6.4.1 1. Alexandria University Policy Statement for water Use

1. Introduction

Alexandria University is committed to promoting sustainable water management by maximizing water reuse, reducing freshwater consumption, and improving water-use efficiency across its campuses, faculties, research facilities, hospitals, and administrative units.

The University recognizes water scarcity as a significant environmental challenge and seeks to integrate water conservation, recycling, and reuse into institutional planning, campus operations, research, and community engagement.

This policy supports Egypt's national water conservation priorities and the United Nations Sustainable Development Goal 6 (Clean Water and Sanitation).

2. Scope

This policy applies to all University campuses, faculties, research institutes, laboratories, hospitals, administrative units, staff, students, contractors, and service providers.

3. Policy Objectives

Alexandria University aims to:

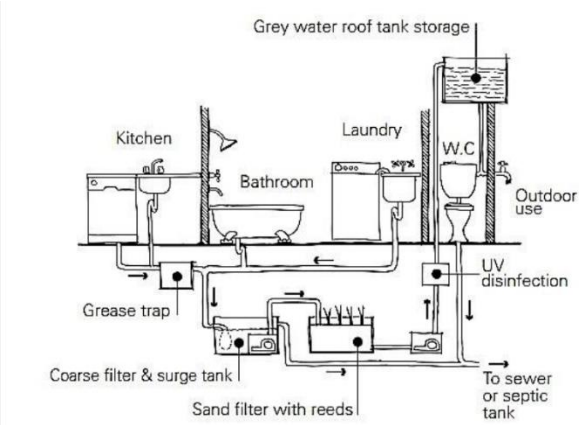
1. Maximize the safe reuse and recycling of water across University facilities.
2. Reduce dependence on freshwater resources through efficient water management.
3. Promote the collection, treatment, and reuse of suitable wastewater.
4. Encourage the use of alternative water sources for irrigation and other non-potable applications.
5. Integrate water-efficient technologies into campus infrastructure and development.
6. Strengthen awareness, research, and innovation in sustainable water management.

4. Policy Commitments

4.1 Water Reuse and Recycling

The University shall promote the collection, treatment, and safe reuse of water wherever technically feasible and environmentally appropriate, including:

- Reuse of treated greywater for landscape irrigation and other suitable non-potable purposes.
- Collection and reuse of air-conditioning condensate where practical.
- Recovery and reuse of water from appropriate laboratory and operational processes, subject to safety requirements.
- Exploration of treated wastewater reuse through approved treatment technologies.



Grey water collection, treatment and re-use for toilet flushing and outdoors

4.2 Sustainable Landscape Irrigation

The University shall encourage the use of recycled and alternative water sources for campus landscaping through:

- Water-efficient irrigation systems.
- Selection of drought-tolerant and locally adapted vegetation.
- Rainwater harvesting and storage where feasible.
- Reduction of potable water use for irrigation.

4.3 Water-Efficient Infrastructure

The University shall integrate water conservation and reuse considerations into the design, renovation, and maintenance of buildings and facilities, including water-efficient fixtures, appropriate treatment systems, and monitoring technologies.



4.4 Research, Education, and Innovation

The University shall encourage academic research, interdisciplinary collaboration, and student participation in water recycling, wastewater treatment, sustainable irrigation, and innovative water management technologies.

4.5 Environmental and Health Protection

All water reuse activities shall comply with applicable Egyptian environmental, public health, and water quality regulations.

Reuse of laboratory, clinical, or potentially contaminated wastewater shall be prohibited unless appropriate treatment, risk assessment, and regulatory requirements have been satisfied.

5. Institutional Responsibilities

- University Administration: Provide institutional oversight and integrate water reuse objectives into strategic and operational planning.
- Facilities and Maintenance Units: Identify opportunities for water recovery, implement appropriate systems, and monitor water consumption.
- Faculties and Research Institutes: Support water reuse initiatives through research, education, and responsible operational practices.
- Staff and Students: Adopt responsible water-use practices and participate in awareness and conservation initiatives.

6. Monitoring and Performance Indicators

The University shall periodically monitor the implementation of this policy using appropriate indicators, including:

- Total annual water consumption (m^3/year).
- Volume of water recycled and reused (m^3/year).
- Percentage of total water demand met through recycled or reused water.
- Reduction in freshwater consumption compared with the established baseline.
- Number of operational water reuse and recycling systems.
- Percentage of landscaped areas irrigated using alternative water sources.
- Compliance of reused water with applicable quality and safety standards.

