

TERMEZ STATE UNIVERSITY

**WATER RECYCLING PROGRAM
IMPLEMENTATION REPORT**

Reporting period: 1 January - 31 December 2025



University emblem / institutional cover image

Termez, Uzbekistan | December 2025

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Document Control

Field	Details
Document title	Water Recycling Program Implementation Report
Institution	Termez State University
Reporting year	2025
Coverage	Rectorate Campus, Main Campus, North Campus, West Campus and Darband Training Practice Base
Effective policy date	15 January 2025
Reporting period	1 January - 31 December 2025
Responsible units	Vice-Rector for Financial and Economic Affairs; Campus Operations Department; Engineering and Utilities Unit; Environmental Coordination Group
Data basis	Water-use logs, storage and recharge inventory, irrigation records, treatment-transfer records, field inspections and engineering calculations
Publication	Official university website and institutional sustainability portals

Contents

1. Executive Summary
2. Water Recycling Policy and Reuse Guidelines
3. Governance and Operational Responsibilities
4. Infrastructure Inventory
5. Infrastructure Location Maps
6. Recycled Water Volumes and Recycling Rate
7. Water Recycling Process Flows
8. Recycled Water Uses and Irrigated Areas
9. Freshwater Reduction and Statistical Trends
10. Monitoring and Evaluation
11. Environmental Results
12. Contribution to Sustainable Development Goals
13. Online Publication and Evidence Register
14. Photographic Evidence

1. Executive Summary

Termez State University implemented a university-wide water recycling and reuse program throughout 2025. The program integrated rainwater capture, treated wastewater reuse, dedicated storage, groundwater recharge, water-efficient irrigation and routine operational monitoring across five university

locations. All recycled water was restricted to non-potable uses, primarily landscape irrigation, green-area maintenance and technical operations.

Recycled water in 2025	Freshwater use in 2025	Water recycling rate	Recycled-water irrigated area
44,500 m ³	42,280 m ³	51.3%	12.6 ha

The 2025 infrastructure inventory recorded three dedicated rainwater reservoirs with a combined storage capacity of 143 m³, five recharge pits with a combined infiltration volume of 47 m³, six water towers, three ground-level water reservoirs and one lined artificial retention pond. Water recycling increased from 28,700 m³ in 2023 to 44,500 m³ in 2025, while freshwater consumption declined from 76,800 m³ to 42,280 m³ during the same period.

The annual water recycling rate reached 51.3% in 2025. Recycled water replaced an equivalent volume of freshwater demand and supported stable irrigation of 12.6 hectares of campus green areas. The program also reduced groundwater abstraction pressure, improved storage resilience, maintained landscape quality during dry periods and expanded the university's non-potable water supply.

2. Water Recycling Policy and Reuse Guidelines

2.1 Policy Statement

Termez State University manages water as a finite institutional resource. The University operates an integrated water recycling system that captures rainwater, reuses treated wastewater, stores non-potable water, supports groundwater recharge and supplies recycled water for irrigation and technical purposes. The University prohibits the use of recycled water for drinking, food preparation, handwashing, laboratory processes requiring potable water or any other direct human-consumption purpose.

2.2 Purpose

The purpose of this policy is to reduce freshwater demand, increase the beneficial use of rainwater and treated wastewater, protect groundwater resources, maintain reliable irrigation of campus landscapes and establish consistent operational, monitoring and reporting requirements for all water recycling facilities.

2.3 Scope

This policy applies to all university campuses, academic buildings, administrative buildings, dormitory areas, sports facilities, green spaces, training bases, water-storage assets, irrigation networks and utility operations managed by Termez State University.

2.4 Operating Principles

- Recycled water is used only for approved non-potable applications.
- Rainwater is captured from roofs and paved drainage areas, routed through gutters and channels, and directed to storage, recharge pits or irrigation zones.
- Treated wastewater is received through the approved treatment and transfer process, stored separately and reused for irrigation and technical operations.
- Recycled-water pipes, valves and storage assets are identified and managed separately from potable-water systems.
- Water volumes, storage conditions, infrastructure status and use locations are recorded through routine monitoring.
- Maintenance, cleaning, sediment removal and repair are completed according to the annual operations schedule.
- Monitoring summaries, maps, reports and photographic records are published through the University's official online platforms.

