

ENVIRONMENTAL FACTORS IN SUSTAINABLE DEVELOPMENT: MUNICIPAL SOLID WASTE TREATMENT IN AZERBAIJAN POLICY PAPER



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ENVIRONMENTAL FACTORS IN SUSTAINABLE DEVELOPMENT: MUNICIPAL SOLID WASTE TREATMENT IN AZERBAIJAN

Policy Paper

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Table of contents

Summary 3

1. Benefits of municipal solid waste management 4

2. Work done so far in the field of waste treatment in Azerbaijan 5

3. International experience in solid waste treatment 7

Conclusion and recommendations 14

1. Summary

This article has been written in order to evaluate municipal solid waste treatment in Azerbaijan, draw attention to existing problems, and show possible solutions and international experience. The study mainly consists of four parts. The first part focuses on the importance of waste treatment and mainly talks about the economic and environmental benefits of waste treatment. The second part is about the works, projects, and statistical indicators done so far in the field of municipal solid waste collection, transportation, and treatment in the country. The waste management system in Baku and the regions, the construction and use of the Balakhani landfill, and the "Clean City" project have been reviewed. The third part is called solid waste treatment in the world and talks about international experience, indicators, etc. in the field of municipal solid waste treatment. This section also talks about the work done in this regard in neighboring countries Turkey and Georgia. The fourth part of the study is result-based and talks about the existing problems and possible solutions in the field of municipal solid waste collection and treatment in the country.

The solutions given in the study are based on international experience and research carried out by various reputable international organizations in the country and proposals made by them. The source of each given data and statistical information is provided at the footer of the pages.

2. Benefits of municipal solid waste management

According to the legislation of Azerbaijan, municipal waste (municipal solid waste) is classified as objects, substances, and materials generated in residential areas as a result of the life activities of the population.¹ Municipal solid waste is that waste that, in addition to being generated by households, includes some commercial and industrial wastes that are the same or similar to household waste and that are collected in municipal landfills. However, it should also be noted that some municipal waste, such as aluminum cans, metals, glass, etc., can also be usefully considered as a source of renewable raw materials through energy conversion and composting through recycling or recovery operations. However, large volumes of solid waste are disposed of in landfills due to low costs and the availability of ready-made raw materials. Biodegradable components of solid waste in landfills (such as paper and food waste) release methane, which is a greenhouse gas and 23 times more potent than carbon, and causes significant environmental problems. Other components (e.g. leachate from waste) can cause serious air and surface water pollution and spread bad odors to surrounding areas.²

Furthermore, the environmental benefits of proper waste management cannot be overlooked. Improper waste management can lead to the pollution of surface and ground water, including soil and air pollution. For example, illegal dumping of waste on roadsides, forests, landfills, lakes, and rivers or improper burning is a result of ineffective management and can affect human health, kill animals, damage plants, and cause infectious diseases.

3. Work done so far in the field of waste treatment in Azerbaijan

In 2006, the Azerbaijani government set priorities to reduce pollution from oil and gas production and municipal waste on the ecologically sensitive Absheron Peninsula. As a result of the "Comprehensive Action Plan for the Improvement of the Environmental Situation in the Republic of Azerbaijan for 2006-2010" signed by the President of the Republic of Azerbaijan on September 28, 2006, a new agenda was formed to change the existing practice of solid waste treatment in the country. Within the framework of the project, with the support of the World Bank, access to daily waste collection services was increased for 800,000 residents of Baku, and the scope of waste collection increased by 19% compared to 2008 to 79%. 6,345 new garbage cans were installed in 5 districts of Baku and 1,973 new collection points were created in order to expand the coverage. According to the project, the Balakhani Solid Waste Sorting Plant was established on the site of the Balakhani landfill, which is one of the largest illegal landfills in Baku, on an area of 120 hectares. Moreover, although 132 illegal landfills have been closed,

¹ <http://azstand.gov.az/upload/files/514-IQ%20İstehsalat%20və%20məişət%20tullantıları%20haqqında.pdf>