7. Review and Continuous Improvement

This policy shall be reviewed periodically to reflect technological developments, regulatory requirements, institutional priorities, and measured environmental performance.

Alexandria University is committed to progressively expanding safe water reuse and recycling practices as part of its long-term environmental sustainability strategy.

A policy to maximize water reuse across the university

Below is the policy endorced document.

Water reuse policy

ALEXANDRIA UNIVERSITY

Policy on Energy and water sustainable use

Alexandria university is Committed to pursuing sustainable development within and through the university and to reassessing higher education and its role in the transition to more sustainable societies. This includes building synergies and collaboration in the search for effective and innovative approaches to solving today's as well as future sustainable development challenges.

The university ensures that all renovations and establishment of new buildings are following energy efficiency standards and water conservation strategies.

The university ensures divesting investments and purchases from Carbon-intensive energy industries particularly coal and oil.

The university through its faculties is committed to maximise water reuse across the university buildings and through all services provided in the process of education and research

The objective of this statement is Commitment to offering an open, interactive and collaborative forum for discussion and action, to raise awareness and advocate for changes needed changes in higher education to best serve the goals of sustainable development, (SDGs) as well as building international linkages and cooperation on the basis of core values of academic freedom, institutional autonomy and related local and global responsibilities to society.

Being uncompliant with the commitment to purse sustainable development issue will be regarded as interfering with personal development of the students, and the university administration will act accordingly

Policy created September 2019

Policy reviewed October 2022

Prof. Abdel Aziz Konsowa

University President

A. Konsowa

Alexandria university implements an integrated water management strategy focused on water

conservation, efficient resource utilization, wastewater treatment, recycling, and water quality protection across its campuses. In accordance with the United Nations sustainable development goals (SDGs) and Egypt's vision 2030, the university develops initiatives to reduce freshwater consumption, optimize operational performance, and address drought and water scarcity through education, research, and sustainable infrastructure.

- The university's water management framework integrates efficient irrigation systems, water-saving technologies, greywater recycling, renewable energy-powered desalination, and environmental monitoring. These methods support wastewater recovery, improve water resource efficiency, and protect freshwater and marine ecosystems. Through technological innovation, scientific investigation, and community awareness programs, Alexandria university strengthens water security, promotes environmental protection, and advances sustainable campus development.
- Water Recycling represents a fundamental component of Alexandria University's sustainability strategy. More than 50% of wastewater is treated and reused for non-potable applications, including landscape Irrigation, agricultural production, and campus cleaning. Reclaimed water supports green spaces, research farms, rooftop gardens, and aquaculture facilities. Key initiatives include greywater recovery systems, air-conditioning condensate collection, wastewater treatment units, a 100 m^3 Desalination plant, and renewable energy-powered desalination technologies that promote integrated Water Resources Management.
- To protect water resources, the University implements water pollution control measures, including wastewater treatment, regulated discharge systems, accredited laboratory testing, and continuous water quality monitoring. The Central Laboratory and specialized research facilities conduct physical and chemical analyses according to internationally recognized standards, supporting environmental protection and aquatic ecosystem conservation. Coastal cleanup campaigns, marine conservation activities, and environmental awareness programs further contribute to reducing pollution and protecting aquatic environments.
- Research and technological development are strengthened through the **Alexandria University Water Resilience Center of Excellence (AWR-CoE)**, a national platform for applied research, capacity building, professional training, and international cooperation. The center advances sustainable water technologies through investigations into wastewater treatment, desalination, water reuse, circular economy solutions, and climate change resilience. Specialized academic programs, workshops, scholarships, and institutional partnerships further support innovation and sustainable water management.



The STDF-funded HMDed project on innovative wastewater treatment technologies concluded with a workshop held at the Faculty of Science, Alexandria University, in December 2025. The workshop combined lectures and hands-on training in water quality analysis and nanomaterial applications, bringing together academics, industry experts, and 51 researchers and students.



The SOA/C workshop was organized by the Alexandria University Water Resilience Center of Excellence (AWR-CoE) to promote knowledge exchange, strengthen research collaboration, and enhance capacity building in sustainable water management and water resilience.



The water Quality Parameters Training and Innovative Strategies Workshop focused on water quality testing, teaching, and the development of innovative strategies for water quality assessment and sustainable water management.



