



**MODELS AND METHODS FOR
INCREASING THE EFFICIENCY OF
INNOVATIVE RESEARCH**

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INCREASING THE EFFICIENCY OF WASTE RECYCLING IN THE ECONOMY OF OUR COUNTRY

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Annotatsiya Bugungi kunda atrof-muhitni ifloslamalik, berilgan resurslardan oqilona foydalanishni yo'lga qo'yish muhim jihatlardan bo'lib kelmoqda. Zero, tabiiy hamda notabiiy resurslarni kelajak avlodga yetkazish, o'zimiz yashayotgan muhitni talab darajasida toza saqlash bizning asosiy burchimiz hisoblanadi. Shu jihatdan ushbu maqolada chiqindilarni boshqarish, ularning samarali strategiyala hamda chiqindilarni boshqarish orqali iqtisodiyotga insoniyatning keltirayotgan afzaliklari ko'rsatib beriladi.

Kalit so'zlar: chiqindilarni energiyaga aylantirish, poligon , kompostlash , doiraviy iqtisodiyot, chiqindilarni poligonga aylantirish, anaerob hazm qilish, aqlli qutilar, biologik parchalanadigan qadoqlash, chiqindilarni saralash, kompostlash, xavfli chiqindilar ,chiqindilarni barqaror boshqarish, elektron chiqindilarni qayta ishlash, yashil texnologiya.

Аннотация Сегодня важными аспектами являются предотвращение загрязнения окружающей среды, рациональное использование предоставленных ресурсов. Ведь передача природных и неестественных ресурсов будущему поколению, поддержание чистоты окружающей среды, в которой мы живем, является нашей главной обязанностью. В связи с этим в этой статье будут показаны преимущества, которые человечество приносит экономике посредством управления отходами, их эффективной стратегии и управления отходами.

Ключевые слова: преобразование отходов в энергию, свалка, компостирование, круговая экономика, превращение отходов в свалки, анаэробное пищеварение, умные коробки, биоразлагаемая упаковка, сортировка отходов, компостирование, опасные отходы, устойчивое управление отходами, переработка электронных отходов, зеленые технологии.





ANNOTATION

Today, it is important aspects to ensure that the environment is not polluted, that the rational use of the given resources is established. After all, it is our main duty to bring natural and notational resources to the future generation, to keep the environment in which we live clean at the required level. In this regard, this article will show the benefits that humanity brings to the economy through waste management, their effective strategy and waste management.

Keywords: waste to energy, landfill , composting , circular economy, waste to landfill, anaerobic digestion, smart boxes, biodegradable packaging, waste sorting, composting, hazardous waste , sustainable waste management, electronic waste recycling , greentechnology.