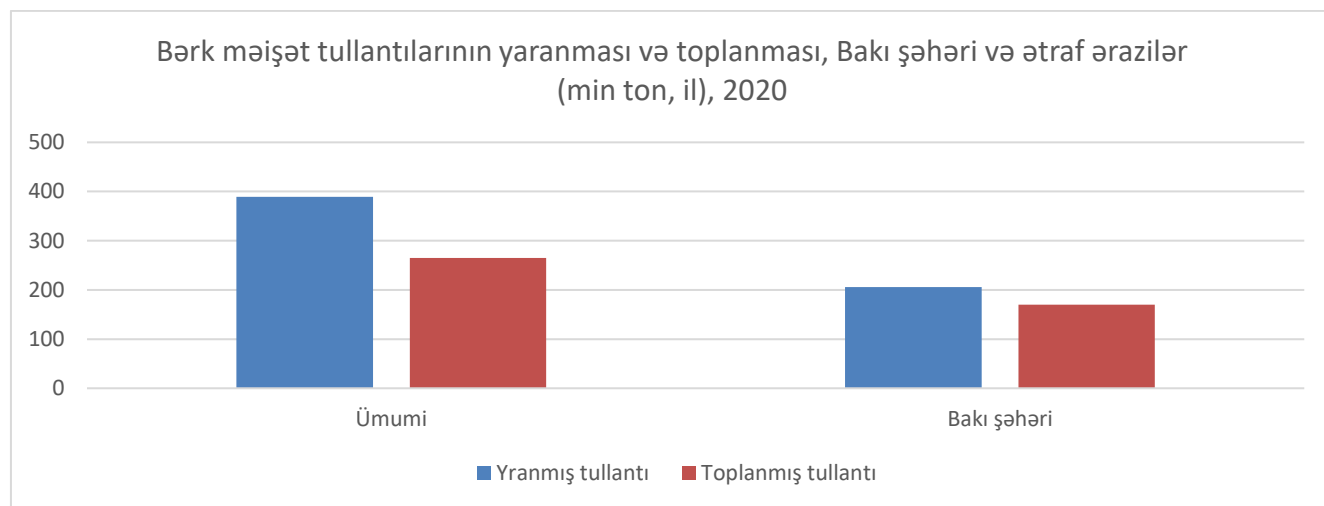
² https://www.ieabioenergy.com/wp-content/uploads/2013/10/40_IEAPositionPaperMSW.pdf

according to the World Bank report, 50% of municipal waste in Baku is dumped in open areas.³ The main reason for this is the lack of accessibility to the waste transfer service.

In 2008, the state-owned Tamiz Shahar Open Joint Stock Company was established by the Order on Improving Municipal Waste Management in Baku.⁴ The company has all the information on the volume, treatment, and monitoring of waste from various sources, but there are operational limitations. Because considering the amount of waste generated in the city during the day, it receives many times less waste than its capacity.⁵

According to the information of the State Statistical Committee, in 2021, 3,778.2 thousand tons of waste were generated in the country, of which only 1,562.5 thousand tons, that is, only 41%, were reused and neutralized. The amount of waste per person was 377 kg.⁶ Municipal waste accounted for 10,760.2 tons of generated waste, of which 2,286.9 tons were used as fuel, 48.9 tons were sold, and the remaining 8,390.5 tons were thrown into landfills.

Figure 1: Generation and collection of municipal solid waste



³ https://ieg.worldbankgroup.org/sites/default/files/Data/reports/ppar_azerbaijanarp2.pdf

⁴ <https://tamizshahar.az/az/haqqimizda>

⁵ https://ieg.worldbankgroup.org/sites/default/files/Data/reports/ppar_azerbaijanarp2.pdf

⁶ https://stat.gov.az/source/environment/az/011_1.xls

4. International experience in solid waste treatment

In recent years, the volume and rate of generation of waste in the world have increased massively, and this volume is expected to increase further. It is predicted that by 2050, the production of municipal solid waste will increase by 70% and exceed 3.4 trillion tons.⁷

According to the World Bank, 2 billion tons of municipal waste are generated annually in the world, of which at least 33% are not properly managed.⁸ According to the generation of waste, the first place is the United States with 265.2 billion tons, the second place is China with 215.2 billion tons, and the third place is Russia with 80.6 billion tons.⁹ Food products (44%), paper and cardboard (17%), and plastic (12%) are the first three types of municipal solid waste.¹⁰

