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RESEARCH ARTICLE
Local Governments, Urban and Environmental Policies

Determining the Amount of Packaging Waste and Evaluation of Recyling it within the Scope of Circular Economy (The Case of Bitlis Province/Türkiye

Ambalaj Atık Miktarının Belirlenmesi ve Döngüsel Ekonomi Kapsamında Geri Kazanımının Değerlendirilmesi (Bitlis İli/Türkiye Örneği)

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ABSTRACT

It is important to put forward the mitigation measures of solid waste management in order to realize sustainable development in cities. In the 21st century, with the dominance of sustainable development understanding, circular economy understanding has started to dominate instead of linear economy. This change has put solid waste management in a very important place for the realization of sustainable development. The first step to be taken in the solid waste management process should be measures to reduce the amount of waste. The aim of this study is to determine what activities are carried out within the scope of circular economy and waste management and to indicate the level of awareness on the subject and the importance given to the subject. Bitlis was selected as a sample in the study. In 2022, in line with the data obtained from ETAP Energy (Enhanced Energy Management Software for Power System Design, Operation and Automation) and Bİ-KA (Bitlis province, building and operating solid waste disposal facilities Union), it will be tried to determine the amount of packaging waste generated in Bitlis province and to develop alternative methods by examining its contribution to the economy.

Keywords: Waste, Solid Waste, Circular Economy,Sustainable Development, Bitlis

Dünya ülkelerinde sürdürülebilir kalkınmanın gerçekleşebilmesi için katı atıklar oldukça önemli bir konudur. Sanayileşmenin artmasıyla beraber atık türlerinde de çeşitlilik ortaya çıkmıştır. Şehirlerde sürdürülebilir kalkınmanın gerçekleşmesi için katı atık yönetiminin azaltıcı tedbirlerini ortaya koymak önemlidir. 21.yy'da sürdürülebilir kalkınma anlayışının hakim olmasıyla birlikte doğrusal ekonomi yerine döngüsel ekonomi anlayışı hakim olmaya başlamıştır. Bu değişim sürdürülebilir kalkınmanın gerçekleşmesi yolunda katı atık yönetimini oldukça önemli bir yere koymuştur. Katı atık yönetimi sürecinde atılacak ilk adım atık miktarını azaltıcı tedbirler olmalıdır. Bu çalışmanın amacı döngüsel ekonomi ve atık yönetimi kapsamında yapılan faaliyetlerin neler olduğunu tespit etmek konuyla ilgili farkındalık düzeyini ve konuya verilen önemi belirtmektir. Çalışama da Bitlis örneklem olarak seçilmiştir. 2022 yılı ETAP Enerji (Güç Sistemi Tasarımı, İşletimi ve Otomasyonu için Gelişmiş Enerji Yönetimi Yazılımı) ve Bİ-KA (Bitlis İli, Katı Atık Bertaraf Tesislerinin Yapılması ve İşletilmesi Birliği)'dan elde edilen veriler doğrultusunda Bitlis ilinde oluşan ambalaj atığı miktarının belirlenmesi ve ekonomiye olan katkısı incelenerek alternatif yöntemler geliştirilmeye çalışılacaktır.

Anahtar Kelimeler: Atık, Katı Atık, Döngüsel Ekonomi, Sürdürülebilir Kalkınma, Bitlis

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INTRODUCTION

With the rapid increase in the world population and the parallel growth of economic developments, consumption has increased. In addition to the increase in the amount of waste, it has been observed that there has been a change in the type of waste (Öktem, 2016). In a cyclical sense, waste refers to the material that is thrown, left or obliged to be thrown into the environment by the waste producer or the person holding the waste (Waste Management Regulation, 2015). Wastes are categorized as domestic, industrial, hazardous, electronic, medical and agricultural (Vaughn, 2009). Considering the amount of waste depending on these variables, it is of great importance in societies to control and manage this waste produced. Therefore, cities need to transition to sustainable economic models (WWF, 2019).

