Calculating consistency for resources and energy criteria

Table 4.38 General importance level of criteria

Comparison Groups	Main Criteria	Eigenvector	Environment And Land Use	Eigenvector	Economic Development	Eigenvector	Transport	Eigenvector	Social Development	Eigenvector	Design And Management	Eigenvector	Resources And Energy	Eigenvector
1	Resources and energy	**0,22**	Conservation and development of biodiversity	**0,18**	Economic development	**0,69**	Increasing walkability	**0,17**	Education	**0,38**	Safety	**0,37**	Energy efficiency	**0,16**
2	Environment and land use	**0,20**	Protecting and enhancing the ecological value of the land	**0,17**	Increasing investment profitability	**0,31**	Increasing/regulating bicycle networks	**0,18**	Inclusive design	**0,25**	Accessibility of public services	**0,36**	Sustainable buildings Renewable energy	**0,14**
3	Social development	**0,15**	Protection and development of agricultural areas	**0,15**	-	-	Preferring areas with high accessibility and served by environmentally friendly mixed transportation systems	**0,15**	Enhancing cultural and heritage identity	**0,22**	Reducing the urban heat island effect	**0,27**	Use of sustainable materials	**0,13**

The ranking of importance for all comparisons is presented in Table 4.27, with 'Economic development' (0.69) ranking first. 'Education' (0.38) comes second and 'Safety' (0.37) third. The main reason for the numerical results of the criteria is the number of sub-criteria compared. The number of sub-criteria belonging to the main headings and the weight ratio for each criterion are inversely proportional. Therefore, while it is possible to interpret groups within themselves, it is not possible to compare groups with different numbers of sub-criteria with each other in a healthy way. It is therefore possible to compare groups with an equal number of sub-criteria in the assessment presented in Table 4.27.

CHAPTER FIVE
RESULTS AND CONCLUSIONS

With the industrial revolution, the relationship between the economy and the environment has been redefined, and the environment has been transformed unconsciously in order to maximize economic production. This transformation, which affects people from all walks of life, albeit at different rates, has brought along many social problems. The concept of "sustainability", which emerged with the understanding that this unbalanced production and consumption equation is not "sustainable", has formed the basis of environment-human based discussions. One of the discussion topics developed in this direction has been the search for sustainable living space.

Realizing the effects of the climate crisis, humanity has taken various initiatives both nationally and internationally to create a sustainable world. These efforts, from micro to macro scale, have also had various reflections in urban design. Certification systems, which were initially developed at the building scale and aimed at auditing sustainability, have also been created at the neighborhood and city scales. It has been revealed that sustainable development is realized through the process of harmony between scales, and that design and implementation studies carried out especially at the neighborhood scale play a key role for the macro urban scale (Dehghanmongabadi, Hoşkara & Shirkhanloo, 2014).

As a result of the studies carried out, it has been determined that many countries have certification systems based on the economic, social and environmental values of the location, which enable the supervision of sustainability at the neighborhood and city scale (BCA Green Mark For Districts, 2018; BREEAM Communities Technical Manual, 2017; CASBEE for UD Technical Manual, 2014; DGNB System Districts Criteria Set, 2020; Ergönül, et al., 2023; LEED ND, 2018). At the same time, with the cooperation of the government and different sectors, these systems also find their place in the legal basis of the country. In this context, it is possible to say that the establishment of a local certification system for sustainability has an important place in terms of guiding managers and strategy developers.

For Turkey, it is possible to say that these efforts have not gone beyond the building scale. There is not yet an officially defined local certification system at the neighborhood scale in Turkey, but the certification systems of other countries are used. In this case, local-specific criteria cannot be evaluated properly. In order to contribute to filling this gap in our country, it is aimed to provide a basis for the creation of a locally specific sustainable neighborhood assessment certification system for Turkey. In this direction, it is aimed to determine the evaluation criteria and their importance ranking.

For this reason, in order to create a locally-specific sustainable neighborhood assessment certification system, previous assessment systems were examined in terms of their main criteria, sub-criteria and scopes. Each assessment tool has its own classification, scoring, and scope of criteria. One of the most critical points of the study is to compare these certification systems with each other and to bring them together under a common denominator and title despite their different scoring systems. Neighborhood scale is defined in different dimensions within the systems. The unique parcel, neighborhood and city definitions of each country are interpreted as the primary reason for this situation. On the basis of the criteria determined it is possible to see the effects of locally specific climate, topography, vegetation, etc.

In the light of these assessments, sustainable neighborhood assessment criteria including 7 main criteria and 37 sub-criteria have been determined by taking into account the local economic, environmental and social impacts of Turkey. They are categorized as shown in Figure 4.1 (See Section 4.2). These criteria were ranked according to the weights of the participants' preferences using the Analytic Hierarchy Process (AHP) method.

Comparison of the main criteria constitutes the first step. According to the survey findings, the criteria are (1) resources and energy, (2) environment and land use, and (3) social development. At the same time, the weight ratios determined for the main criteria in the relevant certification systems included in the literature review (See Section 2.5) are (1) environment and land use, (2) resources and energy, (3) social development. Therefore, although the impacts of the climate crisis vary depending on the local conditions and problems of each country, some key issues affect the whole

world in a similar way. This is also the main reason why each of the certification systems included has chosen these three main topics as the most weighted, although each of them is based on different countries. Therefore, it reemerges that preventing the impacts of the climate crisis can be realized through universal action.

In the second step of comparison, the sub-headings of environment and land-use were compared. The relevant sub-criteria are (1) conservation and development of biodiversity, (2) protecting and enhancing the ecological value of the land and (3) protection and development of agricultural areas. Among the certification systems mentioned in the literature (See Section 2.5), environment and land-use has the highest weight rate and sub-criteria. At this point, it is possible to say that the misrepresentation of the climate crisis in many discourses and studies by attributing it only as "environmental degradation" has an impact on these rates. At the same time, it is also possible to mention that international congresses and treaties (See Section 2.2), which are also included in the literature, frequently mention regulations and restrictions in the field of "environment and land-use" in order to slow down the effects of the climate crisis (Republic of Turkey Ministry of Energy and Natural Resources, 2023). On the other hand, within the framework of the participants' answers to the open-ended questions (See Section 4.1), we see that the title environment and land-use is mostly associated with dense construction and the resulting insufficient open green spaces. For this reason, it is possible to say that the answers given to the open-ended questions and the resulting numerical data are in parallel. However, it should be reminded that the participants who answered the questionnaire are experts in space organization disciplines. For this reason, it is another possibility that the high rate of the environment and land use category may be due to the respondent profile. Therefore, it will be important for subsequent studies to develop a method to obtain the opinions of people from different areas of expertise.

In the third step of comparison, sub-criteria for transport were compared. The order of importance of the criteria is (1) increasing walkability, (2) increasing/regulating bicycle networks and (3) preferring areas with high accessibility and served by environmentally friendly mixed transportation systems.

In the responses to the open questions for the Transport category (See Section 4.1), the development and improvement of sustainable transportation networks emerges as the spatial arrangement that should be done first. In addition, unorganized traffic network and parking problems are secondary responses. According to 2023 data, the fact that Izmir ranks 116th in the world in terms of traffic density is the main factor affecting this preference (Traffic Index, 2024). Therefore, it is clear that urban design and planning strategies need to be improved in this area. In addition to this, it is emphasized that there is a significant implementation problem in all of the evaluation systems in the literature (See Section 2.5), and that approaches that are mostly on paper and far from practice stand out as the main problem. For this reason, the fact that the regulations targeted to be realized do not coincide with the plans is one of the factors that lead to this result.

In the fourth step of comparison, economic development was evaluated. The order of importance of the criteria was calculated as (1) economic development and (2) increasing investment profitability. In all of the evaluation systems in the literature (See Section 2.5), economic development has very few criteria and weight ratios. On the other hand, when the open-ended answers given by the participants (See Section 4.1) are analyzed, it is possible to see that there are almost no evaluations on economic development. As a result, it is possible to say that the relationship between the climate crisis and the economy does not find enough place in sustainable neighborhood assessment systems.

In the fifth step of the comparison, the order of importance of the sub-criteria for social development was calculated as (1) education, (2) inclusive design and (3) enhancing cultural and heritage identity. The open-ended responses (See Section 4.1) highlighted that Izmir's potentials include the already existing community of conscious people and the importance of sustainability awareness and education. In addition, it was noted that the criteria and weighting of criteria in all of the assessment systems in the literature (See Section 2.5) are generally subjective and developed by experts. It is possible to say that the concept of participation, which forms the basis of sustainable development, is not sufficiently reflected here and should be improved in a possible sustainable neighborhood assessment system.

In the next step of the comparison, the criteria belonging to the design and management category were evaluated. The order of importance of the criteria was calculated as (1) safety, (2) accessibility of public services and (3) reducing the urban heat island effect. In respondents' answers to the open-ended questions (See Section 4.1), unplanned urban regeneration was the primary response. These responses reveal the importance of urban design and planning strategies in creating a sustainable neighborhood. However, when compared to the other categories, it is possible to say that the relationship between the climate crisis and the design and management category is not fully established in the certification systems.

In the seventh and final step of the comparison, the resources and energy category was evaluated. The weights of the criteria were calculated as (1) energy efficiency, (2) sustainable buildings and (2) renewable energy and (3) use of sustainable materials. In the evaluation of the main headings that constitute the first step of the benchmarking and in the evaluation systems included in the literature (See Section 2.5), resources and energy are among the most weighted categories. In addition to this, the use of renewable energy sources, especially solar energy, is predominant among the answers given by the participants to the open-ended questions (See Section 4.1). The influence of topography and climate, which constitute the local factors of Izmir, is very important in the preference of these sub-criteria. In addition, the policies developed in our country to reduce dependence on foreign energy also have an impact on these preferences.

In summary, with this research, an original study has been carried out that constitutes the basis for the creation of a locally-specific sustainable neighborhood assessment certification system in Turkey and determines the assessment criteria and importance ranking in this direction. This criterion pool, which was created for the first time in Turkey by taking the neighborhood scale into consideration, and the weight ratios of the relevant criteria will contribute to future studies.

In this context, the relationship between the sustainability of neighborhoods and the sustainability of the city, region and the world is clear (Dehghanmongabadi, Hoşkara & Shirkhanloo, 2014; Hamedani & Huber, 2012). Therefore, the findings of this thesis will provide a locally-specific perspective that is sensitive to

environmental and social needs to the urban design processes to be realized in our country. Moreover, the fact that the identified criteria can be used as a guide in future projects will enable architects, urban planners and local governments to make more informed and sustainable choices in their decision-making processes, thus making significant contributions to urban design.

The aspects of the study that can be improved are the development of methods for measuring the relevant criteria and testing these methods on a pilot neighborhood study. It is aimed to contribute to a possible sustainable neighborhood assessment certification system that can be developed in Turkey by eliminating these deficiencies with other studies to be carried out.

REFERENCES

Abulfotuh, F. (2007). Energy efficiency and renewable technologies: the way to sustainable energy future. *Desalination, 209*(1-3), pp. 275-282. https://doi.org/10.1016/j.desal.2007.04.040

Alberti, M. et al., (2007). The impact of urban patterns on aquatic ecosystems: An empirical analysis in Puget lowland sub-basins. *Landscape and urban planning*, *80*(4), pp. 345-361. https://doi.org/10.1016/j.landurbplan.2006.08.001

Algert, S. J., Baameur, A., & Renvall, M. J. (2014). Vegetable output and cost savings of community gardens in San Jose, California. *Journal of the Academy of Nutrition and Dietetics, 114*(7), pp. 1072-1076. https://doi.org/10.1016/j.jand.2014.02.030

Al-Hagla, K. (2008). Towards A Sustainable Neighborhood: The Role of Open Spaces. *International Journal of Architectural Research, 2*(2), pp. 162-177.

Altunbaş, D. (2003). Uluslararası sürdürülebilir kalkınma ekseninde Türkiye'deki kurumsal değişimlere bir bakış. *Yönetim Bilimleri Dergisi, 1*(1-2), pp. 103-118.

Angelo, H., & Wachsmuth, D. (2020). Why does everyone think cities can save the planet?. *Urban Studies*, *57*(11), pp. 2201-2221. https://doi.org/10.1177/0042098020919081

Araral, E. (2014). Ostrom, Hardin and the commons: A critical appreciation and a revisionist view. *Environmental Science & Policy, 36*, pp. 11-23. https://doi.org/10.1016/j.envsci.2013.07.011

Arnold, C. L., & Gibbons, C. J. (1996). Impervious Surface Coverage: The Emergence of a Key Environmental Indicator. *Journal of the American Planning Association*, *62*(2), pp. 243–258. https://doi.org/10.1080/01944369608975688

Arora, P. (2024). COP28: ambitions, realities, and future. *Environmental Sustainability 7*, pp. 107–113 https://doi.org/10.1007/s42398-024-00304-0

Attaran, A. (2006). Correction: an immeasurable crisis? A criticism of the millennium development goals and why they cannot be measured. *PLOS Medicine*, *3*(5), pp. 224. https://doi.org/10.1371/journal.pmed.0020318

Awad, J., & Jung, C. (2022). Extracting the planning elements for sustainable urban regeneration in Dubai with AHP (analytic hierarchy process). Sustainable Cities and Society, 76, 103496. https://doi.org/10.1016/j.scs.2021.103496

Axelsson, R., et al. (2013). Social and cultural sustainability: Criteria, indicators, verifier variables for measurement and maps for visualization to support planning. *Ambio, 42*, p. 215-228. https://doi.org/10.1007/s13280-012-0376-0

Aznar-Sánchez, J. A., Piquer-Rodríguez, M., Velasco-Muñoz, J. F., & Manzano-Agugliaro, F. (2019). Worldwide research trends on sustainable land use in agriculture. *Land use policy*, *87*, 104069. https://doi.org/10.1016/j.landusepol.2019.104069

Bacon, T. C. (1975). The Role of The United Nations Environment Program (UNEP) in the Development of International Environmental Law. *Canadian Yearbook of International Law/Annuaire canadien de droit international, 12*, pp. 255-266. https://doi.org/10.1017/S0069005800012583

Barrutia, J. M., Echebarria, C., Paredes, M. R., Hartmann, P., & Apaolaza, V. (2015). From Rio to Rio+20: twenty years of participatory, long term oriented and monitored local planning? *Journal of Cleaner Production, 106*, pp. 594–607. https://doi.org/10.1016/j.jclepro.2014.12.085

Barton H., (2002). (Ed.). Do Neighborhoods Matter. In *Sustainable Communities: The Potential for Econeighborhoods*. (pp. 49-65). Earthscan Publications.

Basiago, A. D. (1998). Economic, social, and environmental sustainability in development theory and urban planning practice. *Environmentalist*, *19*(2), pp. 145-161. https://doi.org/10.1023/A:1006697118620

Baykal, H., & Baykal, T. (2008). Küreselleşen Dünya'da çevre sorunları/Environmental problems in a globalized World. *Mustafa Kemal Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, 5*(9).

Beatley, T., & Manning, K. (2013). *The ecology of place: Planning for environment, economy, and community*. Island Press.

Beder, S. (2013). *Environmental principles and policies: an interdisciplinary introduction.* Routledge. https://doi.org/10.4324/9781315065908

Bell, S., & Morse, S. (2003). *Measuring sustainability: Learning from doing.* (1st ed.) Routledge. https://doi.org/10.4324/9781849771962

Bellard, C., Bertelsmeier, C., Leadley, P., Thuiller, W., & Courchamp, F. (2012). Impacts of climate change on the future of biodiversity. *Ecology letters*, *15*(4), pp. 365-377. https://doi.org/10.1111/j.1461-0248.2011.01736.x

Benedict, M. A., & McMahon, E. T. (2012). *Green infrastructure: linking landscapes and communities*. Island press.

Bibri, S. E., & Krogstie, J. (2017). Smart sustainable cities of the future: An extensive interdisciplinary literature review. *Sustainable cities and society,* 31, pp. 183-212. https://doi.org/10.1016/j.scs.2017.02.016

Biermann, F., Kanie, N., & Kim, R. E. (2017). Global governance by goal-setting: the novel approach of the UN Sustainable Development Goals. *Current Opinion in Environmental Sustainability, 26*, pp. 26-31. https://doi.org/10.1016/j.cosust.2017.01.010

Binswanger, H. C., Bonus, H., & Timmermann, M. (1981). *Wirtschaft und Umwelt: Möglichkeiten einer ökologieverträglichen Wirtschaftspolitik*. pp. 242. Stuttgart: Verlag Kohlhammer. From Ayşegül Kaplan (1997), Küresel Çevre Sorunları ve Politikaları. *Mülkiyeliler Birliği Vakfı Yayınları Tezler Dizisi, 18*, Ankara.

Birch, E. L. (2016). A Midterm Report: Will Habitat III Make a Difference to the World's Urban Development? *Journal of the American Planning Association*, *82*(4), pp. 398–411. https://doi.org/10.1080/01944363.2016.1216326

Blair, D., Giesecke, C. C., & Sherman, S. (1991). A dietary, social and economic evaluation of the Philadelphia urban gardening project. *Journal of Nutrition Education*, *23*(4), pp. 161-167. https://doi.org/10.1016/S0022-3182(12)81191-5

Blassingame, L. (1998). Sustainable cities: Oxymoron, utopia, or inevitability? *The Social Science Journal*, *35*(1), pp. 1–13. https://doi.org/10.1016/S0362-3319(98)90055-6

Bogner, F. X. (1998). The influence of short-term outdoor ecology education on long-term variables of environmental perspective. *The Journal of environmental education, 29*(4), pp. 17-29. https://doi.org/10.1080/00958969809599124

Böhringer, C. (2003). The Kyoto protocol: a review and perspectives. *Oxford Review of Economic Policy, 19*(3), pp. 451-466. https://doi.org/10.1093/oxrep/19.3.451

Bolitzer, B., & Netusil, N. R. (2000). The impact of open spaces on property values in Portland, Oregon. *Journal of environmental management*, *59*(3), pp. 185-193. https://doi.org/10.1006/jema.2000.0351

Bond, P. (2006). Global governance campaigning and MDGs: from top-down to bottom-up anti-poverty work. *Third World Quarterly*, *27*(2), pp. 339–354. https://doi.org/10.1080/01436590500432622

Brand, C., Goodman, A., & Ogilvie, D. (2014). Evaluating the impacts of new walking and cycling infrastructure on carbon dioxide emissions from motorized travel: a controlled longitudinal study. *Applied Energy*, *128*, pp. 284-295. https://doi.org/10.1016/j.apenergy.2014.04.072

Bridgewater, P. (2016). The Man and Biosphere programme of UNESCO: Rambunctious child of the sixties, but was the promise fulfilled?. *Current Opinion in Environmental Sustainability, 19*, pp. 1-6. https://doi.org/10.1016/j.cosust.2015.08.009

Brunelli, M. (2014). *Introduction to the analytic hierarchy process*. Springer.

