

From Recycling to Non-Governmental Organizations

Mehtap ÇÖL¹, Derya GİRGIN²

Abstract

This study addresses two different problems. Firstly, recycling in the context of domestic solid waste management. With the developing technology, there is an increase in people's production and consumption habits, and the resulting wastes both endanger human health and harm nature. Domestic solid waste is one of them. For this reason, individuals should be encouraged to recycle their domestic solid waste and recycling habits should be gained. However, current systems are insufficient at this point. The second is the donation of non-governmental organizations (NGOs) in the context of their economic continuity. Most of the income sources of NGOs are donations. However, due to the lack of income sources, most NGOs cannot reach their targets. Therefore, there is a need for systems that can encourage individuals to donate to NGOs. This study offers a solution to these two problems by developing a system that enables individuals to transfer the income they obtain by recycling their domestic solid waste as donations to NGOs. In this respect, a smart recycling vending machine, where individuals can recycle their domestic solid waste, and a mobile application, where they can donate the virtual money they obtain by recycling to NGOs, were designed. In this study, first of all, a scenario was prepared by the researcher to embody the project idea, and then a simulation was developed, in which many people could experience the project idea with the help of an expert in the field in line with the scenario and designs.

Keywords: Domestic Solid Waste, Donation, Non-Governmental Organizations, Recycling, Sustainability

Received: 17.10.2022 – **Accepted:** 07.12.2022 – **Published:** 29.12.2022

¹ **Mehtap Çöl**, Department of Foreign Languages Education, Faculty of Education, Çanakkale Onsekiz Mart University

² **Derya Girgin**, Assoc. Prof. Dr., Educational Sciences, Çanakkale Onsekiz Mart University Education Faculty, ORCID: 0000-0002-6114-7925

Correspondence: deryagirgin@comu.edu.tr

INTRODUCTION

Recycling in the Context of the Management of Domestic Solid Waste

While natural resources are consumed unconsciously due to increased production all over the world, the wastes that arise with increasing consumption threaten both the environment and human health due to their amount and harmful content (Sengül, 2010). One of the types of waste generated as a result of human activities is domestic solid waste. Plastic, glass, water and soft drink bottles, paper, metal cans, and batteries are just a few of them. Domestic solid wastes come to the fore more than other solid wastes as they are accumulated in a narrower area with the population and wait to be collected (Hayta, 2006). This situation necessitates solid waste management in which the process from the formation of solid waste to its disposal is carried out in a plan and regularly to protect the environment and human health in urban areas (Bozkurt & Yılmaz, 2010). “Advanced waste management systems include prioritized management strategies to minimize environmental problems and preserve resources” (Demirbas, 2011, p. 1281). This is called the waste management hierarchy (see Figure 1). In the waste management hierarchy, the aim is to reduce the amount of waste as much as possible while getting the maximum benefit from the existing products (Demirbas, 2011).

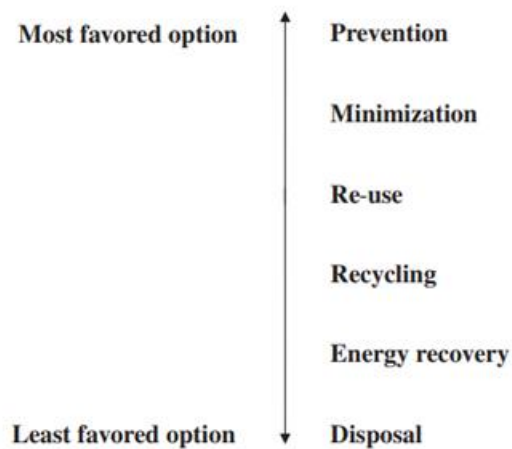


Figure 1. The waste management hierarchy (Demirbas, 2011)

“Recycling”, the fourth component of the waste management hierarchy, is one of the cornerstones of modern waste management. Recycling is a process that involves reprocessing of wastes and, in this process, greenhouse gas emissions are reduced compared to production from scratch by both preventing the waste of useful material resources and reducing raw material consumption and energy use (Magram, 2011). The aim of recycling is to reintroduce wastes that would be disposed of as raw materials to produce new products (Dyson & Chang, 2005). As the first stage of the recycling process, recyclable solid wastes should be collected separately and cleanly from

other wastes and separated according to their types (Karagözoglu et al., 2009). Not collecting waste separately at the source may hinder the recycling process. Therefore, consumers play a crucial role in managing domestic solid waste through proper disposal and recycling of recyclable materials. There is a need for systems that will inform consumers about the importance of recycling and encourage them to separate the waste at the source and gain recycling habits, but the existing systems are insufficient at this point.

