






Investigation of Environmental Sustainability Awareness in the Urban Furniture Design Processes in the Marmara Region

Marmara Bölgesi'ndeki Kent Mobilyası Tasarım Süreçlerinde Çevresel Sürdürülebilirlik Farkındalığının İncelenmesi

Melis Karaca Sert¹ , Yener Altıparmakogulları² , Aysem Gulin Basar³ 

Öz

Bu çalışmada, sürdürülebilirlik kavramının ürün tasarımı ve sürdürülebilir tasarım yöntemleri üzerindeki etkilerinin kent mobilyaları odağında ortaya konulması amaçlanmıştır. Bu amaç doğrultusunda, kent mobilyalarının tasarım süreç ve yöntemlerine ilişkin yaklaşımlar, bu sektörde yer alan belediyeler, firmalar ve tasarımcılar gibi paydaşlar üzerinden tartışılmıştır. Bu sayede sektörün mevcut bakış açılarının belirlenmesi ve gelecek çalışmalara referans olabilecek bilgilerin ortaya çıkarılması hedeflenmiştir. Araştırma, Türkiye'nin Marmara bölgesindeki kent mobilyası üreticileri, tasarım grupları ve belediyeler kapsamında örtük bilgilerin ortaya çıkarılmasına yönelik yarı yapılandırılmış görüşmeler yoluyla gerçekleştirilmiştir. Bu araştırma sonucunda kent mobilyası sektörünün sürdürülebilir tasarım kavramına yaklaşımları tartışma ve değerlendirme yoluyla incelenmiş, çalışmaya kapsamındaki örneklem çerçevesinde çevresel sürdürülebilirlik bilincinin ekonomik ve sosyal sürdürülebilirlik bilincine göre daha düşük seviyede olduğu bulgulanmıştır. Sürdürülebilirlik farkındalığının ise tasarımcılar düzeyinde yüksek, üreticiler ve müşteri rolündeki yerel yönetimler düzeyinde ise değişken olduğu sonucuna ulaşılmıştır.

Anahtar Kelimeler: Sürdürülebilirlik, Sürdürülebilir Tasarım, Kent Mobilyası Tasarımı, Sürdürülebilir Kent Mobilyası

ABSTRACT

This study aims to reveal the effects of the concept of sustainability on product design and sustainable design methods through a focus on urban furniture. In line with this purpose, the approaches to the design processes and methods of urban furniture are discussed through stakeholders such as municipalities, companies, and designers involved in this industry. In this way, it is aimed to determine the current perspectives of the sector and to reveal information that can be a reference for future studies. The research was carried out through semi-structured interviews to reveal in-depth information within the scope of urban furniture manufacturers, design groups, and municipalities in the Marmara region of Turkey. As a result of this research, the approaches of the urban furniture sector to the concept of sustainable design have been examined through discussion and evaluation, and it has been found that environmental sustainability awareness is at a lower level than economic and social sustainability awareness within the framework of the sample included in the study. In addition, it was concluded that sustainability awareness is high at the level of designers and variable at the level of producers and local administrations.

Keywords: Sustainability, Sustainable Design, Urban Furniture Design, Sustainable Urban Furniture

¹ Yeditepe University, Department of Industrial Design, melis.karaca@yeditepe.edu.tr, <https://orcid.org/0000-0002-6744-7267>

² Corresponding Author: Mimar Sinan Fine Arts University, Department of Industrial Design, yener@msgsu.edu.tr, <https://orcid.org/0000-0002-8521-3093>

³ Yeditepe University, Department of Industrial Design, acakiroglu@yeditepe.edu.tr, <https://orcid.org/0000-0002-5073-2010>



INTRODUCTION:

In the studies carried out from past to present, it has been seen that developing technological factors, production and competition environment, and more subjective human needs (such as user experience and emotional expectations), have affected the environment ecologically due to the population growth and density, to meet human needs more quickly. Today, the world population faces significant problems caused by industrial and economic practices that dominated the last century due to rapid population growth. As it can be clearly understood, if world resources are consumed at the current rate and quantity, the chances of the next generation living a human and sustainable life may be reduced. According to the Scopus database, the word "sustainability" can only be found to have 255 of these studies done in 2020. Under the concept of sustainability, 17 goals were set by the United Nations (UN) Sustainable Development Goals (SDG) in 2015. In a world where poverty has increased, hunger has reached deadly dimensions, agricultural areas have lost their productivity, the impact of global climate change is severe, biological diversity has decreased, and desertification and deforestation activities cannot be stopped have become a global problem. The 17 goals set for these issues have become the solutions that are intended to be achieved by 2030, and the theme of the 2030 agenda seems to be based on leaving no one behind. In most definitions of the concept of "Sustainability", there are three dimensions. These are expressed as environmental, social and economic dimensions, as mentioned at the Social Development Summit in 2005 (World Summit, 2005). The results of recent research show that the "concentric sustainable community approach" has emerged in the field of sustainable design. In this model, economic, social and environmental sustainability dimensions are not just intersecting, but also overlapping. The economic dimension created by the social structure is an element of the social dimension. On the other hand, it is among the environmental elements that carry the society in the social dimension (Akgül, 2010). In other words, environmental sustainability includes social and economic sustainability created by society in terms of structures that include social systems. For this reason, environmental sustainability is now more prominent than economic and social sustainability (Özdemir, 2016).