Buck, S. J. (1985). No tragedy on the commons. *Environmental Ethics, 7*(1), pp. 49-61. https://doi.org/10.5840/enviroethics1985716

Budak, S. (2000). Avrupa Birliği ve Türk çevre politikası. *Büke Yayınları,* pp. 17-362.

Bulkeley, H., & Betsill, M. (2005). Rethinking Sustainable Cities: Multilevel Governance and the "Urban" Politics of Climate Change. *Environmental Politics*, *14*(1), pp. 42–63. https://doi.org/10.1080/0964401042000310178

Burkhard, R., Deletic, A., & Craig, A. (2000). Techniques for water and wastewater management: a review of techniques and their integration in planning. *Urban water*, *2*(3), pp. 197-221. https://doi.org/10.1016/S1462-0758(00)00056-X

Burnett, J. (2007). City buildings—Eco-labels and shades of green!. *Landscape and Urban planning*, *83*(1), pp. 29-38. https://doi.org/10.1016/j.landurbplan.2007.09.003

Burton, I. (1987). Report on Reports: Our Common Future. *Environment: Science and Policy for Sustainable Development, 29*(5), pp. 25–29. https://doi.org/10.1080/00139157.1987.9928891

Calkins, M. (2008). *Materials for sustainable sites: a complete guide to the evaluation, selection, and use of sustainable construction materials*. John wiley & sons.

Camagni, R., Capello, R., & Nijkamp, P. (1998). Towards sustainable city policy: an economy-environment technology nexus. *Ecological economics, 24*(1), pp. 103-118. https://doi.org/10.1016/S0921-8009(97)00032-3

Campbell, S. (1996). Green cities, growing cities, just cities?: Urban planning and the contradictions of sustainable development. *Journal of the American Planning Association, 62*(3), pp. 296-312. https://doi.org/10.1080/01944369608975696

Carleton, T. A., & Hsiang, S. M. (2016). Social and economic impacts of climate. *Science, 353*(6304), aad9837. https://doi.org/10.1126/science.aad9837

Carson, R. (1962). *Silent Spring.* Houghton Mifflin.

Çelikyay, H. H. (2021). Türkiye'de Çevre Politikaları: Kalkınma Planları Üzerinden Bir İnceleme. *İktisadi İdari Ve Siyasal Araştırmalar Dergisi, 6*(15), pp. 185-205. https://doi.org/10.25204/iktisad.839408

Cervero, R., Sarmiento, O. L., Jacoby, E., Gomez, L. F., & Neiman, A. (2009). Influences of built environments on walking and cycling: lessons from Bogotá. *International journal of sustainable transportation*, *3*(4), pp. 203-226. https://doi.org/10.1080/15568310802178314

Cettner, A., Ashley, R., Hedström, A., & Viklander, M. (2014). Sustainable development and urban stormwater practice. *Urban Water Journal*, *11*(3), pp. 185-197. https://doi.org/10.1080/1573062X.2013.768683

Chadwick, E. (1843). Report on the sanitary condition of the labouring population of Great Britain :A supplementary report on the results of a special inquiry into the practice of interment in towns. Made at the request of Her Majesty's principal Secretary of State for the Home Department. London: Printed by W. Clowes and Sons, for H.M.S.O.

Chen, Y., Samuelson, H. W., & Tong, Z. (2016). Integrated design workflow and a new tool for urban rainwater management. *Journal of environmental management*, *180*, pp. 45-51. https://doi.org/10.1016/j.jenvman.2016.04.059

Choguill, C. L. (2008). Developing sustainable neighbourhoods. *Habitat international*, *32*(1), pp. 41-48. https://doi.org/10.1016/j.habitatint.2007.06.007

Churchill, C. J., & Baetz, B. W. (1999). Development of decision support system for sustainable community design. *Journal of Urban Planning and Development*, *125*(1), pp. 17-35. https://doi.org/10.1061/(ASCE)0733-9488(1999)125:1(17)

Clarkson, P. J., Coleman, R., Keates, S., & Lebbon, C. (2013). *Inclusive design: Design for the whole population.* Springer. https://doi.org/10.1007/978-1-4471-0001-0.

Cloutier, S., Berejnoi, E., Russell, S., Morrison, B. A., & Ross, A. (2018). Toward a holistic sustainable and happy neighborhood development assessment tool: A critical review of relevant literature. *Ecological Indicators*, *89*, pp. 139-149. https://doi.org/10.1016/j.ecolind.2018.01.055

Cohen, B. (2006). Urbanization in developing countries: Current trends, future projections, and key challenges for sustainability. *Technology in society*, *28*(1-2), pp. 63-80. https://doi.org/10.1016/j.techsoc.2005.10.005

Cohen, M. A. (2016). From Habitat II to Pachamama: a growing agenda and diminishing expectations for Habitat III. *Environment and Urbanization, 28*(1), pp. 35-48. https://doi.org/10.1177/0956247815620978

Çolakoğlu, E. (2010). Haklar söyleminde çevre eğitiminin yeri ve Türkiye'de çevre eğitiminin anayasal dayanakları. *Tbb Dergisi, 88*(2), pp. 151-171.

Cole, R. J. (2009). Environmental assessment: shifting scales. In Ng, E. (Eds.). *Designing High-Density Cities* (pp. 273-282). Routledge.

Colldahl, C., Frey, S., & Kelemen, J. E. (2013). *Smart cities: Strategic sustainable development for an urban world* [Master's degree thesis]. School of Engineering Blekinge Institute of Technology.

Columella LJM. (1948). *Res rustica*. Lucius Junius Moderatus Columella on agriculture, (1st ed.). (Books I – IV). English translation by Harrison Boyd Ash. 1948 reprint. Cambridge: Harvard University Press.

Commoner, B. (1966). *Science and survival.* New York: Viking Press.

Comstock, N., et al. (2010). Neighborhood attachment and its correlates: Exploring neighborhood conditions, collective efficacy, and gardening. *Journal of environmental psychology, 30*(4), pp. 435-442. https://doi.org/10.1016/j.jenvp.2010.05.001

Connelly, S. (2007). Mapping sustainable development as a contested concept. *Local environment, 12*(3), pp. 259-278. https://doi.org/10.1080/13549830601183289

Cunningham, S. A., et al. (2013). To close the yield-gap while saving biodiversity will require multiple locally relevant strategies. *Agriculture, Ecosystems & Environment, 173,* pp. 20-27. https://doi.org/10.1016/j.agee.2013.04.007

Dar, O. A., & Khan, M. S. (2011). Millennium development goals and the water target: details, definitions and debate. *Tropical Medicine & International Health, 16*(5), pp. 540–544. https://doi.org/10.1111/j.1365-3156.2011.02736.x

De Bont, R., Schleper, S., & Schouwenburg, H. (2017). Conservation conferences and expert networks in the short twentieth century. *Environment and History, 23*(4), pp. 569-599. https://doi.org/10.3197/096734017X15046905071889

Deakin, M. (2011). Meeting the challenge of learning from what works in the development of sustainable communities. *Sustainable cities and society, 1*(4), pp. 244-251. https://doi.org/10.1016/j.scs.2011.07.006

DeFries, R., Hansen, A., Turner, B. L., Reid, R., & Liu, J. (2007). Land use change around protected areas: management to balance human needs and ecological

function. *Ecological applications*, *17*(4), pp. 1031-1038. https://doi.org/10.1890/05-1111

Dehghanmongabadi, A., Hoşkara, Ş. Ö., & Shirkhanloo, N. (2014). Introduction to achieve sustainable neighborhoods. *International Journal of Arts and Commerce, 3*(9), pp. 16-26.

Deilami, K., Kamruzzaman, M., & Liu, Y. (2018). Urban heat island effect: A systematic review of spatio-temporal factors, data, methods, and mitigation measures. *International journal of applied earth observation and geoinformation, 67*, pp.30-42. https://doi.org/10.1016/j.jag.2017.12.009

Demiral, B., & Evin, H. (2014). Türkiye'de çevre politikalarının gelişiminin çevresel etki değerlemesi yönetmeliği üzerinden değerlendirilmesi. *Uluslararası Çevre ve Ahlak Sempozyumu, Adıyaman, Türkiye*, pp. 37-48.

Dietz, R., Daly, H., & O'Neill, D. (2013). *Enough is enough: Building a sustainable economy in a world of finite resources*. Routledge.

Dincer, I. (2000). Renewable energy and sustainable development: a crucial review. *Renewable and sustainable energy reviews*, *4*(2), pp. 157-175. https://doi.org/10.1016/S1364-0321(99)00011-8

Doelle, M., & Sinclair, A. J. (2006). Time for a new approach to public participation in EA: Promoting cooperation and consensus for sustainability. *Environmental Impact Assessment Review*, *26*(2), pp. 185-205. https://doi.org/10.1016/j.eiar.2005.07.013

Donegan, H. A., Dodd, F. J., & McMaster, T. B. M. (1992). A new approach to AHP decision-making. *Journal of the Royal Statistical Society: Series D (The Statistician)*, *41*(3), pp. 295-302. https://doi.org/10.2307/2348551

Downes, D. (2000). The New Zealand environmental movement and the politics of inclusion. *Australian Journal of Political Science, 35*(3), pp. 471-491. https://doi.org/10.1080/713649347

Du Pisani, J. A. (2006). Sustainable development–historical roots of the concept. *Environmental sciences*, *3*(2), pp. 83-96. https://doi.org/10.1080/15693430600688831

Easterly, W. (2009). How the millennium development goals are unfair to Africa. *World Development*, *37*(1), pp 26–35. https://doi.org/10.1016/j.worlddev.2008.02.009

Eblen, R. & Eblen, R. (1994). *The Encyclopedia of the Environment.* Houghton Mifflin Company, pp. 432-433.

Egger, S. (2006). Determining a sustainable city model. *Environmental Modelling & Software, 21*(9), pp. 1235-1246. https://doi.org/10.1016/j.envsoft.2005.04.012

Ehrlich, P. R. (1968). *The population bomb.* New York: Ballantine Books.

Eidsvik, H. K. (1980). National parks and other protected areas: some reflections on the past and prescriptions for the future. *Environmental conservation, 7*(3), pp. 185–190. https://doi.org/10.1017/s0376892900007530

Engel-Yan, J., Kennedy, C., Saiz, S., & Pressnail, K. (2005). Toward sustainable neighbourhoods: the need to consider infrastructure interactions. *Canadian Journal of Civil Engineering, 32*(1), pp. 45-57. https://doi.org/10.1139/l04-116

Erdede, S. B., & Bektaş, S. (2018). Türkiye için yeşil bina sertifika sistemi gerekliliği. *In 2nd International Symposium on Innovative Approaches in Scientific Studies, November 3*, pp. 138-143.

Ergönül, S., et al. (2019). Mahalle Ölçeğinde Sürdürülebilir Değerlendirme Sistemi Geliştirilmesi Projesi Final Raporu, (TÜBİTAK), Grant No: MAG-216M027.

Ergönül, S., et al. (2023). Development of A Neighborhood Sustainability Assessment System for Turkey: SEEB-TR Neighbourhood. *Planlama, 33*(1), pp 105–122. https://doi.org/10.14744/planlama.2022.35683

Ergönül, S., Olgun, İ. & Tekin, Ç., (2020). *Kentsel mekâna yeşil yaklaşımlar: Seeb-Tr Mahalle.* Mimar Sinan Güzel Sanatlar Üniversitesi Yayınları.

Evans, A., Strezov, V., & Evans, T. J. (2009). Assessment of sustainability indicators for renewable energy technologies. *Renewable and sustainable energy reviews, 13*(5), pp. 1082-1088. https://doi.org/10.1016/j.rser.2008.03.008

Evans, J., et al. (2019). Smart and sustainable cities? Pipedreams, practicalities and possibilities. *Local Environment, 24*(7), pp. 557-564. https://doi.org/10.1080/13549839.2019.1624701

Evenson, R. E., & Gollin, D. (2003). Assessing the impact of the Green Revolution, 1960 to 2000. *Science, 300*(5620), pp. 758-762. https://doi.org/10.1126/science.1078710

Fehling, M., Nelson, B. D., & Venkatapuram, S. (2013). Limitations of the millennium development goals: a literature review. *Global Public Health, 8*(10), pp. 1109–1122. https://doi.org/10.1080/17441692.2013.845676

Flood, J. (1997). Urban and housing indicators. *Urban studies, 34*(10), pp. 1635-1665. https://doi.org/10.1080/0042098975385

Foucher, A., et al. (2014). Increase in soil erosion after agricultural intensification: Evidence from a lowland basin in France. *Anthropocene, 7*, pp. 30-41. https://doi.org/10.1016/j.ancene.2015.02.001

Fukuda-Parr, S. (2006). Millennium Development Goal 8: *Indicators for International Human Rights Obligations? Human Rights Quarterly 28*(4), pp. 966-997. https://doi.org/10.1353/hrq.2006.0046

Fülöp, J. (2005). Introduction to decision making methods. In *BDEI-3 workshop, Washington* (pp. 1-15).

Gallion, A. B. (1950). *The Urban Pattern: City Planning and Design.* New York: D.van Nostrand Co.

Gardiner, R. A. (1979). *Design for safe neighborhoods*. US Government Printing Office.

Gardner, R. C., & Davidson, N. C. (2011). The ramsar convention. In LePage, B. (eds) *Wetlands: Integrating multidisciplinary concepts*, pp.189-203. Dordrecht: Springer. https://doi.org/10.1007/978-94-007-0551-7_11

Gazete, R. (1930). 1580 Sayılı Belediye Kanunu. (14.04.1930 Sayı: 1471).

Gazete, R. (1930). 1593 Sayılı Umumi hıfzıssıhha kanunu. (06.05.1930 Sayı: 1489).

Gazete, R. (1956). 6785 Sayılı İmar Kanunu. (16.07.1956 Sayı: 9359).

Gazete, R. (1966). 775 Sayılı Gecekondu Kanunu. (30.07.1966 Sayı: 12362).

Gazete, R. (1971). 1380 Sayılı Su Ürünleri Kanunu. (04.04.1971 Sayı: 13799).

Gazete, R. (1978). 16041 Sayılı Bakanlar Kurulu Kararları. (12.08.1978, Sayı: 16375).

Gazete, R. (1983). 2872 Sayılı Çevre Kanunu. (09.08.1983 Sayı: 18132).

Gazete, R. (1991). 443 Sayılı Kanun Hükmünde Kararnameler. (21.08.1991, Sayı: 20976).

Gazete, R. (2001). 4708 Sayılı Yapı Denetimi Kanunu. (13.07.2001, Sayı: 24461).

Gazete, R. (2006). 5491 Sayılı Çevre Kanunu. (13.05.2006, Sayı: 26167).

Gazete, R. (2007). 5627 Sayılı Enerji Verimliliği Kanunu. (02.05.2007, Sayı: 26510).

Gazete, R. (2008). Binalarda Enerji Performans Yönetmeliği. (05.12.2008, Sayı: 27075).

Gazete, R. (2009). 14979 Sayılı Milletlerarası Sözleşme. (13.05.2009, Sayı: 27227).

Gazete, R. (2010). 2010/34 Sayılı KENTGES Bütünleşik Kentsel Gelişme Stratejisi ve Eylem Planı (2010-2023) Kararı. (04.11.2010, Sayı: 27749).

Gazete, R. (2011). 636 Sayılı Kanun Hükmünde Kararnameler. (08.06.2011, Sayı: 27958).

Gazete, R. (2011). 644-645 Sayılı Kanun Hükmünde Kararnameler. (04.07.2011, Sayı: 27984).

Gazete, R. (2012). 2012/1 Sayılı Enerji Verimliliği Strateji Belgesi (2012-2023) Kararı. (25.02.2012, Sayı: 28215).

Gazete, R. (2014). Sürdürülebilir Yeşil Binalar ile Sürdürülebilir Yerleşmelerin Belgelendirilmesine Dair Yönetmelik. (08.12.2014, Sayı: 29199).

Gazete, R. (2017). Binalar ile Yerleşmeler İçin Yeşil Sertifika Yönetmeliği. (23.12.2017, Sayı: 30279).

Gazete, R. (2018). Çevre Etiketi Yönetmeliği. (19.10.2018, Sayı: 30570).

Gazete, R. (2021). 4618 Sayılı Milletlerarası Antlaşma. (07.10.2021, Sayı: 31621).

Gazete, R. (2021). Binalar ile Yerleşmeler için Yeşil Sertifika Uygulama Tebliği. (09.06.2021, Sayı: 31506, Mükerrer).

Gazete, R. (2022). Binalarda Enerji Performansı Yönetmeliğinde Değişiklik Yapılmasına Dair Yönetmelik. (19.02.2022, Sayı: 31755).

Gazete, R. (2023). 2872 Sayılı Çevre Kanunu Uyarınca Alınacak Geri Kazanım Katılım Payı Tutarlarına İlişkin Tebliğ. (29.12.2023, Sayı: 32414).

Gertsakis, J., & Lewis, H. (2003). Sustainability and the waste management hierarchy. *Retrieved on January*, *30*, 2008.

