



EFFECT OF DESIGN ON THE DECISION OF CONSUMERS TO REUSE PACKAGING IN REDUCTION OF SOLID WASTE

Katı Atıkların Azaltılmasında Tasarımın Tüketicilerin Ambalajı Yeniden Kullanması Kararına Etkisi

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ÖZET

Artan nüfus ve buna bağlı olarak artan tüketim sebebiyle tek kullanımlık plastik ambalajların sebep olduğu katı atıklar ciddi bir küresel sorun oluşturmaktadır. Özellikle plastikten üretilen ambalajlar katı atığa dönüşmektedir. Plastik atıklar tüm canlıların yaşamları için gerekli olan toprağı, suyu ve havayı kirletmektedir. Plastik sürekli geri dönüştürülememektedir. Çok yönlü işlevselliğe ve görsel çekiciliğe sahip bir tasarım sayesinde ambalaj birçok defa çeşitli yöntemlerle kullanılarak katı atık olma ihtimali için en başında azaltılabilir. Betimleme araştırma yöntemiyle yapılan bu çalışmada, tüketicilerin bir ürünü kullandıktan sonra ambalajın tekrar kullanılmasını sağlayan etkenleri ve faydaları ortaya konularak katı atıkların azaltılabileceği amaçlanmıştır. Ayrıca, bu çalışmada tüketicilerin çevreye duyarlılıklarının artırılması, temiz ve sağlıklı bir çevrede yaşamının önemi, geri dönüşüm merkezlerinin yeterlilikleri ve çevreci yasaların hazırlanıp uygulanmasında uluslararası iş birliğinin önemine değinilmiştir. Buna ek olarak, plastik ambalajların tekrar kullanılmasında tüketicilerin bilgi ve tecrübelerinin artırılması, ambalajların çöp olmadığı konusunda toplumun değerlerinin geliştirilmesi ve ambalaj tasarımında ambalajın nasıl yeniden kullanılabilceği konusunda bilgilendirmeler ambalajın yeniden kullanım sayı ve süresini arttıracaktır. Ayrıca, işletmelere ambalajlarını yeniden kullanma konusunda devletler tarafından finansal destekler sağlanmalı ve depozitolu cam ambalajlara öncelik vermeleri için teşvik edilmelidirler. Bununla birlikte, işletmelere ambalajlarıyla katı atık ürettiklerinde sorumlu tutularak çeşitli yaptırımlar uygulanmalıdır. Çevreci farkındalığın artırılmasında sanatçılar eserlerinde plastik ambalajların neden olduğu çevre kirliliğini ele alarak eserlerini kullanılmış ambalajlardan üretebilmektedirler.

ABSTRACT

Solid wastes caused by single-use plastic packaging due to increasing population and consequent increasing consumption constitute a severe global problem. Especially the packaging made of plastic turns into solid waste. Plastic waste pollutes the soil, water, and air necessary for the life of all living things. Plastic materials cannot be recycled continuously. Thanks to a design with versatile functionality and visual appeal, the packaging can be used in various ways, reducing the possibility of solid waste from the beginning. This study, conducted with the descriptive research method, aimed to reduce solid waste by revealing the factors and benefits that enable packaging reuse after consumers use a product. In addition, the importance of increasing the environmental awareness of consumers, the importance of living in a clean and healthy environment, the competence of recycling centers, and the importance of international cooperation in preparing and implementing environmental laws are mentioned. In addition, increasing the knowledge and experience of consumers in the reuse of plastic packaging, improving society's values that packaging is not garbage, and informing about how packaging can be reused in packaging design will increase the number and duration of packaging reuse. In addition, governments should financially support businesses to reuse their packaging and should be encouraged to prioritize returnable glass packaging. However, companies should be held responsible when they produce solid waste with their packaging, and various sanctions should be applied. To increase environmental awareness, artists can create their works from used packaging by addressing the environmental pollution caused by plastic packaging in their artworks.