Donation in the Context of the Economic Continuity of Non-Governmental Organizations

There are three main sectors on which democracy is based: the public sector, the private sector with a profit motive, and the non-governmental organizations working for the public interest without a profit motive (Oztürk & Sahin, 2004). Non-Governmental Organizations (NGOs) are democratic organizations based on voluntariness, where a culture of pluralism and participation is developed by working for the benefit of society without any profit (Aslan & Kaya, 2004). Globalization has brought with it some problems such as environmental pollution, drugs, epidemics, population explosion, migration and human smuggling, and the struggle of the state alone can sometimes be insufficient in dealing with these problems and at this point, non-governmental organizations help to identify the problem, seek solutions, and implement these solutions (Göymen, 2004). It is almost impossible to reach a specific goal without any financial support, and non-governmental organizations also need financial support to achieve their goals. However, one of the biggest problems faced by NGOs in Turkey is the scarcity of income sources (Dincay, 2016). Membership fees and donations constitute the main economic resources of NGOs but because of low membership fees and not being paid regularly, non-governmental organizations have to focus on aid from corporate or individual donors (Boztepe, 2014). Considering the direct aid, the amount of donations in Turkey has reached a level comparable to the rest of the world, but since these donations are made directly rather than through institutions, it prevents NGOs from developing and becoming more active in more areas (Carkoğlu & Aytac, 2019). Therefore, there is a need for a system that will encourage individuals to make donations to NGOs and make them gain the habit of donating.

In the context of all these mentioned, this study deals with a total of four problems, two main and two sub-problems.

The main problems addressed by the study;

- The fact that nature and human health are in danger due to solid wastes arising from increased production and consumption because of developments in today's science and technology, industrialization, rapid population growth, and rapid urbanization.
- Inability of non-governmental organizations, working for the benefit of society without a profit motive, to reach sufficient financial resources to continue their activities.

Sub-problems addressed by the study:

- The inadequacy of current systems in getting consumers to adopt recycling habits.
- The fact that individuals donate directly and don't have sufficient awareness about NGOs' needs.

Purpose

Considering all these, the aim of this study is to develop a system that will enable individuals to gain awareness about the importance of recycling and the needs of non-governmental organizations, enable them to gain recycling habits and encourage them to donate to NGOs, and enabling them to transfer the income they will obtain by recycling their recyclable household solid wastes as donations to non-governmental organizations.

LITERATURE REVIEW

Recycling in the Context of the Management of Recyclable Domestic Solid Waste

Demirbag and Gungormus (2012), in their study which aims to determine the knowledge and behaviors of individuals regarding domestic solid waste management; applied a survey to 651 people in Trabzon. Although the majority of the people (73.1%) think that separate collection of wastes is important, they do not collect their waste separately (50.4%) because it is difficult.

Yılmazkarasu (2018) has developed a "Gamified Product for Paper Recycling (MADMAX)" in order to show individuals that recycling paper waste is not a difficult task, to encourage individuals to recycle their paper waste and to get them to adopt recycling habits. It has been concluded through the interviews with the subject matter experts that the product design is effective in raising the environmental awareness of the individuals and encouraging the individuals to use the machine because it is fun.

Çetin (2019), in his study, first examined the concept of solid waste, its types, and disposal methods. Then compared the economic benefits obtained from domestic solid waste management in

the world, European Union countries, and Türkiye, and concluded that Türkiye is behind EU countries. Finally, examined the environmental, social, and economic benefits of domestic solid waste recycled in Türkiye through the example of Eskişehir. Also, Çetin (2019), emphasized that in order to get more efficiency from recyclable solid wastes, it is necessary to carry out studies that will inform individuals about the separate collection of wastes at the source and encourage them to collect waste separately at the source.

Atalay (2021), in his study, discussed the concept of waste, analyzed the contribution of recyclable solid wastes to the economy as a result of recycling processes, and determined that Türkiye lags behind the world economies in terms of recycling habits, not reaching the level of developed countries in the recycling sector. He drew attention to the reasons for not being able to reach the level of developed countries and made suggestions by mentioning the responsibilities of policymakers, individuals, and the private sector in order to reach the desired level.

Tomar et al., (2021), in their study, carried out to determine the level of consciousness and awareness of consumers about the recycling of the solid waste in Türkiye, A questionnaire is applied to 415 people from Istanbul, Ankara, and Izmir provinces. As a result of the research, it has been concluded that; the awareness level of consumers about the importance and benefits of recycling, and the problems that will arise from not recycling are generally high. Also, it has been concluded that there are not enough recycling bins.

Donation in the Context of the Economic Continuity of Non-Governmental Organizations

Arslan (2020), in his study, carried out to determine the sources of income based on the financial statements of foundations; analyzed the income statements of five different foundations. As a result of the study, he concluded that donations and aids constitute the most important income source of foundations.

Similarly, Guvendi (2017) conducted an online survey of 42 different people from 24 different associations in order to examine the studies and problem areas of local NGOs operating in the field of education in the province of Istanbul. It is concluded that donations are the main economic source of NGOs operating in the field of education, but the biggest problem they face is economic problems and their income sources are insufficient.

The study was carried out to reveal the current situation of individual donation, the donation tendencies of individuals, and the perception of philanthropy, like other studies, to support the fact

that most NGOs cannot reach sufficient financial resources. When people were asked whether they would prefer to deliver the money they have directly or by donating to an organization for those in need, approximately 88% stated that they would prefer to deliver the money they have directly to those in need, while only 12% stated that they would prefer to deliver their money to those in need through an organization (Carkoğlu & Aytac, 2019). Another point that the same study draws attention to is how people donate (directly or through organizations), where (to relatives, neighbors, beggars...), and how much they donate in a year in Turkey. According to the study (Carkoğlu & Aytac), the total amount of all aid and donations made directly and through organizations in Turkey in a year is approximately 303 TL per person, 262.7 TL of which is direct aid, only 40,2 TL made through NGOs.