Ghorbanzadeh, O., Moslem, S., Blaschke, T., & Duleba, S. (2018). Sustainable urban transport planning considering different stakeholder groups by an interval-AHP decision support model. Sustainability, 11(1), 9. https://doi.org/10.3390/su11010009

Gibson, B., Hassan, S., Tansey, J., & Whitelaw, G. (2013). *Sustainability assessment: criteria and processes*. Routledge. https://doi.org/10.4324/9781849772716

Gil-González, D., Ruiz-Cantero, M. T., & Álvarez-Dardet, C. (2009). How political epidemiology research can address why the millennium development goals have not been achieved: developing a research agenda. *Journal of Epidemiology & Community Health, 63(*4), pp. 278-280. https://doi.org/10.1136/jech.2008.082347

Goines, L., & Hagler, L. (2007). Noise pollution: a modem plague. *South Med J, 100*(3), pp. 287-94. https://doi.org/10.1097/SMJ.0b013e3180318be5

Goldsmith, E., Allen, R., Allaby, M., Davoll, J., & Lawrence, S. (1972). *A blueprint for survival.* The Ecologist.

Gouda, A. A., & Masoumi, H. E. (2017). Sustainable transportation according to certification systems: A viability analysis based on neighborhood size and context relevance. *Environmental Impact Assessment Review*, *63*, pp. 147-159. https://doi.org/10.1016/j.eiar.2016.10.005

Gražulevičiūtė, I. (2006). Cultural heritage in the context of sustainable development. *Environmental Research, Engineering & Management*, *37*(3).

Greco, A. (2020). Social sustainability: from accessibility to inclusive design. *EGE Revista de Expresión Gráfica en la Edificación*, (12), pp. 18-27. https://doi.org/10.4995/ege.2020.14072

Grimm, N. B., Grove, J. M., Pickett, S. T., & Redman, C. L. (2008). Integrated approaches to long-term studies of urban ecological systems. In Marzluff, J.M., et al., *Urban Ecology* (pp. 123-141). Boston: Springer. https://doi.org/10.1007/978-0-387-73412-5_8

Griškevičiūtė-Gečienė, A., & Griškevičienė, D. (2016). The influence of transport infrastructure development on sustainable living environment in Lithuania. *Procedia Engineering*, *134*, pp. 215-223. https://doi.org/10.1016/j.proeng.2016.01.062

Grubb, M., Koch, M., Thomson, K., Sullivan, F., & Munson, A. (2019). *The'Earth Summit'Agreements: A Guide and Assessment: An Analysis of the Rio'92 UN Conference on Environment and Development.* (1st ed.). London: Routledge. https://doi.org/10.4324/9780429273964

Güleç, S. S., & Sürmeli, İ. (2015). Hükümet programları ve kalkınma planları ekseninde çevre politikası analizi. *Yasama Dergisi,* (30), pp. 22-43.

Haapio, A. (2012). Towards sustainable urban communities. *Environmental Impact Assessment Review*, *32*(1), pp. 165-169. https://doi.org/10.1016/j.eiar.2011.08.002

Hafez, F. S., et al. (2023). Energy efficiency in sustainable buildings: a systematic review with taxonomy, challenges, motivations, methodological aspects, recommendations, and pathways for future research. *Energy Strategy Reviews*, *45*, 101013. https://doi.org/10.1016/j.esr.2022.101013

Haines, A., & Patz, J. A. (2004). Health effects of climate change. *Jama*, *291*(1), pp. 99-103. https://doi.org/10.1001/jama.291.1.99

Häkkinen, T., & Belloni, K. (2011). Barriers and drivers for sustainable building. *Building Research & Information*, *39*(3), pp. 239-255. https://doi.org/10.1080/09613218.2011.561948

Halıcıoglu, F. H. (2005). *Kalite fonksiyon yayılımı yönteminin mimarlıkta uygulanmasına yönelik model önerisi ve bir bina projesi kapsamında irdelenmesi* [Doctoral dissertation]. Dokuz Eylül Üniversitesi.

Halkos, G., & Gkampoura, E. C. (2021). Where do we stand on the 17 Sustainable Development Goals? An overview on progress. *Economic Analysis and Policy*, *70*, pp. 94-122. https://doi.org/10.1016/j.eap.2021.02.001

Hall, P., Hall, P., & Tewdwr-Jones, M. (2019). *Urban and Regional Planning*. (6th ed.). London: Routledge. https://doi.org/10.4324/9781351261883

Hamedani, A. Z., & Huber, F. (2012). A comparative study of DGNB, LEED and BREEAM certificate systems in urban sustainability. In Pacetti, M., Passerini, G., Brebbia, C. A., & Latini, G. (Eds.). *The sustainable city VII: Urban regeneration and sustainability*, *155*, pp. 121-132. Wit Press. https://doi.org/10.2495/SC120111

Handl, G. (2012). Declaration of the United Nations conference on the human environment (Stockholm Declaration), 1972 and the Rio Declaration on Environment and Development, 1992. *United Nations Audiovisual Library of International Law*, *11*(6), pp. 1-11.

Harker, P. T. (1989). The Art and Science of Decision Making: The Analytic Hierarchy Process. In: Golden, B.L., Wasil, E.A., Harker, P.T. (eds) *The Analytic Hierarchy Process*. Springer. https://doi.org/10.1007/978-3-642-50244-6_2

Harper, D. (2001). Online etymology dictionary. Retrieved May 30,2024, from https://www.etymonline.com/word/sustainability#etymonline_v_42671

Hassan, A. M., & Lee, H. (2015). The paradox of the sustainable city: definitions and examples. *Environment, development and sustainability*, *17*, pp. 1267-1285. https://doi.org/10.1007/s10668-014-9604-z

Haughton, G., & Hunter, C. (1994). *Sustainable Cities.* London: Jessica Kingsley.

Healey, P., & Williams, R. (1993). European urban planning systems: Diversity and convergence. *Urban studies*, *30*(4-5), pp. 701-720. https://doi.org/10.1080/00420989320081881

Hellström, D., Jeppsson, U., & Kärrman, E. (2000). A framework for systems analysis of sustainable urban water management. *Environmental impact assessment review*, *20*(3), pp. 311-321. https://doi.org/10.1016/S0195-9255(00)00043-3

Helm, D. (2008). Climate-change policy: why has so little been achieved?. *Oxford Review of Economic Policy*, *24*(2), pp. 211-238. https://doi.org/10.1093/oxrep/grn014

Heylighen, A. (2008). Sustainable and inclusive design: a matter of knowledge?. *Local Environment*, *13*(6), pp. 531-540. https://doi.org/10.1080/13549830802259938

Hierlmeier, J. (2001). UNEP: Retrospect and prospect-Options for reforming the global environmental governance regime. *Georgetown International Environmental Law Review, 14*, pp. 767.

Hill, H. (1993). Die Neue Verwaltung Nachhaltige Entwickeln. *Die Öffentliche Verwaltung, 2*, pp. 56. From Ayşegül Kaplan (1997), Küresel Çevre Sorunları ve Politikaları. *Mülkiyeliler Birliği Vakfı Yayınları Tezler Dizisi, 18*, Ankara.

Hobden, D. W., Laughton, G. E., & Morgan, K. E. (2004). Green space borders—a tangible benefit? Evidence from four neighbourhoods in Surrey, British Columbia, 1980–2001. *Land Use Policy*, *21*(2), pp. 129-138. https://doi.org/10.1016/j.landusepol.2003.10.002

Hodson, M., & Marvin, S. (Eds.). (2014). *After sustainable cities?*. (1st ed.) London: Routledge. https://doi.org/10.4324/9780203074602

Höjer, M., & Wangel, J. (2015). Smart sustainable cities: definition and challenges. In Hilty, L., Aebischer, B. (eds) *ICT innovations for sustainability* (310, pp. 333-349). Springer International Publishing. https://doi.org/10.1007/978-3-319-09228-7_20

Holden, E., Linnerud, K., & Banister, D. (2014). Sustainable development: Our common future revisited. *Global environmental change*, *26*, pp. 130-139. https://doi.org/10.1016/j.gloenvcha.2014.04.006

Holden, M. (2011). Public participation and local sustainability: Questioning a common agenda in urban governance. *International Journal of Urban and Regional Research*, *35*(2), pp. 312-329. https://doi.org/10.1111/j.1468-2427.2010.00957.x

Hölker, F., Wolter, C., Perkin, E. K., & Tockner, K. (2010). Light pollution as a biodiversity threat. *Trends in ecology & evolution*, *25*(12), pp. 681-682. https://doi.org/10.1016/j.tree.2010.09.007

Hsu, A., Lloyd, A., & Emerson, J. W. (2013). What progress have we made since Rio? Results from the 2012 environmental performance index (epi) and pilot trend epi. *Environmental Science & Policy*, *33*, pp. 171-185. https://doi.org/10.1016/j.envsci.2013.05.011

Huberman, L. (1936). *Man's worldly goods*. New York: Monthly Review Press.

Hurley, J., & Horne, R. (2006). Review and analysis of tools for the implementation and assessment of sustainable urban development. *Future, 7*(6).

Ishwaran, N. (2012). Science in intergovernmental environmental relations: 40 years of UNESCO's Man and the Biosphere (MAB) Programme and its future. *Environmental Development, 1*(1), 91-101. https://doi.org/10.1016/j.envdev.2011.11.001

Islam, N., & Winkel, J. (2017). Climate change and social inequality. *UN Department of Economic and Social Affairs (DESA) Working Papers, 152.* https://doi.org/10.18356/2c62335d-en

IUCN. (1988). Bulletin: 40 Years in conservation. *IUCN, 19*(7-12).

Jabareen, Y. R. (2006). Sustainable urban forms: Their typologies, models, and concepts. *Journal of planning education and research, 26*(1), pp. 38-52. https://doi.org/10.1177/0739456X05285119

Janoušková, S., Hák, T., & Moldan, B. (2018). Global SDGs assessments: Helping or confusing indicators?. *Sustainability, 10*(5), pp. 1540. https://doi.org/10.3390/su10051540

Jiang, T., et al. (2024). COP 28: Challenge of coping with climate crisis. *The Innovation, 5*(1). https://doi.org/10.1016/j.xinn.2023.100559

John, G., Clements-Croome, D., & Jeronimidis, G. (2005). Sustainable building solutions: a review of lessons from the natural world. Building and environment, 40(3), pp. 319-328. https://doi.org/10.1016/j.buildenv.2004.05.011

Kaplan, A. (1999). *Küresel çevre sorunları ve politikaları.* Ankara: Mülkiyeliler Birliği Vakfı Yayınları Tezler Dizisi.

Karol, E., & Brunner, J. (2009). Tools for measuring progress towards sustainable neighborhood environments. *Sustainability, 1*(3), pp. 612-627. https://doi.org/10.3390/su1030612

Kasemir, B. (Ed.). (2003). *Public participation in sustainability science: a handbook*. Cambridge University Press. https://doi.org/10.1017/CBO9780511490972

Kayahan, B. (2019). *Sürdürülebilir gelişme bağlamında kentsel proje imar planı ilişkisi, Şile (İstanbul) örneği* [Master's degree thesis]. Mimar Sinan Güzel Sanatlar Üniversitesi.

Keeble, B. R. (1988). The Brundtland report:'Our common future'. *Medicine and war, 4*(1), pp. 17-25. https://doi.org/10.1080/07488008808408783

Keitumetse, S. O. (2013). Cultural resources as sustainability enablers: Towards a community-based cultural heritage resources management (COBACHREM) model. *Sustainability*, *6*(1), pp. 70-85. https://doi.org/10.3390/su6010070

Keleş, R. (2023). Dünyada ve Türkiye'de çevre politikaları ve sürdürülebilir kalkınma. *Çevre Şehir ve İklim Dergisi, 2*(3), pp. 24-30.

Keleş, Ruşen, (1998). Kentbilim Terimleri Sözlüğü. Ankara: İmge Yayınevi. (p. 112).

Khatib, J. (Ed.). (2016). *Sustainability of construction materials*. Woodhead Publishing.

Khatibzada, N. H. (2020). *Mahalle ölçeğinde sürdürülebilirlik değerlendirme sistemlerinin analizi* [Master's degree thesis]. Mimar Sinan Fine Arts University.

Kirschner, F., & Lanzendorf, M. (2020). Parking management for promoting sustainable transport in urban neighbourhoods. A review of existing policies and challenges from a German perspective. *Transport Reviews*, *40*(1), pp. 54-75. https://doi.org/10.1080/01441647.2019.1666929

Kleerekoper, L., Van Esch, M., & Salcedo, T. B. (2012). How to make a city climate-proof, addressing the urban heat island effect. *Resources, Conservation and Recycling*, *64*, pp. 30-38. https://doi.org/10.1016/j.resconrec.2011.06.004

Klopp, J. M., & Petretta, D. L. (2017). The urban sustainable development goal: Indicators, complexity and the politics of measuring cities. *Cities, 63*, pp. 92–97. https://doi.org/10.1016/j.cities.2016.12.019

Knoflacher, H. (2006). A new way to organize parking: the key to a successful sustainable transport system for the future. *Environment and urbanization*, *18*(2), pp. 387-400. https://doi.org/10.1177/0956247806069621

Koch, F., & Krellenberg, K. (2018). How to contextualize SDG 11? Looking at indicators for sustainable urban development in Germany. *ISPRS International Journal of Geo-Information*, *7*(12), pp. 464. https://doi.org/10.3390/ijgi7120464

Koch, T. (2004). The Map as Intent: Variations on the Theme of John Snow. *Cartographica: The International Journal for Geographic Information and Geovisualization*, *39*(4), pp. 1–14. https://doi.org/10.3138/b123-8124-4390-5792

Koohsari, M. J., et al. (2015). Public open space, physical activity, urban design and public health: Concepts, methods and research agenda. *Health & place*, *33*, pp. 75-82. https://doi.org/10.1016/j.healthplace.2015.02.009

Kosai, H., & Isobe, S. (1991). Organized observations of night-sky brightness in Japan. In *International Astronomical Union Colloquium*, 112, pp. 35-44. Cambridge University Press. https://doi.org/10.1017/S0252921100003651

Kriesi, H., Koopmans, R., Duyvendak, J. W., & Giugni, M. G. (1992). *New social movements in Western Europe: A comparative analysis*. (Vol. 5). Kriesi, H. (Eds.). University of Minnesota Press.

Lafortezza, R., Davies, C., Sanesi, G., & Konijnendijk, C. C. (2013). Green Infrastructure as a tool to support spatial planning in European urban regions. *iForest-Biogeosciences and Forestry*, *6*(3), pp. 102. https://doi.org/10.3832/ifor0723-006

Larsen, T. A., & Gujer, W. (1997). The concept of sustainable urban water management. *Water Science and Technology*, *35*(9), pp. 3-10. https://doi.org/10.1016/S0273-1223(97)00179-0

Lélé, S. (1988). The concept of sustainability. In A.T. Charles, & G.N. White (Eds.), *Natural Resources Modelling and Analysis: Proceedings of an Inter-disciplinary Conference held at St. Mary's University and the Bedford Institute of Oceanography* between 29 Sept.–2 Oct. 1988, Halifax, Nova Scotia, Canada: Centre for Resource Systems Analysis, pp. 46–48.

Lélé, S. (1988). The concept of sustainability. In *Natural Resources Modelling and Analysis: Proceedings of an Interdisciplinary Conference held at St. Mary's University and the Bedford Institute of Oceanography between 29,* pp. 46-48.

Lélé, S. M. (1991). Sustainable development: a critical review. *World development*, *19*(6), pp. 607-621. https://doi.org/10.1016/0305-750X(91)90197-P

Leung, D. Y., Caramanna, G., & Maroto-Valer, M. M. (2014). An overview of current status of carbon dioxide capture and storage technologies. *Renewable and sustainable energy reviews*, *39*, pp. 426-443. https://doi.org/10.1016/j.rser.2014.07.093

Levy, B. S., & Patz, J. A. (2015). Climate change, human rights, and social justice. *Annals of global health*, *81*(3), pp. 310-322. https://doi.org/10.1016/j.aogh.2015.08.008

Li, X., Fong, P. S., Dai, S., & Li, Y. (2019). Towards sustainable smart cities: An empirical comparative assessment and development pattern optimization in China. *Journal of Cleaner Production*, *215*, pp. 730-743. https://doi.org/10.1016/j.jclepro.2019.01.046

Lin, K. W., & Shih, C. M. (2018). The comparative analysis of neighborhood sustainability assessment tool. *Environment and Planning B: Urban Analytics and City Science*, *45*(1), pp. 90-105. https://doi.org/10.1177/0265813516667299

Longcore, T., & Rich, C. (2004). Ecological light pollution. *Frontiers in Ecology and the Environment*, *2*(4), pp. 191-198. https://doi.org/10.1890/1540-9295(2004)002[0191:ELP]2.0.CO;2

Loukaitou-Sideris, A. (2006). Is it safe to walk? 1 neighborhood safety and security considerations and their effects on walking. *Journal of Planning Literature*, *20*(3), pp. 219-232. https://doi.org/10.1177/0885412205282770

Luederitz, C., Lang, D. J., & Von Wehrden, H. (2013). A systematic review of guiding principles for sustainable urban neighborhood development. *Landscape and Urban Planning*, *118*, pp. 40-52. https://doi.org/10.1016/j.landurbplan.2013.06.002

Macke, J., Sarate, J. A. R., & de Atayde Moschen, S. (2019). Smart sustainable cities evaluation and sense of community. *Journal of Cleaner production*, *239*, 118103. https://doi.org/10.1016/j.jclepro.2019.118103

Maclaren, V. W. (1996). Urban sustainability reporting. *Journal of the American planning association*, *62*(2), pp. 184-202. https://doi.org/10.1080/01944369608975684

Maxwell, S. (2003). Heaven or hubris: reflections on the new 'new poverty agenda'. *Development Policy Review*, *21*(1), pp. 5-25. https://doi.org/10.1111/1467-7679.00196

Maxwell, S. L., Fuller, R. A., Brooks, T. M., & Watson, J. E. (2016). Biodiversity: The ravages of guns, nets and bulldozers. *Nature*, *536*(7615), pp. 143-145. https://doi.org/10.1038/536143a

McCormick, J. (1991). *Reclaiming paradise: the global environmental movement*. Bloomington: Indiana University Press.