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1. INTRODUCTION

Sustainable economic development is related to responsible production and consumption. This does not mean producing and consuming less than is needed. Sustainable development provides people with a high quality of life in a clean and healthy environment by efficiently using raw materials and energy resources. At the same time, sustainable development is related to reducing solid waste and greenhouse gas emissions. Plastic is a durable and inexpensive material. Plastic recycling, burning, and landfilling harm nature in many ways. If the packaging is not used again after the consumption of the product, it becomes a solid waste. Packaging constitutes 65% of solid waste that threaten nature and human health (Azzi et al., 2012, p. 443). Packaging reuse by consumers and businesses can ensure that solid waste is acceptable. Then, the zero solid waste production target can be achieved. Perhaps, they can eliminate the existing solid waste, at least for now. The non-sustainable reuse of packaging negatively influences human health, social concerns, and environmental and economic issues. We can define the concept of packaging reuse as reusing the whole package or parts within the same and various functions. The economic benefits of reusing packaging save raw materials and energy sources, reducing packaging costs, increasing brand recognition, saving on recycling centers, eliminating logistic costs for recycling, and reducing environmental cleaning costs. In this article, the responsibilities of all stakeholders in the context of the solutions, practices, and methods developed in the widespread adequate packaging reusing for the protection of nature, the features of functional packaging design, and raising the awareness of packaging reuse in society have been discussed. The features of reusable packaging are durability, robustness, protection, easy use, pretty design, easy cleaning, easy repair, multi-functionality, lightweight, made of non-hazardous material, high-quality, biodegradable, ecologically friendly, and recycled materials. Furthermore, businesses should prefer foldable and lightweight packaging when it is empty to make reverse logistics to the production centers. Many countries, including Chad, Iraq, Pakistan, Bahrain, India, and Bangladesh, have been experiencing severe pollution problems caused by solid waste (IQAir, 2023). Many countries have been trying to find solutions for the solid waste generated by single-use packaging. For instance, imposing eco-taxes and severe legal penalties on convicted companies for their mess, forcing responsible companies to clean their pollution, stopping exporting solid waste to developing countries, and improving recycling centers could not wholly solve the waste problem at a sustainable level. For instance, Indonesia, the second most polluting country after China, pollutes the oceans with solid waste caused by single-use plastic packaging. In reality, they cannot be fully recycled (Lestari & Trihadiningrum, 2019, pp. 1, 6, 7). Due to the absence of accurate information, it is difficult to determine the exact amount of plastic packaging waste produced in China and Indonesia. Even though governments always address recycling centers to minimize and prevent solid waste, recycling centers are generally inadequate. Crucial social factors are values, education level, knowledge, experience, convenience, consumer perception, awareness, usability, consumer behavior, love of nature, awareness, concerns, consumer characteristics, and habits of reusing packaging to guide people to understand that solid waste is not considered garbage. Businesses only reuse the packaging according to its original function. On the other hand, consumers reuse the packaging according to its original function and explore its different functions. Thus, consumers can reuse packaging with various ideas that are beyond the designers' vision.

2. SOLID WASTE

In the last century, solid waste generated by packaging was not considered as important as today. Today, solid waste produced by plastics irreversibly reduces and threatens the lives of people, all living species, their habitats, and the all-natural resources necessary for their existence. Plastic packaging generally causes a large part of solid waste. It pollutes soil, water, and air, causing known catastrophic results for humans, animals, vegetation, and marine life. Therefore, it has become a global problem that needs to be solved urgently. Since the 1950s, the growth in the production of plastic has vastly outpaced that of any other material. Plastic packaging correspondingly is liable for about half of the plastic waste (United Nations Environment Programme, 2018, p. vi). Single-use plastics litter the environment partly because of irresponsible benighted individual behaviour. In nature, plastic pollution classifies into macro and micro categories according to their size (Hammer et al., 2012, pp. 5, 6). Unlike metals, plastics do not rust or corrode. In addition, most plastics do not biodegrade but photodegrade into extremely toxic microplastics if ingested (Clapp & Swanston, 2009, p. 318; United Nations Environment Programme, 2018, p. 2; GESAMP, 2015). It takes 450 years for plastic to disappear in nature (The Government of Western Australia, 2019). On the other hand, Styrofoam containers and plastic bags last 1,000 years to decay (United Nations Environment Programme, 2018, p. 12).

