

**THE PROBLEM OF WASTE IN ENVIRONMENTAL
PROTECTION AND MEASURES FOR ITS PREVENTION
ПРОБЛЕМА ОТХОДОВ В СФЕРЕ ОХРАНЫ ОКРУЖАЮЩЕЙ
СРЕДЫ И МЕРЫ ПО ИХ ПРЕДОТВРАЩЕНИЮ**

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Annotation: This article highlights the priority issues related to waste management in our country. It examines the Law of the Republic of Uzbekistan “On Waste” and issues related to preventing the harmful effects of waste on the environment, based on the goals and objectives of the Strategy for the Implementation of Solid Household Waste Management in the Republic of Uzbekistan for 2019–2028.

The article also considers issues such as waste collection, waste reduction, and the regulation of waste management practices in economic activities.

Keywords: waste management, environmental protection, waste prevention, solid household waste, waste legislation, environmental safety, waste recycling, sustainable development, waste disposal.

Аннотация: В данной статье освещаются приоритетные вопросы, связанные с проблемой отходов в нашей стране. В ней рассматривается Закон Республики Узбекистан «Об отходах», предотвращение вредного воздействия отходов на окружающую среду на основе целей и задач стратегии реализации работ, связанных с твердыми бытовыми отходами в Республике Узбекистан в период 2019-2028 годов. Разъясняются такие вопросы, как получение, сокращение образования отходов и регулирование отношений их рационального использования в хозяйственной деятельности.

Ключевые слова: управление отходами, охрана окружающей среды, предотвращение образования отходов, твердые бытовые отходы, законодательство об отходах, экологическая безопасность, переработка отходов, устойчивое развитие, утилизация отходов.

Introduction. Globally, including in Uzbekistan, the waste problem has become one of the most pressing environmental issues. Environmental protection from industrial and consumption waste, food waste, and medical waste is closely related to the rational and comprehensive use of natural resources, as well as the implementation of environmentally friendly technologies and resource-saving practices.

In our republic, the waste problem is considered one of the priority issues that must be addressed first. In Uzbekistan's hot climate conditions, waste poses a serious threat to public health and is a source of air pollution, contamination of surface and groundwater, and reduction of soil fertility. Therefore, developing effective solutions in this area is considered one of the most urgent challenges of today.

The Law of the Republic of Uzbekistan "On Waste" defines the regulation of activities related to waste management within the territory of the Republic of Uzbekistan, prevention of harmful effects of waste on human life and health and the environment, reduction of waste generation, and rational use of waste in economic activities. According to Article 2 of this law, waste includes residues generated from production or consumption processes, other materials and products, as well as goods that have lost their consumer properties. Waste must be stored in specially equipped collection facilities until it is transported for disposal, recycling, or utilization.

In our country, there are 296 disposal and waste elimination sites, including 221 solid household waste landfills, 16 industrial waste sites, 4 construction waste sites, 21 sludge collection facilities, 15 waste collection points, 19 special landfills, and 23 landfills for hazardous waste disposal.