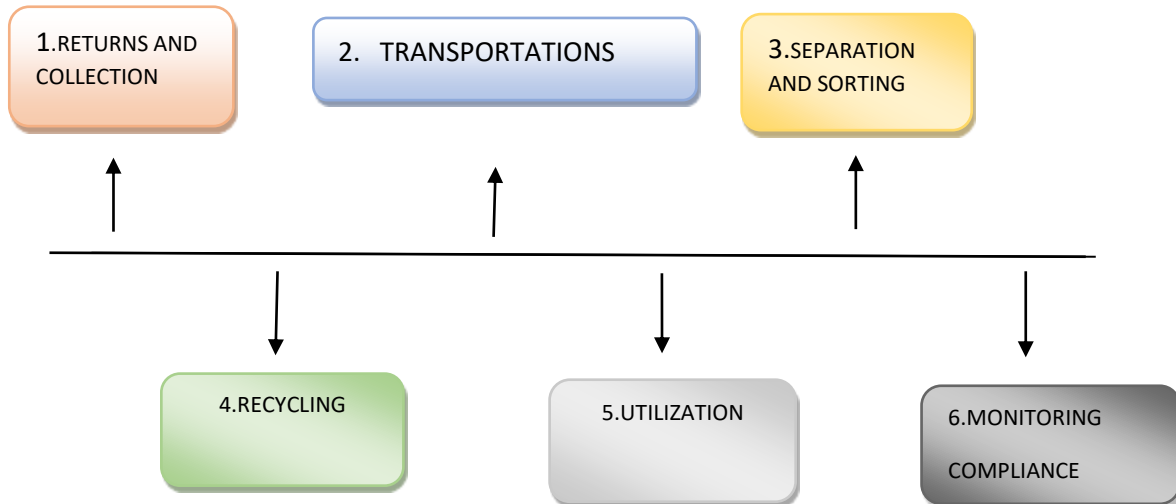
In our country, many reforms are being implemented today. Among these reforms, the issues of preserving the environment, utilizing resources efficiently, and not only protecting nature but also developing the economy are being highlighted. Preserving nature, avoiding harm to the environment in the use of each resource, especially addressing the most urgent issue of our time, is becoming increasingly important. If we define the foundation of the actions to be taken in this regard and pay primary attention to situations related to it, we can avoid mistakes. Managing waste by either disposing of it improperly or incinerating it not only harms the environment but also poses a threat to both biodiversity and human life. Considering such issues, managing waste in conjunction with environmental conservation and bringing benefits to the economy can be seen as a leading solution from a strategic perspective.

Waste management: Improper disposal of waste, including plastic waste, electronic waste, and hazardous materials, leads to environmental degradation and health risks. Implementing effective waste management strategies such as recycling, composting, and waste-to-energy technologies is crucial for sustainable development.

Waste management is considered an essential aspect of green economy because improper waste disposal can have serious implications for the environment and public health. Efficient waste management reduces waste generation, promotes recycling, and minimizes the impact on the environment.



WASTE MANAGEMENT TRACK




It comes to the stages of waste management, the following are typically involved from the population:

1. Collection or Recycling: Instead of simply discarding items, recycling them can extend their lifespan and reduce the amount of waste produced. Promoting activities such as repairing, refurbishing, and gifting items encourages more efficient use of resources and contributes to a circular economy.

Waste is collected through various methods such as household waste collection centers and recycling programs. In our country, several initiatives are being carried out to efficiently collect recyclable waste. The experience of foreign countries is considered particularly important in this regard. For example, Japan's waste separation system: Japan has a highly effective waste management system that incorporates strict rules for separating different types of waste. Residents are required to separate waste into categories such as burnable, non-burnable, recyclable, and hazardous. This system has led to high rates of waste recycling and proper disposal.

Or Sweden's waste-to-energy plants: Sweden has invested in waste-to-energy plants that generate energy from non-recyclable waste, reducing the amount of waste sent to landfills. This approach helps reduce the quantity of waste sent to landfills along with producing renewable energy. Sweden boasts one of the highest rates of converting waste to energy in the world.





South Korea's "Pay as You Throw" system: South Korea has implemented a "pay as you throw" system where residents pay based on the amount of waste they produce for disposal. This system incentivizes waste reduction and recycling as residents have a financial interest in producing less waste. South Korea has achieved high rates of recycling and waste diversion through this system.

Germany's Extended Producer Responsibility (EPR) system: In Germany, manufacturers are responsible for collecting and recycling their products' entire life cycle, including packaging waste, through a comprehensive EPR system. This system encourages manufacturers to design products with recyclability in mind and contributes to the cost of managing product waste.

Singapore's public education campaigns: Singapore has launched extensive public education campaigns to raise awareness about waste management and promote responsible disposal practices. The campaigns emphasize the importance of reducing, reusing, and recycling waste of all kinds. As a result of these initiatives, waste management practices and community engagement have improved in Singapore.

These international examples showcase innovative approaches to waste collection that prioritize sustainability, resource conservation, and community participation. By adopting successful international practices, our country can enhance waste management efforts, promote a circular economy mindset among its population, and implement effective strategies to improve waste management practices within society.