Globally, 348 million tons of plastic are produced each year, which results in approximately 400 million tons of carbon dioxide emissions. Compared to other materials, solid waste treatment plants cannot recycle plastic to a large extent. As a result, only 14% of the plastic solid waste becomes recycled and covers only 5% of the total material cost. On a global scale, only 50% of plastic is used once, and 40% of all plastic consumption comprises plastic packaging (Ellen McArthur Foundation, 2019; Sæter et al., 2020, pp. 1, 2, 5). If people globally adopt packaging reuse, plastic solid waste, and greenhouse gas emissions will decrease by half. However, governments have to allocate a large budget for environmental cleaning costs, health expenditures, and operating costs of recycling centers due to the pollution caused by plastic waste. The European Union (E.U.) countries use 40% of the plastic in packaging production. For example, the E.U. countries used 14.8 million tons of plastic in 2018. Nevertheless, the E.U. countries recycle only 41% of plastic packaging (Wohner et al., 2019, p. 3; Eurostat Statistics Explained, 2020). The European Parliament has banned all single-use plastic packaging in the E.U. countries effective from 2021. In this way, when packaging reuse becomes widespread in the E.U. countries, the production of solid waste caused by plastic will decrease significantly.

Especially developing countries prefer to dispose of solid plastic waste through incineration. When plastic is burned, toxic gases emit high amounts, including dioxins, furans, mercury, and polychlorinated biphenyls. These poisonous substances are harmful to all living things. For instance, these toxic gases impair human health and cause many serious diseases, such as increasing coronary diseases, causing respiratory diseases such as asthma and emphysema, triggering migraine, disrupting the reproductive and growth systems, and causing damage to the lungs, liver, and kidneys. Dioxins are persistent environmental pollutants that settle in crops and water resources. Hence, the dioxins enter the body through food and water, causing cancer, neurological damage, and destruction of the reproductive, thyroid, and respiratory systems

(Karn, 2021, p. 4). Only five countries as, China, Indonesia, the Philippines, Thailand, and Vietnam, are responsible for dumping 60% of the total used plastic into the world's seas (Winn, 2016). On the other hand, worldwide, everyone states that they would prefer environmentally friendly packaged products to protect nature (Nguyen et al., 2020, p. 2).

3. PACKAGING DESIGN

Packaging design is the process that enables the packaging to fulfill essential functions. Packaging design focuses on five fundamental tasks. They are protection, inclusion, ease of use, information, and marketing. The protection function of the packaging is to protect the product integrity against possible deterioration and damage caused by undesirable climatic effects, animals such as mice and insects, bacteriological growth, and physical hazards, and to prevent the product from being tampered with by consumers (Wells et al., 2007, p. 679; Yam & Lee, 2012, pp. 301, 302). In addition, the protection feature of the packaging extends the shelf life of the food. Therefore, it prevents the food from spoiling in a short time. The inclusion function of packaging prevents product loss and change in size, weight, and shape throughout the logistic, storage, and distribution processes from production to consumption. The ease of use provides easy opening-closing, emptying, cleaning, storage, transportation, and distribution (Wohner et al., 2019, p. 6). The information function conveys crucial information to consumers, such as the general characteristics of the product, its content, net weight, maximum retail price, place of manufacture of the product, the name of the manufacturer, and contact information. Additionally, the information on the packaging provides details on how to open the packages, methods of preparation and use of the product, nutritional values, warnings against various allergies, time and temperature indicators, production date, expiration date, warning information, and storage conditions (Sæter et al., 2020, p. 3; Chand, 2021). The marketing function of the packaging is responsible for sales with its attractive colors, graphics, logos, symbols, and slogans. Apart from these five functions, packaging design is divided into two categories according to physical and visual characteristics (Wohner et al., 2019, pp. 2, 3, 6). The physical properties of the packaging are ergonomics, strength, durability, easy use, and easy emptying, but also size, material, and texture. The visual features of the packaging are its shape, colors, symbols, graphics, images, brand identity, printing technique, information, and all texts.