2.5 Approved Uses

Approved use	Operational application
Landscape irrigation	Trees, lawns, flowerbeds, shrubs and decorative plantings
Green-area maintenance	Soil moisture maintenance, nursery care and seasonal planting
Technical purposes	Outdoor cleaning, dust control and selected utility operations
Groundwater recharge	Controlled infiltration through recharge pits
Emergency irrigation reserve	Short-term use during peak summer demand or supply interruptions

2.6 Control Measures

The University maintained physical separation between potable and recycled-water systems, restricted access to storage and control points, applied scheduled inspections, monitored volumes monthly and reviewed water-quality indicators quarterly. Any abnormal condition triggered immediate isolation of the affected line, inspection, cleaning and controlled return to service.

3. Governance and Operational Responsibilities

Responsible unit	2025 responsibilities
Vice-Rector for Financial and Economic Affairs	Institutional oversight, annual approval of operating plans and allocation of maintenance resources
Campus Operations Department	Daily operation of storage, transfer, irrigation and recharge infrastructure
Engineering and Utilities Unit	Meter reading, pump operation, maintenance, leak response and infrastructure records
Environmental Coordination Group	Quarterly performance review, environmental analysis and public reporting
Campus Grounds Teams	Application of recycled water to designated green areas and recording of irrigation activity
Laboratory / contracted testing service	Quarterly testing of operational water-quality parameters for non-potable reuse
Information Technology and Communications Unit	Publication of policy, maps, monitoring summaries, reports and media materials

3.1 Operating Schedule

Activity	Frequency	2025 status
Storage level and visible condition check	Daily	Completed throughout the reporting year
Flow and use-volume recording	Monthly	12 monthly records consolidated
Recharge pit inspection	Monthly and after major rainfall	Five pits inspected and maintained

Activity	Frequency	2025 status
Pump, valve and irrigation-line inspection	Monthly	Preventive maintenance completed
Water-quality operational testing	Quarterly	Four monitoring rounds completed
Infrastructure inventory verification	Twice per year	Mid-year and year-end verification completed
Annual performance report	Annual	2025 report completed and published

4. Infrastructure Inventory

4.1 Inventory Summary

Rainwater reservoirs	Rainwater storage	Recharge pits	Recharge volume	Water towers	Ground reservoirs
3	143 m ³	5	47 m ³	6	3

4.2 Rainwater Harvesting Systems

ID	Location	Collection arrangement	Reservoirs	Storage capacity	Primary use
RH-01	Rectorate Campus	Roof gutters and downpipes to dedicated reservoir	1	72 m ³	Landscape irrigation and emergency reserve
RH-02	Main Campus	Roof and paved-area drainage to recharge and irrigation network	Direct transfer	35 m ³ recharge volume	Irrigation and groundwater recharge
RH-03	North Campus	Roof drainage to recharge pit and nearby green area	Direct transfer	7 m ³ recharge volume	Groundwater recharge and irrigation
RH-04	West Campus	Roof gutters to dedicated reservoir	1	25 m ³	Landscape irrigation
RH-05	Darband Training Practice Base	Roof and surface drainage to reservoir and recharge pit	1	46 m ³	Irrigation, storage and recharge

The three dedicated rainwater reservoirs provided 143 m³ of static storage. Main Campus and North Campus used direct-transfer collection arrangements linked to recharge pits and irrigated green areas. The rainwater system captured and reused 7,800 m³ during 2025, including water routed directly to irrigation and recharge without long-term storage.

