



## **EFFECT OF PACKAGING DESIGN AND DESIGNER ON SUSTAINABLE DEVELOPMENT**

Merve ATMACA<sup>1</sup>

Alper ÇALGÜNER<sup>2</sup>

<sup>1</sup> Gazi University, Faculty of Architecture, Department of Industrial Design, Graduate Student, Ankara, Turkey

<sup>2</sup> Gazi University, Faculty of Architecture, Department of Industrial Design, Ankara, Turkey

### **Article Info**

Received: 10/04/2018  
Accepted: 15/12/2018

### **Keywords**

Packaging design,  
Sustainability, Sustainable  
Development

### **Abstract**

The uncontrolled use and consumption of resources in the process of urbanization and industrialization lead to environmental problems, while the differences between groups of people in urban areas cause social and economic negative consequences in terms of utilization of urban resources. For these reasons, sustainability can be regarded as a design problem. In the light of this design problem, it is aimed to discuss that the place of sustainability in new design concept and relations with designer. Study will start with the definition of the concept of sustainability and will continue with the change in packaging design and the relationship established with sustainability in the historical process, and it will end with a discussion of approaches that designers can contribute to sustainable development..

## **1. INTRODUCTION**

“Ecological design is the art and science by which we would remake the human presence on Earth” [1].

David ORR

Environmental issues such as global warming and energy consumption create an important and critical change in the modern world. Because of this change, the concept of "sustainability" is manifested in many areas including engineering, production and design.

Recognition of the relationship between production operations and the natural environment in these areas is an important factor in deciding among industrial societies. If we look at the producers and designers who play a role in the production channel, we can see that they are increasingly concerned about sustainability issues due to problems such as the rapid depletion of resources and the lack of raw materials [2].

When the sustainability word, which balances the relationship between the universe and person, is examined; it seems to be a concept defined in a wide range of different perspectives and expertise and having different meanings for different people.

From a conceptual point of view, sustainability is related to the preservation and improvement of natural systems that enable the existence of life in the world [3]; from a scientific standpoint, there are many definitions related to this concept.

The first important scientific definition for this concept was found in 1972 by the scientists in the Club of Rome group at the Massachusetts Institute of Technology in the "Limits to Growth" report. For the assumed global equilibrium, authors use the term sustainable. In the Brundtland Report prepared by the United Nations World Commission on Environment and Development (UNCED) in 1987, there is a statement regarding sustainability issues: "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs" [4].

After the announcement by UNCED, many definitions of sustainability are being made. In line with these definitions; questions about sustainability are being examined and evaluated by many institutions.

In order to achieve sustainable development, resources that are consumed by the individual need to be balanced by the resources available in the world, but this balance is shaken by the rapid population growth in the world. It can be seen that the concept of sustainability can be implemented and development can be possible if the problematic is solved.

## **2. Change of the Definition of Packaging Design in the Historical Process and Its Effect on Sustainability**

Packaging is perceived by people as waste, and is thought to pose a risk to the environment and the vital life. This perception can be reversed and the product packaging can accommodate the concept of sustainability [5]. In order to understand the importance of packaging in a sustainable society, it will be useful to first focus on product-oriented packaging definitions and related theories.

According to the Turkish Language Association (TDK) (2017), the packaging "is made of cardboard, paper, wood, plastic, material ". The word comes from French to our language and is used as 'emballage' [6]. Packaging is defined as a container for keeping products inside and protecting them during distribution and sale, but today it is more than a container and improved than ever [7].

Packaging, which has an important role in sustainable development, can be said to protect many products and is produced too much for it. At this point, it is important for sustainable development to consider situations such as low use of materials, recyclability, and rapid disappearance in nature, in the production and consumption of a commonly used product.