Globally, most waste is dumped in open areas or goes to landfills in some form. 37 percent of waste is disposed of in landfills in one form or another, and 8 percent is disposed of in sanitary landfills with landfill gas collection systems. About 33 percent of waste is landfilled, 19 percent is recovered through recycling and composting, and 11 percent is incinerated for final disposal. Adequate waste disposal or treatment, such as controlled landfills or more strictly managed facilities, is almost exclusively the domain of high-income and upper-middle-income countries.¹¹

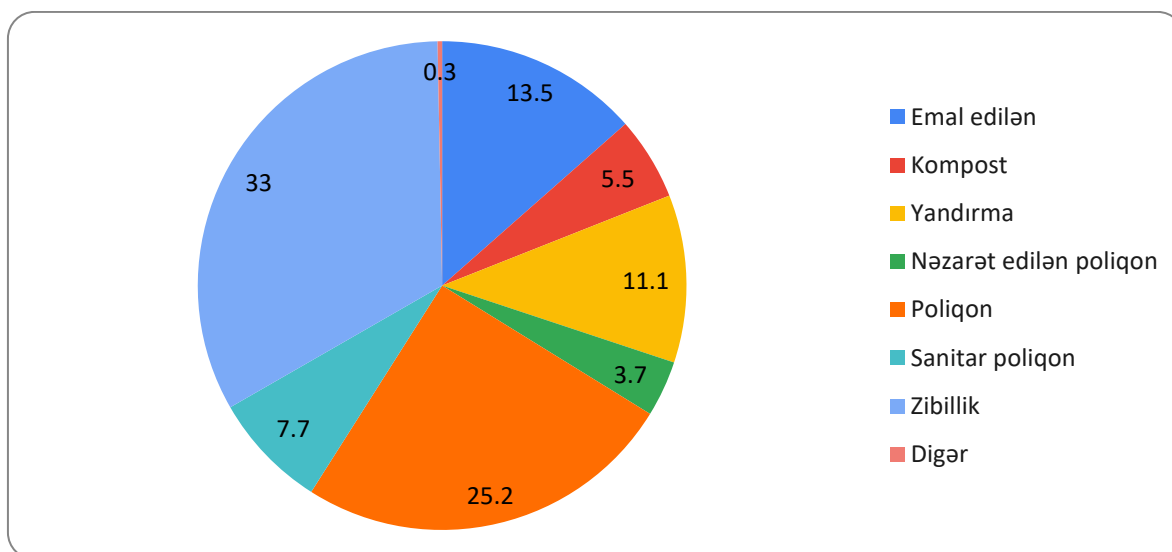


Figure 2: Waste management in the world (%) - World Bank data

⁷ <https://www.statista.com/topics/4983/waste-generation-worldwide/#editorsPicks>

⁸ https://datatopics.worldbank.org/what-a-waste/trends_in_solid_waste_management.html