Therefore, it is aimed to eliminate the buy-make-dispose-use logic that has been going on since the past and to switch to the new circular economy approach of raw material-product-raw material. In this regard, local governments have a big share in waste management (EEA, 2015). The main purpose of adopting a circular approach within cities is to reduce consumption and waste generation. In 2019, Türkiye was the eighth largest and

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fastest growing economy in the OECD. Having become an upper middle-income country in the early 2000s, Turkey has experienced rapid urbanization and population growth, averaging 1.38% and 1.27% per year respectively. The population is expected to reach 97.96 million in 2059 (Reyhan, 2023).

Local governments have a large share in overcoming the problems that arise within the scope of Türkiye's current waste management. Due to the increase in the amount of solid waste, local governments have difficulty in finding solutions to this problem. For this reason, it causes them to cooperate with the private sector regarding waste management and to expand service procurement from the private sector (Güvenç, 2016). In addition to taking measures to reduce the amount of waste within the scope of circular economy, there is a recovery process in solid waste management. In order to ensure that waste management is carried out in a healthy and functional manner, the first step is to ensure the reuse of packaging waste that can be brought into the economy by recycling (Comission 2014).

This study aims to determine the amount of packaging waste generated in Bitlis province, which is selected as a pilot region within the scope of circular economy, and to collect these wastes properly and bring them into the economy. The study consists of 3 main parts. First of all, the relevant literature was reviewed. Then, waste management and zero waste management are mentioned. In the third part, as a result of the research, it is aimed to improve the situation and increase the recovery rate of packaging waste by examining how solid waste management is realized in Bitlis. The aim of the study is to determine what activities are carried out within the scope of circular economy and waste management and to indicate the level of awareness and importance given to the subject. There is no similar study on the evaluation and recovery of waste within the scope of circular economy in Bitlis province. In this respect, it is thought that the study will provide a very important contribution and awareness to the literature.

LITERATURE

One of the negative effects of economic growth in the last century is the irreversibility of waste. Especially since the 21st century, the disposal of waste as well as economic growth and the impact of these developments on the environment have been examined. The impact of the concepts of Recycling and Circular Economy on cities has been examined in terms of countries and their studies.

Circular Economy and Recycling Concept

(Ölander and Thogersen, 2006) Recycling behavior is directly related to individuals' personal characteristics and traditional structures. In their study, Ölander and Thogersen (2006) concluded that the ability of households to develop recycling behavior is directly related to waste collection and recycling services where they live.

(Goldsmith and Goldsmith, 2011) State that developing environmental behaviors such as recycling can be successful with educational and informational programs. In these programs, there are suggestions to use more communication channels to improve recycling behavior and to ensure that both the government, non-governmental organizations, and individuals take an active role in the programs to be carried out.

(Damiano, 2013) Examined the development of recycling behavior in Italian households and suggested that recycling messages should be given in churches, local newspapers, and politicians' television programs. In addition, it was concluded that age, gender, education, and income level directly affect recycling behavior and that insufficient recycling bins may prevent the development of recycling behavior.

Impact of Circular Economy on Cities

(Kutlu, 2007) It is expected and desired to prevent waste in the use of local resources and to consume the available resources at the minimum level. The assessment that it will be relatively easier to obtain reliable data at the local level, which will ensure the use of resources in the right place, is one of the starting points of circular economy applications.

(Hage and Söderholm, 2008) Conducted research on the determinants of household plastic packaging waste collection in Swedish Municipalities. They did this based on data from 252 Swedish Municipalities. According to the results, it was stated that many reasons such as demographic, geographical diversity and socioeconomic factors play a determining role in packaging waste collection. With the data obtained, it was concluded that the cost of collecting packaging waste in Sweden is high.