Packaging, which plays an important role for sustainable development, should not multiply the burden of circulation within the life cycle. Natural resource consumption, the recycling of materials at the top, waste and emissions, and the health and safety risks to the individual and the ecosystem must be minimized [8; 9]. In parallel with this idea, the Japan Packaging Institute, one of the first organizations to incorporate the concept of sustainability into the definition of packaging design, expressed the basic idea in the proposal "Realization of Packaging to a Sustainable Society" published in 2000 as; the desire to build a sustainable society is common wish of humanity. For the creation of such a society, producers, consumers and everyone who is interested in packaging should work. Therefore, every individual in the packaging sector must understand the importance of the packaging and think about the packaging that influences the community [10].

Taking everything into account, according to the Japan Packaging Institute, packaging must be inspected and adapted to meet the following criteria:

- Designed to reduce most of the burden on the environment,
- Designed in accordance with the consumer,
- Carry out the necessary functions such as the protection and logistics of the products,
- For the products to be packed, the material quality and volume should be exceeded,

- Total costs, including environmental costs and welfare costs, should be kept to a minimum,

Many other organizations, including the Sustainable Packaging Alliance (SPA) in Australia and the Sustainable Packaging Coalition (SPC) in the United States, are trying to define sustainable packaging by creating policies or strategies that can guide decision making [11].

SPA was founded in 2002 by Victoria University of Technology in Australia. Packaging and Polymer Research Unit aims to continuously improve with the strategies developed for the packaging industry, it aimed to increase the sustainability of the packaging product. through RMIT University through its Center for Design and Birubi Innovation Pty Ltd [11]. This association has four criteria defining sustainable packaging [12]:

**Effective:** While acting in the supply chain, effectively protecting the products and assisting conscious and responsible consumption, collecting adds real value.

**Efficient:** Packaging systems design materials and energy to be as efficient as possible throughout the life of the product, and involve material and energy efficiency in interactions with storage, handling and support systems.

**Cyclic:** Packaging materials are constantly converted into natural and technical systems by the reduction of the material and the development of the additive material.

**Clean:** Packaging components do not pose a risk to human health and the ecosystem. In case of doubt, the precautionary principle is applied.



**Fig 1 SPA's four measures of sustainable design [11]**

Another organization that defines sustainability is the SPC. Unlike SPA, the Sustainable Packaging Coalition (SPC) in the United States is a membership-based organization. Many of the small and medium-sized companies as well as many multinational companies such as McDonald's, Coca Cola, Huhtamaki, Unilever, Kraft Foods and Johnson & Johnson are members of this organization [11]. In 2005, the SPC produced its own sustainable packaging definition of eight items [13] to 'ensure that all parties work in the same direction':

- During the product life cycle, people using the product should be safe and healthy for the entire community.
- It should meet market needs in terms of performance and price.
- Uses renewable energy in production, logistics and transformability.
- The maximum amount of recycled material is used.
- To environment the respectful production methods and practices are chosen.

- The material used during the life cycle is in a healthy state.
- Physically designed to balance the use of materials and energy.
- Includes reusability and healing properties it must have an industrial cradle-to-cradle cycle.

As seen in the texts of Lewis et al., SPA and SPC form the framework of the definition of this concept by providing criteria for sustainable packaging designs. Packaging designs, where all of the sustainability criteria exist, shape the future and include the activities of the sustainable packaging organization in the areas of 'innovation', 'optimal fit' and 'transformation'.

Apart from organizations like JPI, SPA and SPC, many organizations continue to work on the issue of sustainability and keep going to purpose a sustainable society. Some of the designers, either inside or outside these organizations, make the products they design for this purpose taking into account the criteria of sustainability.

### **3. Relation of Design and Designer with Sustainable Development**

The understanding of environmentally sensitive designs, or in other words, the birth of the need for environmentally sensitive designs, is a consequence of the emergence of post-industrial environmental problems and their reflection in the professional design. Sustainable Development has, as mentioned in previous chapters, directly influenced the design profession as well as all other professions despite the fact that today's truths and mistakes remain uncertain.

The concept of sustainability is often addressed in the fields of business management and communication sciences. In these areas, environmental management is handled from a viewpoint of a social scientist. But the influence of design science on this concept is also great. This section discusses the duties of the design and the designer in sustainability domain.

