

Analysis of the presence of safe Alternatives to single-use plastics

Introduction to single-use plastic

In order to identify alternatives to single-use plastic, it is important to clearly define what the term "single-use plastic" itself is. These are plastic products designed for single use or short-term use before disposal.

General characteristics of single-use plastic:

- are intended for single use;
- they tend to be used for short periods of time;
- They use plastic as the main material, which can be combined with other materials;
- are convenience-oriented.

This category includes plastic packaging, utensils, drink straws, bags, bottles, containers and other items that are usually discarded after losing their original function.

Disposable plastics are made of different types of plastics such as polyethylene, polypropylene, polystyrene and others, which are characterized by high durability, but slowly decompose in the environment causing harm. The most dangerous material used for the production of disposable products is polystyrene (PS). Polystyrene is made from styrene, a chemical compound that is potentially carcinogenic to humans. Ingestion of styrene can lead to toxic effects, including effects on the nervous system and internal organs.

The environmental impact of single-use plastic is a serious problem for the environment and human health

Single-use plastics are often discarded after short-term use and end up in large quantities in landfills, streets, water bodies, rivers and oceans. Microplastics from the breakdown of plastic products accumulate in aquatic and terrestrial ecosystems. These microparticles are easily ingested by marine and terrestrial animals and enter the human body through the food chain. Ingestion of microplastics in the body can cause chronic diseases, as plastics contain toxic additives that can affect health.

Single-use plastics are widely used due to their availability, low cost and convenience, which is particularly important for consumers, small businesses and the catering sector. The introduction of alternatives requires structural changes in the economy, so it is important to consider the economic impact of a shift to reusable materials and products, especially for a sector dependent on plastic packaging.

Analysis of available and utilized alternatives in the Uzbekistan market

In Uzbekistan, as in other Central Asian countries, sustainable alternatives in packaging and FMCG are starting to gain traction. popularity. The development of this sphere is supported by the interest of local communities and businesses in environmentally friendly solutions. The rate of growth of interest is not are high, but already have their practical application. Local residents, who have a higher income level, support the use of alternative packaging.

According to the data obtained during the analysis of open sources, as well as questionnaires from target groups and individual interviews, the alternatives used in Uzbekistan are: reusable cloth shopping bags, thermal mugs and reusable glass cups, metal, wooden and paper utensils (tubes, cutlery), wax napkins for food packaging, paper bags instead of plastic bags and even personal hygiene products (reusable cloth disks and sponges for facial care, metal ear "spoons", silicone ear sticks).

Table 6 presents an analysis of available alternatives for some types of single-use plastic in Uzbekistan.

Table 6 - Types of available alternatives to single-use plastic products

Disposable plastic	Available alternatives	Available alternatives
Packaging		
<p>Plastic bags, wraps, and film used for food and other products: are made from polyethylene, a synthetic polymer that is a derivative of ethylene (hydrocarbon gas). There are several types of polyethylene, but low-density polyethylene (LDPE) and high-density polyethylene (HDPE) are most commonly used for bags</p> <p>Foamed food substrates (expanded polystyrene (Styrofoam): used for food containers and packaging materials, non-biodegradable and difficult to recycle.</p> <p>Plastic beverage bottles: often used for water or soft drinks.</p>	<ul style="list-style-type: none"> • Glass and metal containers; • Wrapping paper • Fabric bags (cotton, linen) • Eco-bags for fruits and vegetables, weighty foodstuffs • Reusable stainless steel and glass water bottles • thermoses, tumblers, thermo mugs 	<p>Fabric bags and eco-bags are already available in supermarkets and eco-shops in major cities such as Tashkent. Kraft paper is used in packaging, but biodegradable packaging are not yet widely available. Reusable bottles and thermoses are widely sold in stores. PLA bottles plastic are less common, but are gradually appearing in eco-oriented retail chains.</p>
Cutlery, crockery		
<p>Plastic disposable cutlery and utensils: are most often made of polystyrene, polypropylene. The first type of plastic is not suitable for contact with hot food, it emits toxic chemicals, including styrene, which is a major component of this material. Polypropylene is safer for humans in contact with hot food and more durable in use</p>	<ul style="list-style-type: none"> • Bamboo utensils 	<p>Reusable utensils (glass, metal, plastic) are available in most major stores and supermarkets. Bamboo utensils are still mostly found in eco stores. Cardboard and paper trays for eggs and some vegetables are available in large supermarkets and markets. Paper alternatives for fruits and vegetables are still less common, but are beginning to be introduced.</p>
Personal care products		
<p>Cotton swabs on a plastic rod The plastic rods on which the absorbent cotton is applied allow the sticks to be durable and also prevent them from becoming brittle. However, this also creates an environmental problem, as the plastic in the cotton swabs takes a long time to decompose, polluting nature and water bodies</p>	<ul style="list-style-type: none"> • Reusable cotton swabs • Sticks with paper rods • Bamboo cotton swabs 	<p>Cotton swabs with paper and bamboo rods are sold at major drugstores and stores, although their market share is still limited. Reusable sticks are found mainly in specialized eco-stores like "Green Shop" or "EcoMarket" in Tashkent.</p>
<p>Wet wipes Contains plastic fibers that do not degrade in water and can clog sewers as well as pollute natural ecosystems</p>	<ul style="list-style-type: none"> • Skin cleansing sprays • Reusable cloth napkins 	<p>Reusable cotton and bamboo cloth wipes are available in eco-shops and supermarkets, especially in Tashkent. Skin cleansing sprays are still not widespread, but can be found in specialized stores.</p>