In a study aiming to reveal the use of corporate web pages as a fundraising tool in the management of the relationship between the non-governmental organization and the donor target groups (Boztepe, 2014), based on the principles of a study that found a link between the way NGOs use their web pages and the amount and frequency of fundraising, the web pages of sixteen NGOs in Turkey were examined in terms of accessibility, accountability, education, interaction, and empowerment, and it was concluded that NGOs could not effectively use their web pages as a funding tool. Boztepe pointed out that these principles should be taken into consideration while developing corporate web pages, and that the development of existing corporate web pages in the context of these principles will encourage the target audience to donate.

In another study, Goktas (2014) determined the factors affecting the donation behaviors of individuals and stated that since NGOs obtain most of their financial resources, they need to continue their activities, from donations, knowing the factors affecting individuals' donation behaviors and developing the fundraising activities carried out in this context will affect the fundraising success of NGOs.

METHODOLOGY

The aim of this project is to create a system where individuals can donate to non-governmental organizations using the virtual money obtained by recycling. In this context, the development of a smart recycling machine for the collection of recyclable domestic solid waste and the development of an application that can work in harmony with ISO and Android systems is a solution proposal for the problems addressed by the project. Within the scope of this project, a simulation was developed in which people can transform their recyclable domestic solid wastes with the virtual money they obtain and donate them to non-governmental organizations.

Smart Recycling Vending Machine

The purpose of using smart recycling vending machines is to collect recyclable waste in an economical and practical way. Individuals will be able to collect their recyclable waste instead of throwing it away and then recycle it in smart recycling vending machines. The smart recycling vending machine has separate waste entry areas for plastic, paper, glass, and battery waste (see Figure 2). At each waste entry area, there are scales to weigh the amount of waste and sensors that can detect the type of waste to avoid receiving unqualified waste. These vending machines have a thermal receipt system and according to the amount of waste, they give the person a receipt with the code on it.

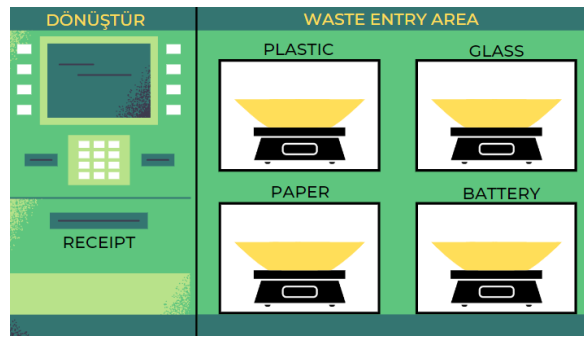


Figure 2. Design of smart recycling vending machine

Mobile Application

An application compatible with ISO and Android systems has been designed that will enable people to transfer the income they generate from the waste they convert to non-governmental organizations as donations. The name of the app is "Dönüştür" (see Figure 3). Some of the main features of the application are as follows. After registering in the application, the person can log in to their own account (see Figure 4). On the home page, a person can access the points s/he has earned by recycling, her/his previous donations, information about recycling, and also can donate (see Figure 5). Points (virtual money) can be earned by entering the code received from the smart vending machine in the "Points" section (see Figure 5). Donations can be made in the "Donate" section with the points earned (see Figure 5). In the app, there are different fields of work for NGOs such as education, health, and environment in practice and many NGO options for these fields of work (see Figure 6). After clicking the "Donate" option on the main page, the person can choose which area they want to donate. For example, if they click on "Education" option, they can see the non-governmental organizations in the education category and donate to the NGO of their choice (see Figure 7).