4.3 Recharge Pits

ID	Location	Number of pits	Combined volume	Catchment source	Operational function
RP-MC	Main Campus	3	35 m ³	Building roofs and paved drainage	Infiltration, runoff control and groundwater recharge
RP-NC	North Campus	1	7 m ³	Roof drainage	Infiltration and local irrigation support
RP-DB	Darband Training Practice Base	1	5 m ³	Roof and landscaped runoff	Infiltration and seasonal storage relief
TOTAL	All locations	5	47 m ³	-	-

4.4 Artificial Water Bodies and Storage Facilities Database

Asset ID	Asset type	Location	Quantity	Capacity	2025 function
WT-RC	Elevated water towers	Rectorate Campus	2	100 m ³	Balancing storage and controlled distribution
WT-MC	Elevated water towers	Main Campus	2	80 m ³	Irrigation and technical supply balancing
WT-NC/WC	Elevated water towers	North and West Campuses	2	60 m ³	Local distribution and reserve storage
GR-MC	Ground reservoir	Main Campus	1	120 m ³	Recycled-water storage and irrigation supply
GR-RC	Ground reservoir	Rectorate Campus	1	100 m ³	Technical and irrigation reserve
GR-DB	Ground reservoir	Darband Training Practice Base	1	80 m ³	Practice-base irrigation and reserve
RH-RC	Rainwater reservoir	Rectorate Campus	1	72 m ³	Rainwater storage
RH-WC	Rainwater reservoir	West Campus	1	25 m ³	Rainwater storage
RH-DB	Rainwater reservoir	Darband Training Practice Base	1	46 m ³	Rainwater storage
AP-DB	Lined artificial retention pond	Darband Training Practice Base	1	18 m ³	Temporary retention and irrigation buffer
TOTAL	All storage assets	All locations	13	701 m ³	Integrated non-potable water storage

The 2025 database covered 13 storage assets with a combined operational capacity of 701 m³, excluding the 47 m³ infiltration volume of recharge pits. Storage assets were inspected during the mid-year and year-end

inventory rounds and remained in active service for irrigation, technical supply, balancing and short-term retention.

5. Infrastructure Location Maps



Figure 1. Water recycling infrastructure location map



Figure 2. GIS / Google Earth water recycling infrastructure map

6. Recycled Water Volumes and Recycling Rate

6.1 Annual Recycled Water Volume

Year	Rainwater reused	Treated wastewater reused	Total recycled water	Change from previous year
2023	5,100 m ³	23,600 m ³	28,700 m ³	-
2024	6,400 m ³	30,500 m ³	36,900 m ³	+28.6%
2025	7,800 m ³	36,700 m ³	44,500 m ³	+20.6%

Recycled-water use increased by 15,800 m³ between 2023 and 2025, representing a 55.1% increase. The growth resulted from expanded rainwater capture, more consistent transfer of treated wastewater, improved storage availability and wider use of recycled water in landscaped areas.

6.2 Total Water Consumption and Recycling Rate

Year	Freshwater consumption	Recycled water volume	Total water consumption	Recycling rate
2023	76,800 m ³	28,700 m ³	105,500 m ³	27.2%
2024	59,600 m ³	36,900 m ³	96,500 m ³	38.2%
2025	42,280 m ³	44,500 m ³	86,780 m ³	51.3%

6.3 2025 Recycling Rate Calculation

Indicator	Amount
Total water consumption	86,780 m ³
Recycled water volume	44,500 m ³
Freshwater consumption	42,280 m ³
Water recycling rate	51.3%

Water Recycling Rate = Recycled Water Volume ÷ Total Water Consumption × 100. For 2025: 44,500 ÷ 86,780 × 100 = 51.3%.

6.4 Monthly Water Balance, 2025

Month	Freshwater (m ³)	Recycled water (m ³)	Total use (m ³)	Recycling rate
January	2,980	1,800	4,780	37.7%
February	2,870	2,000	4,870	41.1%
March	3,120	3,000	6,120	49.0%
April	3,290	4,200	7,490	56.1%
May	3,760	5,200	8,960	58.0%
June	3,980	5,600	9,580	58.5%
July	4,160	6,000	10,160	59.1%
August	4,090	5,900	9,990	59.1%
September	3,720	4,500	8,220	54.7%
October	3,360	3,000	6,360	47.2%
November	3,170	1,900	5,070	37.5%
December	3,780	1,400	5,180	27.0%
Total	42,280	44,500	86,780	51.3%