McDonnell, M. J., & Pickett, S. T. (1990). Ecosystem structure and function along urban-rural gradients: an unexploited opportunity for ecology. *Ecology*, *71*(4), pp. 1232-1237. https://doi.org/10.2307/1938259

McKibbin, W. J., & Wilcoxen, P. J. (2002). The role of economics in climate change policy. *Journal of economic perspectives*, *16*(2), pp. 107-129. https://doi.org/10.1257/0895330027283

Meadows, D. H., Meadows, D. L., Randers, J., & Behrens, W. W. (2018). The limits to growth. In *Green planet blues* (5th ed., pp. 25-29). London: Routledge. https://doi.org/10.4324/9780429493744-3

Meadows, D., & Randers, J. (2012). *The limits to growth: the 30-year update*. (1st ed.). London: Routledge. https://doi.org/10.4324/9781849775861

Mebratu, D. (1998). Sustainability and sustainable development. *Environmental Impact Assessment Review, 18*(6), pp. 493–520. https://doi.org/10.1016/s0195-9255(98)00019-5

Mensah, J. (2019). Sustainable development: Meaning, history, principles, pillars, and implications for human action: Literature review. *Cogent Social Sciences, 5*(1). https://doi.org/10.1080/23311886.2019.1653531

Mohajan, Haradhan (2019): The First Industrial Revolution: Creation of a New Global Human Era. *Journal of Social Sciences and Humanities, 5*(4), pp. 377-387.

Moisiadis, F. (1999). Improving the scales used in AHP for QFD. In *11th Symposium on Quality Function Deployment*, pp. 204-211.

Morillas, J. M. B., Gozalo, G. R., González, D. M., Moraga, P. A., & Vílchez-Gómez, R. (2018). Noise pollution and urban planning. *Current Pollution Reports, 4*(3), pp. 208-219. https://doi.org/10.1007/s40726-018-0095-7

Munasinghe, M. (1992). Environmental Economics and Sustainable Development. Paperpresented at the UN Earth Summit, Rio de Janeiro, Environment Paper No.3, World Bank, Wash.DC, USA.

Munasinghe, M. (2009). Sustainable Development in Practice: Sustainomics Methodology and Applications. Cambridge: Cambridge University Press. https://doi.org/10.1017/CBO9780511626777

Najam, A., & Cleveland, C. J. (2005). Energy and sustainable development at global environmental summits: an evolving agenda. In *The World Summit on Sustainable Development: The Johannesburg Conference* (pp. 113-134). Dordrecht: Springer. https://doi.org/10.1007/1-4020-3653-1_5

Najam, A., Poling, J. M., Yamagishi, N., Straub, D. G., Sarno, J., De Ritter, S. M., & Kim, E. M. (2002). From Rio to Johannesburg progress and prospects. *Environment: Science and policy for sustainable development, 44*(7), pp. 26–38. https://doi.org/10.1080/00139150209605804

Narisada, K., & Schreuder, D. (2013). *Light pollution handbook* (Vol. 322). Springer Science & Business Media.

Naumann, S., Davis, M., Kaphengst, T., Pieterse, M., & Rayment, M. (2011). Design, implementation and cost elements of Green Infrastructure projects. *Final report, European Commission, Brussels*, *138*.

Newman, P., & Jennings, I. (2012). *Cities as sustainable ecosystems: principles and practices*. Island press.

Nocca, F. (2017). The role of cultural heritage in sustainable development: Multidimensional indicators as decision-making tool. *Sustainability*, *9*(10), 1882. https://doi.org/10.3390/su9101882

Nordhaus, W. D. (2006). After Kyoto: Alternative mechanisms to control global warming. *American Economic Review*, *96*(2), pp. 31-34. https://doi.org/10.1257/000282806777211964

Obrecht A., et al. (2021). Achieving the SDGs with Biodiversity. *Swiss Academies Factsheet 16*(1). https://doi.org/10.5281/zenodo.4457298

Odum, H. T. (2007). *Environment, power, and society for the twenty-first century: the hierarchy of energy*. New York: Columbia University Press.

Ogryzek, M., Adamska-Kmieć, D., & Klimach, A. (2020). Sustainable transport: an efficient transportation network—case study. *Sustainability*, *12*(19), 8274. https://doi.org/10.3390/su12198274

Oke, T. R. (1987). *Boundary layer climates*. Routledge.

Olivetti, E. A., & Cullen, J. M. (2018). Toward a sustainable materials system. *Science*, *360*(6396), pp. 1396-1398. https://doi.org/10.1126/science.aat6821

Onions, C. T. (1964). The Shorter Oxford English Dictionary. Oxford: Clarendon Press. (3rd ed., p. 2095).

O'Riordan, T., & Stoll-Kleemann, S. (Eds.). (2002). *Biodiversity, sustainability and human communities: protecting beyond the protected*. Cambridge University Press. https://doi.org/10.1017/CBO9780511492655

Otto, S., & Pensini, P. (2017). Nature-based environmental education of children: Environmental knowledge and connectedness to nature, together, are related to ecological behaviour. *Global environmental change*, *47*, pp. 88-94. https://doi.org/10.1016/j.gloenvcha.2017.09.009

Owusu, P. A., & Asumadu-Sarkodie, S. (2016). A review of renewable energy sources, sustainability issues and climate change mitigation. *Cogent Engineering*, *3*(1), 1167990. https://doi.org/10.1080/23311916.2016.1167990

Özcan, K. (2006). Tanzimat'ın kent reformları: Türk imar sisteminin kuruluş sürecinde erken plânlama deneyimleri (1839-1908). *Osmanlı Bilimi Araştırmaları, 7*(2), pp. 149-180.

Özçevik, Ö., et al. (2018). Sürdürülebilirlik, kentsel form, kentsel dönüşüm ve yeşil sertifika sistemleri ilişkisi üzerine bir değerlendirme: Ulusal yeşil sertifika YeS_TR deneyimi. *Türkiye Kentsel Morfoloji Ağı*, pp. 797-809.

Özdemir, Ş. (1988). *Türkiye'de toplumsal değişme ve çevre sorunlarına duyarlılık.* Palme Yayınları.

Özmehmet, E. (2005). *Sürdürülebilir mimarlık bağlamında akdeniz iklim tipi için bir bina modeli önerisi* [Master's degree thesis]. Dokuz Eylül Üniversitesi.

Pakzad, P., & Osmond, P. (2016). Developing a sustainability indicator set for measuring green infrastructure performance. *Procedia-social and behavioral sciences, 216*, pp. 68-79. https://doi.org/10.1016/j.sbspro.2015.12.009

Palka, G., Oliveira, E., Pagliarin, S., & Hersperger, A. M. (2021). Strategic spatial planning and efficacy: an analytic hierarchy process (AHP) approach in Lyon and Copenhagen. European Planning Studies, 29(6), 1174-1192. https://doi.org/10.1080/09654313.2020.1828291

Pallemaerts, M. (2014). International environmental law from Stockholm to Rio: back to the future?. In *Greening International Law* (pp. 1-19). London: Routledge. https://doi.org/10.4324/9781315070353

Parkes, E. (2013). Mode of Communication of Cholera. By John Snow, MD. (2nd ed.). London, 1855, pp. 162. *International Journal of Epidemiology, 42*(6), pp. 1543–1552. https://doi.org/10.1093/ije/dyt193

Parnell, S. (2016). Defining a global urban development agenda. *World development, 78*, pp. 529-540. https://doi.org/10.1016/j.worlddev.2015.10.028

Parry, M., et al. (2007). *Climate Change 2007: Impacts, Adaptation and Vulnerability.* New York: Cambridge University Press.

Patel, R. (2013). The Long Green Revolution. *Journal of Peasant Studies, 40*(1), pp. 1–63. https://doi.org/10.1080/03066150.2012.719224

Pereira Roders, A., & Van Oers, R. (2011). Bridging cultural heritage and sustainable development. *Journal of Cultural Heritage Management and Sustainable Development, 1*(1), pp. 5-14. https://doi.org/10.1108/20441261111129898

Peterson, J. A. (2003). *The birth of city planning in the United States, 1840–1917.* Baltimore: Johns Hopkins University Press.

Pezzoli, K. (1997). Sustainable Development: A Transdisciplinary Overview of the Literature. *Journal of Environmental Planning and Management, 40*(5), pp. 549–574. https://doi.org/10.1080/09640569711949

Pingali, P. L. (2012). Green revolution: impacts, limits, and the path ahead. *Proceedings of the national academy of sciences, 109*(31), pp. 12302-12308. https://doi.org/10.1073/pnas.0912953109

Potschin, M., & Haines-Young, R. (2006). "Rio+ 10", sustainability science *and Landscape Ecology. Landscape and urban planning, 75*(3-4), pp. 162-174. https://doi.org/10.1016/j.landurbplan.2005.03.005

Pretty, J., Peacock, J., Sellens, M., & Griffin, M. (2005). The mental and physical health outcomes of green exercise. *International journal of environmental health research, 15*(5), pp. 319-337. https://doi.org/10.1080/09603120500155963

Purvis, B., Mao, Y., & Robinson, D. (2019). Three pillars of sustainability: in search of conceptual origins. *Sustainability science, 14*, pp. 681–695. https://doi.org/10.1007/s11625-018-0627-5

Qasim, S. R. (2017). *Wastewater treatment plants: planning, design, and operation*. Routledge. https://doi.org/10.1201/9780203734209

Rametsteiner, E., Pülzl, H., Alkan-Olsson, J., & Frederiksen, P. (2011). Sustainability indicator development—Science or political negotiation?. *Ecological indicators, 11*(1), pp. 61-70. https://doi.org/10.1016/j.ecolind.2009.06.009

Redclift, M. (2005). Sustainable development (1987-2005): an oxymoron comes of age. *Sustainable Development, 13*(4), pp. 212–227. https://doi.org/10.1002/sd.281

Reddy, S., & Heuty, A. (2008). Global development goals: The folly of technocratic pretensions. *Development Policy Review, 26*(1), pp. 5-28. https://doi.org/10.1111/j.1467-7679.2008.00396.x

Reith, A., & Orova, M. (2015). Do green neighbourhood ratings cover sustainability?. *Ecological Indicators, 48*, pp. 660-672. https://doi.org/10.1016/j.ecolind.2014.09.005

Revi, A. (2016). Afterwards: Habitat III and the Sustainable Development Goals. *Urbanisation, 1*(2), pp. x-xiv. https://doi.org/10.1177/2455747116682899

Rhodes, C. J. (2016). The 2015 Paris climate change conference: COP21. *Science progress*, *99*(1), pp. 97-104. https://doi.org/10.3184/003685016X14528569315192

Rizwan, A. M., Dennis, L. Y., & Chunho, L. I. U. (2008). A review on the generation, determination and mitigation of Urban Heat Island. *Journal of environmental sciences*, *20*(1), pp. 120-128. https://doi.org/10.1016/S1001-0742(08)60019-4

Robinson, J. G. (1993). The limits to caring: sustainable living and the loss of biodiversity.. *Conservation biology*, *7*(1), pp. 20–28. https://doi.org/10.1046/j.1523-1739.1993.07010020.x

Roe, D. (2008). The origins and evolution of the conservation-poverty debate: a review of key literature, events and policy processes. *Oryx*, *42*(4), pp. 491–503. https://doi.org/10.1017/s0030605308002032

Rogers, R. (2008). *Cities for a small planet*. Basic Books.

Rohe, W. M., & Gates, L. B. (1985). *Planning with neighborhoods*. UNC Press Books.

Rome, A. (2003). "Give earth a chance": The environmental movement and the sixties. *The Journal of American History*, *90(*2), pp. 525-554. https://doi.org/10.2307/3659443

Rosen, A. M. (2015). The wrong solution at the right time: The failure of the kyoto protocol on climate change. *Politics & Policy*, *43*(1), pp. 30-58. https://doi.org/10.1111/polp.12105

Rosen, M. A. (1996). Energy efficiency and sustainable development. *IEEE Technology and society magazine*, *15*(4), pp. 21-26. https://doi.org/10.1109/44.546454

Ross, C. (2015). Tropical nature as global patrimoine: Imperialism and international nature protection in the early twentieth century. *Past & Present*, *226*, pp. 214-239. https://doi.org/10.1093/pastj/gtu019

Saaty, R. W. (1987). The analytic hierarchy process—what it is and how it is used. *Mathematical modelling*, *9*(3-5), pp. 161-176. https://doi.org/10.1016/0270-0255(87)90473-8

Saaty, T. L. (2001). Fundamentals of the Analytic Hierarchy Process. In: Schmoldt, D.L., Kangas, J., Mendoza, G.A., Pesonen, M. (eds) *The Analytic Hierarchy Process in Natural Resource and Environmental Decision Making*. Managing Forest Ecosystems, 3. Springer. https://doi.org/10.1007/978-94-015-9799-9_2

Saaty, T. L. (2008). Decision making with the analytic hierarchy process. *International journal of services sciences*, *1*(1), pp. 83-98. https://doi.org/10.1504/IJSSCI.2008.017590

Saaty, T. L. (2010). *Mathematical principles of decision making (Principia mathematica decernendi)*. RWS publications.

Saaty, T. L. (2012). *Decision making for leaders: the analytic hierarchy process for decisions in a complex world* (3rd ed.). RWS publications.

Sachs, J. D. (2012). From millennium development goals to sustainable development goals. *The Lancet*, *379*(9832), pp. 2206–2211. https://doi.org/10.1016/S0140-6736(12)60685-0

Sanderson, S. E., & Redford, K. H. (2003). Contested relationships between biodiversity conservation and poverty alleviation. *Oryx, 37*(4), pp. 389–390. https://doi.org/10.1017/s003060530300070x

Sands, P., & Peel, J. (2012). *Principles of international environmental law.* Cambridge University Press. https://doi.org/10.1017/CBO9781139019842

Santamouris, M. (2001). *Energy and climate in the urban built environment.* Routledge. https://doi.org/10.4324/9781315073774

Şantiye Dergisi. (2021). Yeşil bina ve yerleşkeler için yerli sertifika sistemi YeS-TR'de sona doğru. *Şantiye Dergisi,* (390), pp. 68-69.

Sarasin, P. (2022). *"Weltnaturschutz"; global protection of nature.* In Verhandlungen der Schweizerischen Naturforschenden. Vol 1. (pp. 50-74). (P. Kupper, Trans.). Basel: E. Birkhäuser. (Original work published 1911) https://www.environmentandsociety.org/sites/default/files/key_docs/paul_sarasin_weltnaturschutz_english_0.pdf

Savaresi, A. (2016). The Paris Agreement: a new beginning? *Journal of Energy & Natural Resources Law*, *34*(1), pp. 16–26. https://doi.org/10.1080/02646811.2016.1133983

Schaefer, A., & Crane, A. (2005). Addressing sustainability and consumption. *Journal of Macromarketing, 25*(1), pp. 76–92. https://doi.org/10.1177/0276146705274987

Schleussner, CF., et al. (2016). Science and policy characteristics of the Paris Agreement temperature goal. *Nature Climate Change 6,* pp. 827–835. https://doi.org/10.1038/nclimate3096

Schoner, B., & Wedley, W. C. (1989). Ambiguous criteria weights in AHP: consequences and solutions. *Decision Sciences, 20*(3), pp. 462-475. https://doi.org/10.1111/j.1540-5915.1989.tb01561.x

Seadon, J. K. (2010). Sustainable waste management systems. *Journal of cleaner production, 18*(16-17), pp. 1639-1651. https://doi.org/10.1016/j.jclepro.2010.07.009

Şen, E. (1995). Çevrenin korunmasında Türkiye'deki örgütlenme ve bu örgütlerin görevleri ile yetkileri. *İstanbul Üniversitesi Siyasal Bilgiler Fakültesi Dergisi,* (10).

Şengün, H. (2015). Türkiye'de çevre yönetimi ve çevre ve Şehircilik Bakanlığının uygulamaları. *Strategic Public Management Journal, 1*(1), pp. 109-130. https://doi.org/10.25069/spmj.289946

Serageldin, I. (1993). Making development sustainable. *Finance and development, 30*(4), pp. 6-10.

Sharifi, A., & Murayama, A. (2013). A critical review of seven selected neighborhood sustainability assessment tools. *Environmental impact assessment review, 38*, pp. 73-87. https://doi.org/10.1016/j.eiar.2012.06.006

Shirley, P., & Moughtin, J. C. (2006). *Urban Design: Green Dimensions.* London: Routledge. https://doi.org/10.4324/9780080455297

Simon, D. (2016). Sustainable cities in sustainable societies. In Simon, D. (eds) *Rethinking sustainable cities: Accessible, green and fair* (pp. 1-10). Policy press. . https://doi.org/10.26530/OAPEN_613676

Simon, D., et al. (2016). Developing and testing the Urban Sustainable Development Goal's targets and indicators – a five-city study. *Environment and Urbanization, 28*(1), pp. 49-63. https://doi.org/10.1177/0956247815619865

Singh, R. (2016). Factors affecting walkability of neighborhoods. *Procedia-Social and Behavioral Sciences,* 216, pp. 643-654. https://doi.org/10.1016/j.sbspro.2015.12.048

Snow, J. (1849). *On the mode of communication of cholera.* London: John Churchill.

Solaymani, S. (2019). CO2 emissions patterns in 7 top carbon emitter economies: The case of transport sector. *Energy, 168*, pp. 989-1001. https://doi.org/10.1016/j.energy.2018.11.145

Stanislav, A., & Chin, J. T. (2019). Evaluating livability and perceived values of sustainable neighborhood design: New Urbanism and original urban

suburbs. *Sustainable cities and society*, *47*, 101517. https://doi.org/10.1016/j.scs.2019.101517

Stead, D. (2013). Unsustainable settlements. In *Sustainable communities*. (pp. 29-45). Routledge.

Steffen, W., Grinevald, J., Crutzen, P., & McNeill, J. (2011). The Anthropocene: conceptual and historical perspectives. *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences*, *369*(1938), pp. 842-867. https://doi.org/10.1098/rsta.2010.0327

Strabo. (1949). *The geography.* (2nd ed.). (Book V). English translation by Horace Leonard Jones. London: Heinemann.