Since urban furniture are public products for common use in daily life, they can be under a lot of environmental and usage-related effects. Due to these effects, the maintenance and replacement cycle may cause various design problems within the framework of sustainability. Along with these design problems, various design criteria such as functionality, ergonomics, aesthetics, form, material, color, texture and perceptibility should be taken into consideration. It is thought that this situation complicates the design process of urban furniture and may push the actors who play an active role in urban furniture design to a non-integrated tendency despite the holistic structure of the economic, social and environmental dimension of sustainability. In this context, urban furniture should be designed by taking into consideration the selection of environmentally friendly raw materials, durability, easy maintenance, labor saving, functional products, economic, recyclable, protection against vandalism and easy maintenance or replacement of parts in case of any damage (Kılıç and Sungurlu, 2021). Today, the industrial design profession has an important role in ensuring the social changes necessary for sustainable development, influencing cultural transformation and ensuring sustainability in the industry (Özdemir, 2016).

In this study, it is aimed to determine the current situation of urban furniture design processes within the framework of the environmental dimensions of the concept of sustainability and to reveal how the concept of sustainability is handled in these processes.

1. Environmental dimension of sustainability

Environmental sustainability can be defined as ensuring the ecological cycle for the future by protecting existing reserves and trying to minimize the negative effects of mankind on the environment (KTH Royal Institute of Technology, 2018). It is also defined as creating and maintaining conditions for the harmonious coexistence of humans and nature, and meeting the social, economic, and environmental needs of present and future generations (U.S. Department of Energy, 2020). Environmental sustainability is a fundamental and integral part of development. Therefore, shareholders, producers, designers, employees, and customers, i.e., society in general, are important stakeholders in the environment because of their commitment to the environment, and the activities of governments, businesses and consumers greatly affect the environment (Gedik, 2020). According to Moldan et al., to develop an operational environmental policy in the context of sustainable development, four interlinked strategic and fundamental principles of ecological sustainability can be listed as follows:

- Renewal (renewable resources will be utilized efficiently and this process will not exceed the natural rate of renewal)
- Substitutability (non-renewable resources will be utilized efficiently and their use will be limited to levels that can be offset by substitution with renewable resources or other forms of capital)
- Assimilation (cannot exceed the ambient assimilation capacity of hazardous or polluting substances)
- Irreversibility, i.e., avoiding irreversible processes (emphasizing recycling) (Moldan et al., 2012).

Recently, population growth, industrial development and damage to natural resources have started to be taken into consideration by governments. As a result, legal regulations and performance indices have been established at many different levels. The most important of these is EPI, the Environmental Performance Index.

EPI indicators provide an accurate way to identify problems, set targets, monitor trends, and identify best policy practices by understanding results. EPI also provides a powerful policy tool to support efforts to achieve the UN Sustainable Development Goals and move towards a sustainable future. The overall EPI ranking is based on indicators of how countries are responding to environmental challenges. EPI is a powerful policy tool to move towards a sustainable future (YCELP⁴, 2022). 2022 EPI, Environmental Performance Index category results show that the top five countries are Denmark, England, Finland, Malta and Sweden. The last five are Pakistan, Bangladesh, Vietnam, Myanmar and India. According to the 2012 data of the Environmental Performance Index, Turkey ranked 66th in 2012 and 99th in 2020. In 2022, it ranked 172nd and showed a radical decline in the 10 years (EPI, 2022).

It is an inevitable fact that sustainable approaches are needed to ensure the continuity of urban areas (Atabay et al. 2001, 41-48; Barboux, 2010; Gehl, 2010) in which urban furniture is also included and human beings play a role in their evolution. It is possible to say that reducing the amount of material used in the production of urban furniture, economically reducing the production cost and regulating the resources used from an environmental perspective are important in terms of environmental sustainability. The main purpose of environmentally friendly production is to increase

⁴ Yale Center for Environmental Law and Policy

resource efficiency without disturbing the natural balance, minimizing the impact of wastes on the environment and not using harmful chemicals (Şatır, 2015, p.5).

2. Sustainable Design and Urban Furniture

Urban furniture has an important role in improving the quality of urban spaces with the added value of representing the identity of the region where it is located (Spangenberg, 2013). One of the most important strategies for sustainable urban design is the sustainability of urban furniture (Rehan, 2013, p.175-176). According to Karslı and Öztürk (2019), sustainable design criteria have been added to the criteria of functionality, aesthetics, form, material, color, texture and perceptibility that urban furniture should have. Indicators of sustainable urban furniture design include energy and material use, natural environment, economy, applicability, social justice, social development, health and product life cycle (Karslı and Öztürk, 2019). The features of sustainable urban furniture can be summarized as follows:

- Fulfil the function of the product (Aksu, 2012)
- Preference for durable and easy-care natural materials and recyclable materials (Şatır, 2015; El Ghorab and Shalaby, 2016; Kılıç and Sungurlu, 2021)
- Utilisation of renewable energy sources in the production process and during use (Şatır, 2015; Allameh and E., Heidari, 2020)
- Extended product life due to easy maintenance (Şatır, 2005; Kılıç and Sungurlu, 2021)
- Universal product for user diversity (Akyol, 2006)
- Socio-cultural sustainability of the product by reflecting the identity of the city (Aksu, 1998; (Karslı and Öztürk, 2019)
- Emphasis on forms that are easily perceivable and aesthetically pleasing for users (Aksu, 1998; Akyol, 2006; Karslı and Öztürk, 2019)
- Awareness of producing environmentally sensitive urban furniture by applying sustainable design criteria (Allameh and E., Heidari, 2020; Kılıç and Sungurlu, 2021)

The most important of the above criteria is undoubtedly the creation of awareness of the concept of sustainability. This awareness should be addressed within the framework of the social and political scale as well as the formation of the designers who play the most active role in the process. Therefore, it is important to create this awareness in design education.

Studies on sustainability awareness can be seen at the vocational education stage. One of these is the subject of "Urban Furniture on the Basis of Sustainable Design" in the product design project work carried out with the participation of the willing students of the project groups as a 2009-2010 Summer School study at Istanbul Technical University- Department of Industrial Design, mentioned in Şatır's (2015) article. In the study, urban furniture has found value in different subject contents. Within the scope of the project, topics such as alternative energies, development of urban units as a precaution against air pollution or noise pollution, evaluation of human energy, programming of material time labour savings while designing, increasing the efficiency of the products and taking measures to ensure the interchangeability of deteriorated parts, facilitating assembly and disassembly were studied. Another study is the project study mentioned in Hergül's (2021) article. Within the scope of the project, students were informed about the concept of urban furniture, which architectural products will be considered as urban furniture and urban furniture requirements during the Urban Furniture Design II course period. In addition, the concept of sustainability, its components, sub-definitions and ensuring sustainability in design were emphasized. It was aimed that students internalize the concept of sustainability and reflect it to their projects. Sustainability of the material, low energy consumption during production, production, use and recycling of furniture it is emphasised to prioritize sustainability at all stages during the transformation cycle.

Although there are examples of sustainability awareness in the vocational education of design disciplines, it is a matter of curiosity to what extent this awareness are included in the design processes in the business environment.

3. Methodology

The scope of the study was determined from the perspectives of local administrations, companies, and product designers working in the urban furniture sector on the concept of sustainability. The qualitative research design was preferred following this purpose in the study where the aim of exploration was pursued (Johnson and Christensen, 2012). Qualitative research is "research in which qualitative data collection methods such as observation, interview and document analysis are used and a qualitative process is followed to reveal perceptions and events in a realistic and holistic way in a natural environment" (Yıldırım and Şimşek, 2008). In the research, the "interview" technique, which is one of the qualitative research techniques, was carried out by preparing a semi-structured interview form (DeMarrais 2004, 51-68; Merriam, 2013; Glesne, 2013). The interview is defined as "a social interaction in which questions prepared in advance within the subject are asked to the interview by the researcher in a certain systematic way and answers are obtained" (Rubin & Rubin, 1995). Darlington and Scott (2005) stated that the interview method could be used to explore situations such as perspectives, expectations, and thoughts.

3.1 Participant Profile

In this study, to examine the issue, interview studies were conducted with 2 municipalities, 3 companies and 6 actors involved in urban furniture design in the Marmara region of Turkey on sustainable urban furniture design and examination of the process in terms of environmental sustainability. At the beginning of the study, an interview study was planned with 3 municipalities, 3 companies and 3 designers, and then more actors were reached through the connection of people in the sector with each other and 11 actors involved in the process of urban furniture before it is positioned in public spaces were contacted. Although 5 local governments were reached in the study, the interview with the targeted 3 municipalities was limited to 2 municipalities due to the approval process of local governments. In the study, it was determined that the participants involved in the design of urban furniture in the study graduated not only from the discipline of industrial design but also from the fields such as landscape architect, interior architect and environmental engineer. On the local government side, it was determined that the units responsible for urban furniture are "The Directorate of Public Works" and "Directorate of Parks and Gardens".

4. Findings

In the first stage of this study, questions were asked to all participants about the determination of the need for urban furniture, the design process and the criteria affecting the design process. In this process, who is the decision maker involved in the implementation and outcome phase was examined. Afterwards, questions were asked about the main theme of the study, "the concept of sustainability". These questions consist of different question types as municipalities, companies, and designers. However, as a result, it has the same meaning, and it is aimed to examine the awareness and tendencies toward sustainable design.

4.1 Interview findings in terms of local governments (municipalities)

In the first stage of the study, the journey of urban furniture from the state of need to the design process was analyzed. First of all, when the issue is addressed through the local administration that

determines the state of need, it is determined that the units dealing with urban furniture are "Directorate of Parks and Gardens" and "The Directorate of Public Works". In one of the municipalities interviewed under these directorates, actors who did not receive any design education were the decision makers, while in another, it was seen that a process that was carried out and decided in the department established under the directorate such as "Design and Innovation Chief and Urban Equipment Chief" was implemented. The urban furniture process varies; it is determined that it is both selected and decided through ready-made products and carried out by the carpentry workshops or design team within the administrations. However, this situation varies within the interviewed A and B municipalities. In one of them, the determinants were senior managers who did not receive design education, while in the other; it was observed that the design team was the decision-maker determining the model and form of the urban furniture in the presence of senior managers. In tender processes, it is stated that they generally carry out projects jointly with the companies they are affiliated with to save time. For example, it was determined that joint studies were carried out with the company for the development of a project designed within the scope of local government.