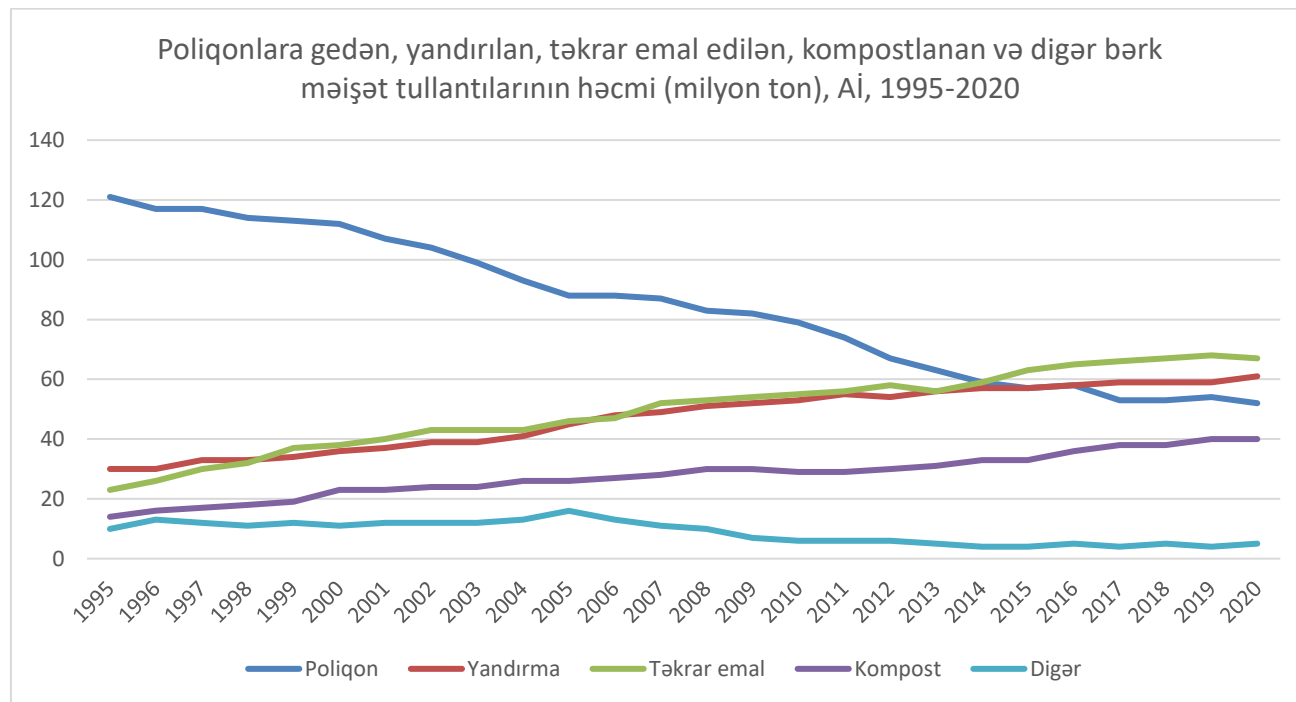
⁹ <https://www.statista.com/statistics/916749/global-generation-of-municipal-solid-waste-by-country/>

¹⁰ <https://www.statista.com/statistics/916666/global-generation-of-municipal-solid-waste-share-by-material/>

¹¹ https://datatopics.worldbank.org/what-a-waste/trends_in_solid_waste_management.html

Worldwide solid waste collection and treatment vary by region. The variation in the amount of waste produced throughout Europe reflects differences in consumer culture and the level of the economy, as well as how waste is collected and processed. However, there are differences between the volume and management of commercial and trade waste, as well as municipal waste, collected in the territory of the countries included in the European Union.¹²

Figure 3: Change in the volume of landfilled, incinerated, recycled, composted, and other municipal solid waste over the years (million tons)



According to the figure, 225 million tons of solid waste was generated in the European Union in 2020, of which 23% went to landfills and 27% was incinerated. 30% of produced waste was recycled and 17.8% was composted.¹³

The reduction in the total volume of waste is due to the plastic packaging waste reduction and recycling law adopted by the European Parliament in 1994. According to that law, EU countries had to reduce the amount of landfilled waste to 10% by 2035. To achieve this goal, each country has implemented various strategies to achieve the legally defined result - economic methods,

¹² https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Municipal_waste_statistics#Municipal_waste_generation

¹³ https://ec.europa.eu/eurostat/statistics-explained/images/e/eb/Municipal_waste_landfilled%2C_incinerated%2C_recycled_and_composted%2C_EU%2C_1995-2020.png

packaging and marketing restrictions, as well as tools such as restrictions on the use of plastic bags.¹⁴

Regarding the market price of recycled products, mainly glass, paper, cardboard, and plastic, the data show that the prices of recycled products have changed significantly over time. According to official sources, the volume of recycled glass entering circulation in 2021 was 322,000 tons per month, and the value was 73 euros/ton in January of that year. The price of recycled paper and cardboard products on the European market has increased rapidly since 2013, and this indicator was 213 euros/ton in 2021. Internal trade in the EU increased to 13.68 million tons. In 2021, the upper limit of the trade of recycled plastic products within the Union was 3 million tons, and the maximum price was 400 euros/ton.¹⁵