Strong, M. F. (1977). The International Community and the Environment. *Environmental Conservation, 4*(3), pp. 165–172. https://doi.org/10.1017/s0376892900025704

Talbot, L. M. (1980). The World's Conservation Strategy. *Environmental conservation, 7*(4), pp. 259–268. https://doi.org/10.1017/s0376892900007955

Talen, E., & Koschinsky, J. (2011). Is subsidized housing in sustainable neighborhoods? Evidence from Chicago. *Housing Policy Debate*, *21*(1), pp. 1-28. https://doi.org/10.1080/10511482.2010.533618

Talen, E., & Koschinsky, J. (2013). The walkable neighborhood: A literature review. *International journal of sustainable land use and urban planning*, *1*(1). https://doi.org/10.24102/ijslup.v1i1.211

Teed, J., Condon, P., Muir, S., & Midgley, C. (2005). Sustainable Urban Landscapes Neighborhood Pattern Typology. *The University of British Columbia*.

Tekeli, İ. (1996). *Habitat II konferansı yazıları.* TC Başbakanlık Toplu Konut İdaresi Başkanlığı.

Tekeli, İ. (2001). Sürdürülebilirlik Kavramı Üzerinde İrdelemeler. *Cevat Geray'a Armağan, Mülkiyeliler Birliği Yayınları, 25,* pp. 729-746.

Tekeli, İ., & Keleş, R. (2015). Katılımcılık ve Gerçekçilik Sorgulamaları Arasında Habitat III Türkiye Raporu. *Mimarlık Dergisi,* (383).

Thompson, C. W. (2002). Urban open space in the 21st century. *Landscape and urban planning*, *60*(2), pp. 59-72. https://doi.org/10.1016/S0169-2046(02)00059-2

Thompson, C. W. (2011). Linking landscape and health: The recurring theme. *Landscape and urban planning*, *99*(3-4), pp. 187-195. https://doi.org/10.1016/j.landurbplan.2010.10.006

Tosun, J., & Leininger, J. (2017). Governing the interlinkages between the sustainable development goals: Approaches to attain policy integration. *Global challenges, 1*(9), 1700036. https://doi.org/10.1002/gch2.201700036

Tranel, M., & Handlin Jr, L. B. (2006). Metromorphosis: documenting change. *Journal of Urban Affairs, 28*(2), pp. 151-167. https://doi.org/10.1111/j.0735-2166.2006.00265.x

Türkiye Cumhuriyeti Anayasası (1961). Kanun Numarası: 334, Kabul Tarihi: 09.07.1961.

Türkiye Cumhuriyeti Anayasası (1982). Kanun Numarası: 2709, Kabul Tarihi: 7.11.1982.

Van Norren, D. E. (2012). The Wheel of Development: the Millennium Development Goals as a communication and development tool. *Third World Quarterly, 33*(5), pp. 825–836. https://doi.org/10.1080/01436597.2012.684499

Van Zon H. (2002). Geschiedenis & duurzame ontwikkeling. Duurzame ontwikkeling in historisch perspectief: enkele verkenningen. Nijmegen/Groningen: Werkgroep Disciplinaire Verdieping Duurzame Ontwikkeling.

Vargas, L. G. (1990). An overview of the analytic hierarchy process and its applications. *European journal of operational research, 48*(1), pp. 2-8. https://doi.org/10.1016/0377-2217(90)90056-H

Vashisth, A., Kumar, R., & Sharma, S. (2018). Major principles of sustainable transport system: a literature review. *International Journal for Research in Applied Science & Engineering Technology, 6*(2), pp. 218.

Viederman, S. (1994). The economics of sustainability: Challenges. Paper presented at the workshop, The Economics of Sustainability, Fundacao Joaquim Nabuco, Recife, Brazil.

Vitousek, P. M., D'antonio, C. M., Loope, L. L., Rejmanek, M., & Westbrooks, R. (1997). Introduced species: a significant component of human-caused global change. *New Zealand Journal of Ecology, 21(1*), pp. 1-16.

Voicu, I., & Been, V. (2008). The effect of community gardens on neighboring property values. *Real Estate Economics, 36*(2), pp. 241-283. https://doi.org/10.1111/j.1540-6229.2008.00213.x

Von Frantzius, I. (2004). World summit on sustainable development johannesburg 2002: A critical analysis and assessment of the outcomes. *Environmental politics, 13*(2), pp. 467–473. https://doi.org/10.1080/09644010410001689214

Von Weizsaecker, E. U. (1992). Umweltpolitik nach Rio. Entwicklung und Zusammenarbeit. *Deutschen Stiftung für Internationale Entwicklung, 8,* pp. 22. From Ayşegül Kaplan (1997), Küresel Çevre Sorunları ve Politikaları. *Mülkiyeliler Birliği Vakfı Yayınları Tezler Dizisi, 18*, Ankara.

Waage, J. et al., (2010). The Millennium Development Goals: a cross-sectoral analysis and principles for goal setting after 2015. *The lancet, 376*(9745), pp. 991-1023. https://doi.org/10.1016/S0140-6736(10)61196-8

Wakefield, P. (1982). Is Unep Still a Good Investment? *Environment: Science and Policy for Sustainable Development, 24*(4), pp. 7–38. https://doi.org/10.1080/00139157.1982.9933155

Watson, D., & Adams, M. (2010). *Design for flooding: Architecture, landscape, and urban design for resilience to climate change*. John wiley & sons. https://doi.org/10.1002/9781118259870

Wind, Y., & Saaty, T. L. (1980). Marketing applications of the analytic hierarchy process. *Management science, 26*(7), pp. 641-658. https://doi.org/10.1287/mnsc.26.7.641

Wirth, D. A. (1995). The Rio declaration on environment and development: two steps forward and one back, or vice versa. *Georgia Law Review, 29*(3), pp. 599-653.

Worster, D. (1993). *The wealth of nature: environmental history and the ecological imagination*. USA: Oxford University Press. https://doi.org/10.1093/oso/9780195092646.001.0001

Wu, J. (2013). Landscape sustainability science: ecosystem services and human well-being in changing landscapes. *Landscape Ecology, 28*(6), pp. 999–1023. https://doi.org/10.1007/s10980-013-9894-9

Yıldız, S., Yılmaz, M., Kıvrak, S., & Gültekin, A. B. (2016). Neighborhood Sustainability Assessment Tools and a Comparative Analysis of Five Different Assessment Tools. *Planlama, 26*(2), pp. 93-100. https://doi.org/10.14744/planlama.2016.05914

Yücel, M., & Babuş, D. (2005). Doğa korumanın tarihçesi ve Türkiye'deki gelişmeler. *Doa Dergisi, 11*, pp. 151-175.

Zahabi, S. A. H., Chang, A., Miranda-Moreno, L. F., & Patterson, Z. (2016). Exploring the link between the neighborhood typologies, bicycle infrastructure and commuting cycling over time and the potential impact on commuter GHG emissions. *Transportation research part D: transport and environment, 47*, pp. 89-103. https://doi.org/10.1016/j.trd.2016.05.008

Zahedi, F. (1986). The analytic hierarchy process—a survey of the method and its applications. *Interfaces*, *16*(4), pp. 96-108. https://doi.org/10.1287/inte.16.4.96

INTERNET RESOURCES

Building and Construction Authority, BCA. (2024, June 6). Green Building Masterplans. https://www1.bca.gov.sg/buildsg/sustainability/green-building-masterplans

Building and Construction Authority, BCA. (2024, June 6). BCA Green Mark For Districts (Version 2.1). https://www1.bca.gov.sg/docs/default-source/docs-corp-buildsg/sustainability/gm_district_v2_1.pdf

Building Research Establishment, BREEAM. (2024, June 6). BREEAM Communities Technical Manual, SD202 – Issue: 1.2. https://files.bregroup.com/breeam/technicalmanuals/communitiesmanual/

Comprehensive Assessment System for Built Environmental Efficiency, CASBEE. (2024, June 6). CASBEE. https://www.ibecs.or.jp/CASBEE/english/document/CASBEE_brochure_2024.pdf

Comprehensive Assessment System for Built Environmental Efficiency, CASBEE. (2024, June 6). CASBEE for Urban Development, Technical Manual (2014). https://www.ibecs.or.jp/CASBEE/english/download/CASBEE-UDe_2014manual.pdf

Çevre Dostu Yeşil Binalar Derneği, ÇEDBİK. (2019). B.E.S.T - Konut Sertifika Kılavuzu (Versiyon 2.0). https://l24.im/qQw3cG

Çevre Dostu Yeşil Binalar Derneği, ÇEDBİK. (2020). B.E.S.T - Ticari Binalar Sertifika Kılavuzu (Versiyon 1.0). https://l24.im/mB5JS

Çevre ve Şehircilik Bakanlığı, ÇŞB. (2024, May 30). Çevre, Şehircilik ve İklim Değişikliği Bakanlığı'nın tarihçesi. (2022). https://csb.gov.tr/tarihcemiz-i-7012

Çevre ve Şehircilik Bakanlığı, ÇŞB. (2024, May 30). İklim Değişikliği Ulusal Eylem Planı 2011-2023. https://webdosya.csb.gov.tr/db/iklim/editordosya/uyum_stratejisi_eylem_plani_TR.pdf

Çevre ve Şehircilik Bakanlığı, ÇŞB. (2024, May 30). Yeşil sertifika bina değerlendirme ve yeşil sertifika yerleşme kılavuzu, YeS-Tr.

https://sem.isparta.edu.tr/assets/uploads/sites/473/files/yes_tr-degerlendirme-kilavuzu-20072022.pdf

Deutsche Gesellschaft für Nachhaltiges Bauen, DGNB. (2024, June 6). DGNB System Districts Criteria Set https://www.dgnb.de/en/certification/districts

Gilman, R. (2024, May 30). *Sustainability. From the 1992 UIA/AIA Call for sustainable community solutions.* Context Institute. http://www.context.org

Harrison, H. (2024, May 30). *A Timeline of COP*. Climatalk. https://climatalk.org/2021/01/29/a-timeline-of-cop/

International Union for the Conservation of Nature. (2024, May 30). World conservation strategy: Living resource conservation for sustainable development. *World Wildlife Fund, 1*. Switzerland. (1980). https://portals.iucn.org/library/efiles/documents/wcs-004.pdf

Keleş, R. & Tunçer, M. (2022, April 22). Kapadokya sürdürülebilirlik konuşmaları: Türkiye'de çevre politikaları. [Video]. YouTube. https://www.youtube.com/watch?v=Pm0ZWIliLsA&ab_channel=Kapadokya%C3%9Cniversitesi

Leadership in Energy and Environment Design, LEED. (2024, June 6). LEED v4 for Neighborhood Development. https://www.usgbc.org/leed/rating-systems/neighborhood-development

McGuinness Institute. (2024, May 30). *Timeline of climate-related policy (institutions, legislation, international commitments, instruments and Conference of Parties).* McGuinness Institute. www.mcguinnessinstitute.org/publications/working-papers

Milman O. (2024, May 30). *James Hansen, father of climate change awareness, calls Paris talks 'a fraud'*. The Guardian. https://www.theguardian.com/environment/2015/dec/12/james-hansen-climate-change-paris-talks-fraud

T.C. Cumhurbaşkanlığı Strateji ve Bütçe Başkanlığı. (2024, June 6). On ikinci kalkınma planı. (2022). https://www.sbb.gov.tr/wp-content/uploads/2023/12/On-Ikinci-Kalkinma-Plani_2024-2028_11122023.pdf

T.C. Dışişleri Bakanlığı (2024, June 6). Paris anlaşması. https://www.mfa.gov.tr/paris-anlasmasi.tr.mfa (2022).

T.C. Enerji ve Tabii Kaynaklar Bakanlığı (2024, May 30). *Enerjide Dışa Bağımlılık Azaldı.* https://enerji.gov.tr/haber-detay?id=21208 (2023).

Traffic Index. (2024, June 6). Izmir traffic in 2023. https://www.tomtom.com/traffic-index/izmir-traffic/

United Nations. (2024, May 30). *68% of the world population projected to live in urban areas by 2050, says UN*. UN. https://www.un.org/tr/desa/68-world-population-projected-live-urban-areas-2050-says-un

United Nations. (2024, May 30). The 2030 Agenda for Sustainable Development. New York. (2015b). https://undocs.org/en/A/RES/70/1

United Nations. (2024, May 30). *COP28 ends with call to 'transition away' from fossil fuels*. UN News. https://news.un.org/en/story/2023/12/1144742

United Nations. (2024, May 30). Declaration of the United Nations conference on the human environment. (2012a). https://legal.un.org/avl/pdf/ha/dunche/dunche_ph_e.pdf?_gl=1*1bkj0f0*_ga*MTA0MTAzNTYwNC4xNzA1NTg5OTE2*_ga_TK9BQL5X7Z*MTcxNzY3MDY3NC4yMi4xLjE3MTc2NzMxMzAuMC4wLjA

United Nations. (2024, May 30). United Nations conference on sustainable development. (2012b). https://sustainabledevelopment.un.org/index.php?page=view&type=111&nr=1358&menu=35

United Nations. (2024, May 30). Kyoto Protocol. (1998). https://unfccc.int/sites/default/files/kpeng.pdf

United Nations. (2024, May 30). New Urban Agenda. (2016a). http://habitat3.org/wp-content/uploads/NUA-English.pdf

United Nations. (2024, May 30). Our common future: report of the world commission on environment and development. Geneva. (1987). http://www.un-documents.net/ocf-ov.htm

United Nations. (2024, May 30). Paris Agreement. Paris. (2015a). https://unfccc.int/files/essential_background/convention/application/pdf/english_paris_agreement.pdf

United Nations. (2024, May 30). Report of the United Nations conference on the human environment. Stockholm. (1972). https://undocs.org/en/A/CONF.48/14/Rev.1

United Nations. (2024, May 30). The Vancouver Declaration on human settlements, Habitat I. Vancouver. (1976). https://undocs.org/en/A/CONF.70/15

United Nations. (2024, May 30). UN Conference on housing and sustainable urban development, Habitat III. Quito. (2016b). https://www.un.org/en/conferences/habitat/quito2016

United Nations. (2024, May 30). United Nations conference on environment and development. Rio de Janeiro. (1992). https://undocs.org/en/A/CONF.151/26/Rev.1(vol.I)

United Nations. (2024, May 30). United Nations conference on human settlements, Habitat II. İstanbul. (1996). https://undocs.org/en/A/CONF.165/14

United Nations. (2024, May 30). United Nations environment programme, UNEP. (1975). https://wedocs.unep.org/bitstream/handle/20.500.11822/17274/75_0304_GC3_Report_K7510025.pdf?sequence=52

United Nations. (2024, May 30). World summit on sustainable development. Johannesburg. (2002). https://undocs.org/en/A/CONF.199/20

Vierra, S. (2024, May 30). *Green building standards and certification systems.* National Institute of Building Sciences. https://globalgbc.org/wp-content/uploads/2022/07/034_green-building-standards-and-certification-system.pdf

World Health Organization. (2024, May 30). *Copenhagen Consensus of Mayors. Healthier and happier cities for all.* WHO. https://www.who.int/europe/publications/m/item/copenhagen-consensus-of-mayors.-healthier-and-happier-cities-for-all

APPENDICES

ANNEX 1: Ethics Committee Decision

HİZMETE ÖZEL

T.C.
DOKUZ EYLÜL ÜNİVERSİTESİ REKTÖRLÜĞÜ
Fen Bilimleri Enstitüsü Müdürlüğü

Sayı : E-59347747-659-995230 16.05.2024

Konu : Etik Kurul Kararı (Fatma İrem YILDIRIM)

ŞEHİR VE BÖLGE PLANLAMA ANABİLİM DALI BAŞKANLIĞINA

İlgi : 29.04.2024 tarihli ve E-84508594-300-977310 sayılı yazınız.

İlgi başvuruda Enstitümüz Şehir ve Bölge Planlama Anabilim Dalı Kentsel Tasarım Yüksek Lisans programı 2021900321 numaralı öğrencisi Fatma İrem YILDIRIM tarafından yapılacak olan , "Evaluation of Urban Green Spaces in The Context of Sustainable Neighborhood and Environmental Behaviour Theories: The Case of Karşıyaka" başlıklı çalışmanın etik açıdan uygun bulunduğuna ilişkin Hukuk Müşavirliğinden gelen cevabi yazının bir örneği ekte sunulmuştur.

Bilgilerinizi ve gereğini rica ederim.

Prof. Dr. Okan FISTIKOĞLU
Enstitü Müdürü

Ek: Hukuk Müşavirliği' nin 14/05/2024 tarihli E-87347630-659-993891 sayılı yazısı.

Bu belge, güvenli elektronik imza ile imzalanmıştır.
Doğrulama Kodu: 1AAE4661-056F-40A0-9CD2-332093DF1FB5 Doğrulama Adresi: https://turkiye.gov.tr/dokuz-eylul-universitesi-ebys

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KEP Adresi : dokuzeylüluniversitesi@hs01.kep.tr

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Bilgisayar İşletmeni
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HİZMETE ÖZEL

ANNEX 2: Survey Form

Sızı Doç. Dr. Gözde Ekşioğlu Çetintahra ve Fatma İrem Yıldırım tarafından yürütülen "Evaluation of Urban Green Spaces in the Context of Sustainable Neighborhood and Environmental Behaviour Theories: The Case of Karşıyaka" başlıklı **araştırmaya** davet ediyoruz. Bu araştırmaya katılıp katılmama kararını vermeden önce, araştırmanın neden ve nasıl yapılacağını bilmeniz gerekmektedir. Bu nedenle bu formun okunup anlaşılması büyük önem taşımaktadır. Eğer anlayamadığınız ve sizin için açık olmayan şeyler varsa, ya da daha fazla bilgi isterseniz bize sorunuz.