(Commission, 2014) Another step taken by the European Union for a circular economy is on waste. Towards a Circular Economy: It sets important targets for reducing waste with the program called Zero Waste Program. This plan advocates giving priority to green products in public procurement.

(Commission, 2015) Stated that circular economy is defined differently in many sources. According to the definition of the European Union, Circular Economy; It is defined as an economic approach in which the value of products, materials and resources is kept in the economy for as long as possible and the amount of waste is minimized.

(Halkos & Petrou, 2016) Waste is defined by the European Union as 'any substance or object that the owner throws away or plans to throw away or is required to throw away'. A definition similar to the definition here is the term municipal waste. The term municipal waste excludes waste from sewage treatment, construction and demolition activities, but includes waste produced by domestic, commercial and industrial waste together.

(Byström, 2018) Cities have concentrations that respond to the intense consumption demands of citizens and businesses that produce material and resource flows with cyclical potential. Most cities have great enough power to enable rapid decision-making by relying on autonomous power to regulate and promote, while also enabling the establishment of circular city functions and services and circular business models. Cities also provide citizens with infrastructure and public services that have circular potential.

(Kutlu, 2021) It is necessary to take into account the guiding and role modeling aspect of local governments, especially in the field of local economy and above. Since local governments make indicative expenditures and reflect indicative economic preferences, their business style and perspective on the economy draw attention rather than the economic resources they control. Their effects can be realized more clearly when local governments rule over relatively small but nominally large figures.

(Yaş, 2022) Turkey is also making significant efforts to align its environmental policy regulatory framework with EU standards. Those who manage the city, that is, institutions in authority positions such as municipalities and governorships, should ensure that these authorities, who are responsible for a city in the legislation in force for both circular economy and sustainability criteria, take action for these circular approaches. Therefore, it should be aimed to provide information about local government in Turkey, especially municipal legislation, in connection with the circular city. Legislation regarding the concept of circular economy should change according to the perception of the country and the texts in the legislation should touch this concept.

Waste Management in Circular Economy

Nature has a perfect cycle. We see that there is no waste in nature and that nature transforms itself. Today, as human beings use resources uncontrollably in their production and consumption model, the sustainability of nature threatens our resources. Thus, we witness climate crises and natural events in the world together (Ministry of Environment, Urbanization and Climate Change, 2024). Countries around the world have slowly begun to abandon the linear economy model and switch to a circular economy business model. This gave us the concept of Circular Economy. The concept of circular economy dates back to the 1970s and 1980s. However, this concept started to become popular in the 2000s (Altuntaş, 2012). It is known that the European Union first came to the agenda with the concept of bio-economy. It has been observed that the linear economy has come to a dead end with the take-use-throw mentality in the production and consumption process in meeting human needs of limited resources. For this reason, it is thought that future generations' adoption of the circular economy take-reuse-recycle-reduce approach will contribute more to ensuring the sustainability of societies. It seems that waste management is very important in the circular economy approach (Çokmutlu, 2023).

Using waste repeatedly is important for recycling. While waste increases every year, the same amount of natural resources decreases day by day. In order to make waste management more strategic, approaches known as R strategies have been developed. For this reason, the 9R approach was introduced to reduce the amount of waste in a certain way (Akkoy and Poyraz, 2023). These concepts, which include the 9Rs, are as follows:

0.Reject: Offering a different product that will provide the same function,

1. Rethinking: Making product use more active, sharing the product instead of selling it,

2.Reduce: Increasing the manufacturing process by using fewer resources,

3.Reuse: Reusing a functional product as a second hand product,

4. Repair: Making the product reusable by performing maintenance and repair operations,

5.Renew: Restoring the product

6. Remanufacturing: Using product parts that perform the same function to make another product again,

7. Suitability for Other Purposes: Using product parts to re-use another product with a new function,

8. Recycling: Transforming products into other products of the same quality or close to the same quality,

9.Remediation: Burning the products and obtaining new products from the resulting heat (Potting et al., 2017).