Urban furniture needs and criteria vary according to the location.

"Needs are determined according to the location and the socio-economic environment. For example, if the sitting action is more dominant in the X region, the need for benches is more dominant, while in the Y region, children's play equipment or limiters may be more prominent, to give a rough example. Or more innovative works may be required due to the visibility of the Z region" (Participant Municipality B, personal interview, 2022).

According to these statements, the socio-economic differences of the region where the design products are located are taken into consideration. The primary expectations of the local administration from the products are that they reflect the identity of the region or the city and meet the needs of the region. Another criterion is durability. Since vandalism of these products, which are open to common use, has become a major problem, more durable or easily maintainable products are demanded. Participant municipality B made the following statements:

"The fact that the products remain durable for a long time and are resistant to external factors and unexpected interventions provides economic sustainability, while the adoption of the equipment by the users provides social sustainability. Otherwise, products that wear out quickly and are not adopted easily become victims of vandalism and turn into items that pose a risk to users in the neighborhood".

Municipality A described the problem of vandalism in detail as follows:

"One of the biggest problems with the use of urban furniture in all municipal areas is vandalism. The manufactured products are damaged in a short time when they are placed in the areas where they will be used (for example, they are burnt, or broken, metal materials are stolen by scrap dealers and the product is used outside the service it provides). This happens every 1 to 3 months and the products are renewed in the maintenance and repair atelier."

Thus, it is aimed to provide a significant gain in terms of cost. When the local administrations were asked about their awareness of the concept of sustainability, a result as shown in Table 1 emerged.

Table 1: Approaches of the local administrations participating in the study to the questions on "sustainability concept".

	Urban furniture sustainability criteria in case of need	Future and currently planned studies in the field of sustainable urban furniture	Environmental dimension of sustainability	Economic dimension of sustainability	Social dimension of sustainability
A	-	-	-	+	+
B	+	+	+	+	+

As seen in Table 1, the concept of sustainability shows great differences between the 2 local governments. While Municipality A is under the management of a more rural area, Municipality B is under the management of a more developed and urban area. It was determined that Municipality A did not have information about the definition of the "sustainability concept" during the interviews. After the subject was analyzed, it was seen that the focus was on reinforcement elements where people can spend a more comfortable time in open spaces and meet their needs without disturbing the texture of the region, they live in. This shows the social dimension of sustainability. It was stated that the equipment elements they positioned were damaged in a short time and that they were constantly in need of maintenance or replacement. It was stated that vandalism is frequently experienced between 1 and 3 months and this situation has a great economic impact. As a result of this, it has been determined that they prioritize the durability of the product and the ability to repair the product by replacing parts instead of replacing the whole product when the product is damaged. It is concluded that extending the product life points to the economic dimension of sustainability on the grounds that it is beneficial in terms of cost.

In case municipality B needs urban furniture, it is also taken into consideration that it is sustainable within the criteria determined. At the same time, it is argued that three dimensions of sustainability should be considered. When the subject was evaluated, it was determined that they adhered to the economic and social dimension of sustainability with the criteria of the products being durable and durable for a long time, the users' adoption of the reinforcement elements and the easy perception of its function. It is concluded that they are aware that the correct use of the material will contribute to sustainability. As can be seen in Table 1, it has been determined that studies have been carried out on the re-evaluation of the existing out-of-use reinforcement elements to make urban furniture sustainable.

As a result, the efforts to contribute to sustainability differ between Region B, which has a large population, and Region A, which has a smaller population. While responding to the needs of overpopulation, Region B aimed to minimize the damage in all areas by considering the environmental, economic, and social dimensions of sustainability as a whole. Region A, while responding to more needs, focused on economic sustainability by looking for ways to eliminate the damage to urban furniture (Table 2)

Table 2: Approaches of the local administrations.