Wastewater treatment unit - Faculty of Engineering

- The *Water Recycling Program* demonstrates significant progress in non-potable water reuse and resource recovery. Treated sewage effluent (TSE) from the *Campus*, totaling approximately 1.12 million m^3 annually, is utilized for landscape irrigation. At the *Faculty of Pharmacy*, a greywater pilot system treats hand-wash wastewater for toilet flushing, while air-conditioning condensate recovery systems in select buildings supply irrigation and flushing operations. Rainwater is harvested into a central retention lake, providing an additional source for green-area irrigation. The *Faculty of Agriculture's* aquaculture facility recycles nutrient-rich effluent from its eight-pond fish farm to irrigate adjacent crops, enhancing soil fertility and yield. The University also operates a 100 m^3/day solar-powered desalination unit at *Wadi El-Natroun*. It has developed an innovative renewable energy–driven multi-stage flash desalination system (RE-NF-MSF) with nanofiltration pre-treatment, demonstrating leadership in sustainable water technologies.
- In relation to *Treated Water Consumption*, Alexandria University channels the entirety of its wastewater 1,116,625.26 m^3 annually, through the *Alexandria Sanitation Company* for secondary and tertiary treatment. A substantial portion of this treated water supports Egypt's *New Delta* agricultural reclamation project, thereby contributing to the country's national food security objectives. Treated water is reused for irrigation, aquaculture, and experimental research, establishing a closed-loop water management model that exemplifies the University's commitment to sustainable resource utilization.
- Raising awareness among Alexandria University students from various faculties—including Science, Engineering (Civil,Mechanical, and Mechatronics), Commerce, Arts (Surveying, mapping, and GIS), and Fine Arts (Architecture)—about wastewater treatment was achieved through summer training and periodic visits to the laboratories of the Alexandria Sewerage Company. This effort supports the achievement of the Sustainable Development Goals by enhancing partnerships for sustainable development and fostering collaborations that mobilize and share knowledge, expertise, and technology. The training aimed to provide students with essential scientific skills and practical experience to prepare them for the job market (September 2024).
- A cooperation protocol was signed between Alexandria University and Alexandria Sewerage Company to employ outstanding graduates from the faculties of Engineering, Commerce, Law, Science, and Arts over the past five years, based on the actual needs and annual workforce plan of the sewerage company. Additionally, the protocol aims to prepare a new generation of skilled professionals in modern technologies. It includes agreements for employees to access masters and doctoral programs at reduced fees and to conduct workshops and training courses with professors from Alexandria University to enhance partnerships for sector performance and achieve sustainable development goals.
- The faculty of pharmacy is advancing the "Green Circle" project, which is a non-profit project that seeks to keep the environment cleanand green in a sustainable way by separating waste for recycling. Also, the faculty implement a grey water (wastewater) recycling system that depends on reusing wastewater from sewage basins only (without using wastewater from laboratory basins) by re-pumping it into the flushing bins in the toilets after work. Filtration and primary treatment.




Innovative Renewable Energy RE-Multi-stage flash system (MSF) with salt precipitator and nanofiltration (NF-MSF) to pre-treat feedwater (RE-NF-MSF). Faculty of Agriculture, Alexandria University




A 100 m^3 desalination unit in Wadi Natroun (Faculty of Agriculture, Alexandria University)




Raising awareness among university staff about water conservation through seminars and workshops organized in collaboration with Alexandria Drinking Water Company at the Faculty of Science.









Raising awareness among Alexandria University students about wastewater treatment was achieved through summer training activities conducted at Alexandria Sewerage for students from various faculties, including Science, Engineering (Civil, Mechanical, and Mechatronics), Commerce, Arts (Surveying, Mapping, and GIS), and Fine Arts (Architecture), September 2024.

Alexandria University also has a large number of research projects in the field ofwaste recycling, treatment and reuse of sewage and industrial wastewater.

- Enhancing Resource Recovery and Improving Wastewater Reuse Through Synergistic Cooperation betweenBioelectrochemical Systems and Forward Osmosis, (2019-2024).
- A novel combined approach for Poultry slaughterhouse wastewater treatment: prototype design and development,(2021-2024).
- Agricultural sustainability and water reuse in Egypt: innovative wastewater treatment and soil health, (2021-2024).
- Wastewater Treatment by Integrated Green Coagulation and Membrane Technology for Reuse, (2021-2024).
- Construction of a Self-Charging Unit for Collecting Wasted Mechanical Energy from Basic Human Motion, (2023-2025).
- Production, modification and new prospects of biochar derived from biomass waste, (2023-2026).
- Microbial technology as a bioremediation tool for heavy metals removal from industrial wastewater throughproteomic and nanotechnological approaches, (2023-2025).