Figure 3. Dönüştür's App Icon

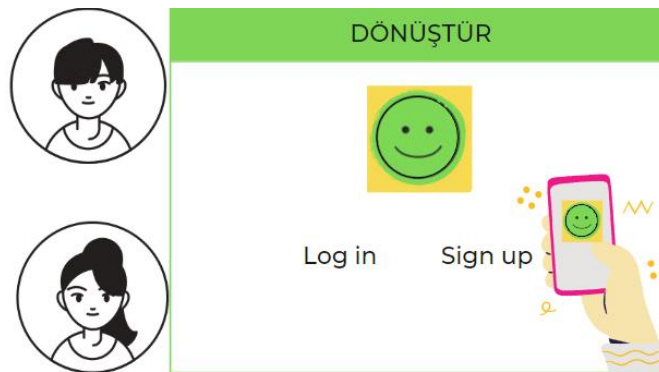


Figure 4. Dönüştür's Log in / Sign Up Page

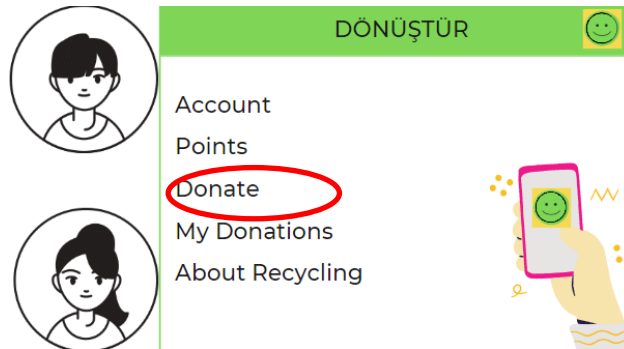


Figure 5. Dönüştür's home page

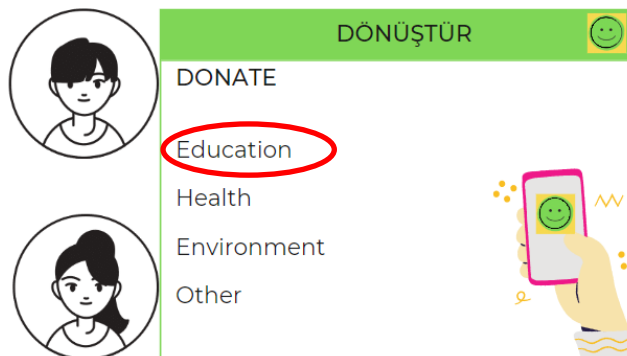


Figure 6. Dönüştür's donation page

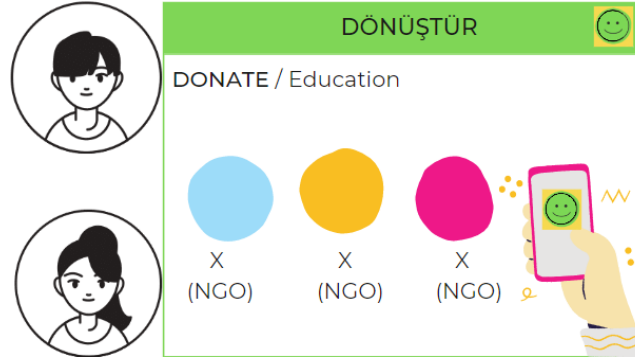


Figure 7. Choosing the NGO for donation

The Basic Working System of The Designed Product

Domestic solid waste (plastic, glass, paper, battery) is collected at the source instead of being disposed of separately from other wastes. The “Dönüştür” application is downloaded and registered. Domestic solid waste, for example, plastic, is placed in the relevant area in the smart recycling vending machine. After scanning and weighing the waste, the vending machine gives a receipt with a disposable code on it depending on the type and amount of waste. Points (virtual money) are earned after entering the code in the relevant field in the "Dönüştür" application. Afterward, donations can be made to a desired non-governmental organization by using the virtual money earned from recycling.

Scenario

A scenario was prepared by the researcher to embody the project idea. In this scenario, there are two characters named Ayşe and Ahmet. Ayşe shows Ahmet how the smart recycling vending machine works in practice and how the virtual money generated by recycling is donated to NGOs. The scenario is as follows (see Figure 8).