Solid Waste Management

"Solid waste is solid substances and sewage sludge that are intended to be disposed of by the producer and that must be disposed of regularly for the sake of public peace and, primarily, the protection of the environment." It is defined as (Ministry of Environment and Urbanization, 2019). All waste collected by local governments within the scope of urban solid waste management is called solid waste. These wastes consist of domestic waste, paper/cardboard, plastic, glass and metal (Aktepe, 2015).

In the Annex-4 Waste List of the "Waste Management Regulation", which came into force after being published in the Official Gazette No. 29314 dated 02.04.2015, each type of waste was examined in a section with 20 items and a table was prepared regarding Packaging Wastes;

Table 1. Packaging Waste is divided into 4 groups.

Classification of Waste	
Packaging Waste	It refers to all types of packaging and packaging materials that meet the definition of waste in the Waste Management Regulation, except for production residues (Resmi Gazete, 2019).
Paper/Cardboard Packaging	Paper is an indispensable product of the modern world. It is mainly in sheets and consists of cellulosic fibers of wood pulp (Turkısh Paper, 2019).
Plastic Packaging	Plastics are composed of organic molecules or polymers. Their source is gas, crude oil, and coal. Because it takes the desired shape more easily and the production cost is low, it has increased in terms of production in recent years.
Glass Packaging	Glass is a liquid formed by the dissolution of supercooled alkali and alkaline earth metal oxides and some other metal oxides and its main substance (SiO2) is silicon (Anadolucam, 2019). The feature that distinguishes glass from other wastes is its long life without compromising product quality.

Note: Table created by the author

General Functioning of Zero Waste Concept and Its Impact on Cities

Disposal of waste in the recycling/recovery process causes both material and serious energy loss. There is an increase in the amount of waste in direct proportion to the increase in the world population and the change in consumption habits (Kök, 2021). As the amount of consumption increases in societies, the resulting waste management situation has become quite difficult. For this reason, the pressure on our natural resources is increasing, and considering that our resources are not unlimited, the necessity of the Zero Waste target is revealed in every respect (Erdur, 2019). The action of using natural resources more efficiently and recycling the waste generated into the economy forms the basis of the Zero Waste Project target.

In this context, the Zero Waste Regulation came into force by being published in the Official Gazette dated 12.07.2019 and numbered 30829. The purpose of this regulation is to determine the principles and principles regarding the establishment, development, financing and certification of a zero waste management system that aims to protect the environment and human health in line with sustainable principles through the effective management of raw materials and natural resources (EIA, 2022).

With the aim of the Zero Waste Management System in society, various studies are carried out under the leadership of the Ministry of Environment and Urbanization, as it is possible to access the data above. In this context, the Zero Waste Information System was established by the Ministry in order to control, report and monitor the places that will implement the zero waste management system (Zero Waste, 2024). Zero Waste Information System is an application connected to the "Integrated Environmental Information System" of the Ministry of Environment and Urbanization, and it is a system that requires online login for institutions and organizations responsible for establishing this system. In line with the data collected on recyclable produced waste since the date the Zero Waste Information System application was activated in our country, it has been determined that 26,410.7584 m3 of "Greenhouse Gas Emission" has been prevented, 3,715.4936 m3 of "Water Saving" has been achieved, and 826,211.8032 kWh of "Energy Saving" has been achieved. has been made.

Material and Method

In the research, a research was conducted on circular economy policies in cities and the impact of these policies on waste management. Bitlis was preferred as the pilot province. Waste management in cities has started in Bitlis province, as in Türkiye. Within the scope of the research, Bitlis was selected as the pilot province. In the research, data was obtained from the Bitlis Provincial Directorate of Environment and Urbanization on non-confidential issues related to the Zero Waste Project and data that are accessible to member companies, schools and citizens that do not carry state secrets regarding the Zero Waste Information System. Packaging Waste Recovery studies that have been carried out since the beginning of Zero Waste studies in Bitlis were accessed and this information was included in the study. The amount of waste generated throughout the province and the qualities of these wastes were determined in the light of the information obtained from relevant institutions and organizations, and the current recovery methods of wastes, the value they provide to the economy, and what studies can be done in the coming years are explained in detail in the study.