Demand for sustainable solutions such as reusable products and recycled resources remains limited in Uzbekistan. For many sectors of the economy, including retail, food processing and catering, the introduction of such alternatives faces serious obstacles. The main problems are lack of information, weak infrastructure for recycling and the high cost of sustainable materials. Despite some attempts to reduce the use of single-use plastic, they are still rather sporadic and not widespread. During the interviews, it was found that in residential neighborhoods the tendency to use alternative packaging is higher than the average. In the makhalyas, as in the private sector residents most often have their own internal rules and regulations, and the usual way of life.

For example, in order to minimize the purchase of bottled water at the point of sale, the practice of installing water mats¹ in major cities and towns of Uzbekistan is being introduced.

As part of the analysis of the current situation, it was found that many coffee shops in major cities of Uzbekistan: Tashkent, Fergana, Samarkand, Bukhara and others support the service "in your cup". For example, in the coffee chain "Safia"² - you will not refuse to pour a drink into your cup or put a dessert in your food container. However, some coffee shops cannot afford to support this trend because of their own equipment, which requires only certain packaging for filling drinks.

Another very significant example: a local fast food cafe - "Oktepa Lavash"³, which according to the sanitary norms have no right to pack their ready products in consumers' containers. The only solution they managed to support is to clarify with consumers the need for disposable straws, napkins, and additional packaging.

A similar example can be found at Milliy Taomlari⁴, where the staff is very welcoming to all visitors and especially favors the eco-community. Eco-activists and conscious visitors of the establishment can take away their order in their own containers and use cloth bags instead of plastic bags.

Minimizing single-use plastic not only reduces economic losses and negative impact, but also opens new opportunities economic growth through the development of the recycling and waste management industry.

1 Water dispensers - vending machines for selling purified water for bottling in the buyer's container.

2 https://www.instagram.com/safia_uz

3 <https://www.instagram.com/oqtepalavashuz/>

4 <https://www.instagram.com/ozbegimilliytaomlar/>

As mentioned above, legislative efforts are also being made to reduce the use of plastic. Thus, it is proposed to ban from 2026 use of disposable plastic products, the restriction will affect nature protection, health improvement and recreational areas of Uzbekistan. According to the text of the draft law, this measure aims to protect the environment by refusing to dispose of waste with a short span, while causing long-term damage to the environment. For non-compliance with the law, fines are stipulated (Table 7).

The following fines are prescribed for violations of this law	
for citizens	55 - 137.5 USD
for officials	137.5 - 275 USD.
For a violation of a significant amount	
for citizens	275 - 412.5 USD.
for officials	412.5 - 550 USD
In the case of a major violation	
for citizens	550 - 687.5 USD.
for officials	687.5 - 825 USD

Table 7 - Penalties for different audit targets

For a successful transition to sustainable alternatives to single-use plastics in Uzbekistan, it is necessary not only to continue developing legislative initiatives, but also to actively involve the population, develop environmental technologies and recycling. This will open up new opportunities for economic growth, job creation and environmental improvement, strengthening the country's position in the international arena in the field of sustainable development.