When we look at the material data used in all packaging production worldwide in 2014, they were made of plastic 38%, corrugated cardboard 27%, glass 15%, wood 7%, cardboard 6%, metal 5%, and paper 2% (Özek, 2016, p. 6). The consumer brings the product home. After use, the package is unsuitable for recycling and reuse if damaged and polluted (Sæter et al., 2020, p. 2). The packaging gives the consumer the final decision about reusing the packaging on its material, form, versatility, and information. According to the materials and shapes of production, some packages are preferred for reusing than others. For instance, consumers opt for reusing glass packages more than packages produced from other materials. According to consumer behaviors, 37 % of consumers prefer glass products, compared to a <5 % preference for flexible plastics in the United Kingdom (Greenwood et al., 2021, p. 1699). Since glass packages are transparent, bright, aesthetic, smooth, healthy, durable, and easy to clean. Glass packages do not cause pollution because they quickly dissolve in nature. In particular, glass packaging with a cylindrical form is more reused than other shapes (Langley et al., 2011, pp.

161, 168, 170-172). In addition, glass is an ecologically friendly packaging material because it can be recycled many times without deteriorating glass quality (Petljak et al., 2019, p. 113).

The physical design features of the packaging are durable, robust, and non-health-threatening materials, easy cleaning, easy opening-closing, easy stacking and storage, accessible transportation, and easy filling, increasing the packaging reuse for businesses. In addition, the safety, quality materials, longevity, brand recognition, repairability, easy maintenance, popular visual design, visual and physical compatibility with other items, and various packaging functions increase packaging reuse (Sæter et al., 2020, pp. 7, 8). Generally, about 9% of the production cost of a product is the packaging cost (Azzi et al., 2012, p. 443). Packaging costs mainly include raw materials, labor, production equipment, design, logistics, and storage. Therefore, it is necessary to develop materials used in packaging products to increase packaging reuse. To ensure continuity in the reuse of packaging, the materials used in its production must be original, valuable, durable, compatible with other goods, lightweight, transportable, storable, and not harmful to health and the environment. In addition, the size and shape of the packages should have a standard that will increase the reuse of the packaging, as it can facilitate the use of the packages together. A successful design obtains functionality, economic benefit, visual charm, and comfortable usability (Heskett, 2017, pp. 9-11). Also, the design arranges visual elements to make an object more attractive and look good. Therefore, a good packaging design increases the quality of life with its value, indispensability, healthy, strong, beauty, communication skills, and discovering the consumer needs and preferences about reusable packaging. And the packaging design has a strong influence on the consumers' shopping habits, behaviors, and consumers' purchasing decisions. Therefore, companies prefer impressive packaging designs that attract consumers' attention to increase sales of their products in competitive markets. More than 73% of the interviewed consumers stated that the packaging positively affects their purchasing decisions. In addition, consumers have been increasingly demanding charming and functional packaging designs according to their preferences, tastes, and needs (Wells et al., 2007, pp. 677, 685). Increasing consumer awareness through charming packaging design and labeling is critical to reusable packaging uptake. Since branding influences 92 % of the purchase decisions of consumers. Environmentally friendly food packaging is in demand. People can consider that packaging is not harmful to the environment if a product is environmentally certified (Bradley & Corsini, 2023, p. 133). Awareness, lifestyle, culture, knowledge, education level, creativity disposal income, attitudes, and values are all identified as consumer characteristics that may influence consumer behavior toward reusing packaging.

The consumer uptake of reusable packaging relies on the convenience of the use, cleaning, maintenance, and future usefulness of the packaging. Functionality, ergonomics, durability, originality, visuality, brand recognition, brand loyalty, packaging related to popular places, eco-friendly material, and quality materials can encourage consumers to reuse packaging. The environmental impact of packaging is an ingredient in how the consumer perceives a product. Still, this perception is balanced by the personal benefits of the consumer in forming their preferences (Lindh et al, 2016, p. 10). To increase perception, interest, and awareness about reusing packaging, the designers can address websites and social media accounts with examples of various packaging reusing and facts about solid waste problems on the packaging.

With the company's permission of the product, the designer may add this information somewhere on the packaging and perhaps pave the way for a new trend in packaging design that will emerge shortly and new laws that may encourage packaging reuse.