Result

Located in the Eastern Anatolia Region, Bitlis province lies between 41° 33' and 43° 11' eastern longitudes and 37° 54' and 38° 58' northern latitudes. Bitlis is a province located on the border of the Upper Euphrates and Upper Murat sections of the Eastern Anatolia Region. (TMMO, 2019). According to 2022 TÜİK data, the population of Bitlis is 353,988 people. Population data of 7 districts, including the central district, are given in Figure 1;

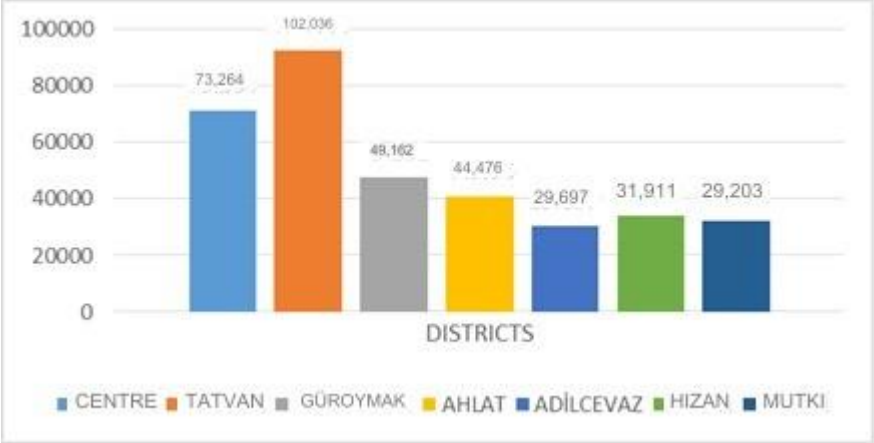

Fıgure 1: Populatıon of Bitlis
Source: (TÜİK, 2022).

Figure 1 shows that Tatvan is the most populous province, followed by the central district and Güroymak, and the population of the other districts is relatively low. Studies on solid waste were provided by BI-KA (Bitlis province, building and operating solid waste disposal facilities Union) and ETAB(Enhanced Energy Management Software for Power System Design, Operation and Automation) in Bitlis Province. Using the obtained 2022 waste data and 2022 population data, per capita waste production factors were calculated for each district.

Figure 2: Total Amount of Waste in 2022.
Source: (TÜİK, 2022).

When Figure 2 is examined, it is possible to compare the amount of waste generated per person with the income level. It is stated that as the income level and welfare level in a city increases, the amount of waste produced by the society will also increase. As the level of development increases, it is expected that the consumption of packaged products will increase, the purchase of packaged products will increase, and therefore the amount of waste

produced per person will increase (Öztürk, 2015). Even though the income level of the city is low, the AÜF data obtained is quite low and it is thought that this is due to the fact that solid waste is not collected effectively and efficiently in Bitlis.

Solid Waste Management in Bitlis Province

The average amount of waste collected per person in Turkey is 1.03 kg/person.day (TMMO, 2019). When we look at the big three cities, this number for Istanbul, Ankara and Izmir is 1.28 kg, 1.18 kg and 1.36 kg, respectively. The most waste generated per person per day is produced in Muğla, Balıkesir, Aydın, Antalya and Tekirdağ, respectively (Ölander, 2016). Research on solid waste in the city was provided by BI-KA (Bitlis province, building and operating solid waste disposal facilities Union) and ETAP (Enhanced Energy Management Software for Power System Design, Operation and Automation). According to the data obtained, domestic solid waste from municipalities and the private sector was accepted and stored in the Bitlis Solid Waste Storage Facility. The total amount of waste stored is approximately 69,262 tons. The monthly distribution and daily average of the amount of stored waste is shown in the table below (BİKA, 2022).