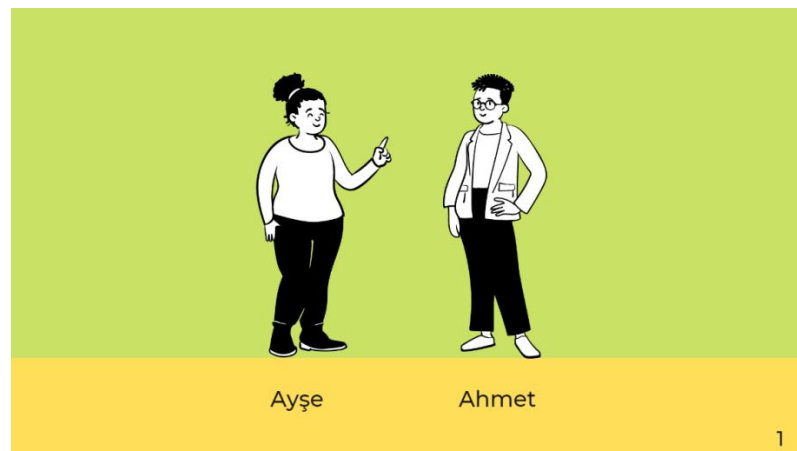
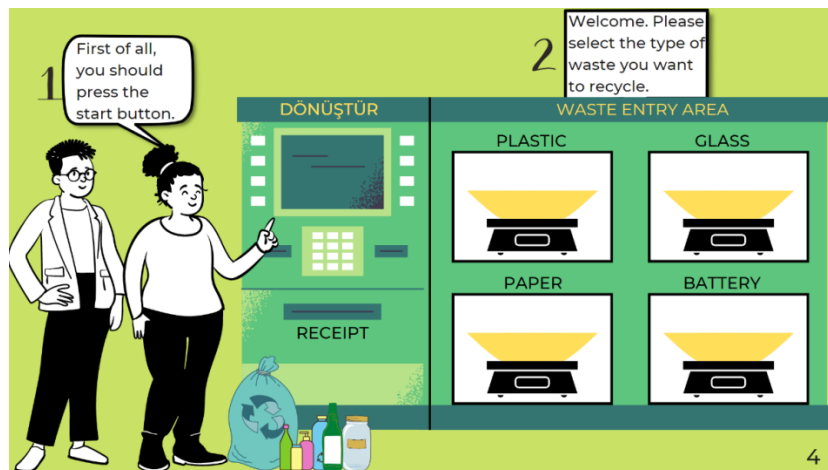
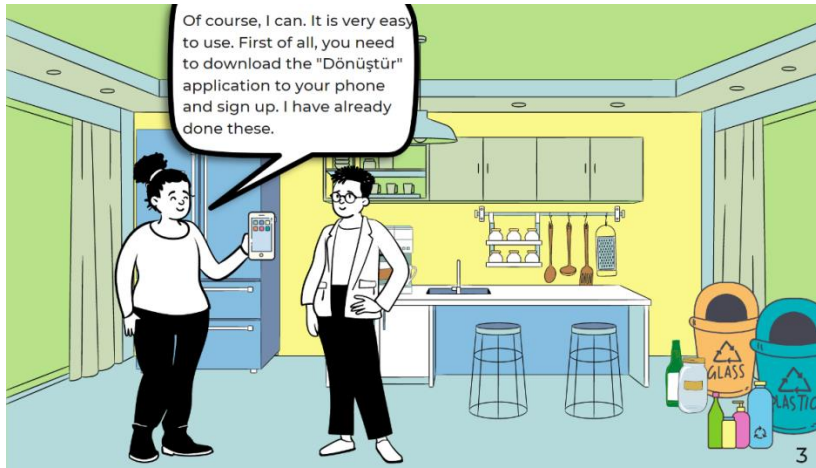
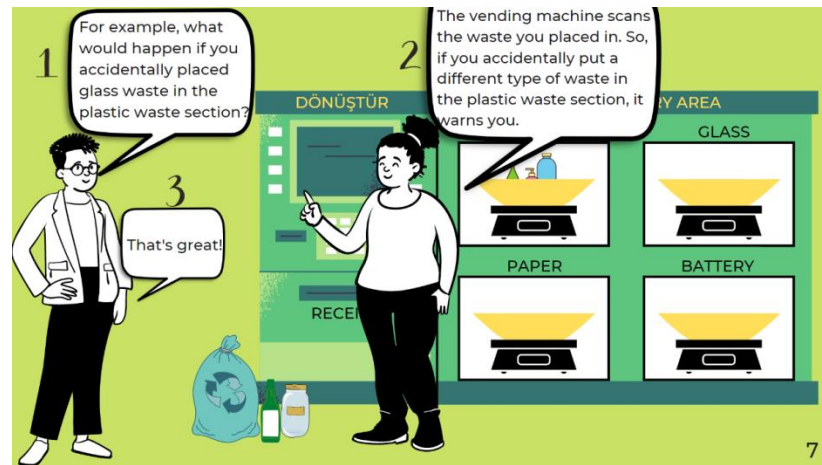
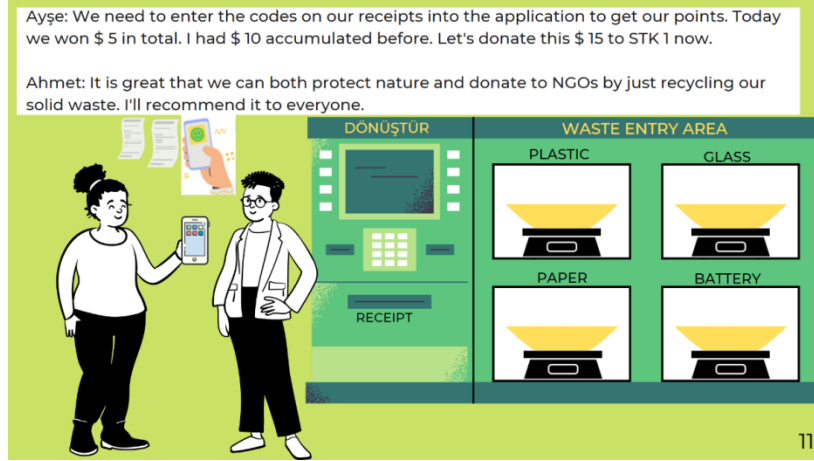


Figure 8. Scenario









Simulation

A simulation was developed so that the project idea could reach more people and be experienced by more people. The simulation was prepared with the help of an expert in this field, based on the designs and scenarios prepared by the researcher within the scope of the project. The way the simulation works is as follows. It is explained through the example of plastic waste recycling.

First, the person clicks on the start symbol, selects the type of waste s/he wants to recycle (plastic), and presses the next button (see Figure 9). The person places the plastic waste by clicking on the plastic waste bin in the waste entry area (see Figure 10). The vending machine scans the waste placed in the plastic waste area (see Figure 10). After the waste is scanned, the vending machine weighs waste placed in the relevant area (see Figure 11). The vending machine tells the amount of virtual money won and gives a receipt with a code on it and the person gets the receipt by clicking on it (see Figure 12). After receiving the receipt, the person should click on the "Dönüştür" application symbol and earn points by entering the code in the relevant section (see Figure 13). Lastly, donations can be made to the desired NGO by selecting the NGO working area (see Figure 14).