4. METHODS OF PACKAGING REUSE

There is little information about packaging reuse at home. We do not know the lifespan of reusing packages, their number of reusing, their share in the packaging industry, or their environmental and economic effects (Rigamonti, Biganzoli, and Grosso, 2019: 35). The single-use plastic packaging industry uses many plastic materials. Therefore, people seek ways to reuse packaging. Generally, plastic packaging of drinks is produced from polyethylene terephthalate (PET) (Hahladakis & Iacovidou, 2018, p. 1396). PET packaging generates large amounts of solid waste at open-air music festivals within a few days.

In Lithuania, Šuškevičė and Kruopienė have worked on three different methods to minimize single-use packaging waste reusable plastic cups with no deposit refund, reusable plastic cups with a deposit refund, and disposable plastic cups with a return on a deposit. People do not pay any penalty for plastic cups that are forgotten, lost, or broken in all three methods. Reusable packaging produces more pollution than disposable packaging if not managed sustainably. For example, disposable 500 ml cups are made of 8 grams of plastic. However, reusable 500 ml cups are produced from 32 grams of plastic. Therefore, 22% more plastic solid waste is generated in the first method than in the last two methods (Šuškevičė & Kruopienė, 2021, pp. 1, 3, 6, 8, 10, 12). For instance, the audience can receive wristbands with a number at the entrance of the music festival. Then, they only would be allowed to buy food and beverages by exposing their numbers. Therefore, the organizers detect those who haven't delivered their packaging and make them pay a deterrent fine for non-returned packaging at the exit to minimize solid waste.

Large companies are pledging to reduce packaging waste when people worry about plastic pollution. When considered in the axis of technological developments, the visibility and retention of brands in social media are based on the effectiveness of digital storytelling, correct content management, and narrative fiction. At the same time, when public relations activities are examined, a broad perspective is discussed, ranging from creating the desired attitude change in the brands' audiences to creating awareness and consciousness in society. At the same time, when public relations activities are examined, a broad perspective is discussed, ranging from creating the desired attitude change in the brands' audiences to creating awareness and consciousness in society. Brands follow approaches that prioritize sharing accurate, honest, and transparent information in their public relations activities. In this way, to be known, to be known, and to provide visibility requires image and reputation management for institutions and brands (Uğurlu Akbaş, 2021, pp. 333-335). The Coca-Cola Company produced more solid waste than other soft-drink brands. In response to the report, the Coca-Cola Company announced, "We believe that all packaging materials have benefits and they can be turned into valuable resources for reuse if properly managed. We are ready to do our part." (Wiener-Bronner, 2019). Large companies like the Coca-Cola Company can encourage packaging reuse in their various commercials, education, and awareness campaigns. For instance, many videos on social media show people how to reuse PET bottles differently (Thaitrick, 2017; Birdy

Official, 2017; 5-Minute Crafts Family, 2019). On the other hand, the ratings of these videos' views are deficient compared to the world population. In many parts of the world, objects such as toys, flower pots, baskets, and brooms are made with reused PET bottles, which are also reused as building materials. Walls constructed with PET bottles are one-third more economical than concrete blocks and bricks. A two-room house can be built with 14,000 PET bottles. In addition, houses made of PET bottles are 20 times more resistant to earthquakes than houses built of concrete and brick. Besides, structures constructed with PET bottles instead of traditional building materials have proven more longevity and sustainability (Fatima, 2017, pp. 2079, 2080).

In Bangladesh, 70% of the population lives in slums. In 2016, Ashis Paul invented the Eco Cooler air conditioner using waste PET bottles. Because the volume of gas cools when it expands rapidly, Paul reuses plastic bottles to reduce the slum houses' temperature by 5°C (The Observers, 2016). With this invention, any building can be cooled without any energy costs. A two-liter PET bottle weighs 42 grams (Petra, 2015). If the Eco Cooler is made from 30 PET two-liter bottles, the total weight of plastics of the Eco cooler equals 1,260 grams. Therefore, the amount of plastics does not become solid waste. Many environmental and financial benefits emerge if people sincerely interiorize the reusing packaging. Another example of reusing packaging is the usage of ordinary plastic bags as construction material. People put the earth in pre-used plastic bags. Then, they use these stuffed plastic bags as building material blocks to construct their houses (Green Dream Project, 2021).