2. Transportation: Collected waste is transported to transfer stations or recycling facilities using trucks, trains, or other modes of transportation. The faster this process is carried out, the more efficiently subsequent stages can proceed.

3. Sorting and Separation: At transfer stations or recycling facilities, waste is sorted into various categories such as recyclables, organics, and non-recyclables. If waste can be sorted effectively, costs at this stage can be reduced, and excess time and resources can be saved, or even avoided altogether. The efficiency of this sorting stage is crucial for the overall waste management process. Sending materials for recycling instead of disposing of them increases the processing time and reduces the quantity of waste generated. Promoting activities such as repairing, refurbishing, and gifting items allows for more efficient use of resources and contributes to the development of a circular economy.

4. Recycling: Sorted waste is processed through various methods such as composting, recycling, or converting waste into energy for useful materials or energy. This process depends on the type of waste. Food waste is usually sent to





farms for composting. Technologies for converting waste into energy involve processes such as incineration, gasification, and anaerobic digestion. These technologies help reduce the volume of waste sent to landfills by converting waste into reusable energy.

5. Disposal: Any remaining waste that cannot be recycled or processed further is either sent to landfills or disposed of in waste-to-energy plants.

6. Monitoring and Compliance: Throughout the entire process, waste management authorities monitor and ensure compliance with regulations and ecological standards to minimize the impact of waste on the environment and public health. If recycling is not feasible for certain waste materials, maximum precautions are taken to ensure the safety of the public or the environment. Proper disposal of hazardous waste, including chemicals, electronic waste, and medical waste, is crucial for preventing environmental degradation and health risks. Establishing regulations, guidelines, and monitoring systems for managing hazardous waste is essential.

Raising awareness about the importance of waste management, promoting sustainable practices, and educating the public about proper waste disposal are key strategies to reduce waste generation and enhance recycling culture. Implementing these strategies and aligning waste management practices with environmental protection goals can lead to more sustainable resource management and a greener economy for future generations.

Waste management involves responsibly and efficiently collecting, transporting, sorting, recycling, reusing, and disposing of waste materials. Effective waste management plays a crucial role in preserving the environment, public health, and natural resources.


Effective waste management requires a multifaceted approach, encompassing infrastructure development, public education, stakeholder collaboration, and policy support. This holistic strategy ensures sustainable outcomes and contributes to a circular economy characterized by efficient and responsible resource utilization.

Recent years have witnessed a surge in innovative inventions and technologies that have revolutionized waste management practices, leading to more sustainable and efficient waste processing. Here are some notable examples:

* **Smart bins and sensors:** These technologies optimize waste collection routes and schedules by monitoring bin levels, reducing unnecessary pickups and fuel consumption.

* **Anaerobic digestion systems:** Employing microorganisms to break down organic waste in the absence of oxygen, these systems generate biogas (a





renewable energy source) and nutrient-rich digestate, diverting organic waste from landfills and producing valuable resources.

* **Advanced plastic recycling technologies:** Innovations like chemical recycling allow for the processing of previously non-recyclable plastics, expanding recycling capabilities and reducing plastic pollution.

* **Waste sorting robots:** Automated systems equipped with artificial intelligence efficiently sort and separate waste streams, improving recycling accuracy and efficiency.

* **Mobile recycling units:** Bringing recycling services to remote or underserved areas, these units promote participation and accessibility in recycling programs.

* **Biodegradable packaging materials:** Replacing traditional plastics with biodegradable alternatives minimizes environmental impact and reduces landfill accumulation.

* **Wastewater treatment innovations:** Advanced filtration, disinfection, and resource recovery techniques protect water resources and enhance water quality.

These innovations highlight the potential of technological advancements in tackling environmental challenges, promoting resource recovery, and establishing a more sustainable waste management system. By embracing these technologies and solutions, communities can progress towards a cleaner and greener future for waste management practices.