Local Governments (Municipalities)		
Design criteria and question contents obtained from the literature	A	B
Utilisation of renewable energy sources in the production process and during use (Şatır, 2015; Allameh and E., Heidari, 2020)		<i>"They consider renewable energy sources in their own and ready-made products in their urban furniture demands. Related studies are being carried out."</i>
Preference for durable and easy-care natural materials and recyclable materials (Şatır, 2015; El Ghorab and Shalaby, 2016; Kılıç and Sungurlu, 2021)	<i>"One of the biggest problems with the use of urban furniture in all regions is the problem of vandalism. For example; they are burnt, broken, metal materials are stolen and the product is used outside the service it provides. In order to extend the life of the product against these problems, we are looking for solutions within ourselves and we pay attention to this as a priority in the furniture to be purchased from outside."</i>	They take care that urban furniture is durable and easy to maintain. Thus, they argue that the sustainability of the material contributes both economically and environmentally.
Socio-cultural sustainability of the product by reflecting the identity of the city (Aksu, 1998; (Karslı and Öztürk, 2019)	While durability and longevity come first among the criteria, aesthetic concerns and suitability to the urban identity come second. They pay attention to the fact that the product is special to the region where it will be located and that it is suitable for the culture of the region. They emphasise that it should be "different" and "special" many times during decision making. However, since they attach importance to cost, they make choices over ready-made products.	<i>"Needs are determined by location and socio-economic environment."</i>
Emphasis on forms that are easily perceivable and aesthetically pleasing for users (Aksu, 1998; Akyol, 2006; Karslı and Öztürk, 2019)	Despite the fact that vandalism is seen intensely due to the region where the municipality is located, they take care to respond to the function with easily perceptible and simple solutions. Considering these situations, there is an aesthetic concern.	Public spaces and the urban furniture it contains are common use areas of people. For this reason, they argue that it should have a perceptible and aesthetic appearance that fulfils its function regardless of people. They even carry out studies considering that products that are quickly worn out and not adopted by the user are subjected to vandalism and can turn into products that may pose a risk to the user.
Awareness of producing environmentally sensitive urban furniture by applying sustainable design criteria (Allameh and E., Heidari, 2020; Kılıç and Sungurlu, 2021)		<i>"Environmental sustainability in urban furniture design is an important element especially for the efficient use of materials and provides advantages in various fields."</i>

4.2 Interview Findings In Terms Of Companies

The processes and sustainability approaches of urban furniture manufacturing companies, which are directly linked to municipalities, in this field have been analyzed. In this section, three companies in the Marmara region were interviewed.

When the production processes of urban furniture were analyzed, a common conclusion was reached in 3 interviewed companies. It is the customer, i.e., municipalities, who primarily determine the criteria of the reinforcement element to be designed. Although the tender method is applied, it has been determined that the municipalities generally reach the companies in the process and the general criteria are determined according to the need and cost-oriented progress is made.

Table 3: Approaches of the companies participating in the study to the questions on "sustainability concept".

	Studies on sustainable design	Training, seminars, orientations, etc. to inform employees about the concept of sustainability	Sustainable design criteria applications for urban furniture to be sustainable	Environmental dimension of sustainability	Economic dimension of sustainability	Social dimension of sustainability
A	+	-	-	-	+	-
B	+	+	+	+	+	+
C	+	+	+	+	+	+

In the next stage, it is stated that the municipalities primarily demand that the products reflect the city identity and be specific to that region and that they focus on being resistant to vandalism and climate conditions. From time to time, it was determined that they directly stated similar design

demands through an example. The decision maker of the product within the company varies according to the structure of the interviewed companies. For example, in one company, the actors at the head of the design team decide on these reinforcement elements, which are a design product, while in another company, it is stated that the final decision is made by the boss. However, when the issue is considered as a whole, it is determined that the main decision-maker is the customer, i.e., the municipalities. While it was stated that the authorities in the municipalities often come without criteria and are not design-oriented, it was stated that the municipalities respond to the cost and aesthetic concerns and support the design criteria that should be more freely. When the concept of sustainability was analyzed in terms of companies, the results in Table 3 were reached.

As stated in the literature review part of the study, the studies carried out to minimize the environmental, economic, and social degradation of sustainability of the 17 development goals targeted in 2030 are of close interest to companies and offer solutions for linking their strategies with global priorities. Former Secretary of the United Nations Ban Ki-moon explained the situation as follows;

"Business is a vital partner in achieving Sustainable Development Goals. Companies can contribute through their core activities, and we ask companies everywhere to assess their impact, set ambitious goals and communicate transparently about the results. (GRI, 2022).

As can be seen in Table 2, during the interviews with the companies it has been determined that there are efforts and some studies in terms of sustainability. In this regard, it is also seen that activities such as seminars, training, orientations, etc. are included to be informed about sustainable design and its requirements on a company basis. While B and C companies integrate sustainable design criteria into the urban furniture design process, it has been determined that A company is more customer-oriented and focuses on recycling and use of surplus material or existing out-of-use products with economic thinking.

It has been determined that the criteria considered for the designs to be sustainable are generally durability, reflecting the city identity and design works that utilize alternative energy sources in line with the customer's demand. It was stated that the municipality experienced difficulties in the decision-making process since the designs planned by utilizing alternative energy sources increase the costs. On the other hand, it is also stated that some municipalities are knowledgeable about this issue and specifically demand these technologies to contribute to the environment in their region and to provide future benefits.

As a result, in line with the interview study, it is concluded that while the economic dimension of sustainability is generally seen more intensely in these 3 companies, there are efforts in environmental and social terms (Table 4).

Table 4: Approaches of the companies.