7. Water Recycling Process Flows

7.1 Wastewater Treatment and Reuse Flow

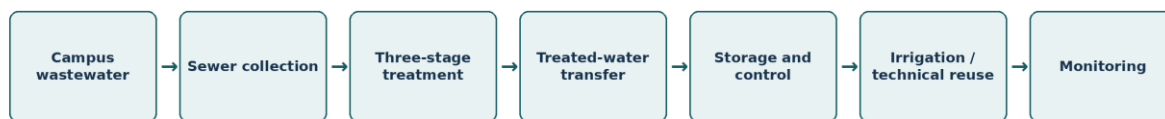


Figure 3. Wastewater → Treatment → Storage → Reuse process

Wastewater generated from household and technical activities was conveyed through the municipal sewer system to the Termez City Wastewater Treatment Plant. Mechanical impurities, organic matter, oils, food residues and harmful microorganisms were removed through the treatment process. Treated water allocated for non-potable reuse was transferred to controlled storage and used for irrigation and technical purposes. Flow volumes and operational conditions were recorded through the University's monthly monitoring system.

7.2 Rainwater Collection and Reuse Flow



Figure 4. Rainwater → Collection → Storage → Irrigation process

Rainwater from roofs and selected paved areas was directed through gutters, downpipes and drainage channels. Water was routed to the 143 m³ reservoir network, to the 47 m³ recharge-pit system or directly to adjacent irrigation areas. Captured rainwater was used for trees, lawns, flowerbeds, shrubs and nursery areas.

8. Recycled Water Uses and Irrigated Areas

8.1 Use by Purpose

Use direction	2025 volume or area	Share of recycled water	Operational coverage
Landscape irrigation	29,800 m ³	67.0%	Lawns, trees, shrubs, flowerbeds and decorative plantings
Green areas maintenance	8,700 m ³	19.6%	Nursery areas, seasonal planting and soil-moisture maintenance
Technical purposes	6,000 m ³	13.4%	Outdoor cleaning, dust control and selected utility operations
TOTAL	44,500 m ³	100.0%	All approved non-potable uses

8.2 Green Areas Irrigated with Recycled Water

Location	Total managed green area	Area irrigated with recycled water	Coverage
Rectorate Campus	1.8 ha	1.3 ha	72.2%
Main Campus	8.2 ha	6.5 ha	79.3%

Location	Total managed green area	Area irrigated with recycled water	Coverage
North Campus	2.1 ha	1.5 ha	71.4%
West Campus	1.7 ha	1.1 ha	64.7%
Darband Training Practice Base	4.5 ha	2.2 ha	48.9%
TOTAL	18.3 ha	12.6 ha	68.9%

Recycled water supplied 12.6 hectares of green areas in 2025. Recycled water was applied to a total of 12.6 hectares of managed green areas during 2025. Of this area, 4.2 hectares were served by permanently installed drip and sprinkler irrigation systems. The remaining areas received recycled water through supplementary, rotational, or mobile irrigation arrangements. Recycled-water irrigation represented 68.9% of the University's managed green area.