For faster transition to the use of alternatives it is necessary to carry out activities aimed at educating local residents about the content of toxic additives in a number of presented and used plastic packaging on the Uzbek market. Such measures are quite acceptable to increase the capacity of local residents.

Challenges and barriers to the implementation of sustainable alternatives

During the analysis of the availability of sustainable alternatives to single-use plastics in the Uzbek market, the main challenges and barriers to the spread of sustainable practices can be identified:

1. Low public awareness of the problem of plastic pollution and the need to reduce waste:

One of the main challenges to reducing the use of single-use plastic is the low level of public awareness of the extent and consequences of plastic pollution. Many residents do not think about how single-use plastic affects the environment, ecosystems and human health. Lack of information about the harms of plastic and the benefits of sustainable alternatives leads people to continue using plastic products, focusing on their convenience and low cost compared to alternative packaging made of paper, glass or metal.

2. Lack of information on the chemical composition of plastic products One significant problem is the complete lack of data on the chemical composition of plastic products, both those produced in Uzbekistan and those imported into the country. This leads to toxic additives such as phthalates and bisphenol-A entering the human body through food, water or skin contact, creating serious health risks. In addition, such substances contaminate the environment when disposed of or recycled plastic, releasing harmful substances into the environment. Recycling plastic with unknown composition exacerbates the problem: toxic substances end up in secondary raw materials, which contributes to their recirculation through new products. To solve this problem, it is necessary to create a national register of the composition of plastics, mandatory certification of products and raising public and business awareness of the risks involved, as well as of the chemical composition of a particular plastic product

3. Limited availability of sustainable alternatives

In addition to low public awareness and engagement, the limited availability of sustainable alternatives in the local market remains a significant barrier. Most sustainable products, such as reusable tableware, remain expensive and are available in limited quantities. Alternative product packaging is difficult or impossible to obtain in convenience stores, requiring a visit to specialized supermarkets. It is important to emphasize that biodegradable materials are far from being environmentally friendly, and there are often more questions about the composition of such packaging. The decomposition of biodegradable packaging often requires special conditions, such as industrial composting facilities, which are not available in most regions. As a result, such biodegradable packaging/products may not only fail to solve the pollution problem, but may exacerbate it if not disposed of correctly. This creates significant barriers to the widespread adoption of such solutions, especially in contexts where the population is forced to choose cheaper plastic counterparts.

4. Need for government incentives

More successful adoption of sustainable alternatives requires active government support. The inclusion of subsidies, tax breaks or other incentives for enterprises working with environmentally friendly materials can significantly accelerate the process of transition to alternatives to single-use plastics. Promoting a range of awareness raising activities for local residents through local Khokimats and mahalla representatives.

5. Problems with processing infrastructure

Despite efforts to recycle plastic waste, the infrastructure for this process is still underdeveloped in Uzbekistan. Not all regions of the country have access to modern recycling facilities, which hinders the efficient utilization of plastic waste and reduces the economic efficiency of recycling. In the system of separate waste collection, the most frequently involved are Lyulishki (traveling gypsies), who collect secondary raw materials by illegal methods and resell them to processing companies. Recycling companies often do not have a high interest in the clean composition of plastic products, as they need to fulfill the plan, so that the equipment does not stand idle and the work is fully implemented.



Conclusions

Thus, for a successful transition to sustainable alternatives, it is necessary not only to raise public awareness and business involvement, but also to address one of the key problems - the complete lack of information about the chemical composition of plastic products, both produced in Uzbekistan and imported into the country. This leads to the fact that toxic additives from plastic get into the human body and the environment, putting human health and wildlife at risk.

It is particularly important to emphasize that recycling plastic with unknown composition contributes to the contamination of secondary raw materials with toxic substances. This reinforces the problem of recycling toxic additives and chemicals in goods made from recycled plastic.

Thus, the lack of transparency of information on the chemical composition of plastics prevents not only efficient recycling, but also the safe use of secondary materials, which jeopardizes efforts to implement environmentally important solutions. The solution to this problem requires the development and implementation of mechanisms to control the chemical composition of plastic products, as well as the active participation of government and business in ensuring transparency and safety at all stages of plastics production, import and recycling.

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