Bu çalışmaya katılmak tamamen **gönüllülük** esasına dayanmaktadır. Çalışmaya **katılmama** veya katıldıktan sonra herhangi bir anda çalışmadan **çıkma** hakkında sahipsiniz. **Çalışmayı yanıtlamanız, araştırmaya katılım için onam verdiğiniz** biçiminde yorumlanacaktır. Size verilen **formlardaki** soruları yanıtlarken kimsenin baskısı veya telkini altında olmayın. Bu formlardan elde edilecek kişisel bilgiler tamamen gizli tutulacak ve yalnızca araştırma amacı ile kullanılacaktır.

EK 1. Anket Formu

Bu anket; "Evaluation of Urban Green Spaces In The Context of Sustainable Neighborhood and Environmental Behaviour Theories: The Case of Karşıyaka" başlıklı yüksek lisans tez çalışması için hazırlanmıştır.

Tez Danışmanı: Doç. Dr. Gözde Ekşioğlu Çetintahra

Sorumlu Araştırmacı: Mimar Fatma İrem Yıldırım 2021900321

A. Genel Bilgiler

Hangisi uygunsa X koyarak belirtiniz.

1.	CİNSİYETİNİZ NEDİR?
	Kadın
	Erkek

2.	MESLEĞİNİZ/GÖREVİNİZ NEDİR?

3.	BİRİMİNİZ NEDİR?
	İmar ve Şehircilik Müdürlüğü
	Kentsel Tasarım Müdürlüğü
	Plan ve Proje Müdürlüğü
	Kentsel Dönüşüm Müdürlüğü
	Fen İşleri Müdürlüğü
	Park ve Bahçeler Müdürlüğü
	Çevre Koruma ve Kontrol Müdürlüğü
	İklim Değişikliği ve Sıfır Atık Müdürlüğü
	Diğer (Belirtiniz)

4.	KAÇ YILDIR BU KURUMDA ÇALIŞMAKTASINIZ?
	1-5
	6-10
	11-20
	20+

5.	SÜRDÜRÜLEBİLİRLİK İLE İLGİLİ HANGİ PROJELERİ YÖNETTİNİZ? YÖNETTİĞİNİZ PROJELERDEN UYGULANANLAR OLDU MU? OLDUYSA HANGİLERİ?

B. Sürdürülebilirlik ve Sertifikalandırma

	Önem derecesine göre cevaplandırılacaktır. 1(Çok İyi) 2(İyi) 3(Kararsızım) 4(Yetersiz) 5(Çok Yetersiz)	1	2	3	4	5
6.	SÜRDÜRÜLEBİLİRLİK KAVRAMI HAKKINDAKİ BİLGİ SEVİYENİZİ NASIL BULUYORSUNUZ?					

7.	SÜRDÜRÜLEBİLİRLİK DENİLİNCE AKLINIZA GELEN 3 KELİME, KAVRAM YA DA FİKİR NEDİR?

8.	SÜRDÜRÜLEBİLİR MAHALLE DENİLİNCE AKLINIZA GELEN 3 KELİME, KAVRAM YA DA FİKİR NEDİR?

9.	HANGİ YEŞİL SERTİFİKA SİSTEMİ/SİSTEMLERİNE İLİŞKİN BİLGİ SAHİBİSİNİZ?
	LEED ND (Leadership in Energy and Environmental Design for Neighborhood Development)
	LEED BD+C (Building Design and Construction)
	LEED for Cities
	BREEAM Communities (Building Research Establishment Environmental Assessment Method - Communities)
	BREEAM New Construction
	BREEAM Infrastructure
	DGNB NUD (The German Sustainable Building Council - New Urban District)
	DGNB System for New Construction
	CASBEE UD (Comprehensive Assessment System for Built Environment Efficiency for Urban Development)
	CASBEE for Housing Units
	CASBEE for Cities
	BCA Green Mark For Districts (Building and Construction Authority Greenmark for Districts)
	BCA Green Mark for Infrastructure
	BCA Green Mark For New & Existing Buildings
	PCRS For Estidama (Pearl Community Rating System for Estidama)
	QSAS (Global Sustainability Assessment System/Qatar Sustainability Assesment System Neighborhood)
	Green Star Communities
	B.E.S.T. – Konut (Binalarda Ekolojik ve Sürdürülebilir Tasarım)
	B.E.S.T-Ticari Binalar Sertifikası
	YeS_TR- Yeşil Sertifika – Yerleşme
	YeS_TR-Yeşil Sertifika – Bina
	SEEB-TR - Neighbourhood (Sürdürülebilir Enerji Etkin Binalar – Neighbourhood)
	Türk Standartları Enstitüsü (TSE) - Güvenli Yeşil Bina (GYB) ve Yeşil Sanayi Kuruluşları (YSK) Sertifikaları
	Diğer(belirtiniz)

C. Mekânsal Değerlendirme

10.	İZMİR'DE SÜRDÜRÜLEBİLİR MAHALLE BAŞLIĞI ALTINDA HANGİ PROJELERİ BAŞARILI BULUYORSUNUZ?

11.	SÜRDÜRÜLEBİLİR BİR MAHALLE OLUŞTURMAK İÇİN İLÇENİZDE ÖNCELİKLE YAPILMASI GEREKEN MEKÂNSAL DÜZENLEME NEDİR?

12.	SÜRDÜRÜLEBİLİR BİR MAHALLE İÇİN İLÇENİZİN EN ÖNEMLİ MEKÂNSAL SORUNLARI NELERDİR?

13.	SÜRDÜRÜLEBİLİR BİR MAHALLE İÇİN İLÇENİZİN EN ÖNEMLİ MEKÂNSAL POTANSİYELLERİ NEDİR?

D. Kriterlerin Önem Sırasının Belirlenmesi

Aşağıdaki ankette sürdürülebilir mahalle kriterlerinin önemi göz önünde bulundurularak kriterlerin birbiri ile karşılaştırılması beklenmektedir.

Çevre ve Arazi Kullanımı: Doğa, biyoçeşitlilik, su yönetimi ve arazi kullanımı

Ekonomik Gelişme: İstihdam, uzaktan çalışma ve yatırım karlılığını artırma

Ulaşım: Toplu taşıma, yaya ve bisiklet yolları ve otopark

Sosyal Gelişme: Yaşam kalitesi, sosyal altyapı ve kentsel bağlam

Tasarım ve Yönetim: Tasarım ilkeleri, ısı adaları, politika ve yönetişim

Kaynaklar ve Enerji: Atık yönetimi, malzeme kullanımı ve yenilenebilir enerji

Inovasyon: Yenilikçi uygulamalar ve teknolojik gelişmeler

ANNEX 2: Survey Form –*continues*

14. SÜRDÜRÜLEBİLİR MAHALLE İÇİN KRİTER TERCİHİNDE AŞAĞIDAKİ ANA BAŞLIKLARDAN HANGİSİ DAHA ÖNEMLİDİR?

1=Eşit 2=Biraz daha fazla 3=Fazla 4=Çok fazla

	4	3	2	1	2	3	4	
Çevre ve Arazi Kullanımı								Ekonomik Gelişme
Çevre ve Arazi Kullanımı								Ulaşım
Çevre ve Arazi Kullanımı								Sosyal Gelişme
Çevre ve Arazi Kullanımı								Tasarım ve Yönetim
Çevre ve Arazi Kullanımı								Kaynaklar ve Enerji
Çevre ve Arazi Kullanımı								İnovasyon
Ekonomik Gelişme								Ulaşım
Ekonomik Gelişme								Sosyal Gelişme
Ekonomik Gelişme								Tasarım ve Yönetim
Ekonomik Gelişme								Kaynaklar ve Enerji
Ekonomik Gelişme								İnovasyon
Ulaşım								Sosyal Gelişme
Ulaşım								Tasarım ve Yönetim
Ulaşım								Kaynaklar ve Enerji
Ulaşım								İnovasyon
Sosyal Gelişme								Tasarım ve Yönetim
Sosyal Gelişme								Kaynaklar ve Enerji
Sosyal Gelişme								İnovasyon
Tasarım ve Yönetim								Kaynaklar ve Enerji
Tasarım ve Yönetim								İnovasyon
Kaynaklar ve Enerji								İnovasyon

15. ÇEVRE VE ARAZI KULLANIMI ANA BAŞLIĞININ ALT KRİTERLERİNDEN HANGİSİ DAHA ÖNEMLİDİR?

1=Eşit 2=Biraz daha fazla 3=Fazla 4=Çok fazla

	4	3	2	1	2	3	4	
Su Yönetimi								Atık Su Yönetimi
Su Yönetimi								Yağmur Suyu Yönetimi
Su Yönetimi								Tarım Alanlarının Korunması ve Geliştirilmesi
Su Yönetimi								Arazinin Ekolojik Değerinin Korunması ve Geliştirilmesi
Su Yönetimi								Biyoçeşitliliğin Korunması ve Geliştirilmesi
Su Yönetimi								Arazi-Kentsel Peyzaj İlişkisinin Kurulması
Su Yönetimi								Kamusal Açık Alan Gelişimi
Su Yönetimi								Gürültü Kirliliği
Su Yönetimi								Işık Kirliliği
Atık Su Yönetimi								Yağmur Suyu Yönetimi
Atık Su Yönetimi								Tarım Alanlarının Korunması ve Geliştirilmesi
Atık Su Yönetimi								Arazinin Ekolojik Değerinin Korunması ve Geliştirilmesi
Atık Su Yönetimi								Biyoçeşitliliğin Korunması ve Geliştirilmesi
Atık Su Yönetimi								Arazi-Kentsel Peyzaj İlişkisinin Kurulması
Atık Su Yönetimi								Kamusal Açık Alan Gelişimi
Atık Su Yönetimi								Gürültü Kirliliği
Atık Su Yönetimi								Işık Kirliliği
Yağmur Suyu Yönetimi								Tarım Alanlarının Korunması ve Geliştirilmesi
Yağmur Suyu Yönetimi								Arazinin Ekolojik Değerinin Korunması ve Geliştirilmesi
Yağmur Suyu Yönetimi								Biyoçeşitliliğin Korunması ve Geliştirilmesi
Yağmur Suyu Yönetimi								Arazi-Kentsel Peyzaj İlişkisinin Kurulması
Yağmur Suyu Yönetimi								Kamusal Açık Alan Gelişimi
Yağmur Suyu Yönetimi								Gürültü Kirliliği
Yağmur Suyu Yönetimi								Işık Kirliliği
Tarım Alanlarının Korunması ve Geliştirilmesi								Arazinin Ekolojik Değerinin Korunması ve Geliştirilmesi
Tarım Alanlarının Korunması ve Geliştirilmesi								Biyoçeşitliliğin Korunması ve Geliştirilmesi
Tarım Alanlarının Korunması ve Geliştirilmesi								Arazi-Kentsel Peyzaj İlişkisinin Kurulması
Tarım Alanlarının Korunması ve Geliştirilmesi								Kamusal Açık Alan Gelişimi
Tarım Alanlarının Korunması ve Geliştirilmesi								Gürültü Kirliliği
Tarım Alanlarının Korunması ve Geliştirilmesi								Işık Kirliliği
Arazinin Ekolojik Değerinin Korunması ve Geliştirilmesi								Biyoçeşitliliğin Korunması ve Geliştirilmesi
Arazinin Ekolojik Değerinin Korunması ve Geliştirilmesi								Arazi-Kentsel Peyzaj İlişkisinin Kurulması
Arazinin Ekolojik Değerinin Korunması ve Geliştirilmesi								Kamusal Açık Alan Gelişimi
Arazinin Ekolojik Değerinin Korunması ve Geliştirilmesi								Gürültü Kirliliği
Arazinin Ekolojik Değerinin Korunması ve Geliştirilmesi								Işık Kirliliği
Biyoçeşitliliğin Korunması ve Geliştirilmesi								Arazi-Kentsel Peyzaj İlişkisinin Kurulması
Biyoçeşitliliğin Korunması ve Geliştirilmesi								Kamusal Açık Alan Gelişimi
Biyoçeşitliliğin Korunması ve Geliştirilmesi								Gürültü Kirliliği
Biyoçeşitliliğin Korunması ve Geliştirilmesi								Işık Kirliliği
Arazi-Kentsel Peyzaj İlişkisinin Kurulması								Kamusal Açık Alan Gelişimi
Arazi-Kentsel Peyzaj İlişkisinin								Gürültü Kirliliği

Kurulması								
Arazi-Kentsel Peyzaj İlişkisinin Kurulması								Işık Kirliliği
Kamusal Açık Alan Gelişimi								Gürültü Kirliliği
Kamusal Açık Alan Gelişimi								Işık Kirliliği
Gurultu Kirliliği								Işık Kirliliği

16. ULAŞIM ANA BAŞLIĞININ ALT KRİTERLERİNDEN HANGİSİ DAHA ÖNEMLİDİR?

1=Eşit 2=Biraz daha fazla 3=Fazla 4=Çok fazla

	4	3	2	1	2	3	4	
Otopark Stratejisi Geliştirilmesi								Trafik Deseninin Geliştirilmesi
Otopark Stratejisi Geliştirilmesi								Bisiklet Ağlarının Artırılması/Düzenlenmesi
Otopark Stratejisi Geliştirilmesi								Yürünebilirliğin Artırılması
Otopark Stratejisi Geliştirilmesi								Toplu Taşıma Araçlarına İlişkin Strateji
Otopark Stratejisi Geliştirilmesi								Ulaşım Karbon Emisyonunun Azaltılması
Otopark Stratejisi Geliştirilmesi								Çevreye Duyarlı Karma Ulaşım Sistemlerinin Hizmet Verdiği ve Erişilebilirliği Yüksek Alanların Tercih Edilmesi
Otopark Stratejisi Geliştirilmesi								Optimum Toplu Taşıma Kullanımı İçin Kentsel Altyapı Stratejilerinin Geliştirilmesi
Trafik Deseninin Geliştirilmesi								Bisiklet Ağlarının Artırılması/Düzenlenmesi
Trafik Deseninin Geliştirilmesi								Yürünebilirliğin Artırılması
Trafik Deseninin Geliştirilmesi								Toplu Taşıma Araçlarına İlişkin Strateji
Trafik Deseninin Geliştirilmesi								Ulaşım Karbon Emisyonunun Azaltılması
Trafik Deseninin								Çevreye Duyarlı

Geliştirilmesi								Karma Ulaşım Sistemlerinin Hizmet Verdiği ve Erişilebilirliği Yüksek Alanların Tercih Edilmesi
Trafik Deseninin Geliştirilmesi								Optimum Toplu Taşıma Kullanımı İçin Kentsel Altyapı Stratejilerinin Geliştirilmesi
Bisiklet Ağlarının Artırılması/Düzenlenmesi								Yürünebilirliğin Artırılması
Bisiklet Ağlarının Artırılması/Düzenlenmesi								Toplu Taşıma Araçlarına İlişkin Strateji
Bisiklet Ağlarının Artırılması/Düzenlenmesi								Ulaşım Karbon Emisyonunun Azaltılması
Bisiklet Ağlarının Artırılması/Düzenlenmesi								Çevreye Duyarlı Karma Ulaşım Sistemlerinin Hizmet Verdiği ve Erişilebilirliği Yüksek Alanların Tercih Edilmesi
Bisiklet Ağlarının Artırılması/Düzenlenmesi								Optimum Toplu Taşıma Kullanımı İçin Kentsel Altyapı Stratejilerinin Geliştirilmesi
Yürünebilirliğin Artırılması								Toplu Taşıma Araçlarına İlişkin Strateji
Yürünebilirliğin Artırılması								Ulaşım Karbon Emisyonunun Azaltılması
Yürünebilirliğin Artırılması								Çevreye Duyarlı Karma Ulaşım Sistemlerinin Hizmet Verdiği ve Erişilebilirliği Yüksek Alanların Tercih Edilmesi
Yürünebilirliğin Artırılması								Optimum Toplu Taşıma Kullanımı İçin Kentsel Altyapı Stratejilerinin Geliştirilmesi
Toplu Taşıma								Ulaşım Karbon

Araçlarına İlişkin Strateji								Emisyonunun Azaltılması
Toplu Taşıma Araçlarına İlişkin Strateji								Çevreye Duyarlı Karma Ulaşım Sistemlerinin Hizmet Verdiği ve Erişilebilirliği Yüksek Alanların Tercih Edilmesi
Toplu Taşıma Araçlarına İlişkin Strateji								Optimum Toplu Taşıma Kullanımı İçin Kentsel Altyapı Stratejilerinin Geliştirilmesi
Ulaşım Karbon Emisyonunun Azaltılması								Çevreye Duyarlı Karma Ulaşım Sistemlerinin Hizmet Verdiği ve Erişilebilirliği Yüksek Alanların Tercih Edilmesi
Ulaşım Karbon Emisyonunun Azaltılması								Optimum Toplu Taşıma Kullanımı İçin Kentsel Altyapı Stratejilerinin Geliştirilmesi
Çevreye Duyarlı Karma Ulaşım Sistemlerinin Hizmet Verdiği ve Erişilebilirliği Yüksek Alanların Tercih Edilmesi								Optimum Toplu Taşıma Kullanımı İçin Kentsel Altyapı Stratejilerinin Geliştirilmesi

17. EKONOMİ GELİŞME BAŞLIĞININ ALT KRİTERLERİNDEN HANGİSİ DAHA ÖNEMLİDİR?

1=Eşit 2=Biraz daha fazla 3=Fazla 4=Çok fazla

	4	3	2	1	2	3	4	
Ekonomik Gelişme								Yatırım Karlılığını Artırma

18. SOSYAL GELİŞME ANA BAŞLIĞININ ALT KRİTERLERİNDEN HANGİSİ DAHA ÖNEMLİDİR?

1=Eşit 2=Biraz daha fazla 3=Fazla 4=Çok fazla

	4	3	2	1	2	3	4	
Toplumsal Katılım								Eğitim ve Toplumsal Katılım
Toplumsal Katılım								Kapsayıcı Tasarım
Toplumsal Katılım								Kültür ve Miras

								Kimliğinin Geliştirilmesi
Eğitim ve Toplumsal Katılım								Kapsayıcı Tasarım
Eğitim ve Toplumsal Katılım								Kültür ve Miras Kimliğinin Geliştirilmesi
Kapsayıcı Tasarım								Kültür ve Miras Kimliğinin Geliştirilmesi