Figure 3: Total Amount of Waste
Source:(BIKA,2022).

It is seen that Tatvan is the district with the highest total amount of waste in Bitlis province in 2022.

Figure 4: Amount of Packaging Waste Collected in 2022
Source: (BIKA, 2022)

Table 2: Amount of packaging waste sent by ETAB (Enhanced Energy Management Software for Power System Design, Operation and Automation) company to licensed companies by 2022

MONTHS	PAPER-CARDBOARD	PET-PLASTİC	TOTAL

JANUARY	14.438	11.103	25.541
FEBRUARY	9.547		9.547
MARCH	15.654	17.572	33.226
APRIL	14.628	16.336	30.964
MAY	14.539	24.283	38.822
JUNE	13.903		13.903
JULY	23.576		23.576
AUGUST	12.920		12.920
SEPTEMBER	13.694	24.520	38.214
OCTOMBER		22.325	22.325
NOVEMBER			0
DECEMBER			0
TOTAL	132.899	116.139	

Source: (BIKA, 2022).

According to 2022 data, 132,899 pieces of paper and cardboard were collected in the province. The amount of Pet-Plastic was collected at 116,139. A total of 260,366 packaging wastes were collected in one year.

Data obtained from ETAB (Enhanced Energy Management Software for Power System Design, Operation and Automation) company regarding packaging waste with the date of 2022 are included in Table 2. Bitlis province is located in the Eastern Anatolia Region and due to its geographical coordinates and being a mountainous region, winters are harsh and heavy with snow. It is a province where industrialization has not developed and the economic livelihood is based on animal husbandry and animal products. Considering the low income level and insufficient welfare level, previous studies were examined and it was predicted that the amount of waste was less than in societies with high welfare levels, as a matter of fact, this prediction was proven in line with the information obtained from ETAP (Enhanced Energy Management Software for Power System Design, Operation and Automation) and BI-KA (Bitlis province, building and operating solid waste disposal facilities Union).

The average amount of daily waste produced per person, calculated by establishing a proportion between the population of Bitlis province and its districts and the collected waste, was calculated to be 0.48 kg. As a result of this calculation, it has been concluded that the waste has not yet been collected effectively and efficiently and the entire amount of waste produced has not been sent to the licensed company. One of the most important problems of the city is that the public has insufficient knowledge about waste disposal due to the low level of education. Most of the waste in the city is left to nature instead of being recycled. Tatvan, Adicevaz and Ahlat, which are the districts of the city, are among the places on the coast of Lake Van. It has been observed that this situation has a negative impact on both Lake Van and the rivers of the city (Alkan, 2015).

CONCLUSION

In this article, waste characterization was made throughout Bitlis province, and the amount of waste produced per person per day, the types of wastes, and the contribution to recycling/recovery were investigated. Households in Turkey do not yet have an efficient perspective on waste management. The most important reason is that environmental policies in Turkey are not regulated at a sufficient level of awareness. As a priority step, education and awareness raising activities on waste management should be carried out, starting from primary schools. In this regard, local governments and municipalities have a responsibility. With recycling for a sustainable economy in Bitlis province, natural resources will be protected and the budget of the municipalities will be relieved. Municipalities can contribute to awareness-raising and education activities by working together with headmen and providing citizens with brochures, posters and encouraging gifts. In the research, Bitlis province and its surroundings were faced with important environmental problems. It is predicted that permanent damage will occur if precautions are not taken against the environmental problems occurring in the city. In line with the data obtained in the study, it was concluded that a significant portion of the waste was not recycled and went to the storage facility through the collection system of the municipalities. It should also be prevented that solid wastes are randomly released into the receiving environment by people in the city. In most workplaces, solid waste is left on streets, streets and roads, especially in Bitlis stream. In order to prevent pollution, authorities should take precautions and warning signs should be hung in different parts of the city. Particularly solid wastes should be prevented from mixing with Bitlis stream. At the same time, it has been determined that a large part of these wastes that are not sent for recycling are left to nature in a way that may endanger human health and environmental health due to lack of awareness and low education level. In order to minimize existing environmental problems and create a healthy environment, environmental education should be given from an early age. Therefore, information about environmental awareness should be provided in schools in different parts of the city. In the city of Bitlis, solid