Design criteria and question contents obtained from the literature	Companies		
	A	B	C
Utilisation of renewable energy sources in the production process and during use (Şatır, 2015; Allameh and E., Heidari, 2020)		"Among the products we design, we have products that utilise solar energy, but since this increases the cost, we offer the customer a choice"	They are working on integrating solutions that utilise renewable energy systems into their projects.
Preference for durable and easy-care natural materials and recyclable materials (Şatır, 2015; El Ghorab and Shalaby, 2016; Kılıç and Sungurlu, 2021)	"Since vandalism has become a major problem in urban furniture used in public spaces, the primary criterion required from us is that the product should be durable and easy to maintain, have a long service life and thus become economical."	Since they are products that have common use in public areas, they pay attention to their durability and easy maintenance. Especially in the designs prepared for catalogues, they continue to work on the right material selection, ensuring durability, low cost but at the same time minimising ecological damage.	In line with the requests received to extend the life of the product, they are working to ensure durability and easy maintenance of the product. "We take into consideration criteria such as being resistant to vandalism and weather conditions, contributing to the identity of the city. In addition, we carry out studies on materials to ensure the criteria of sustainability. In all the works we carry out, we support the environment through waste management and avoid overuse of the material."
Socio-cultural sustainability of the product by reflecting the identity of the city (Aksu, 1998; Karslı and Öztürk, 2019)	Among the prioritised demands of the customers in general, reflecting the city identity is also included and they make designs by paying attention to this.	They make designs in accordance with the identity of the city in line with the demand from the customer. In their designs for catalogues, they generally work for function.	"We shape our works according to the identity of the city as well as the identity of the region where the product will be positioned. For example, by using the theme of education at the stops in the school areas we have built, we aimed to create the perception that passing drivers should obey the traffic rules and pass by reducing the speed."
Emphasis on forms that are easily perceivable and aesthetically pleasing for users (Aksu, 1998; Akyol, 2006; Karslı and Öztürk, 2019)	Since aesthetic concerns are predominant in line with the demand from the customer, they work by paying attention to this in their designs.	They argue that by increasing the welfare of people, the product-human relationship should be established in the right way and that people in every situation should be able to adapt to the environment in some way, so that urban furniture can respond to the service more accurately.	According to the example of the stops designed for the school area, they continue to work by considering criteria such as easy perception and aesthetics of the products they make.
Awareness of producing environmentally sensitive urban furniture by applying sustainable design criteria (Allameh and E., Heidari, 2020; Kılıç and Sungurlu, 2021)	They want to make environmentally sensitive products. However, since they are mostly costly solutions, they pay attention that their priority criteria are economic. Because customers mostly demand low-cost but functional and aesthetic products.	It argues that environmentally sensitive products can be produced when social sustainability, economic sustainability and environmental sustainability are applied as a whole in the urban furniture design process.	They are trying to produce environmentally sensitive products in line with economic limits.

4.3 Interview Findings For Designers

As a result of the interviews with the designers, who are the main actors in the design process of urban furniture, the urban furniture design process was primarily analyzed. In general, it is stated that the priority in this process is to respond to the customer's request. In this case, the first focal point of the customer was stated as reflecting the city's identity, being durable and being economic solutions. It is also stated that demands such as "let it be flashy, let it be different, let it be special for us" are frequently encountered. It was mentioned that while the department manager or department manager makes decisions at the design stage and at the application stage before the product is delivered to the customer, the main decision maker is the customer and whatever the customer says is what happens. In general terms, they stated that they work in accordance with general design principles since they are people with design knowledge and training.

Table 5: Approaches of the designers participating in the study to the questions on the "concept of sustainability"

	Being informed about sustainable design during education	Training, seminars, etc. on the concept of sustainability within the company	Sustainable design criteria applications in urban furniture design process	Environmental dimension of sustainability	Economic dimension of sustainability	Social dimension of sustainability	Contributing with suggestions in the design process for more environmentally friendly urban furniture within the company
A	+	-	-	-	+	-	-
B	+	-	-	-	+	+	+
C	+	+	-	+	+	-	+
D	+	-	-	-	+	+	+
E	-	-	+	-	+	+	_{+}
F	+	+	+	+	+	+	+

While it is seen in Table 5 that 6 designers in the design team were informed about the concept of sustainability and sustainable design in their education life, 4 people stated that there were no activities such as trainings or seminars in order to renew and improve the knowledge of their employees about the concept of sustainability in the companies they worked in. 2 designers stated that although the concept of sustainability is given importance in their companies, they do not participate in activities such as training, seminars and orientation etc. During the design process, it was determined that to respond to the customer's demand, demand-oriented designs such as "being durable and reflecting the city identity" were made. In line with these demands, criteria such as function, material, form, aesthetics, and ergonomics are also shaped. However, since the awareness of the importance of sustainable design is high, it was also determined that they generally make suggestions within the company and to the customer. In line with the interview study, it was stated that even though they are aware of the requirements of sustainability, they are mostly limited to the economic dimension of sustainability, as studies and practices are carried out in line with the needs and demands of the customer.

4.4 According To the Interview Findings, 3 Dimensions Of Sustainability

When the environmental dimension of sustainability in the sustainable urban furniture design process, which is the subject of the research, is analyzed according to these interview studies conducted with 11 actors, as seen in Figure 1, it is seen that the environmental dimension is less considered due to cost-increasing reasons.