The waste management system also varies from country to country. For example, in Austria, one of the states with the highest average waste treatment in the EU, until 2009, an additional tax was imposed on radioactive waste in landfills in a difficult condition. According to the law applied in Hungary and Ireland, the separate collection of natural (food, plant, animal, etc.) waste has been made mandatory. In Lithuania, the disposal of biodegradable (organic) waste generated in gardens and parks in landfills has been banned, along with the imposition of additional taxes on landfills. As for Spain, there are bans on the disposal of waste that can be recycled.¹⁶

Solid waste management experience in Turkey

In 2020, 104.8 million tons of solid waste was generated in neighboring Turkey. 53.6% of it was sold or transferred to licensed waste treatment facilities, 24.2% was sent to landfills, 7.1% was stored on the premises of the enterprise, 7% was processed within the facility, 3.2% was collected by municipalities or was collected by industrial zones, 1.7% was burned, and the remaining part was used as reclamation material or destroyed in other ways.¹⁷ In general, according to legislation, municipalities are responsible for the collection, transportation, collection, treatment, and disposal of waste in urban areas in Turkey.

According to Article 11 of the Environmental Law of the country, municipalities are responsible for building and managing infrastructure for the disposal of municipal waste. Based on the tariff set by the Municipal Assembly, those who benefit from this service pay the fee for solid waste collection, transportation, and disposal. This amount cannot be excluded from solid waste services. Tariffs are set and collected directly by the municipalities.¹⁸

In villages, this activity is carried out in two ways:

¹⁴ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A01994L0062-20180704>

¹⁵ https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Recycling_-_secondary_material_price_indicator#General_overview

¹⁶ <https://www.eea.europa.eu/publications/municipal-waste-management-across-european-countries>

¹⁷ <https://data.tuik.gov.tr/Bulten/Index?p=37198&dil=2>

¹⁸ <https://dergipark.org.tr/tr/download/article-file/269724>

- The organization of these services in the villages where the municipality exists is under the jurisdiction of the municipalities;

- In small villages where there are no municipalities, this service is carried out by companies specialized in cleaning services with the legal status of "private administration" connected to state authorities (governorships and district governorships) at the level of provinces and districts.¹⁹ In the 2006 municipal solid waste statistics survey, it was reported that 3,115 out of 3,225 municipalities in Turkey provided solid waste services, they collected 12.75 million tons of waste during the summer months of that year, and 12.53 million tons during the winter.²⁰

In order to accelerate the transition of Turkey to the European Union, within the framework of the projects for the improvement of the environmental infrastructure, with the financial support of the EU, in 2005, at the request of the Kütahya Municipality, the Kütahya Region Local Administration Solid Waste Disposal Facilities Construction and Operation Association (KÜKAB) was established, which includes Amasya and Bitlis regions.²¹

The main goal of the association, which consists of 5 municipalities and 19 villages, is to evaluate the measures to be taken for the disposal or treatment of solid waste collected in the regions included in the association between 2009 and 2028, in terms of environmental protection and public health, and to implement appropriate work principles.²² The project is also aimed at educating the local population on this topic, contributing to the separation of municipal waste at home. In the framework of the project, a solid domestic waste landfill, infrastructure for waste treatment, a composting facility for biodegradable waste, transfer stations, waste bins, and waste processing centers have been established in the region to ensure convenient treatment of plastic waste.²³

Solid waste management experience in Georgia

In another neighboring country, Georgia, solid waste management is governed by the Environmental Assessment Code, the Local Self-Government Code, the Waste Management Code, the Law of Georgia on Local Fees, the Law of Georgia on Import, Export, and Transit of Waste, and local regulations to support the implementation of those laws and tax decisions established by local authorities regarding waste collection and transportation.

¹⁹ <https://www.ebelediye.info/dosya/belediyelerde-kati-atik-yonetimi>

²⁰ <https://dergipark.org.tr/tr/download/article-file/194596>

²¹

https://www.researchgate.net/publication/323117582_KUTAHYA_ILINDE_KATI_ATIK_YONETIMININ_MALI_YET_VE_MEKANSAL_ANALIZI

²² Kütahya Katı Atık Yönetimi Projesi ÇED Raporu, Kütahya İli Yerel Yönetimler Katı Atık Bertaraf Tesisleri Yapma ve İşletme Birliği (KÜKAB) Nihai ÇED Raporu, Cilt: 1, ENCON Çevre ve Danışmanlık Ltd. Şti, Ankara, 2006, s. 1.

