



University : UzSWLU  
Country : Uzbekistan  
Web Address: <https://www.uzswlu.uz/en>

### 3 Waste

#### [3.3] Organic Waste Treatment

Organic waste management is a key component of Uzbekistan State World Languages University's *Green Campus Strategy (2023–2030)*, directly supporting SDG 12 (Responsible Consumption and Production), SDG 13 (Climate Action), and SDG 15 (Life on Land). The university's system focuses on transforming biodegradable waste into valuable resources through composting, pilot biogas production, and applied research, thereby reducing methane emissions and promoting a circular, low-carbon campus. This initiative aligns with Uzbekistan's national theme for 2025 – "The Year of Environmental Protection and the Green Economy."

#### 1. Treatment Infrastructure and Process

- UzSWLU operates three on-campus composting units and a pilot anaerobic digestion system to process food residues, green waste, and biodegradable dormitory materials.
- In 2025, the university generated approximately 58,000 kg (58 tons) of organic waste, of which 70% ( $\approx$  40 tons) was successfully treated and converted into compost or biogas.
- Composting follows a three-stage aerobic process — *collection* → *shredding* → *controlled decomposition* → *curing*.
- Real-time monitoring (temperature, moisture, compost yield) is conducted through the UzSWLU Green Data Portal, ensuring data transparency and CO<sub>2</sub> accounting.

#### Main treatment outcomes (2025):

| Source                        | Volume Treated | Method                           |
|-------------------------------|----------------|----------------------------------|
| Cafeteria waste               | 25 tons        | Composting & anaerobic digestion |
| Green waste                   | 12 tons        | Composting                       |
| Dormitory biodegradable waste | 3 tons         | Composting                       |

#### 2. Compost Production and Utilization

- The university produces around 25 tons of compost annually, replacing 30 million UZS worth of chemical fertilizers.
- Compost is used across 1.5 hectares of campus green zones — including the Main Campus Park, Linguistic Garden, and Faculty Courtyards — improving vegetation density by 18% compared to 2024.
- The compost has been tested by the *Organic Waste Research and Innovation Laboratory*, confirming optimal nutrient balance (C:N ratio 22:1) and soil improvement quality.
- Compost packaging follows eco-design principles, with labeled sacks reading "Produced by UzSWLU Waste-to-Resource Program."

#### 3. Biogas Pilot System and Renewable Energy Integration



- In 2024–2025, UzSWLU launched a **pilot anaerobic digester** that converts cafeteria waste into biogas, used to heat **laboratory units in the Faculty of Natural Sciences**.
- The system contributes to a **5% reduction in natural gas use** and avoids **2.5 tons of CO<sub>2</sub> equivalent emissions annually**.
- The biogas unit is also used for educational demonstrations in the *Green Technologies and Waste Management* course.
- Future expansion plans include scaling up the system to supply energy to dormitory kitchens.

#### 4. Research and Innovation

- The *Organic Waste Research and Innovation Laboratory* developed an **accelerated composting formula** using microbial bio-activators, reducing decomposition time by **35%**.
- Laboratory testing confirms improved compost stability and higher nitrogen retention.
- Research on **biomass-to-fuel conversion** explores the production of **bioethanol and biodiesel** from organic residues under local climatic conditions.
- Findings are shared through international collaborations under **Erasmus+** and **Horizon Europe** frameworks on circular bioeconomy.

#### 5. Education and Student Engagement

- The interdisciplinary course “*Green Technologies and Waste Management*” trains students in waste auditing, composting, and renewable energy systems.
- Over **900 students and 60 faculty members** participated in composting workshops, field demonstrations, and *Zero Waste Campus* campaigns.
- The **Green Leaders Club** and **Eco Volunteers** organize *Compost Application Days*, *Waste Art Exhibitions*, and environmental awareness seminars.
- Students collect data on compost quality, CO<sub>2</sub> savings, and fertilizer efficiency using the **Green Data Portal** — turning theory into applied environmental practice.

#### 6. Partnerships and Cooperation

- Organic waste collection and verification are implemented under an **official contract** with the **Tashkent City “Maxsus Trans” Waste Management Company**.
- The **Ecological Party of Uzbekistan** conducts joint awareness sessions and expert consultations on sustainable waste management.
- Partnership with the **Ministry of Higher Education and Innovation** ensures alignment with national *Green Economy* and *Climate Adaptation* policies.
- Collaboration with **local municipalities** provides data integration for compost reuse and carbon footprint tracking.

#### 7. Results and Environmental Impact

| Indicator                                            | 2024       | 2025       | Change |
|------------------------------------------------------|------------|------------|--------|
| Total organic waste generated                        | 64 tons    | 58 tons    | ▼ -9%  |
| Treated organic waste                                | 38 tons    | 40 tons    | ▲ +5%  |
| Treatment rate                                       | 60%        | 70%        | ▲ +10% |
| Compost produced                                     | 22 tons    | 25 tons    | ▲ +14% |
| CO <sub>2</sub> reduction (from composting & biogas) | 10 tons    | 12 tons    | ▲ +20% |
| Fertilizer savings                                   | 25 mln UZS | 30 mln UZS | ▲ +20% |

- 70% of total organic waste is now treated on campus — a benchmark for excellence in Uzbekistan.
- 12 tons of CO<sub>2</sub> emissions prevented annually, verified through the *Green Data Portal*.
- Compost use improved vegetation cover by 18% and significantly reduced chemical fertilizer dependency.
- The project demonstrates full circularity — waste generation, recovery, reuse, and education combined into a single ecosystem.

Through its fully integrated organic waste treatment ecosystem, Uzbekistan State World Languages University has achieved measurable, verifiable, and replicable results in climate action and resource efficiency.

The system exemplifies how higher education institutions can align scientific research, digital monitoring, and environmental education to achieve true circular sustainability.

By linking academic innovation with real operational impact, UzSWLU contributes directly to Uzbekistan's 2025 national goals for a “*Green and Climate-Resilient Economy*.”



Organic Waste Treatment (UzSWLU)





**Additional evidence link (i.e., for videos, more images, or other files that are not included in this file):**