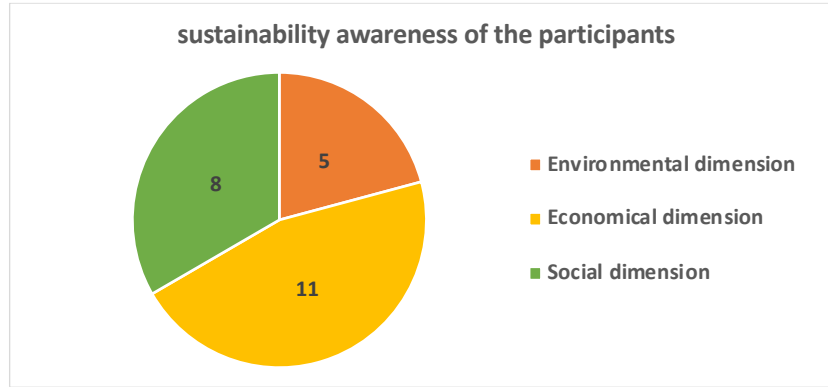


Figure 1: Pie chart representation of the outputs of the 3 dimensions of sustainability according to the interviews conducted

In this context, since there is an economic concern in the process from the determination of the need for reinforcement elements to their production, it is observed that 11 participants are oriented toward the economic dimension of sustainability according to the data obtained from 11 participants. At the same time, since these elements serve common use in public spaces, it is also seen that the social dimension of sustainability is important according to the answers of eight participants.

According to the outputs of the study, when municipalities, companies and designers are considered in the urban furniture design process, it has been determined that the economic dimension of sustainability is given importance by providing durability in these design products, which are frequently vandalized, and by choosing the material accordingly and using it correctly. Social sustainability was the second most important aspect of sustainability, with emphasis on criteria such as reflecting the urban identity, easy perception, and fulfilment of its function. The environmental dimension comes last due to less emphasis on recycling materials, waste management, not using more than necessary and utilizing alternative renewable energy sources.

At the end of the interviews, it has become possible to say that municipalities are the primary actors determining these criteria. Firms and designers carry out studies that respond to the needs of municipalities. As seen in Figure 2, municipalities, companies, and designers are directly and indirectly connected to each other.

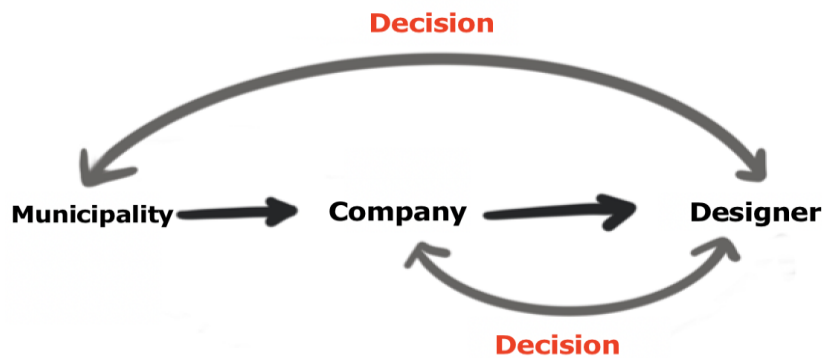


Figure 2: Demonstration of the relationship between the municipality, firms and designers.

First of all, municipalities, which are the decision-makers, should be more aware of this issue, urban furniture should be sustainable, and a budget should be allocated for these products, which are generally located outdoors, to contribute to the environment by minimizing their damage to the environment. Municipalities directly affect companies and indirectly affect designers. Since designers are already aware of all dimensions of sustainability, if the approach to implementing sustainable design criteria by municipalities changes, it may be possible to perceive and implement the three dimensions of sustainability with more equal importance.

5. Discussion

The concept of livability, which constitutes the relationship between the society living in cities and the urban environment, is one of the primary objectives of local governments. Local governments, which are the primary decision-makers in developments related to public spaces, must make decisions that will lead to solutions that will be used efficiently and effectively so that people living in cities can live in more prosperous places and access urban services more easily and quickly (Sezik, 2019). In the urban furniture used in public spaces, municipalities are the primary decision-makers from the determination of the need, criteria, and location up to the design stage. Accordingly, local governments are the primary actors that determine the integration of sustainable design criteria in urban furniture from the design to the implementation phase. In the study, it was generally stated that the material selection of the demanded product should be durable by planning to remain robust for a long time against external factors and unexpected interventions. While the economic dimension is provided by extending the life of the products, it is possible to state that the social dimension is provided with designs that can be adopted by the user. At the same time, it was emphasized that there are studies on the re-evaluation of reinforcement elements that have been out of current use and that attention is paid to the efficient use of materials. Regarding the utilization of renewable energy sources, in the interviews with the developed urban region municipality, it was stated that they have products designed and produced by utilizing alternative energy sources and that they will make improvements in this regard. Extending the life of products with durability and easy maintenance, 2 participating municipalities stated that they pay particular attention to this issue and that it is a priority criterion in the criteria of the requested products.

It is seen that the urban furniture production sector in Turkey is concentrated in the Marmara region according to the urbanization rate and has the production capacity and development level to meet the country's demand (Dilik and Gürsoy, 2017). The impact of global efforts to minimize environmental damage is also reflected in urban furniture production. There is an increasing interest in preferring wood, which is a natural material and ensuring durability by evaluating wood according to its types (Dilik and Gürsoy, 2017). While it is the municipalities that primarily determine the design process of urban furniture, the active role in the production process is on the companies, indirectly related to the designer working within the company.