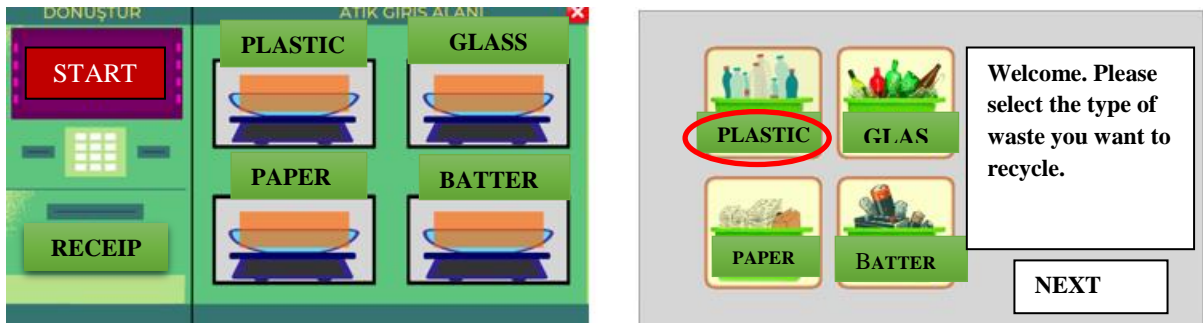


Figure 9. The person selects the type of waste s/he wants to recycle (Plastic)