Generally, reusable packaging seems more costly than single-use packaging in the short term. However, the overall advantages of reusable packaging may be higher than single-use packaging by considering its pollutant effects within the scope of sustainable clean environment target (Coelho et al., 2020, p. 5). To increase the widespread reuse of packaging, all countries should make joint decisions and act together about this urgent issue. The governments can financially support nature-friendly companies by providing tax advantages to businesses that reuse their packages. However, the governments can impose penalties and sanctions on the companies if they do the opposite. For example, with the widespread use of coffee drinking, disposable paper cups cause solid waste production.

For this reason, Starbucks has promoted the reuse of packaging with cups made from recycled materials since 2012 (Starbucks, 2021). Starbucks has also started the practice of reused cups in all its coffee shops. In some countries, Starbucks offers price reductions for customers who prefer reused cups. Consumers appreciate and prefer cups made of recycled materials in Starbucks coffee shops because of their weight, dimensions, graphic designs, print quality, easy use, easy cleaning, and keeping the coffee hot for a long time. In addition, the reuse of packaging also depends on the psychological reasons of the consumers (Barr et al., 2001, p. 78). The psychological and social preferences of the consumers can be the habit of preferring reusable cups, adopting environmentalist campaigns, not contradicting environmentally sensitive people, the feeling of doing something good, raising environmental awareness in the society, protecting natural resources, saving energy and raw material in the new packaging production, and living sensitively to the environment in all its aspects.

Single-used packages dominate the product supply chain in the world. The Ellen MacArthur Foundation works on projects and researches about reducing solid waste to enable the earth to be a better place. The foundation explored that there are four methods to reuse the single-used packages. In the first method, the consumer puts the new product into the previously used package. In the second, the consumer returns the empty container to a courier while buying the new product. Third, the consumer puts the product in the previously used package that the consumer brings to the supermarket when shopping. Lastly, the consumer returns the once-consumed product's package to the packaging collection boxes in the sales points in the fourth (Ellen MacArthur Foundation, 2019). Consumers prefer the first method when buying oil, detergent, and dried legumes. However, Loop Company has adopted the second method in its business model. Loop Company cleans the packaging from people during product delivery and puts it back into reuse for its new deliveries (Sykes, 2019). TerraCycle, the parent foundation of Loop Company, offers a range of easy-to-use recycling platforms that allow everyone to reuse everything to achieve a sustainable shopping experience. TerraCycle states that a package does not pollute the environment as solid waste when recycled after being used at least three times. However, Dasani PureFill Company, a bottled water company, interiorizes the third method. Consumers can reuse empty water bottles by filling them in Dasani PureFill water vending machines (Danigelis, 2019; Wiener-Bronner, 2019). In the fourth method, legally responsible companies collect their already used packages from their collection boxes and then classify them according to their physical conditions. These companies reuse the physically good-conditioned packages, after cleaning them (Infinitum, 2019, pp. 52, 58).

According to the World Economic Forum, plastic manufacturers produce around 400 million tons yearly. However, just 14%-18% is recycled (Fibre-Reinforced Plastic Technologies, 2021, p. 9). The plastic industry may want consumers to think of buying plastic products that do not cause pollution. Nevertheless, most recycling facilities are not sophisticated enough to process all common plastics. When consumers see the ubiquitous recycling symbol on the package, they feel good about not polluting. According to an investigation chronicled in the 2020 frontline documentary *Plastic Wars*, the plastic industry never believed recycling would work adequately. Moreover, the plastic industry tries to change public concerns and perceptions about plastic pollution. It would eventually vanish, so people could continue using plenty of plastic packaging. The three chasing arrows sign that is the recycling symbol tells us our item is made of plastic. Therefore, the recycling symbol does not guarantee that our item can be recycled. The types of plastic are PET/PETE, HDPE, PVC, LDPE, P.P., P.S., and other plastic kinds. In reality, plastic types from 3 to 7 are rarely recycled, although PET/PETE and HDPE types can only be recycled (Grisé, 2021, pp. 11-12). Therefore, it is barely seen that the current status quo of the world recycling system is insufficient to recycle all plastic waste. Thus, a determined leadership of the United Nations Environment Programme, the European Environment Agency, and the U.S. Environmental Protection Agency can pave the way for restoring pollution issues and working collaboratively with the governments. United Nations Environment Programme needs to legalize pollution policies that force all countries to take more responsibility against solid waste caused by single-use plastic packaging. The governments can assign plastic manufacturers to clean their mess alone rather than loading the burden onto their citizens and their paid taxes. It is known that the use of PET