19. TASARIM VE YÖNETİM ANA BAŞLIĞININ ALT KRİTERLERİNDEN HANGİSİ DAHA ÖNEMLİDİR?

1=Eşit 2=Biraz daha fazla 3=Fazla 4=Çok fazla

	4	3	2	1	2	3	4	
Güvenlik								Kamu Hizmetlerinin Erişilebilir Olması
Güvenlik								Isı Adası Etkisinin Azaltılması
Kamu Hizmetlerinin Erişilebilir Olması								Isı Adası Etkisinin Azaltılması

20. KAYNAKLAR VE ENERJİ KULLANIMI ANA BAŞLIĞININ ALT KRİTERLERİNDEN HANGİSİ DAHA ÖNEMLİDİR?

1=Eşit 2=Biraz daha fazla 3=Fazla 4=Çok fazla

	4	3	2	1	2	3	4	
Yapım Aşamasındaki Atık Yönetimi								Kullanım Aşamasındaki Atık Yönetimi
Yapım Aşamasındaki Atık Yönetimi								Yenilenebilir Enerji
Yapım Aşamasındaki Atık Yönetimi								Enerji Verimliliği
Yapım Aşamasındaki Atık Yönetimi								Yeşil Altyapı
Yapım Aşamasındaki Atık Yönetimi								Sürdürülebilir Binalar
Yapım Aşamasındaki Atık Yönetimi								Yerel Malzeme Kullanımı
Yapım Aşamasındaki Atık Yönetimi								Sürdürülebilir Malzeme Kullanımı
Yapım Aşamasındaki Atık Yönetimi								Sertifikalı Malzeme Kullanımı
Yapım Aşamasındaki								Ekonomik Malzeme

Atık Yönetimi								Kullanımı
Kullanım Aşamasındaki Atık Yönetimi								Yenilenebilir Enerji
Kullanım Aşamasındaki Atık Yönetimi								Enerji Verimliliği
Kullanım Aşamasındaki Atık Yönetimi								Yeşil Altyapı
Kullanım Aşamasındaki Atık Yönetimi								Sürdürülebilir Binalar
Kullanım Aşamasındaki Atık Yönetimi								Yerel Malzeme Kullanımı
Kullanım Aşamasındaki Atık Yönetimi								Sürdürülebilir Malzeme Kullanımı
Kullanım Aşamasındaki Atık Yönetimi								Sertifikalı Malzeme Kullanımı
Kullanım Aşamasındaki Atık Yönetimi								Ekonomik Malzeme Kullanımı
Yenilenebilir Enerji								Enerji Verimliliği
Yenilenebilir Enerji								Yeşil Altyapı
Yenilenebilir Enerji								Sürdürülebilir Binalar
Yenilenebilir Enerji								Yerel Malzeme Kullanımı
Yenilenebilir Enerji								Sürdürülebilir Malzeme Kullanımı
Yenilenebilir Enerji								Sertifikalı Malzeme Kullanımı
Yenilenebilir Enerji								Ekonomik Malzeme Kullanımı
Enerji Verimliliği								Yeşil Altyapı
Enerji Verimliliği								Sürdürülebilir Binalar
Enerji Verimliliği								Yerel Malzeme Kullanımı
Enerji Verimliliği								Sürdürülebilir Malzeme Kullanımı
Enerji Verimliliği								Sertifikalı Malzeme Kullanımı

Enerji Verimliliği								Ekonomik Malzeme Kullanımı
Yeşil Altyapı								Sürdürülebilir Binalar
Yeşil Altyapı								Yerel Malzeme Kullanımı
Yeşil Altyapı								Sürdürülebilir Malzeme Kullanımı
Yeşil Altyapı								Sertifikalı Malzeme Kullanımı
Yeşil Altyapı								Ekonomik Malzeme Kullanımı
Sürdürülebilir Binalar								Yerel Malzeme Kullanımı
Sürdürülebilir Binalar								Sürdürülebilir Malzeme Kullanımı
Sürdürülebilir Binalar								Sertifikalı Malzeme Kullanımı
Sürdürülebilir Binalar								Ekonomik Malzeme Kullanımı
Yerel Malzeme Kullanımı								Sürdürülebilir Malzeme Kullanımı
Yerel Malzeme Kullanımı								Sertifikalı Malzeme Kullanımı
Yerel Malzeme Kullanımı								Ekonomik Malzeme Kullanımı
Sürdürülebilir Malzeme Kullanımı								Sertifikalı Malzeme Kullanımı
Sürdürülebilir Malzeme Kullanımı								Ekonomik Malzeme Kullanımı
Sertifikalı Malzeme Kullanımı								Ekonomik Malzeme Kullanımı

Evaluation of Urban Green Spaces in the Context of Sustainable Neighborhood and Environmental Behaviour Theories: The Case of Karşıyaka adlı yüksek lisans tez çalışması kapsamında şahsıma yöneltilen soruları cevaplamayı, yapılan uygulamaların, fotoğraflarının çekilmesini ve ses kaydının alınmasını kabul ediyorum.

Ad-Soyadı:

İmza:

Tarih:

ANNEX 3: Comparison matrix of criteria in level 2 for KSK participants

Comparison Matrix							
MAIN CRITERIA	**Environment And Land Use**	**Economic Development**	**Transport**	**Social Development**	**Design And Management**	**Resources And Energy**	**Innovation**
Environment And Land Use	**1,00**	2,12	1,17	1,06	0,94	0,66	1,00
Economic Development	0,47	**1,00**	0,58	0,67	0,77	0,64	0,64
Transport	0,85	1,74	**1,00**	0,82	0,91	0,77	0,91
Social Development	0,94	1,49	1,22	**1,00**	1,29	0,91	1,29
Design And Management	1,06	1,29	1,10	0,77	**1,00**	0,67	0,74
Resources And Energy	1,51	1,57	1,29	1,10	1,49	**1,00**	1,29
Innovation	1,00	1,57	1,10	0,77	1,35	0,77	**1,00**
TOTAL	**6,8**	**10,8**	**7,5**	**6,2**	**7,7**	**5,4**	**6,9**

ANNEX 4: Normalized comparison matrix of criteria in level 2 for KSK participants

Normalized Comparison Matrix								Eigenvector
MAIN CRITERIA	**Environment And Land Use**	**Economic Development**	**Transport**	**Social Development**	**Design And Management**	**Resources And Energy**	**Innovation**	
Environment And Land Use	0,15	0,20	0,16	0,17	0,12	0,12	0,15	0,15
Economic Development	0,07	0,09	0,08	0,11	0,10	0,12	0,09	0,09
Transport	0,12	0,16	0,13	0,13	0,12	0,14	0,13	0,13
Social Development	0,14	0,14	0,16	0,16	0,17	0,17	0,19	0,16
Design And Management	0,15	0,12	0,15	0,12	0,13	0,12	0,11	0,13
Resources And Energy	0,22	0,15	0,17	0,18	0,19	0,18	0,19	0,18
Innovation	0,15	0,15	0,15	0,12	0,17	0,14	0,15	0,15
TOTAL	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**

ANNEX 5: Comparison matrix of criteria in environment and land use for KSK participants

Comparison Matrix										
ENVIRONMENT AND LAND USE	**Water Management**	**Waste Water Management**	**Rainwater Management**	**Protection and Development of Agricultural Areas**	**Protecting and Enhancing the Ecological Value of Land**	**Biodiversity Conservation and Development**	**Establishment of Land-Urban Landscape Relationship**	**Public Open Space Development**	**Noise Pollution**	**Light Pollution**
Water Management	**1,00**	0,94	0,94	0,91	0,81	0,85	1,43	1,29	1,74	2,07
Waste Water Management	1,06	**1,00**	1,00	1,00	0,85	0,91	1,29	1,51	1,64	1,81
Rainwater Management	1,06	1,00	**1,00**	1,00	0,85	0,82	1,06	1,17	1,29	1,51
Protection and Development of Agricultural Areas	1,10	1,00	1,00	**1,00**	1,17	1,10	1,84	2,07	1,87	2,07
Protecting and Enhancing the Ecological Value of Land	1,24	1,17	1,17	0,85	**1,00**	1,29	1,24	1,10	1,77	1,77
Biodiversity Conservation and Development	1,17	1,10	1,22	0,91	0,77	**1,00**	1,74	1,74	1,95	1,84
Establishment of Land-Urban Landscape Relationship	0,70	0,77	0,94	0,54	0,81	0,58	**1,00**	1,43	1,43	1,51
Public Open Space Development	0,77	0,66	0,85	0,48	0,91	0,58	0,70	**1,00**	1,49	1,84
Noise Pollution	0,58	0,61	0,77	0,53	0,57	0,51	0,70	0,67	**1,00**	1,29
Light Pollution	0,48	0,55	0,66	0,48	0,57	0,66	0,66	0,54	0,77	**1,00**
TOTAL	**9,17**	**8,82**	**9,57**	**7,71**	**8,30**	**8,30**	**11,66**	**12,53**	**14,95**	**16,71**

ANNEX 6: Normalized comparison matrix of criteria in environment and land use for KSK participants

Normalized Comparison Matrix											Eigenvector
ENVIRONMENT AND LAND USE	**Water Management**	**Waste Water Management**	**Rainwater Management**	**Protection and Development of Agricultural Areas**	**Protecting and Enhancing the Ecological Value of Land**	**Conservation and Development of Biodiversity**	**Establishing the Land-Urban Landscape Relationship**	**Public Open Space Development**	**Noise Pollution**	**Light Pollution**	
Water Management	0,11	0,11	0,10	0,12	0,10	0,10	0,12	0,10	0,12	0,12	0,11
Waste Water Management	0,12	0,11	0,10	0,13	0,10	0,11	0,11	0,12	0,11	0,11	0,11
Rainwater Management	0,12	0,11	0,10	0,13	0,10	0,10	0,09	0,09	0,09	0,09	0,10
Protection and Development of Agricultural Areas	0,12	0,11	0,10	0,13	0,14	0,13	0,16	0,17	0,13	0,12	0,13
Protecting and Enhancing the Ecological Value of Land	0,14	0,13	0,12	0,11	0,12	0,16	0,11	0,09	0,12	0,11	0,12
Conservation and Development of Biodiversity	0,13	0,13	0,13	0,12	0,09	0,12	0,15	0,14	0,13	0,11	0,12
Establishing the Land-Urban Landscape Relationship	0,08	0,09	0,10	0,07	0,10	0,07	0,09	0,11	0,10	0,09	0,09
Public Open Space Development	0,08	0,08	0,09	0,06	0,11	0,07	0,06	0,08	0,10	0,11	0,08
Noise Pollution	0,06	0,07	0,08	0,07	0,07	0,06	0,06	0,05	0,07	0,08	0,07
Light Pollution	0,05	0,06	0,07	0,06	0,07	0,08	0,06	0,04	0,05	0,06	0,06
TOTAL	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**

ANNEX 7: Comparison matrix of criteria in transport for KSK participants

Comparison Matrix								
TRANSPORT	**Developing a Parking Strategy**	**Improving Traffic Pattern**	**Increasing /Regulating Bicycle Networks**	**Increasing Walkability**	**Strategy for Public Transportation Vehicles**	**Reducing Transportation Carbon Emissions**	**Preferring areas with high accessibility and served by environmentally friendly mixed transportation systems**	**Developing Urban Infrastructure Strategies for Optimal Public Transport Use**
Developing a Parking Strategy	**1,00**	0,91	0,47	0,61	0,67	0,61	0,52	0,50
Improving Traffic Pattern	1,10	**1,00**	0,47	0,52	0,54	0,42	0,45	0,41
Increasing/Regulating Bicycle Networks	2,12	2,12	**1,00**	1,00	1,74	1,22	1,35	1,64
Increasing Walkability	1,64	1,92	1,00	**1,00**	1,06	1,29	1,17	1,06
Strategy for Public Transportation Vehicles	1,49	1,84	0,58	0,94	**1,00**	0,85	0,91	1,00
Reducing Transportation Carbon Emissions	1,64	2,38	0,82	0,77	1,17	**1,00**	1,06	1,43
Preferring areas with high accessibility and served by environmentally friendly mixed transportation systems	1,92	2,21	0,74	0,85	1,10	0,94	**1,00**	1,35
Developing Urban Infrastructure Strategies for Optimal Public Transport Use	2,00	2,44	0,61	0,94	1,00	0,70	0,74	**1,00**
TOTAL	**12,91**	**14,81**	**5,69**	**6,65**	**8,29**	**7,04**	**7,20**	**8,38**

ANNEX 8: Normalized comparison matrix of criteria in transport for KSK participants

Normalized Comparison Matrix									Eigenvector
TRANSPORT	**Developing a Parking Strategy**	**Improving Traffic Pattern**	**Increasing/ Regulating Bicycle Networks**	**Increasing Walkability**	**Strategy for Public Transportation Vehicles**	**Reducing Transportation Carbon Emissions**	**Preferring areas with high accessibility and served by environmentally friendly mixed transportation systems**	**development of urban ınfrastructure strategies for optimal public transport use**	
Developing a Parking Strategy	0,08	0,06	0,08	0,09	0,08	0,09	0,07	0,06	0,08
Improving Traffic Pattern	0,09	0,07	0,08	0,08	0,07	0,06	0,06	0,05	0,07
Increasing/Regulating Bicycle Networks	0,16	0,14	0,18	0,15	0,21	0,17	0,19	0,20	0,17
Increasing Walkability	0,13	0,13	0,18	0,15	0,13	0,18	0,16	0,13	0,15
Strategy for Public Transportation Vehicles	0,12	0,12	0,10	0,14	0,12	0,12	0,13	0,12	0,12
Reducing Transportation Carbon Emissions	0,13	0,16	0,14	0,12	0,14	0,14	0,15	0,17	0,14
Preferring areas with high accessibility and served by environmentally friendly mixed transportation systems	0,15	0,15	0,13	0,13	0,13	0,13	0,14	0,16	0,14
development of urban ınfrastructure strategies for optimal public transport use	0,15	0,16	0,11	0,14	0,12	0,10	0,10	0,12	0,13
TOTAL	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**

ANNEX 9: Comparison matrix of criteria in economic development for KSK participants

Comparison Matrix		
ECONOMIC DEVELOPMENT	**Economic Development**	**Increasing Investment Profitability**
Economic Development	**1,00**	1,81
Increasing Investment Profitability	0,55	**1,00**
TOTAL	**1,55**	**2,81**

ANNEX 10:Normalized comparison matrix of criteria in economic development for KSK participants

Normalized Comparison Matrix			Eigenvector
ECONOMIC DEVELOPMENT	**Economic Development**	**Increasing Investment Profitability**	
Economic Development	0,64	0,64	0,64
Increasing Investment Profitability	0,36	0,36	0,36
TOTAL	**1**	**1**	**1**

ANNEX 11: Comparison matrix of criteria in social development for KSK participants

Comparison Matrix				
SOCIAL DEVELOPMENT	**Public Participation**	**Education**	**Inclusive Design**	**Enhancing Cultural and Heritage Identity**
Public Participation	**1,00**	0,67	0,91	0,77
Education	1,49	**1,00**	1,22	1,29
Inclusive Design	1,10	0,82	**1,00**	0,82
Enhancing Cultural and Heritage Identity	1,29	0,77	1,22	**1,00**
TOTAL	**4,88**	**3,27**	**4,34**	**3,89**

ANNEX 12: Normalized comparison matrix of criteria in social development for KSK participants

Normalized Comparison Matrix					Eigenvector
SOCIAL DEVELOPMENT	**Public Participation**	**Education**	**Inclusive Design**	**Enhancing Cultural and Heritage Identity**	
Public Participation	0,20	0,21	0,21	0,20	0,20
Education	0,30	0,31	0,28	0,33	0,31
Inclusive Design	0,23	0,25	0,23	0,21	0,23
Enhancing Cultural and Heritage Identity	0,26	0,24	0,28	0,26	0,26
TOTAL	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**

ANNEX 13: Comparison matrix of criteria in design and management for KSK participants

Comparison Matrix			
DESIGN AND MANAGEMENT	**Safety**	**Accessibility of Public Services**	**Reducing the Heat Island Effect**
Safety	**1,00**	0,94	1,22
Accessibility of Public Services	1,06	**1,00**	1,10
Reducing the Heat Island Effect	0,82	0,91	**1,00**
TOTAL	**1,00**	**0,94**	**1,22**

ANNEX 14: Normalized comparison matrix of criteria in design and management for KSK participants

Normalized Comparison Matrix				Eigenvector
DESIGN AND MANAGEMENT	**Safety**	**Accessibility of Public Services**	**Reducing The Urban Heat Island Effect**	
Safety	0,35	0,33	0,37	0,35
Accessibility of Public Services	0,37	0,35	0,33	0,35
Reducing The Urban Heat Island Effect	0,28	0,32	0,30	0,30
TOTAL	**1,00**	**1,00**	**1,00**	**1,00**

ANNEX 15: Comparison matrix of criteria in resources and energy for KSK participants

Comparison Matrix										
RESOURCES AND ENERGY	**Waste Management During Construction**	**Waste Management in Use Phase**	**Renewable Energy**	**Energy Efficiency**	**Green Infrastructure**	**Sustainable Buildings**	**Local Material Use**	**Sustainable Material Use**	**Certified Material Use**	**Economic Material Use**
Waste Management During Construction	**1,00**	1,00	0,85	0,91	0,85	0,58	1,22	0,91	1,29	2,00
Waste Management in Use Phase	1,00	**1,00**	0,94	1,00	0,77	0,70	1,57	1,22	1,43	1,43
Renewable Energy	1,17	1,06	**1,00**	1,17	1,00	1,10	1,51	1,10	1,81	1,77
Energy Efficiency	1,10	1,00	0,85	**1,00**	1,43	1,17	1,84	1,43	1,92	1,95
Green Infrastructure	1,17	1,29	1,00	0,70	**1,00**	0,82	1,29	1,17	1,74	2,03
Sustainable Buildings	1,74	1,43	0,91	0,85	1,22	**1,00**	1,51	1,00	1,92	1,92
Local Material Use	0,82	0,64	0,66	0,54	0,77	0,66	**1,00**	0,52	1,10	1,29
Sustainable Material Use	1,10	0,82	0,91	0,70	0,85	1,00	1,92	**1,00**	2,00	2,00
Certified Material Use	0,77	0,70	0,55	0,52	0,58	0,52	0,91	0,50	**1,00**	1,04
Economic Material Use	0,50	0,70	0,57	0,51	0,49	0,52	0,50	0,50	0,96	**1,00**
TOTAL	**10,38**	**9,64**	**8,24**	**7,91**	**8,97**	**8,07**	**13,28**	**9,35**	**15,17**	**16,43**