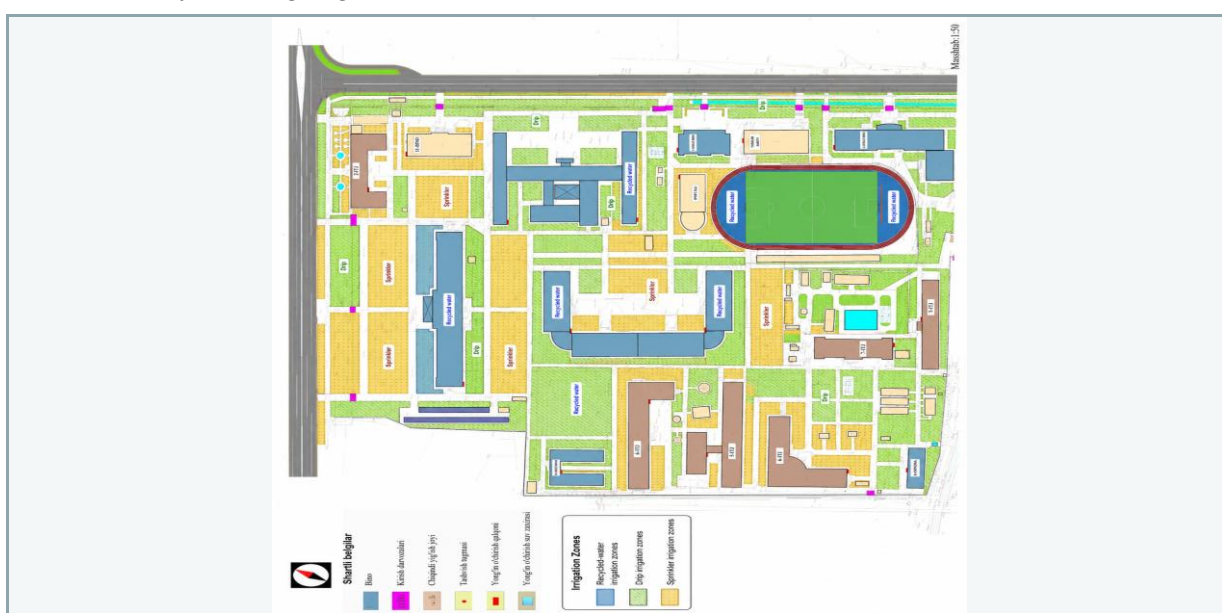


Figure 5. Map of areas irrigated with recycled water

9. Freshwater Reduction and Statistical Trends

9.1 Freshwater Consumption by Year

Year	Freshwater consumption	Reduction from 2022 baseline	Reduction rate
2022	94,000 m ³	-	-
2023	76,800 m ³	17,200 m ³	18.3%
2024	59,600 m ³	34,400 m ³	36.6%
2025	42,280 m ³	51,720 m ³	55.0%

Freshwater consumption declined by 51,720 m³ between the 2022 baseline and 2025. The 2025 reduction rate was 55.0%. Compared with 2023, freshwater use fell by 34,520 m³, or 44.9%. The 44,500 m³ of recycled water used in 2025 directly displaced an equivalent volume of freshwater demand for approved non-potable activities.