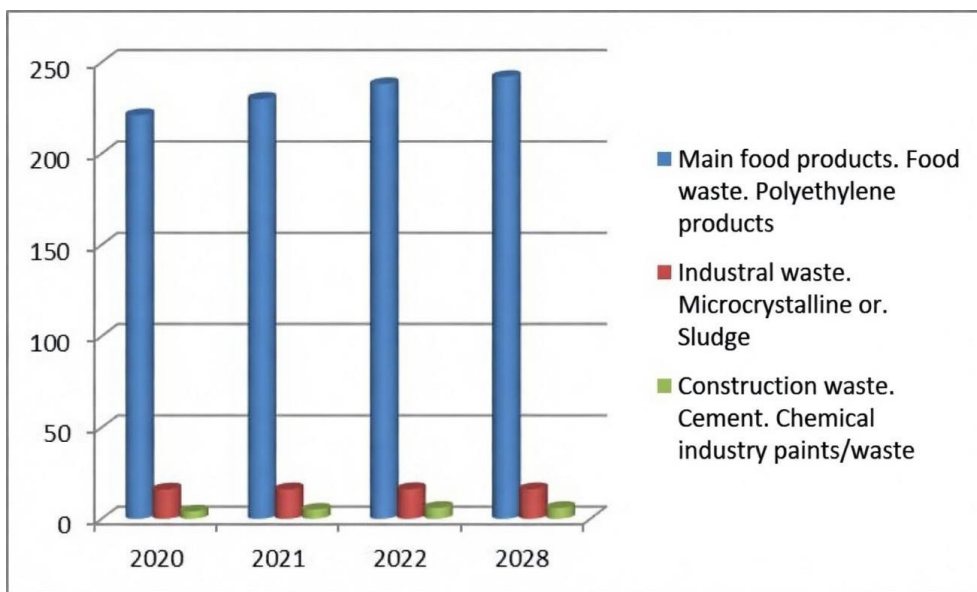


Figure 1. Increase in Waste

At the same time, the burial of municipal solid waste (MSW) in landfills has become widespread in Uzbekistan. MSW is stored in 165 registered landfills covering more than 1,445 hectares. By 2022, more than 33,533 thousand tons of waste had accumulated in these landfills. Excluding uncontrolled and unauthorized dumping sites, nearly 1,445 hectares of land have been allocated for landfill organization.

Despite ongoing environmental monitoring, illegal disposal of municipal solid waste by the population currently leads to the formation of unauthorized dumps in residential areas, along highways, field zones, and along the banks of water reservoirs. In recent years, the number of administrative violations related to illegal waste disposal by citizens amounted to 28.9 thousand cases in 2020, 18.7 thousand cases in 2021, and more than 20.3 thousand cases in 2022.

Approximately 115 million tons of industrial waste are generated annually. The largest volumes of industrial waste are produced by mining and processing enterprises located in the Navoi, Tashkent, and Fergana regions. The amount of waste accumulated in 20 industrial waste landfills with a total area of 286.3 hectares amounts to 40,879.4 thousand tons. Additionally, 256,831.5 thousand tons of waste are stored in 21 sludge collectors covering 985.1

hectares, and 2,953,788.0 thousand tons are stored in 15 raw material waste dumps occupying 7,751.0 hectares. The main part of waste is stored in sludge collectors and raw material dumps, while only a small portion of industrial waste is used as secondary raw materials.

Medical waste varies depending on its epidemiological, toxicological, and radiological hazard levels, as well as its negative impact on the environment. In 7,950 medical institutions across the country, an average of 42,411 tons of medical waste is generated annually, of which 1,668 tons are classified as hazardous medical waste. Medical institutions are not adequately provided with special containers for proper storage of such waste. Infectious medical waste is disinfected at the place of origin in autoclaves at a temperature of 132°C for 20 minutes. Cases of disposing of medical waste together with household waste are also frequently observed [5].

The Strategy for the Implementation of Solid Municipal Waste Management in the Republic of Uzbekistan for 2019–2028 (PQ-4291, 2019) identifies insufficient provision of services for the collection and removal of solid municipal waste in rural settlements, unsatisfactory infrastructure in the waste management sector, and the non-compliance of existing landfills with sanitary requirements and environmental standards.

In the Republic of Uzbekistan, an increase in waste generation per capita and in the total volume of waste generation is being observed. The collection of solid municipal waste (coverage of the population with waste collection and removal services) has increased to 85 percent. However, a large portion of waste is still disposed of in landfills. Opportunities for recycling and neutralizing industrial, medical, and electronic waste remain extremely limited.

According to the Strategy for the Implementation of Solid Municipal Waste Management, the annual projected volume of solid municipal waste generation currently amounts to approximately 14–14.5 million tons, and this figure is expected to reach 16–16.7 million tons by 2028.

The strategy is planned to be implemented in the following stages. The first stage (2019–2021) focuses on improving mechanisms for solid municipal waste management and ensuring the effective organization of waste collection and removal services.