Waste management plays a critical role in environmental sustainability, ensuring the proper processing and disposal of waste to minimize its impact on the environment. In Uzbekistan, harnessing innovation in waste management can yield significant improvements in environmental sustainability, public health, and resource efficiency. Implementing innovative approaches and technologies can address key challenges such as inadequate waste collection and disposal infrastructure, limited recycling and composting facilities, and increasing waste generation due to population growth and economic development.

By embracing new ideas and approaches in waste management, Uzbekistan can strive towards a cleaner environment, healthier communities, and a more sustainable future for its citizens.

In conclusion, effective waste management is crucial for Uzbekistan to mitigate environmental problems, health hazards, and resource depletion. By implementing comprehensive waste control measures, the country can achieve the following:

1.Environmental Sustainability: Proper waste management practices, including segregation, recycling, and composting, can reduce the amount of waste sent to landfills, minimize air pollution, protect soil and water resources, and





safeguard biodiversity and ecosystems.

2. Improved Public Health: Efficient waste management prevents the spread of diseases, reduces exposure to hazardous materials, and enhances overall health outcomes for communities in Uzbekistan.

By prioritizing and investing in innovative waste management solutions, Uzbekistan can pave the way for a healthier environment and a more sustainable future.

3. Resource Efficiency: Implementing waste control measures helps conserve valuable resources such as energy, water, and raw materials through recycling and recovery processes. This contributes to a more sustainable and circular economy.

4. Economic Benefits: Investing in waste management infrastructure and technologies can generate new job opportunities, stimulate innovation within the waste management sector, and create economic value from recycling and waste-to-energy initiatives.

5. International Collaboration: Collaborating with international partners and organizations allows Uzbekistan to leverage expertise, best practices, and funding opportunities to support the implementation of effective waste management strategies.

Overall, by prioritizing waste control efforts and adopting sustainable waste management practices, Uzbekistan can enhance its environmental sustainability, protect public health, improve resource efficiency, and contribute to a more sustainable future for current and future generations.



AHOLI TURMUSH DARAJASI VA UNING SIFATINI BELGILOVCHI MIQDORLAR

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Annotatsiya: *Mazkur maqolada aholi turmush darajasi xalqaro hamda O'zbekiston miqyosida rivojlanishi bo'yicha nazariy ma'lumotlar berilgan. Aholi farovonligini belgilovchi asosiy omillar va ularning iqtisodiy o'sishga salbiy, ijobiy ta'sirlari tahlil qilingan. Maqolada aholi farovonligi oshirishda chet el mamlakatlari tajribasidan foydalanish samaradorligi oshirish bo'yicha taklif va xulosalar berildi.*

Annotation: *This thesis presents economic data on the international standard of living of the population and the development of Uzbekistan. The main factors determining the well-being of the population and their negative, positive impact on economic growth were analyzed. In our research work, proposals and conclusions were made to improve the effectiveness of the use of experience of foreign countries in improving the well-being of the population.*

Аннотация: *В данной диссертации представлены экономические данные о международном уровне жизни населения и развитии Узбекистана. Проанализированы основные факторы, определяющие благосостояние населения и их негативное, позитивное влияние на экономический рост. В нашей исследовательской работе даны предложения и выводы по повышению эффективности использования опыта зарубежных стран в повышении благосостояния населения.*

Kalit so'zlar: *Turmush darajas, aholi farovonligi, iqtisodiy o'sish, "turmush faoliyati xavfsizligi", "turmush tarzi", "mehnat faoliyati sifati".*

Keywords: *Standard of living, population well-being, economic growth, "safety of life", "lifestyle", "quality of labor activity".*

Ключевые слова: *Уровень жизни, благосостояние населения, экономический рост, "безопасность жизнедеятельности", "образ жизни", "качество трудовой деятельности".*