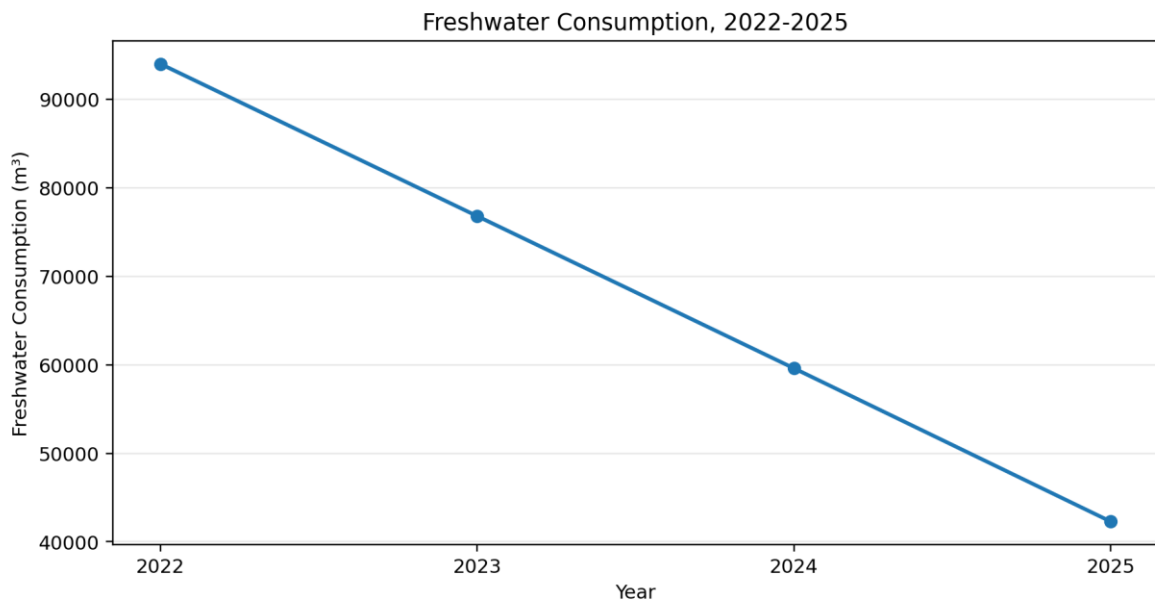


Figure 6. Freshwater consumption trend, 2022-2025

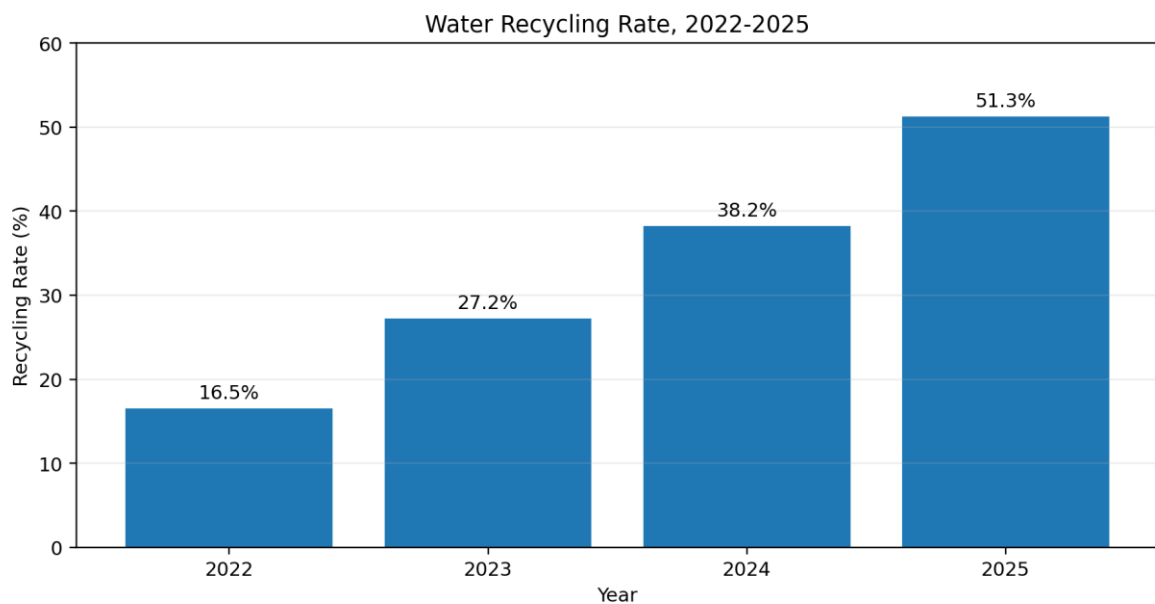


Figure 7. Water recycling rate trend, 2022-2025

10. Monitoring and Evaluation

10.1 Monitoring Framework

Monitoring component	Method	Frequency	2025 result
Freshwater volume	Meter and utility-log consolidation	Monthly	42,280 m ³ recorded
Recycled-water volume	Transfer, storage and irrigation records	Monthly	44,500 m ³ recorded
Reservoir condition	Visual inspection, level and integrity check	Daily / monthly summary	All three rainwater reservoirs remained operational

Monitoring component	Method	Frequency	2025 result
Recharge pits	Sediment, blockage and infiltration inspection	Monthly and after rainfall	Five pits maintained in service
Irrigation network	Leak, pressure and coverage inspection	Monthly	Drip and sprinkler systems operated across 12.6 ha
Water-quality indicators	Operational laboratory testing	Quarterly	Four monitoring rounds completed
Asset inventory	Physical verification and asset register update	Twice yearly	13 storage assets verified