²³ <https://dergipark.org.tr/tr/download/article-file/194596>

According to Article 16 of the Local Self-Governance Code, local self-governing bodies (municipalities) are responsible for cleaning public places and solid waste management in their territories. Those bodies deal with drafting and approval of the municipal budget, hearing and evaluation of a budget report; disposal of budgetary funds, management and disposal of property owned by the municipality, imposition and abolition of local taxes and fees, and collection of the local fee.²⁴ The Waste Management Code of 2015 creates conditions for the implementation of waste reduction, reuse, environmentally safe treatment and disposal strategies²⁵.

Figure 4. Differences in the waste collection between the capital and regions in Georgia (2019)

	Urban	Rural	Overall
Regions	385, 361.61	316,146.06	701, 507.67
Tbilisi	411, 450.42	4,438.40	415, 888.82
Georgia	796, 812.02	320,584.46	1, 117,396. 49

According to the mentioned indicators, 1.17 million tons of waste were generated in Georgia in 2019. 71% of them were formed in cities and 28% in villages.²⁶ Unlike Azerbaijan, the amount of waste collected in the capital during the year (37%) does not exceed the regions (62%). However, in Georgia, as in many countries, the indicator of waste collection in urban areas remains higher than in villages. With some exceptions, all work related to waste management - collection, transportation, and street cleaning - is carried out by municipalities.²⁷

Furthermore, the cleaning and sanitation services of some regions are implementing pilot projects in the field of waste separation. Thus, in the Mtskheta, Kutaisi, and Tslaltubo regions, the separation of recyclable waste is carried out. For example, 100 tons of paper waste were collected in Mtskheta in 2019 and sold to some companies. In Kutaisi, about 200 tons of cardboard waste were collected from shops that year.²⁸

²⁴ <https://matsne.gov.ge/en/document/download/2244429/15/en/pdf>

²⁵ <https://matsne.gov.ge/ka/document/download/2676416/1/en/pdf>

²⁶ <https://openknowledge.worldbank.org/handle/10986/35704>

²⁷ UNDP/PMCG, Baseline Study for 39 Municipalities, UNDP/PMCG Project: Performance Management System for Street Cleaning and Waste Management Services in 23 Municipalities of Georgia, May 2020.

²⁸ UNDP/PMCG, Baseline Study for 39 Municipalities, UNDP/PMCG Project: Performance Management System for Street Cleaning and Waste Management Services in 23 Municipalities of Georgia, May 2020.

5. Conclusion and recommendations

Despite the work done so far and allocated funds in the field of waste management in Azerbaijan, there are still barriers in this field. One of the main reasons for this is that the waste collection service is carried out in a fragmented manner and not in the hands of a specific institution. The City Housing and Utilities Departments of local executive bodies, including the executive bodies of Baku, undertake the collection and transportation of waste. Municipalities are actually subordinated to local executive authorities and their participation in providing municipal solid waste services is weak.²⁹ For comparison, let's say that in European countries, as well as in neighboring countries Turkey and Georgia, municipalities are directly responsible for waste collection, storage, and other activities. It should be taken into account that, unlike Azerbaijan, municipalities in these countries have sufficient budgets and they have the right to impose taxes when it comes time to make any decision.

One of the main differences in the waste management system in Azerbaijan and the EU is the lack of an Extended Producer Responsibility mechanism³⁰ (where waste producers (including households) have financial or physical responsibilities for the disposal or treatment of post-consumer products (mainly waste)) and lack of a plan for its implementation.³¹

According to official figures, about half of the country's population lives in rural areas, and waste collection services only partially cover villages (Figure 5). In this regard, more attention should be paid to the effective establishment of this process in the regions. In Baku, the executive power is mainly responsible for waste collection, and "Tamiz Shahar" is responsible for the next stage of the process. They are responsible for waste sorting, treatment, and disposal.