Through design that plays a central role in shaping a sustainable civilization [14], we can solve the problems we face. Because there is a designer throughout the life cycle of a space or an object, and its share is great at the point of decision making. The designer who plays a role in the sustainable environment has different task foci for years.

The basic needs of people until 1960s have been transformed into desires after 60s. The designer forgets the duty to the environment while struggling to meet the demands of the consumer. Along with environmental problems seen at the end of the 1980s, the task focus, widely adopted by the designer at the beginning of the 1990s, changed to be sustainable design [14].

Along with this changes, the concept of "sustainability" began to take place in the design of many companies' products. Nowadays, many companies and designers have gone to a serious solution to this problem by minimizing the bad environmental reflections of the production process.

All product life-images of these companies' products include sustainable design. From a broad perspective, sustainable design is often a product development process that performs its functions. It successfully produces profit for companies and uses materials that do not produce minimum energy and hazardous waste [15]. Environmentally sensitive design applications contribute to sustainability by taking into account global ecology and resources in addition to traditional consumer and cost requirements.

Sustainability is acknowledged by many Industrial Design organizations. Members of the International Association of Universities and Colleges of Art, Design and Media, representing a global design trainer and research community, have undertaken the initiative summarized in the Kyoto Design Declaration for the self-sustainable development ideals [16]. With global development and the associated rise in environmental and social problems, it presents current advantages for design work. In addition, Cumulus members, educational and cultural institutions, companies, governments and government agencies, design

and other professional organizations and Non Governmental Organizations (NGOs) have decided to seek cooperation to promote and share their ideals on sustainable development [17].

Organizations that come together in search of this cooperation want to bring a new definition of the design concept involving sustainability.

In line with this request, the Declaration sets out a new design definition; “design is a means of creating social, cultural, industrial and economic values by merging humanities, science, technology and the arts. It is a human-centered process of innovation that contributes to our development by proposing new values, new ways of thinking, of living and adapting to change” [17].

With the introduction of the concept of sustainability, there are some fundamental differences between traditional design and contemporary design. In his book entitled "Sustainable by Design", Walker (2006) compares the basic features of traditional design and sustainable design, which is presented in Table 3.1. [18]

<b>Conventional Design</b>	<b>Sustainable Design</b>
Industrial design	Design of functional objects
Product design	Creation of material culture
Specialization	Improvisation
Conventional	Amateur, dilettante
Specific	Holistic, integrative
Instrumental	Intrinsic
Problem - solving	Experimenting
Solutions	Possibilities
A priori design	Contingent design

**Table 1 Reframing design: A comparison of key characteristics**

Sustainable development is incompatible with traditional methods, but new methods are needed to develop sustainable principles. Rather than trying to 'push and practice' the principles of sustainability into an existing and often unacceptable production system, it may be more useful to approach the object in the opposite direction and to think about how functional objects can be. Objects should be designed and produced to be compatible with sustainable development principles. The inclusion of sustainable concerns from the very beginning allows for the development and direction of new production models [18].

The designers who put forth the products that embody the environmental problem reveal the boundaries of how a sustainable future may be in the future, and it can inspire the gathering. Nevertheless, designers must well identify the problems in front of the power they contain. With the right fixations, they are able to overcome problems more easily and to lessen the difficulty of making their decisions for sustainability [16].

#### **4. CONCLUSION**

Packaging that promote and maintain a majority of objects are often used in everyday life and have a lot of impact on the environment. Designers are the ones who can produce solutions that will reduce raw material consumption and environmental effects to minimum in the product life cycle of the packaging. Designers who can create a sustainable society for the future and inspire people with these formations can have the ability to understand and acquire sustainable knowledge and produce this solution. In addition, packaging designers must identify the hurdles they can encounter and learn how to deal with this hurdle.

If designers are knowledgeable about this issue, they experience less difficulty in implementing the decisions they make for sustainability.