waste is collected from garbage containers and garbage collection points placed at certain points by the municipality and disposed of in the facility belonging to BİKA. Due to its location and distance from several districts, the facility cannot operate at full efficiency in waste collection. For this reason, it is necessary to establish a packaging waste transfer center through local governments in order to collect the packaging waste collected in Adilcevaz and Ahlat districts before being delivered to the collection sorting facility.

REFERENCES

Akkoy, S., & Poyraz, M. Sürdürülebilir Çevre Eğitimi Kapsamında İlkokul Öğretim Programında Geri Dönüşüm Kavramının Yeri. Ankara Üniversitesi Çevrebilimleri Dergisi, 10(2), 15-24.

Anadolucam (2019). www.anadolucam.net/ Date of access:24.04.2024.

Altuntaş, A. (2013). Sürdürülebilir Toplumlar ve Metropollerin Baskılarından Kurtulmak İçin Alternatif Bir Yol: Sürdürülebilir Kentler/ Sustainable Communities And An Alternative Way to Escape The Pressures of Metropolis: Sustainable Cities. Mustafa Kemal Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, 9(17), 135-148.

ALKAN, A. (2015). Bitlis Şehrinin Çevre Sorunlari ve Alinmasi Gereken Önlemler. Doğu Coğrafya Dergisi, 20(33), 11-36.

Aktepe T, 2015. Kayseri İli Katı Atık Yönetimi ve Çözüm Önerileri. Yüksek Lisans Tezi, Erciyes Üniversitesi Fen Bilimleri Enstitüsü, Kayseri.

Byström, J. (2018). Circular Economy for Cities circular_economy_15_steps_for_cities_en tr.pdf. Date of access:30.05.2024.

Comission, European. (2014). Towards a circular economy: A zero waste programme for Europe, COM/2014/0398 C.F.R.

Comission, European. (2015). Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions—closing the loop—an EU action plan for the Circular Economy.

Çevre Durum Raporu (2022). https://webdosya.csb.gov.tr/db/ced/icerikler/b-tl-s_-cdr2022-20231114081338.pdf. Date of access: 25.04.2024

Çevre Şehircilik ve İklim Değişikliği Bakanlığı (2019). https://csb.gov.tr/sss/kati-atik Date of access: 14.04.2024.

Çevre, Şehircilik ve İklim Değişikliği Bakanlığı (2024). https://dongusel.csb.gov.tr/hakkinda-i-105778 Date of access:24.04.2024.

Ece Çokmutlu, M. (2023). Sürdürülebilir Kalkınma Temelinde Döngüsel Ekonomi Performansı. Verimlilik Dergisi.

EEA. (2015). The European Environment State And Outlook 2015 Synthesıs Report, Access address: https://www.kowi.de/Portaldata/2/Resources/horizon2020/coop/S OER-Synthesis-2015-EN.pdf, (22.04.2024).

Eskin, F. (2020). Avrupa Birliğinin döngüsel ekonomi modeli ve Türkiyede yerel yönetimlerin atık politikası: Konya Büyükşehir Belediyesi örneği (Yüksek Lisans Tezi, Lisansüstü Eğitim Enstitüsü).