Observations show that the collection, storage, and transportation of waste in different districts of Baku is inadequate and not properly planned. For example, it was determined that only a small part (2-5%) of the waste collected in Garadagh and Balakhani districts reached Balakhani, and a large amount of waste was dumped in huge illegal landfills in the region.³² Except for Baku, almost all waste is sent to landfills in open areas. Each district has a managed landfill, mostly located in the center of the district. In addition, there are illegal dumps, but there is very little information about them. Except for the Baku landfill, landfills are not properly constructed and do not meet international standards. One of the main problems is the lack of waste sorting in households; moreover, the interest of industrial enterprises in using processed raw materials is low.³³

²⁹ <https://e-qanun.az/framework/3186>

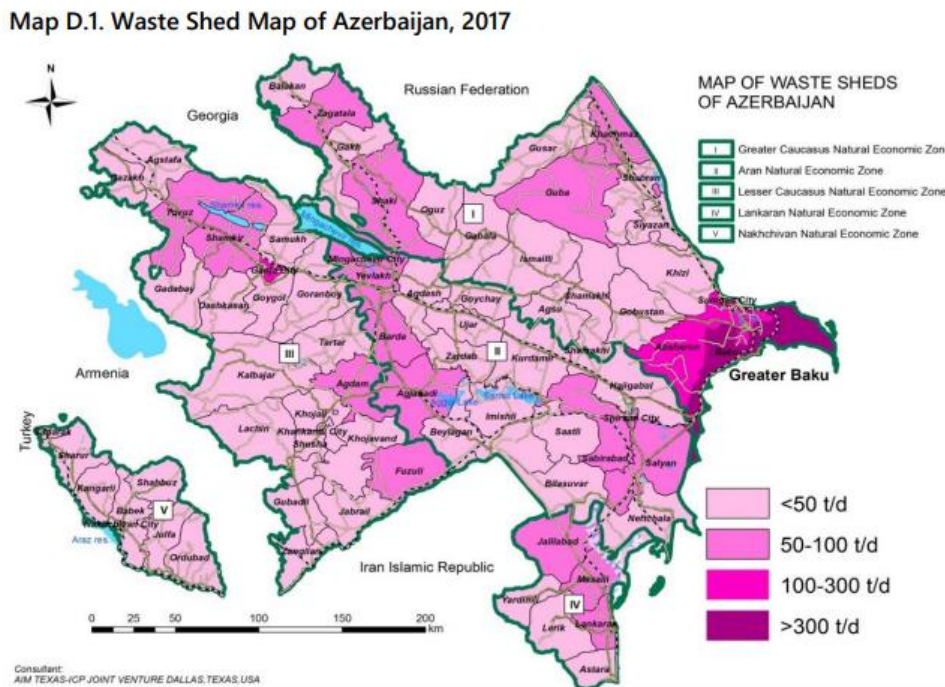
³⁰ <https://www.oecd.org/env/tools-evaluation/extendedproducerresponsibility.htm>

³¹ <https://eni-seis.eionet.europa.eu/east/areas-of-work/data/Annex3AzerbaijanCountryFactSheetFeb2018.pdf>

³² EBRD, Clean City Project description

³³ <https://eni-seis.eionet.europa.eu/east/areas-of-work/data/Annex3AzerbaijanCountryFactSheetFeb2018.pdf>