In his book entitled "Design for the Real World," Victor Papanek (1985) supports the above-mentioned: "Design, if it is to be ecologically responsible and socially responsive, must be revolutionary and radical (going back to the roots) in the truest sense. It must dedicate itself to nature's 'principle of least effort', in other words, minimum inventory for maximum diversity (to use Peter Pearce's good phrase) or, doing the most with the least. That means consuming less, using things longer, recycling materials, and probably not wasting paper printing books such as this" [19].

## 5. ACKNOWLEDGEMENT

This paper includes a part of the thesis of Merve ATMACA, who continues a Masters degree in Gazi University Industrial Design Department.

## REFERENCES

- [1] Internet: <https://medium.com/@designforsustainability/ecological-design-on-the-edge-of-a-new-story-f039a4d9a1ba>, (2018).
- [2] Rosen, A. M. and Kishawy, A. H., "Sustainable manufacturing and design: concepts, practices and needs". *Sustainability*, 4(2): 154-174, (2012).
- [3] Egger, S., "Determining a sustainable city model". *Environmental Modelling & Software*, 21(9): 1235-1246, (2006).
- [4] World Commission on Environment and Development. *Our Common Future* 2 nd ed., Oxford University Press, USA, (1987).
- [5] Yenilmez, F., "Ambalaj Tasarımında Kullanıcı Deneyimi: Bir Zeytinyağı Ambalajı Üzerinden Değerlendirme", MSc Thesis, İstanbul Technical University Institute of Science and Technology, İstanbul, (2012).
- [6] Internet: [http://www.tdk.gov.tr/index.php?option=com\\_bts&view=bts&kategori1=veritbn&kelimesec=14292](http://www.tdk.gov.tr/index.php?option=com_bts&view=bts&kategori1=veritbn&kelimesec=14292), (2018).
- [7] Denison, E. and Cawthray, R. *Packaging Prototypes 1: Design Fundamentals* 1 st ed., Rotovision, Switzerland, (1999).
- [8] Lewis, H., Verghese, K. and Fitzpatrick, L. "Evaluating the sustainability impacts of packaging: the plastic carry bag dilemma". *Packaging Technology and Science*, 23: 145-160, (2010).
- [9] Övüç, S. "Tüketicilerin Sürdürülebilir Ambalaja Sahip Ürün Satın Alma Niyeti", MSc Thesis, İstanbul Technical University Institute of Science and Technology, İstanbul, (2015).
- [10] JPI. *A Proposal For Packaging in 21st Century, Realization of Packaging Contributing to a Sustainable Society*. Retrived July 19, 2017 from <http://www.jpi.or.jp/english/proposal.htm>, (2000).
- [11] Lewis, H., Fitzpatrick L., Verghese K., Sonneveld K. and Jordon, R. "Sustainable packaging redefine", *Sustainable Packaging Alliance*, Australia, (2007).
- [12] James, K., Fitzpatrick, L., Lewis, H., and Sonneveld, K. "Sustainable packaging system development", Walter Leal Filho (Ed.), in "Handbook of sustainability research", Peter Lang Scientific Publishing, Frankfurt, (2005).

- [13] SPC. “Definition of sustainable packaging” (version 2.0, August 2011). Sustainable Packaging Coalition (SPC), 1-2, (2005).
- [14] Wahl, D.C., and Baxter S. “The designer’s role in facilitating sustainable solutions”. Massachusetts Institute of Technology, 24(2): 72-83, (2008)
- [15] Chiu, M. C. and Chu, C.H. “Review of sustainable product design from life cycle perspectives”. International Journal of Precision Engineering and Manufacturing, 13(7): 1259-1272, (2012).
- [16] Turhan, S. “Sürdürülebilir kalkınmada endüstriyel tasarımcının rolü”, Sanat ve Tasarım Dergisi, 7: 125-139, (2011).
- [17] Internet: <http://www.cumulusassociation.org/kyoto-design-declaration-signed-on-march-28-2008/>, (2018).
- [18] Walker, S. Sustainable by Design, Earthscan, London, (2006).
- [19] Papanek, V. J. Design for the Real: Human Ecology and Social Change 2nd. ed., Academy Chicago Publishers, USA, (1985).