Erdur, E. (2019). Türkiye'de sıfır atık projesi ve projenin kamu kurumlarında uygulanması; süleymanpaşa belediyesi örneği. Yayımlanmamış yüksek lisans tezi, Ankara Gazi Üniversitesi Fen Bilimleri Enstitüsü Çevre Bilimleri Ana Bilim Dalı, Ankara.

Funda, K. Ö. K. (2021). Organik atıkların yönetimi, geri dönüşümü ve uygulamaları. Ulusal Çevre Bilimleri Araştırma Dergisi, 4(2), 99-108.

Güvenç L, 2016. Kartal Belediyesi Sınırları İçerisinde Oluşan Ambalaj Atıklarının Karakterizasyonu ve Ekonomik Analizi. Yüksek Lisans Tezi, İstanbul Üniversitesi Fen Bilimleri Enstitüsü, İstanbul.

Halkos, G. E., & Petrou, K. N. (2016). Moving towards a circular economy: Rethinking waste management practices. Journal of Economic and Social Thought, 3(2), 220-240.

Kutlu, Ö. (2007). Yerel Yönetim Geleneği ve Kültürel, Sosyal ve Siyasal Temelleri: Konya Modeli. Eleştiri: Eleştirel Orta Doğu Çalışmaları , 16 (3), 255–271. https://doi.org/10.1080/10669920701616500

Kutlu, Ö. (2022). Yerel Yönetimlerin Döngüsel Ekonomi için Anlamı. M. Bulut ve C. Korkut (Eds). Döngüsel Ekonomi ve Sürdürülebilir Hayat (s. 315-338). Türkiye Bilimler Akademisi Yayınları. DOI: 10.53478/TUBA.978-605-2249-97-0.ch12.

Ölander, F., & Thøgersen, J. (2006). The ABC of recycling. In European Advances in Consumer Research (pp. 297-302). Association for Consumer Research.

Öktem B, 2016. Atık Yönetiminde Entegre Uygulama. Batman Üniversitesi, Yaşam Bilimleri Dergisi, 6: 135-147.

Potting, J., Hekkert, M., Worrell, E. and Hanemaaijer, A. 2017. "Circular economy: Measuring innovation in the product chain", PBL Netherlands Environmental Assessment Agency.

Reyhan, A. S. 100. Yılında Türkiye Cumhuriyeti'nin Yeni Ekonomik Yol Güzergahı: Yeşil Mutabakat Süreci ve Döngüsel Ekonomi Üzerine Bir Değerlendirme. Süleyman Demirel Üniversitesi Fen-Edebiyat Fakültesi Sosyal Bilimler Dergisi, 211-224.

Resmi Gazete (2024) www.resmigazete.gov.tr/eskiler/2017/12/20171227-12.html Date of access: 28.04.2024.

TMMOB Çevre Mühendisleri Odası, 2019. Dünya Çevre Günü Türkiye Raporu, Date of access:20.04.2024.

Öztürk, İ. (2015). Katı Atık Yönetimi ve AB Uygulamalar. İSTAÇ AŞ Teknik Kitaplar Serisi-2, İstanbul.

Turkısch Paper (2024). www.turkishpaper.org/TR,79/kagit-karton-sektor-raporu.html, (Erişim tarihi: 28.04.2024). Yaş, H. (2022). Döngüsel Kentler ve Türkiye'deki Çevre Mevzuatının Uugunluğu. Anadolu Akademi Sosyal Bilimler Dergisi, 4(2), 71-92.

Zero Waste (2024). https://sifiratik.gov.tr/ Date of access:24.04.2024.

Waste Management Regulation (2015). T.C. Resmi Gazete, 29314, 2 Nisan 2015 .http://www.resmigazete.gov.tr/eskiler/2015/04/20150402-2. htm Date of access:22.04.2024.

WWF. (2019). July 29: Earth overshoot day 2019 is the earliest ever. Erişim adresi: https://wwf.panda.org/?350491/Earth-OvershootDay-2019, Date of access: 22.04.2024.