bottles worldwide generates pollution. There is an innovative method to increase PET bottle reuse in Brazil. Consumers return their used empty PET bottles to the collection boxes at the points of sale. Then, the Grupo Simões, a part of Coca-Cola Brazil, takes them to its beverage filling center. Some PET bottles contain substances that the washer cannot remove. The company inspects reusable PET bottles for caustic residues with its air control compact detector called Sniffer, which reliably detects any contagion. After detecting Sniffer, contaminated PET bottles do not stand a chance to meet its quality stipulations (Lemos Junior et al., 2019, pp. 329-331). To ensure the proliferation and reuse of PET bottles, informative content, and symbols can be placed on the labels to remind the consumers not to put anything else inside the empty PET bottles. Therefore, people decrease solid waste by returning their clean PET bottles. The decision of even just one person to reuse packaging makes an outstanding contribution to protecting the environment (Babader et al., 2016, p. 419). This decision is related to individual and social motivation, education level, knowledge, experience, values, awareness, residence time at the same address, house size, and suitability. People explore and diversify the other packaging functions with their creative ideas to reuse them as various objects. For instance, some creative people reuse their empty perfume bottles as decorative LED lamps and kerosene lantern lamps. Understanding and adopting the importance of packaging reuse in individuals can begin early in their childhood. In this context, parents and teachers can educate children to raise awareness of keeping the environment clean with its reasons and consequences. Children can learn how to reuse packaging through various activities. For instance, children can make toys, jewelry, costumes, musical instruments, flower pots, birdhouses, pet bowls, shelves, cabinets, and furniture out of the packaging (Turner, 2012). Thus, children can quickly internalize the habit of packaging reuse.

Consumption culture causes depletion of natural resources and environmental pollution due to overconsumption and overproduction (Dajian, 2004, p. 9). In the survey conducted with consumers at least high school graduates in Croatia in 2019, 94% of survey respondents said they prefer to buy food products in reusable, refundable, and returnable packaging (Petljak et al., 2019, pp. 120, 121). As seen, educated people are more sensitive and conscious about pollution and greenhouse gas emissions than companies, governments, and designers do. Based on the motto "One person's trash is another person's treasure.", environmentally conscious artists use the solid waste generated by the packaging in their artworks to emphasize environmental awareness. Nature-friendly artists and eco designers support this environmentalist green movement by producing paintings with the slogan "reuse, reduce and recycle." For instance, textile artist Mirka Knaster, who reuses packaging as material in her artworks, aims to raise nature-friendly awareness in society by advocating the habit of reusing packaging. She emphasizes that the reuse of single-use packaging can replace many objects. (Knaster, 2019) As another example, the designer Anna Evers shows that anyone can easily make a unique coffee table by themselves after painting a wooden palette, putting wheels underneath, and placing a glass on top (Turner, 2016, p. 83). Furthermore, some art organizations publicize the seriousness of the pollution caused by single-use packaging. For instance, Art of Recycle, a non-profit art center in Ephrata, Pennsylvania, strives to raise environmentally conscious artists and people (Art of Recycle, 2020). Since 2015, the Seattle Recycled Arts Festival has aimed to demonstrate how artists can express themselves by using