Company A, which provides services both at the national and international levels, designs and manufactures urban furniture made of concrete. While it was determined that this company did not have information on "sustainable design", when the subject was examined, it was answered that the concrete material left as a result of out-of-use products or improper production is utilized in different ways. At the same time, it was explained that waste glass is crushed and mixed with concrete

material and used in the production of the product. As a result, while it was concluded that this criterion was not applied according to the customer's demand, it was determined that the company applied it with a focus on cost reduction within the company.

Company B is a company that works both in line with customer demand and by creating ready-made catalogues. Especially in the designs prepared for catalogues, it was answered that it can contribute to the issue of minimizing ecological destruction by ensuring durability with the right material selection at the same time with low cost. While explaining that it is possible to plan the design process of urban furniture from recycled materials and that durability can still be ensured, it was stated that the customer does not demand it because it is a costly solution. It was explained that they include these solutions as options in the urban furniture design catalogue and that the customer can choose according to their own criteria and budget.

Participant C made the following statements:

"Through waste management, we provide ecological support, and through optimal material utilization, we avoid overuse of materials and transfer this to production (Participant C, personal interview, 2022)"

According to these statements, it has been determined that ecological and economic solutions are applied. Two out of three companies responded positively about the utilization of renewable energy sources in the production process and during use. In urban furniture designs, two participant companies stated that they use alternative energy sources upon customer demand.

It is important for sustainability to extend the life of the product due to its durability and easy maintenance. In this regard, it is seen that vandalism has become a major problem in the use of urban furniture. Three participant companies stated that they take into consideration every stage of the design to be resistant to vandalism and easy maintenance.

Urban furniture must provide integrity with the region they are defined in terms of the socio-cultural, socio-economic, and physical environment. To ensure this integrity, reflecting the urban identity of urban furniture is one of the important criteria. Reflecting urban identity in urban furniture is an important criterion for municipalities. The interviewed companies also explained that this criterion is a particularly important criterion for the customer. According to the common answer of 3 participant companies, it is concluded that this criterion is important in the design process and is especially included in the design.

As with all other products in urban furniture design, 80% of the environmental impacts are foreseen at the design stage in the process from function, form and material selection to production practices, marketing and waste management (Marmara Belediyeler Birliği, 2020). The primary determinant of the criteria in urban furniture is the companies that form the link between the municipalities and the designer. Companies and designers have stated that they are working to integrate the applications of the criteria of functionality, durability, correct use of materials and sustainability into the design of the requested urban furniture in ways that can meet the criteria determined by the customer. Regarding the utilization of renewable energies during the use or production process in the urban furniture design process, only two out of six participants stated that there are applications and suggestions for alternative energy, while the other four explained that municipalities and then companies do not prefer it because it is cost-increasing solutions. This situation leads to the fact that

designers cannot use the knowledge they have acquired due to cost-oriented limitations, despite the project studies on the concept of sustainability in the educational stages mentioned in the articles of Şatır (2015) and Hergül (2021) and the fact that designers state that they are familiar with the concept of sustainability in their university life. This finding shows that the information given in the educational stages and the activities in the business environment do not overlap. Considering that Turkey's Environmental Performance Index declined 106 places from 2012 to 2022, it is possible to say that effective strategies are needed in terms of environmental sustainability in urban furniture design and implementation processes. With the Delphi method applied by Feil et al. (2015) in the furniture sector, it has been suggested that 3 dimensions of sustainability can be evaluated quickly. In the production process of urban furniture, the existing situation and the aspects that need to be developed can be determined by considering such rapid evaluations within the framework of local administrations. In this way; within the framework of the global call for sustainability, designers can apply the knowledge they have acquired during the training phase in the real design process.

CONCLUSION:

Sustainability is the phenomenon of planning the future in an ecological, sociological and economic context to maintain the same quality of life and welfare of society. Considering that the phenomenon of sustainability directly affects people's lives, it is inevitable that the products, services and spaces used in daily life should be designed within the framework of this phenomenon. The general focus of the research is to examine the urban furniture design process in terms of environmental sustainability and to examine the approaches of the actors in this field on sustainable urban furniture. Considering all the criteria for the production of environmentally friendly urban furniture, it has been determined that the customer acts cost-oriented in terms of implementation and the designer works following the customer's demand. Therefore, it was observed that the applications remained on a limited scale. It has been concluded that for the reinforcement elements to be environmentally friendly, the design phase generally focuses on material selection and is implemented considering the cost. Even though they work in accordance with the demand, it is seen that they try to contribute due to good intentions by offering environmentally sensitive solutions. As a result, when the sustainable design criteria in urban furniture are examined by the designers, it is concluded that they are generally informed about the concept of sustainability in their education life, but they can apply it in a limited way to respond to the demands of customers in their business life. Considering that the decision-making authority is local governments, it is possible to say that sustainability practices should be addressed within the legal framework rather than initiative.

Compliance with Ethical Standard

Conflict of Interests: There is no conflict of interest between the authors or any third party individuals or institutions.

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