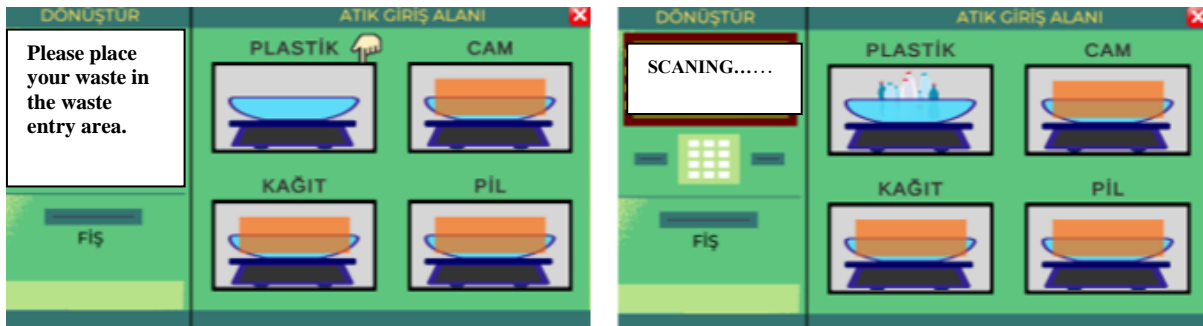


Figure 10. Placing the waste in waste entry area

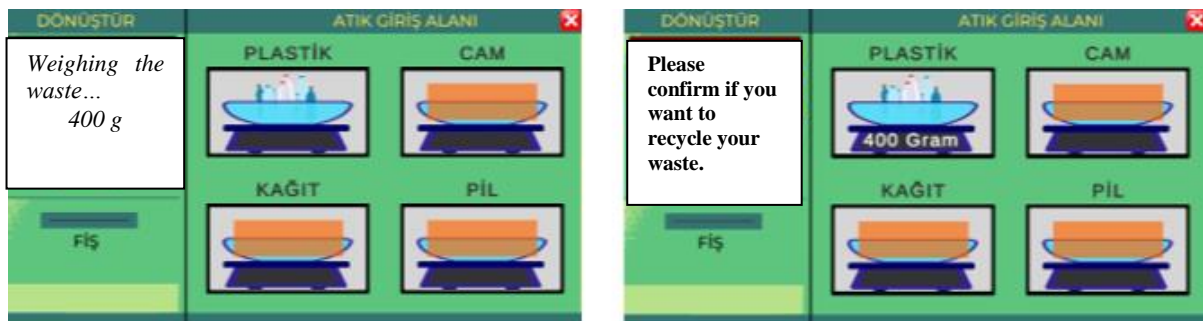


Figure 11. Weighing the waste

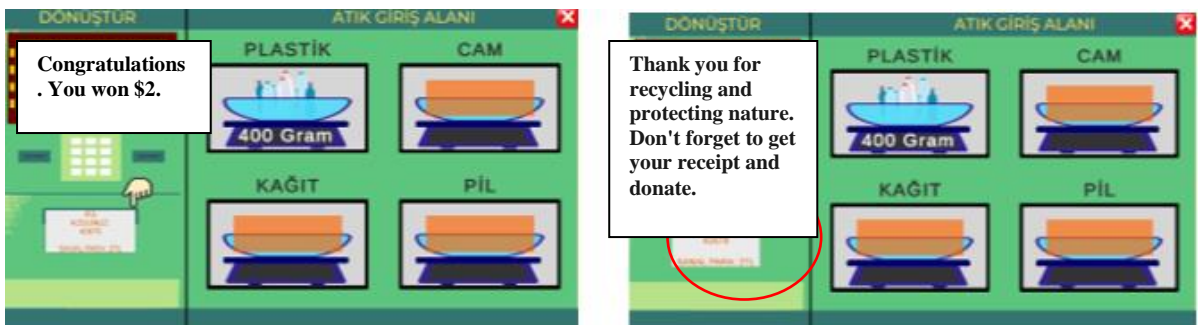


Figure 12. Receipt

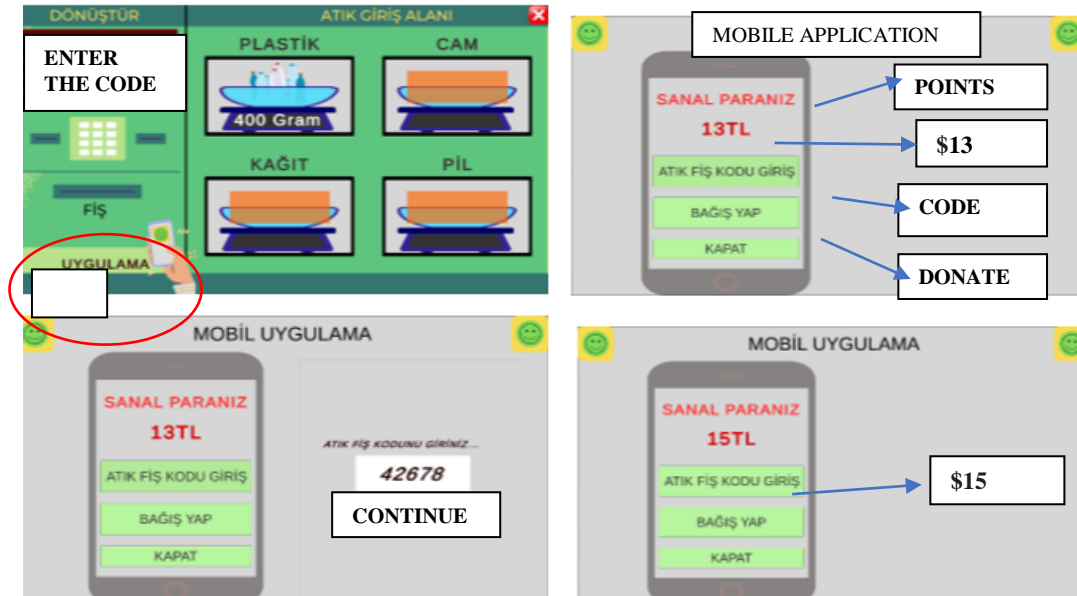


Figure 13. Code



Figure 14. Donating

DISCUSSION

Firstly, when we look at the studies in the literature about the recycling of domestic solid waste or solid waste, there are many studies in terms of the environmental, social, and economic benefits of recycling, the awareness and consciousness levels of individuals in Türkiye, the knowledge and behaviours of individuals regarding solid waste management or the barriers to recycling faced by consumers. However, the studies carried out to encourage individuals to recycle and to enable them to acquire recycling habits are very limited. Secondly, when we look at the studies in the literature about the economic continuity of NGOs, it is possible to reach many studies conducted to determine the factors affecting the donation behaviour of individuals, to reveal the current state of individual donations, to reveal the donation actions of individuals, to examine the problem areas of NGOs, and to determine the sources of income. However, no study that encourages people to donate and enables them to acquire donor habits has been found. Finally, unlike the other

studies in the literature, this study acts as a bridge between recycling and non-governmental organizations.

With this project, individuals will be encouraged to donate the income they earn by recycling their domestic solid waste, thus both natures will be protected and the continuity of non-governmental organizations will be ensured. These are the original aspects of the work. This study will contribute to the literature by offering solutions to these different problems.

CONCLUSION

Since the waste resulting from excessively increased production and consumption are not managed properly, they harm nature and threaten human health. In this case, consumers have so many responsibilities. Consumers should be conscious about the recycling of waste, especially waste prevention, minimization, and reuse, and should have recycling habits. Globalization has brought different problems with it. Sometimes, the support of the state may be insufficient in solving these problems. At this point, Non-Governmental Organizations (NGOs) come into play. Non-governmental organizations are voluntary organizations, and they try to offer solutions to many problems that have arisen with globalization. They need financial support to achieve their goals. The main sources of income for NGOs are membership fees and donations. However, many non-governmental organizations cannot serve their purpose by having difficulty in maintaining their economic continuity due to insufficient donation amounts. In order to offer a solution to these two different problems, within the scope of this project; the idea was put forward to develop a system that could encourage individuals to both recycle and donate to NGOs. A smart recycling vending machine where recyclable domestic solid waste (plastic, paper, glass, and batteries) can be recycled and an application that can act as a bridge for people to donate virtual money they obtain through recycling to NGOs has been designed. In this framework, a simulation has been developed that will enable the project idea to reach many people over the scenario prepared to embody the project idea.

SUGGESTIONS

There are two suggestions for similar studies that can be done in the future. First, it was not possible to develop and observe the designed products due to economic limitations within the scope of this project. However, with the realization of the project idea, the impact of the products on people's recycling and donation habits can be examined. Secondly, the project idea is limited to recycling

plastic, glass, paper and battery wastes from domestic solid waste. This limitation can be eliminated by adding different types of recyclable waste, such as technological or metal waste.

ACKNOWLEDGMENT

This article is a product of a research project funded by the Scientific and Technological Research Council of Turkey by Grant No. 1919B012101654 within the scope of 2209-A University Students Research Projects Support Program.

The authors equally took part in all processes of the article.

The authors declare that there is no conflict of interest.

The authors declare no competing interest.