ANNEX 16: Normalized comparison matrix of criteria in resources and energy for KSK participants

Normalized Comparison Matrix											Eigenvector
RESOURCES AND ENERGY	**Waste Management During Construction**	**Waste Management in Use Phase**	**Renewable Energy**	**Energy Efficiency**	**Green Infrastructure**	**Sustainable Buildings**	**Use of Local Materials**	**Use of Sustainable Materials**	**Use of Certified Materials**	**Economic Material Use**	
Waste Management During Construction	0,10	0,10	0,10	0,11	0,10	0,07	0,09	0,10	0,09	0,12	0,10
Waste Management in Use Phase	0,10	0,10	0,11	0,13	0,09	0,09	0,12	0,13	0,09	0,09	0,10
Renewable Energy	0,11	0,11	0,12	0,15	0,11	0,14	0,11	0,12	0,12	0,11	0,12
Energy Efficiency	0,11	0,10	0,10	0,13	0,16	0,14	0,14	0,15	0,13	0,12	0,13
Green Infrastructure	0,11	0,13	0,12	0,09	0,11	0,10	0,10	0,13	0,11	0,12	0,11
Sustainable Buildings	0,17	0,15	0,11	0,11	0,14	0,12	0,11	0,11	0,13	0,12	0,13
Use of Local Materials	0,08	0,07	0,08	0,07	0,09	0,08	0,08	0,06	0,07	0,08	0,07
Use of Sustainable Materials	0,11	0,09	0,11	0,09	0,10	0,12	0,14	0,11	0,13	0,12	0,11
Use of Certified Materials	0,07	0,07	0,07	0,07	0,06	0,06	0,07	0,05	0,07	0,06	0,07
Economic Material Use	0,05	0,07	0,07	0,06	0,05	0,06	0,04	0,05	0,06	0,06	0,06
TOTAL	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**

ANNEX 17: Comparison matrix of criteria in level 2 for DEU participants

Comparison Matrix							
MAIN CRITERIA	**Environment And Land Use**	**Economic Development**	**Transport**	**Social Development**	**Design And Management**	**Resources And Energy**	**Innovation**
Environment And Land Use	**1,00**	1,67	1,67	1,35	1,22	1,22	1,84
Economic Development	0,60	**1,00**	1,10	0,94	0,73	0,70	1,10
Transport	0,60	0,91	**1,00**	0,67	0,82	0,51	0,96
Social Development	0,74	1,06	1,49	**1,00**	0,85	0,77	1,35
Design And Management	0,82	1,37	1,22	1,17	**1,00**	0,96	1,74
Resources And Energy	0,82	1,43	1,95	1,29	1,04	**1,00**	1,81
Innovation	0,54	0,91	1,04	0,74	0,58	0,55	1,00
TOTAL	**5,1**	**8,3**	**9,5**	**7,2**	**6,2**	**5,7**	**9,8**

ANNEX 18: Normalized comparison matrix of criteria in level 2 for DEU participants

Normalized Comparison Matrix								Eigenvector
MAIN CRITERIA	**Environment And Land Use**	**Economic Development**	**Transport**	**Social Development**	**Design And Management**	**Resources And Energy**	**Innovation**	
Environment And Land Use	0,20	0,20	0,18	0,19	0,20	0,21	0,19	0,19
Economic Development	0,12	0,12	0,12	0,13	0,12	0,12	0,11	0,12
Transport	0,12	0,11	0,11	0,09	0,13	0,09	0,10	0,11
Social Development	0,14	0,13	0,16	0,14	0,14	0,14	0,14	0,14
Design And Management	0,16	0,16	0,13	0,16	0,16	0,17	0,18	0,16
Resources And Energy	0,16	0,17	0,21	0,18	0,17	0,17	0,18	0,18
Innovation	0,11	0,11	0,11	0,10	0,09	0,10	0,10	0,10
TOTAL	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**

ANNEX 19: Comparison matrix of criteria in environment and land use for DEU participants

Comparison Matrix										
ENVIRONMENT AND LAND USE	**Water Management**	**Waste Water Management**	**Rainwater Management**	**Protection and Development of Agricultural Areas**	**Protecting and Enhancing the Ecological Value of Land**	**Biodiversity Conservation and Development**	**Establishment of Land-Urban Landscape Relationship**	**Public Open Space Development**	**Noise Pollution**	**Light Pollution**
Water Management	**1,00**	0,91	1,00	0,85	0,62	0,60	1,35	1,43	1,84	2,12
Waste Water Management	1,10	**1,00**	1,22	0,77	0,70	0,81	1,67	1,67	1,81	1,81
Rainwater Management	1,00	0,82	**1,00**	0,60	0,62	0,70	1,04	1,00	1,43	1,57
Protection and Development of Agricultural Areas	1,17	1,29	1,67	**1,00**	0,77	0,70	1,67	1,81	1,64	1,92
Protecting and Enhancing the Ecological Value of Land	1,60	1,43	1,60	1,29	**1,00**	0,82	1,95	2,25	2,38	2,67
Biodiversity Conservation and Development	1,67	1,24	1,43	1,43	1,22	**1,00**	2,25	2,21	2,03	2,38
Establishment of Land-Urban Landscape Relationship	0,74	0,60	0,96	0,60	0,51	0,45	**1,00**	1,49	1,74	1,81
Public Open Space Development	0,70	0,60	1,00	0,55	0,45	0,45	0,67	**1,00**	1,49	1,92
Noise Pollution	0,54	0,55	0,70	0,61	0,42	0,49	0,58	0,67	**1,00**	1,22
Light Pollution	0,47	0,55	0,64	0,52	0,37	0,55	0,55	0,52	0,82	1,00
TOTAL	**10,00**	**8,99**	**11,21**	**8,23**	**6,70**	**6,57**	**12,72**	**14,04**	**16,18**	**18,43**

ANNEX 20: Normalized comparison matrix of criteria in environment and land use for DEU participants

Normalized Comparison Matrix											Eigenvector
ENVIRONMENT AND LAND USE	**Water Management**	**Waste Water Management**	**Rainwater Management**	**Protection and Development of Agricultural Areas**	**Protecting and Enhancing the Ecological Value of Land**	**Conservation and Development of Biodiversity**	**Establishing the Land-Urban Landscape Relationship**	**Public Open Space Development**	**Noise Pollution**	**Light Pollution**	
Water Management	0,10	0,10	0,09	0,10	0,09	0,09	0,11	0,10	0,11	0,12	0,10
Waste Water Management	0,11	0,11	0,11	0,09	0,10	0,12	0,13	0,12	0,11	0,10	0,11
Rainwater Management	0,10	0,09	0,09	0,07	0,09	0,11	0,08	0,07	0,09	0,09	0,09
Protection and Development of Agricultural Areas	0,12	0,14	0,15	0,12	0,12	0,11	0,13	0,13	0,10	0,10	0,12
Protecting and Enhancing the Ecological Value of Land	0,16	0,16	0,14	0,16	0,15	0,12	0,15	0,16	0,15	0,15	0,15
Conservation and Development of Biodiversity	0,17	0,14	0,13	0,17	0,18	0,15	0,18	0,16	0,13	0,13	0,15
Establishing the Land-Urban Landscape Relationship	0,07	0,07	0,09	0,07	0,08	0,07	0,08	0,11	0,11	0,10	0,08
Public Open Space Development	0,07	0,07	0,09	0,07	0,07	0,07	0,05	0,07	0,09	0,10	0,07
Noise Pollution	0,05	0,06	0,06	0,07	0,06	0,07	0,05	0,05	0,06	0,07	0,06
Light Pollution	0,05	0,06	0,06	0,06	0,06	0,08	0,04	0,04	0,05	0,05	0,06
TOTAL	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**

ANNEX 21: Comparison matrix of criteria in transport for DEU participants

Comparison Matrix								
TRANSPORT	**Developing a Parking Strategy**	**Improving Traffic Pattern**	**Increasing/ Regulating Bicycle Networks**	**Increasing Walkability**	**Strategy for Public Transportation Vehicles**	**Reducing Transportation Carbon Emissions**	**Preferring areas with high accessibility and served by environmentally friendly mixed transportation systems**	**Developing Urban Infrastructure Strategies for Optimal Public Transport Use**
Developing a Parking Strategy	**1,00**	0,76	0,57	0,40	0,47	0,64	0,49	0,51
Improving Traffic Pattern	1,32	**1,00**	0,64	0,57	0,77	0,70	0,71	0,64
Increasing/Regulating Bicycle Networks	1,77	1,57	**1,00**	0,77	0,91	1,10	0,94	0,82
Increasing Walkability	2,48	1,77	1,29	**1,00**	1,12	1,06	1,06	1,00
Strategy for Public Transportation Vehicles	2,12	1,29	1,10	0,89	**1,00**	1,00	1,06	1,10
Reducing Transportation Carbon Emissions	1,57	1,43	0,91	0,94	1,00	**1,00**	0,77	0,91
Preferring areas with high accessibility and served by environmentally friendly mixed transportation systems	2,03	1,40	1,06	0,94	0,94	1,29	**1,00**	0,77
Developing Urban Infrastructure Strategies for Optimal Public Transport Use	1,95	1,57	1,22	1,00	0,91	1,10	1,29	**1,00**
TOTAL	**14,25**	**10,79**	**7,78**	**6,52**	**7,12**	**7,90**	**7,33**	**6,75**

ANNEX 22: Normalized comparison matrix of criteria in transport for DEU participants

Normalized Comparison Matrix									Eigenvector
TRANSPORT	**Developing a Parking Strategy**	**Improving Traffic Pattern**	**Increasing/Regulating Bicycle Networks**	**Increasing Walkability**	**Strategy for Public Transportation Vehicles**	**Reducing Transportation Carbon Emissions**	**Preferring areas with high accessibility and served by environmentally friendly mixed transportation systems**	**development of urban ınfrastructure strategies for optimal public transport use**	
Developing a Parking Strategy	0,07	0,07	0,07	0,06	0,07	0,08	0,07	0,08	0,07
Improving Traffic Pattern	0,09	0,09	0,08	0,09	0,11	0,09	0,10	0,09	0,09
Increasing/Regulating Bicycle Networks	0,12	0,15	0,13	0,12	0,13	0,14	0,13	0,12	0,13
Increasing Walkability	0,17	0,16	0,17	0,15	0,16	0,13	0,14	0,15	0,16
Strategy for Public Transportation Vehicles	0,15	0,12	0,14	0,14	0,14	0,13	0,14	0,16	0,14
Reducing Transportation Carbon Emissions	0,11	0,13	0,12	0,14	0,14	0,13	0,11	0,13	0,13
Preferring areas with high accessibility and served by environmentally friendly mixed transportation systems	0,14	0,13	0,14	0,14	0,13	0,16	0,14	0,11	0,14
development of urban ınfrastructure strategies for optimal public transport use	0,14	0,15	0,16	0,15	0,13	0,14	0,18	0,15	0,15
TOTAL	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**

ANNEX 23: Comparison matrix of criteria in economic development for DEU participants

Comparison Matrix		
ECONOMIC DEVELOPMENT	**Economic Development**	**Increasing Investment Profitability**
Economic Development	**1,00**	1,22
Increasing Investment Profitability	0,82	**1,00**
TOTAL	**1,82**	**2,22**

ANNEX 24: Normalized comparison matrix of criteria in economic development for DEU participants

Normalized Comparison Matrix			Eigenvector
ECONOMIC DEVELOPMENT	**Economic Development**	**Increasing Investment Profitability**	
Economic Development	0,55	0,55	0,55
Increasing Investment Profitability	0,45	0,45	0,45
TOTAL	**1**	**1**	**1**

ANNEX 25: Comparison matrix of criteria in social development for DEU participants

Comparison Matrix				
SOCIAL DEVELOPMENT	**Public Participation**	**Education**	**Inclusive Design**	**Enhancing Cultural and Heritage Identity**
Public Participation	**1,00**	0,58	0,66	0,87
Education	1,74	**1,00**	1,04	1,37
Inclusive Design	1,51	0,96	**1,00**	1,37
Enhancing Cultural and Heritage Identity	1,15	0,73	0,73	**1,00**
TOTAL	**5,40**	**3,27**	**3,43**	**4,61**

ANNEX 26: Normalized comparison matrix of criteria in social development for DEU participants

Normalized Comparison Matrix					Eigenvector
SOCIAL DEVELOPMENT	**Public Participation**	**Education**	**Inclusive Design**	**Enhancing Cultural and Heritage Identity**	
Public Participation	0,19	0,18	0,19	0,19	0,19
Education	0,32	0,31	0,30	0,30	0,31
Inclusive Design	0,28	0,29	0,29	0,30	0,29
Enhancing Cultural and Heritage Identity	0,21	0,22	0,21	0,22	0,22
TOTAL	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**

ANNEX 27: Comparison matrix of criteria in design and management for DEU participants

Comparison Matrix			
DESIGN AND MANAGEMENT	**Safety**	**Accessibility of Public Services**	**Reducing the Heat Island Effect**
Safety	**1,00**	1,00	1,22
Accessibility of Public Services	1,00	**1,00**	1,10
Reducing the Heat Island Effect	0,82	0,91	**1,00**
TOTAL	**2,82**	**2,91**	**3,32**

ANNEX 28: Normalized comparison matrix of criteria in design and management for DEU participants

Normalized Comparison Matrix				Eigenvector
DESIGN AND MANAGEMENT	**Safety**	**Accessibility of Public Services**	**Reducing The Urban Heat Island Effect**	
Safety	0,35	0,34	0,37	0,36
Accessibility of Public Services	0,35	0,34	0,33	0,34
Reducing The Urban Heat Island Effect	0,29	0,31	0,30	0,30
TOTAL	**1,00**	**1,00**	**1,00**	**1,00**

ANNEX 29: Comparison matrix of criteria in resources and energy for DEU participants

Comparison Matrix										
RESOURCES AND ENERGY	**Waste Management During Construction**	**Waste Management in Use Phase**	**Renewable Energy**	**Energy Efficiency**	**Green Infrastructure**	**Sustainable Buildings**	**Local Material Use**	**Sustainable Material Use**	**Certified Material Use**	**Economic Material Use**
Waste Management During Construction	**1,00**	0,91	0,64	0,51	0,77	0,70	0,91	0,64	0,94	0,91
Waste Management in Use Phase	1,10	**1,00**	0,61	0,61	0,61	0,74	0,79	0,67	0,82	0,96
Renewable Energy	1,57	1,64	**1,00**	0,82	1,10	1,10	1,29	1,10	1,57	1,84
Energy Efficiency	1,95	1,64	1,22	**1,00**	1,06	1,06	1,17	1,29	1,51	1,95
Green Infrastructure	1,29	1,64	0,91	0,94	**1,00**	1,10	1,29	0,82	1,35	1,43
Sustainable Buildings	1,43	1,35	0,91	0,94	0,91	**1,00**	1,37	1,00	1,22	1,57
Local Material Use	1,10	1,27	0,77	0,85	0,77	0,73	**1,00**	0,89	1,22	1,22
Sustainable Material Use	1,57	1,49	0,91	0,77	1,22	1,00	1,12	**1,00**	1,51	1,84
Certified Material Use	1,06	1,22	0,64	0,66	0,74	0,82	0,82	0,66	**1,00**	1,29
Economic Material Use	1,10	1,04	0,54	0,51	0,70	0,64	0,54	0,54	0,77	**1,00**
TOTAL	**13,19**	**13,19**	**8,13**	**7,63**	**8,89**	**8,90**	**10,30**	**8,62**	**11,92**	**14,01**

ANNEX 30: Normalized comparison matrix of criteria in resources and energy for DEU participants

Normalized Comparison Matrix											Eigenvector
RESOURCES AND ENERGY	**Waste Management During Construction**	**Waste Management in Use Phase**	**Renewable Energy**	**Energy Efficiency**	**Green Infrastructure**	**Sustainable Buildings**	**Use of Local Materials**	**Use of Sustainable Materials**	**Use of Certified Materials**	**Economic Material Use**	
Waste Management During Construction	0,08	0,07	0,08	0,07	0,09	0,08	0,09	0,07	0,08	0,06	0,08
Waste Management in Use Phase	0,08	0,08	0,07	0,08	0,07	0,08	0,08	0,08	0,07	0,07	0,08
Renewable Energy	0,12	0,12	0,12	0,11	0,12	0,12	0,13	0,13	0,13	0,13	0,12
Energy Efficiency	0,15	0,12	0,15	0,13	0,12	0,12	0,11	0,15	0,13	0,14	0,13
Green Infrastructure	0,10	0,12	0,11	0,12	0,11	0,12	0,13	0,10	0,11	0,10	0,11
Sustainable Buildings	0,11	0,10	0,11	0,12	0,10	0,11	0,13	0,12	0,10	0,11	0,11
Use of Local Materials	0,08	0,10	0,10	0,11	0,09	0,08	0,10	0,10	0,10	0,09	0,09
Use of Sustainable Materials	0,12	0,11	0,11	0,10	0,14	0,11	0,11	0,12	0,13	0,13	0,12
Use of Certified Materials	0,08	0,09	0,08	0,09	0,08	0,09	0,08	0,08	0,08	0,09	0,08
Economic Material Use	0,08	0,08	0,07	0,07	0,08	0,07	0,05	0,06	0,06	0,07	0,07
TOTAL	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**