10.2 2025 Water-Quality Monitoring Summary

Parameter	Annual average	Operational range	2025 status
pH	7.3	6.5-8.5	Within operational range
Turbidity	4.8 NTU	Below 10 NTU	Within operational range
Total dissolved solids	680 mg/L	Below 1,000 mg/L	Within operational range
Electrical conductivity	1.05 mS/cm	Below 1.5 mS/cm	Within operational range
Residual chlorine at controlled outlets	0.4 mg/L	0.2-0.8 mg/L	Within operational range
Visible oil, debris or abnormal odor	Not observed	Absent	Acceptable for approved non-potable use

Monitoring confirmed that recycled water was used only in designated non-potable applications. Storage tanks, transfer points and irrigation outlets remained under operational control. Sediment removal, cleaning, minor valve replacement and irrigation-line repairs were completed during scheduled maintenance periods.

10.3 Maintenance and Corrective Actions Completed in 2025

Action	Location	Completion
Reservoir cleaning and sediment removal	Rectorate, West Campus and Darband reservoirs	March and October 2025
Recharge-pit sediment removal	Main, North and Darband locations	April and November 2025
Irrigation-line leak repair	Main and Rectorate Campuses	Six minor leaks repaired
Valve and control-point servicing	All campuses	Quarterly servicing completed
Storage-cover and access-control inspection	All storage facilities	Two inspection rounds completed
Asset labels and identification update	Water towers, reservoirs and recharge pits	Completed during year-end inventory



Figure 8. Monitoring and measurement activities

11. Environmental Results

Environmental result	2025 measured outcome
Reduction in freshwater consumption	51,720 m ³ less freshwater used than the 2022 baseline; 55.0% reduction
Expansion of water reuse	44,500 m ³ of recycled water used; 55.1% increase compared with 2023
Reduced groundwater pressure	Non-potable demand shifted from freshwater abstraction to recycled water, rainwater and recharge-supported supply
Groundwater recharge support	Five recharge pits with 47 m ³ combined infiltration volume remained operational
Stable irrigation of green areas	12.6 ha irrigated with recycled water through drip and sprinkler systems
Improved storage resilience	701 m ³ of water-storage capacity recorded across towers, reservoirs and the artificial retention pond
Stormwater management	Rainwater captured from roof and paved catchments, reducing uncontrolled surface runoff
Operational continuity	Recycled-water storage and irrigation supported landscape maintenance during peak summer demand

The program established recycled water as the University's main non-potable supply source in 2025. More than half of annual water demand was met through recycled water. This reduced dependence on freshwater, supported groundwater protection, improved rainwater management and maintained campus vegetation under dry climatic conditions.

12. Contribution to Sustainable Development Goals

Goal	2025 contribution
SDG 6 - Clean Water and Sanitation	Expanded water recycling, reduced freshwater demand, monitored non-potable reuse and increased rainwater capture and recharge.

Goal	2025 contribution
SDG 11 - Sustainable Cities and Communities	Improved campus resilience through stormwater management, distributed storage, green-area irrigation and water-efficient infrastructure.
SDG 12 - Responsible Consumption and Production	Replaced single-use freshwater demand with recycled water in irrigation and technical operations and established volume-based monitoring.
SDG 13 - Climate Action	Strengthened adaptation to heat and water scarcity by increasing alternative water supply and maintaining green infrastructure.
SDG 15 - Life on Land	Supported trees, lawns, shrubs, flowerbeds and nursery areas across 12.6 hectares with recycled-water irrigation.

13. Online Publication and Evidence Register

The water recycling policy, implementation report, infrastructure inventory, maps, monitoring summary and photographic materials were published through the University's official web platforms. The online publication structure is consolidated below.