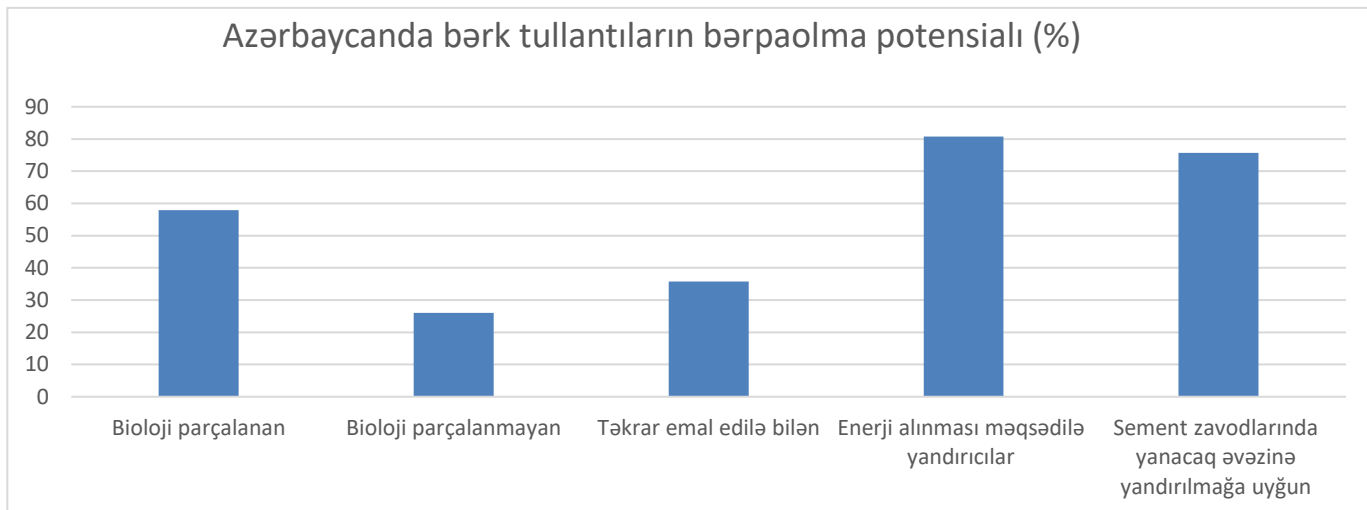
Figure 5: The number of waste sheds by territories in Azerbaijan



One of the other problems in this field is the lack of knowledge about this field in society. Despite the fact that environmental problems have been included in preschool and school textbooks in recent years, various NGOs and some international organizations have implemented various activities in schools in Azerbaijan, and lessons on this topic have been taught in universities, there is still a lot of work to be done on this topic. Given the lack of a conceptual approach to environmental education in schools, it is questionable whether most school leavers will acquire some understanding of the environment and waste management issues. The current curriculum and teaching materials do not meet modern requirements. However, the United Nations Economic Commission for Europe (UNECE) has made a proposal in this regard, but the education strategy for sustainable development in Azerbaijan has not yet been developed.³⁴

³⁴ https://unece.org/DAM/env/epr/epr_studies/Synopsis/Azerbaijan%20ECE.CEP.158.synopsis%20english.pdf

Qrafik 6: Solid waste recovery potential in Azerbaijan



During the collection of waste in Azerbaijan, their informal treatment is also widespread. The treatment of plastic, metal, and paper waste for the production of second-hand raw materials from scrap is mainly carried out informally. There is not enough statistical information about the production of secondary materials. Metal scraps collected by scrap dealers and waste collectors are mainly processed by large iron and steel industries located in Baku and Sumgayit. Treatment of paper waste is mainly carried out in Sumgayit and Balakhani for the production of napkins, packages, etc.³⁵ In developed countries, the treatment of metal, plastic, and glass waste is carried out using the newest technologies, which make it possible to make more use of the waste while doing less damage to the environment.³⁶ From this point of view, there is a serious need to apply new technologies related to waste management in Azerbaijan.

Another common form of waste treatment is composting. Composting is an oxygen-requiring process that enriches the soil with organic materials through natural decomposition. In Europe and America, home composting methods are being promoted to reduce waste volume and protect the environment. It consists of collecting and decomposing natural waste at home and using it as fertilizer. Even some European countries (for example, the Italian city of Casalgrande) apply a 20% reduction in taxes paid for waste collection to households that compost and recycle food and garden (mainly animal) waste.³⁷ Taking into account the above indicators, the promotion and application of this method would be very useful in our country, where more than half of the waste is organic waste.

³⁵ https://ieg.worldbankgroup.org/sites/default/files/Data/reports/ppar_azerbaijanarp2.pdf

³⁶ https://blacksea-cbc.net/wp-content/uploads/2020/09/BSB457_MWM-GMR_-_Guide-to-European-Union-Practices-on-Waste-Recycling-Technologies_EN.pdf

³⁷ <https://www.interregeurope.eu/sites/default/files/2022-04/Biowaste%20challenge.pdf>

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Reference to IDI is compulsory when using information.

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