packaging with the slogan "Reduce, Reuse, Recycle, Repurpose, and Recycle." The themes of the artwork are to promote Zero Waste through Art (Seattle Recycled Arts, 2021). Moreover, Bristol-based design company Cod Steaks creates large-scale paintings for public display to raise awareness of solid waste caused by single-use packaging. For instance, the artwork entitled Bristol Whales is two life-size whales made of 70,000 PET bottles (Ignacia, 2019). Another art initiative has emerged in India. Maharashtra is known for its natural beauty and rich cultural heritage. In 2019, The Maharashtra Pollution Control Board (BMC) banned single-use plastic packaging in Maharashtra. BMC decided primarily to discover the circulation of prohibited plastic packaging in Mumbai, such as PET bottles and plastic bags. Then, BMC employed 200 inspectors to collect 600 kg of plastic packaging in Mumbai. SAGE and the Arthat Studio worked together to build an 8-meter-high Plastic Monster sculpture on the beach of Bandra. Its slogan is "He is not going anywhere" to raise public awareness against all the harms of plastic waste, such as plastic-covered beaches and the presence of microplastics in food. The Mumbai Metropolitan Region and Maharashtra State Road Development Corporation supported making this exciting statue (BCCL, 2019; Homegrown Staff, 2019).

5. CONCLUSION

The pollution caused by single-use plastic packaging contaminates land, water, and air. Therefore, pollution threatens all living things and human health by penetrating their food and water. The contamination reduces agricultural areas and habitats. Solid waste cannot be eliminated by being buried in landfills or incinerated. These methods contaminate land, water, and air pollution. However, recycling centers do not entirely recycle all solid waste caused by plastic packaging. The recycling centers have high establishment costs to run. In addition, the number of recycling centers is insufficient in developing countries. The greenhouse gases emerge from the production and recycling of single-use plastic packaging. The internalization of reusing packaging has many advantages in terms of environmental and economic aspects. Packaging reuse can reduce raw material consumption, avoid environmental pollution, and minimize greenhouse gas emissions. Furthermore, people can save money on their budgets by adopting the cost-efficient habit of reusing packaging instead of consuming new products with new packages. In addition, companies can save the cost of raw materials, energy, labor, and waste creation if reusable packaging is designed for repeated use.

Due to prevent environmental pollution caused by single-use packaging, there are ways to figure out a sustainable solution. Firstly, people should adopt the reuse of packaging as an unbiased lifestyle. Parents and educators can educate children about environmental and economic awareness for reusing packages. In addition, consumers can discover the benefits of packaging reuse to prefer returnable and refundable packaged products instead of products with single-use packaging. Secondly, the designers can increase the life span of packaging with their design specifications if designed meticulously. Easy-to-implement ideas can increase packaging reuse. In terms of the reuse of the packaging, there are some essential factors that optimal packaging should contain durability, easily portable, easy to use, multi-functionality, robustness, easy cleaning, easy opening-closing, and compatibility with their items. People can versatilely reuse multi-functional designed packaging rather than less elaborately designed packaging. Famous brand names, charming designs, decoratively matching with other goods, representing a popular place, funny slogans, and compelling images on packages are important

visual factors for people to reuse packaging. In addition, the specifications of packaging material let consumers reuse packaging. These are valuable, original, high-quality, and made of non-hazardous and ecological-friendly materials.

Moreover, designers can significantly reduce the amount of solid waste by using glass instead of plastic in packaging design. Additionally, eco-artists can lead people to participate in this ecological-friendly movement with their artworks to lead people to reuse packaging. Thirdly, to reduce the amount of solid waste, consumers should change their habits, and companies in all businesses on a global scale should agree on determined common laws and responsibilities in the reuse of packaging. Governments can put tax reductions and incentives into effect for companies that spend their budgets on returnable and refundable packaging instead of preferring single-use plastic packages. However, governments can put eco-taxes and legal penalties into action against single-use packaged products. Besides, the companies that pollute the environment with their containers must be held responsible for cleaning their pollution. Furthermore, the problem should be prevented at the source by working with the United Nations Environment Program and the European Environment Agency while preparing effective international laws regarding packaging reuse.

Last but not least, people should take today as the beginning to find a way to reuse their previously used packaging. Reusing packaging is the most economical and easiest method to decrease solid waste. Therefore, the consumers do not postpone the pollution problem to the future. People can leave a more livable world to future generations by reusing the packaging we consume today.

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