REFERENCES

- Arslan, O. Türk Medeni Kanunu'na Göre Kurulan Vakıfların Gelir Kaynakları. *Akademik Bakış Uluslararası Hakemli Sosyal Bilimler Dergisi*, 235-245.
- Aslan, M., & Kaya, G. (2004). 1980 Sonrası Türkiye'de Siyasal Katılımda Sivil Toplum Kuruluşları. *CÜ İktisadi ve İdari Bilimler Dergisi*, 5(1), 213-223.
- Atalay, Nazan. (2021). *Geri Dönüşümün Ekonomilere Katkısı* (Yayınlanmamış Yüksek Lisans Tezi). Gaziantep Üniversitesi, Sosyal Bilimler Enstitüsü, Gaziantep.
- Boztepe, H. (2014). Sivil Toplum Kuruluşlarında Halkla İlişkiler: Kurumsal Web Sayfalarının Bağışçı İlişkileri Açısından Fon Sağlama Aracı Olarak Kullanımı. *Erciyes İletişim Dergisi*, 3(4), 150-168.
- Çarkoğlu, A., & Aytaç, S. E. (2020). Türkiye'de bireysel bağışçılık ve hayırseverlik. *İstanbul: TÜSEV Yayınları*, (84).
- Çetin, H. (2020). *Türkiye'de geri dönüşümü yapılan evsel katı atıkların çevresel, toplumsal ve ekonomik faydalarının incelenmesi: Eskişehir örneği* (Master's thesis, Fen Bilimleri Enstitüsü).
- Demirbağ, B. C. & Güngörmüş, Z. (2012). Bireylerin Evsel Katı Atık Yönetimine İlişkin Bilgi ve Davranışları. *Gümüşhane Üniversitesi Sağlık Bilimleri Dergisi*, 1 (3), 127-137. Retrieved from <https://dergipark.org.tr/tr/pub/gumussagbil/issue/7507/98958>
- Demirbas, A. (2011). Waste management, waste resource facilities and waste conversion processes. *Energy Conversion and Management*, 52(2), 1280-1287.
- Dinçay, İ. (2016). Sivil Toplum Kuruluşlarının Ekonomik Sorunları Ve Çözüm Önerileri. *Kahramanmaraş Sütçü İmam Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 5(2), 331-346.

- Dyson, B., & Chang, N. B. (2005). Forecasting municipal solid waste generation in a fast-growing urban region with system dynamics modeling. *Waste management*, 25(7), 669-679.
- Güvendi, F. M. (2018). *Eğitim alanında faaliyet gösteren yerel sivil toplum kuruluşlarının çalışmalarının ve sorunlarının incelenmesi* (Master's thesis, Eğitim Bilimleri Enstitüsü).
- Göktaş, V. (2014). *Bireylerin bağış yapma davranışlarını etkileyen faktörlerin belirlenmesine yönelik bir araştırma* (Master's thesis, Sakarya Üniversitesi).
- Göymen, Korel (2004). "Küresel Sivil Toplum: Gereksinme, Fırsatlar ve Engeller". I. Ulusal Sivil Toplum Kuruluşları Kongresi, *Küresel Demokrasinin Gelişmesi ve Katılım Sağlanması Açısından Sivil Toplum Kuruluşları Bildiriler Kitabı*, 4-6 Haziran 2004, s: 67-71.
- Hayta Bayazıt, A. (2006). Çevre kirliliğinin önlenmesinde ailenin yeri ve önemi. *Ahi Evran Üniversitesi Kırşehir Eğitim Fakültesi Dergisi*, 7(2), 359-376.
- Karagözoğlu, M. B., Özyonar, F., Yılmaz, A., & Atmaca, E. (2009). Katı atıkların yeniden kazanımı ve önemi. Türkiye'de Katı Atık Yönetimi Sempozyumu (TÜRKAY 2009), 15-17.
- Magram, S. F. (2011). Worldwide solid waste recycling strategies: A review. *Indian Journal of Science and Technology*, 4(6), 692-702.
- Şahin, L., & Öztürk, M. (2011, January). Küreselleşme Sürecinde Sivil Toplum Kuruluşları ve Türkiye'deki Durumu. *In Journal of Social Policy Conferences* (No. 54, pp. 3-29).
- Şengül, Ü. (2010). Atıkların geri dönüşümü ve tersine lojistik. *Paradoks Ekonomi, Sosyoloji ve Politika Dergisi*, 6(1), 73-86.
- Yılmaz, A., & Bozkurt, Y. (2010). Türkiye'de Kentsel Katı atık Yönetimi Uygulamaları ve Kütahya Katıatık Birliği (KÜKAB) Örneği. *Suleyman Demirel University Journal of Faculty of Economics & Administrative Sciences*, 15(1).
- Yılmaz, A. M., Niyaz, Ö., & Tomar, O. (2021). Türkiye'deki Tüketicilerin Katı Atıkların Geri Dönüşümü Konusundaki Bilinç Düzeylerinin ve Farkındalıklarının Belirlenmesi. *ÇOMÜ Ziraat Fakültesi Dergisi*, 9(2), 379-392.
- Yılmazkarasu, B. (2018). *Gamified Product Design For Paper Recycling* (Unpublished Master Thesis). Bahçeşehir University Graduate School Of Social Sciences Game Design Master Program, İstanbul.
- Yüksel, M. (2020). *Geri dönüşüm neden zor? Tüketici açısından geri dönüşüm önündeki engeller* (Master's thesis, Sosyal Bilimler Enstitüsü).