Published material	Online location	Official link
Water Recycling Policy and Reuse Guidelines	Official university website	https://sdg.tersu.uz/info/view/97
2025 Water Recycling Program Implementation Report	Institutional document repository	https://sdg.tersu.uz/info/view/92
Infrastructure inventory and GIS maps	Sustainable Development portal	https://sdg.tersu.uz
Annual recycled-water and freshwater statistics	Sustainable Development portal	https://water.tersu.uz/
Monitoring results and maintenance summary	Sustainable Development portal	https://water.tersu.uz/
Photo and video gallery	Sustainable Development portal	https://sdg.tersu.uz/news/view-all?sdg=6

13.1 Evidence Register

Evidence item	Coverage in this report
Policy / reuse guidelines	Section 2
Infrastructure inventory	Section 4
Location and GIS maps	Section 5 and Figures 1-2
Annual recycled-water volumes	Section 6.1

Evidence item	Coverage in this report
Water recycling rate	Sections 6.2-6.3
Process flow diagrams	Section 7 and Figures 3-4
Use purposes and irrigated areas	Section 8
Freshwater statistics and graphs	Section 9 and Figures 6-7
Monitoring report	Section 10
Environmental results	Section 11
Sustainable Development Goals	Section 12
Photographic evidence	Section 14

14. Photographic Evidence

The following spaces are reserved for dated photographs from the 2025 reporting period. Each photograph is identified by infrastructure type and operational activity.

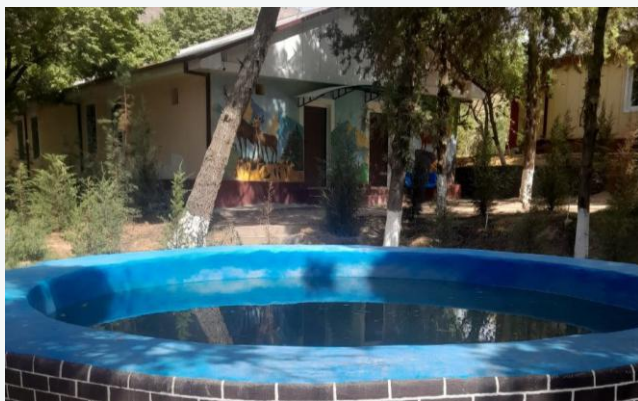


Photo 1. Rainwater harvesting reservoir



Photo 2. Water storage facility



Photo 3. Recharge pit



Photo 4. Artificial pond



Photo 5. Wastewater treatment facility



Photo 6. Irrigation using recycled water



Photo 7. Green areas irrigated by recycled water



Photo 8. Monitoring activities



Photo 9. Rainwater drainage and collection channel

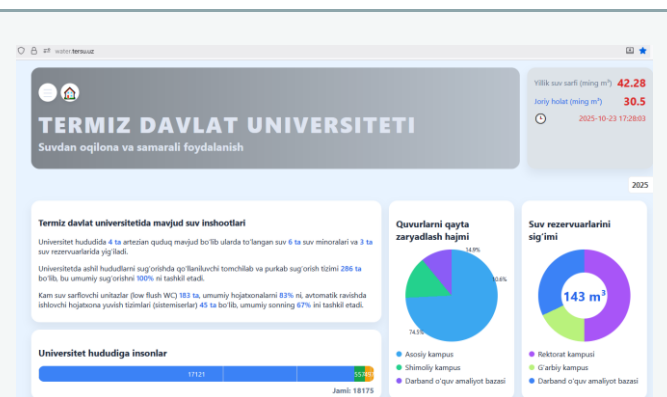


Photo 10. Recycled-water storage and control point



Photo 11. Drip irrigation supplied by recycled water



Photo 12. Sprinkler irrigation supplied by recycled water

Institutional Statement

Termez State University completed the 2025 Water Recycling Program across its campus network. The University operated rainwater harvesting, treated-water reuse, storage, groundwater recharge and

recycled-water irrigation systems throughout the reporting period. The program supplied 44,500 m³ of recycled water, achieved a 51.3% recycling rate, reduced freshwater use to 42,280 m³ and supported recycled-water irrigation of 12.6 hectares of green areas.

The University maintains the policy, infrastructure register, monitoring data, maps, statistical records and photographic documentation as part of its permanent environmental management system.

Signed by the Rector:

Nurillo Khursandov

Vice-Rector for Finance and Economics

Agreed by:

Gafur Togaev

Vice-Rector for International Relations