The second stage (2022–2028) focuses on developing infrastructure for separate waste collection, optimizing landfills, constructing recycling facilities, improving operational efficiency, increasing population coverage with waste collection and removal services to 100 percent, recycling at least 60 percent of solid municipal waste, increasing recycling of specific waste types (such as mercury-containing waste, tires, batteries, used oils, and packaging waste) up to 25 percent, reducing the volume of solid municipal waste disposed of in landfills by up to 60 percent, and utilizing alternative energy sources derived from waste management processes up to 35 percent.

Due to the diverse composition of waste, the directions, sectors, groups, economic efficiency, and environmental aspects of waste utilization also vary widely.

It is difficult to assess the overall economic significance of waste; therefore, it is logical to evaluate its efficiency after determining its composition. For example, the presence of aluminum, glass containers, steel, paper, plastics, and broken glass in waste increases the efficiency of their reuse as secondary raw materials. In fact, waste is generated as a result of using certain raw materials, materials, goods, or products and discarding their unnecessary parts. However, disposing of all generated waste by dumping or burying it is an inefficient and improper approach to waste management.

Results: The main problem lies in the use of waste as secondary raw materials. There are mainly two ways to dispose of household waste:

- Burying waste away from densely populated areas
- Incinerating waste at specialized waste incineration plants

The first method is convenient; however, waste may seep into groundwater, leading to contamination. The second method requires the construction of large-capacity waste incineration plants. In developed countries, a significant portion of waste is incinerated at such facilities, resulting in the production of low-cost energy. In Japan, for example, there are about 1,850 waste incineration plants, where approximately 80 percent of municipal waste is incinerated.

Based on this, many positive measures are being implemented at the national level to improve the mechanisms for implementing the Law of the Republic of Uzbekistan “On Waste.”

It is known that various food products are consumed in every household, and a certain amount of waste (such as peels, seeds, and other residues) is generated from these products. In rural areas, especially in households where domestic animals (livestock, poultry, and others) are raised, this waste is not discarded but instead used as feed for animals. This practice helps maintain environmental cleanliness, supports livestock breeding, and generates additional income for family budgets. Unfortunately, in some areas with densely populated multi-storey residential buildings, such waste is disposed of by residents into general waste bins. In addition, to improve this negative situation and transform it into a positive one, the following measures can be implemented in areas with densely populated apartment buildings.

For example, if we consider a single homeowners’ association, approximately 20 multi-storey buildings may be attached to one association. If each building contains an average of 40 to 60 households, there would be about 800–1200 households in total. Each household consists of an average of three people. Over one week, a family consumes approximately 2 kg of potatoes, 2 kg of carrots, 1 kg of onions, and other food products (melons, fruits, and others). From these products, an average of 0.5 kg of food waste suitable for animal feed is generated.

To effectively utilize this waste, it is advisable to develop livestock farming as an auxiliary activity under the homeowners' association. For this purpose, the homeowners' association should submit a business plan to the bank where it maintains its account. The business plan may include indicators such as purchasing 10 or 20 head of cattle, constructing facilities for feeding and raising livestock, purchasing necessary equipment, organizing distribution, and providing various informational materials. Based on this business plan, the homeowners' association may obtain credit or loans and use these funds for targeted purposes.

The homeowners' association can involve each family and its members in implementing the business plan. If each household generates 0.5 kg of food waste, then within a week (0.5×800 or 1200 households), approximately 400 kg to 600 kg of feed waste can be collected. This feed waste can then be provided to livestock according to feeding rations. Each household can place food waste into special containers distributed by the association and deliver them to a "Food Waste Collection Center." Representatives of the center will organize the regular collection of food waste. Additionally, as supplementary feed, necessary land can be allocated within the association's territory to grow alfalfa and corn, and to harvest hay and grass.

Conclusion. Efficient use of waste generated from multi-storey residential buildings helps reduce environmental pollution, prevents wastefulness, protects human health, promotes rational use of waste in economic activities, improves economic efficiency, and, most importantly, contributes to improving the moral, economic, and environmental awareness of the population.

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