جامعة الإسكندرية
ALEXANDRIA UNIVERSITY

SDG 6

Clean Water and Sanitation

2023-2024

6.2.1 - Total volume of water used in the university

Alexandria University consume water wisely from the main piles according to the figures mentioned in the table below. At the same time recycle the refuse water form air conditions as pilot examples for water conservation. The center of excellence of water in Alexandria University is carrying out pilot studies for water desalination using local membranes produced in cooperation with industrial sector.

Table 1. Water consumption per faculty/ institution

water consumption by Faculties and institutes	
Faculty or institute	Water in cubic meters
University Administration Building	3600
Faculty of Arts	21229
Faculty of Business	15536
Faculty of Education	12211
Faculty of Medicine	61653
Faculty of Dentistry	15320
Faculty of Engineering	45138
Faculty of Agriculture	75801
Faculty of Pharmacy	18264
Faculty of Science	44122
Faculty of Nursing	19391
Faculty of Veterinary Medicine	6605
Higher Institute of Public Health	1982
Medical Research Institute	60100
Institute of Graduate Studies and Research	9109
Faculty of Physical Education for girls	10044
Faculty of Physical Education for boys	153373
Faculty of Specific Education	4380
Saba Pasha Faculty of Agriculture	907
Faculty of Education for Early Childhood	6486
Faculty of Fine Arts	1656
Faculty of Tourism and Hotels	3501
Faculty of Law	63000
Total	**653408**

6.3.1 - Process to treat waste water

Alexandria university treat waste water using different processes including collection, storage, treatment, recycling and finally reuse. The following are some of the waste water treatment processes:

Alexandria University program for Sewage Disposal

- Providing a sewage treatment plant at the university to make it suitable for irrigating green areas and gardens inside the university campus.
- The irrigated water supplied to the fish farm at the Agriculture Experimental Research Station of the Faculty of Agriculture is recycled to irrigate the crops, vegetables, and fruits of the land farm. The recycled water is rich with natural fertilizers and enhances the crops production.
- In addition, the water recycling in Fish Aquaculture of the Faculty of Agriculture, Alexandria University: The water sewage of the Aquaculture of the Faculty of Agriculture, Alexandria University which consist of eight ponds (one acre and quarter/each) in Abis region. Alexandria University used the recycled water for crops culturing in the adjacent agriculture research center in Abis.
- The use of biochar produced from Agricultural waste and waste Forests in residual removal chlorpyrifos pesticide Imidacloprid is from water agricultural drainage. Cooperation project between the Egyptian Academy of Research Science and Technology and the Czech Academy of Sciences.
- The sewage water will be treated and reused in the irrigation of green areas in Alexandria National University.
- Faculty of Pharmacy is seeking to implement a grey water (wastewater) recycling system that depends on reusing wastewater from sewage basins only (without using wastewater from laboratory basins) by repumping it into the flushing bins in the toilets after work. Filtration and primary treatment. The grey water recycling initiative has a significant impact on rationalizing water use.

The water sewage of the Aquaculture of the Faculty of Agriculture (Alexandria University, Egypt)
The irrigated water supplied to the fish farm at the Agriculture Experimental Research Station of the Faculty of Agriculture is recycled to irrigate the crops, vegetables, and fruits of the land farm.

The sewage water will be treated and reused in the irrigation of green areas in the project (Alexandria University)

- 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 m³ 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* 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 m³/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.
- Implementation of *Water-Efficient Appliances* has expanded substantially, with 80.1% of all fixtures on campus now classified as water-saving devices. These include 90.97% of bathroom faucets, 50.48% of toilets, and 57.69% of urinals that have been retrofitted with flow-control mechanisms. The University enforces institutional policies mandating water-efficient design standards in all new buildings and major renovations. The *Abis Campus* exemplifies these efforts, with green infrastructure now covering 52% of its total site area, integrating sustainability principles into the built environment.
- 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.
- In relation to *Treated Water Consumption*, Alexandria University channels the entirety of its wastewater 1,116,625.26 m³ 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.

- Recent initiatives of the Center of Excellence for Water include student training in wastewater treatment operations, entrepreneurship bootcamps on water innovation, and workshops on EU-funded research opportunities. These activities have positioned Alexandria University as a national and regional leader in sustainable water governance, demonstrating how academic excellence, technological advancement, and environmental responsibility can be effectively integrated to address Egypt's water and climate challenges.

Wastewater treatment unit at Faculty of Engineering

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.

The Center of Excellence for Water at Alexandria University is organizing a training program for scholarship students in collaboration with EPROM Company. This initiative aims to equip students with practical skills in water management including training courses about Water Treatment for Industrial Applications, and Wastewater Plant Operations and Troubleshooting, ensuring they are well-prepared for the business sector and aligned with labor market requirements (March, 2024).

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

- Enhancing Resource Recovery and Improving Wastewater Reuse Through Synergistic Cooperation between Bioelectrochemical 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).
- Towards a green Economy Farm: Innovative Solar Collector for Biochar Production from Agricultural & Food Industry Wastes, Power Generation, and Crops Drying, (2021-2023).
- 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).

6.3.2 - Process to prevent polluted water entering the water system, including pollution caused by accidents and incidents at the university

Alexandria University implements a comprehensive water pollution management system that prevents contaminated water from entering campus and coastal environments through continuous monitoring, strict analysis of physical, chemical, and biological parameters, and adherence to national and international standards. Accredited laboratories across the University ensure rapid detection and control of pollutants, including those arising from unexpected incidents, while research programs and community initiatives support broader pollution mitigation and protect surrounding ecosystems. This integrated approach strengthens environmental protection, enhances sustainability, and safeguards regional water resources.

Water Pollution Control is rigorously maintained through strict adherence to Egyptian environmental legislation and international standards such as the *APHA Standard Methods*. The University's accredited *Central Laboratory at the Faculty of Science and the Faculty of Engineering and the Institute of Graduate Studies and Research* conduct regular monitoring of physical, chemical, and biological parameters in stormwater, sewage, and coastal discharges. In parallel, Alexandria University actively contributes to marine conservation through shoreline clean-up initiatives, environmental impact assessments for coastal infrastructure, and research programs addressing marine biodiversity and pollution mitigation. The University's pivotal role in advancing research and innovation for the protection of Mediterranean coastal ecosystems is exemplified through collaborative projects such as the EU-funded *"Circular Economy: From the Beach to the Lab"* initiative and the *Erasmus+* programs on the blue economy and sustainable aquaculture.

Students from the Faculty of Sport Education at Abu Qir took part in a week-long initiative to clean the eastern harbour of Alexandria, starting on July 8, 2024. The initiative aims to promote sustainable tourism, improve waste disposal practices, and raise awareness about the dangers of plastic waste to marine life, while encouraging recycling efforts and maintaining clean beaches. The project included the Alexandria university, El-Raml Rotary Club, and the Egyptian Diving and Rescue Federation.

Students from various schools in Alexandria, alongside those from the French Institute, participated in a large-scale cleanup campaign at Anfouchi beach titled “Our Sea is Clean Without Trash .” Following the cleanup, participants explored the process of transforming plastic waste into usable materials through 3D printing at the Fab Lab at Alexandria University. This initiative is part of the "Circular Economy: From the Beach to the Lab" project, led by the French Consulate and the French Institute, with financial backing from the European Union and collaboration with the Alexandria Governorate. The project aims to foster partnerships for sustainability and actively engage the local community in environmental efforts.

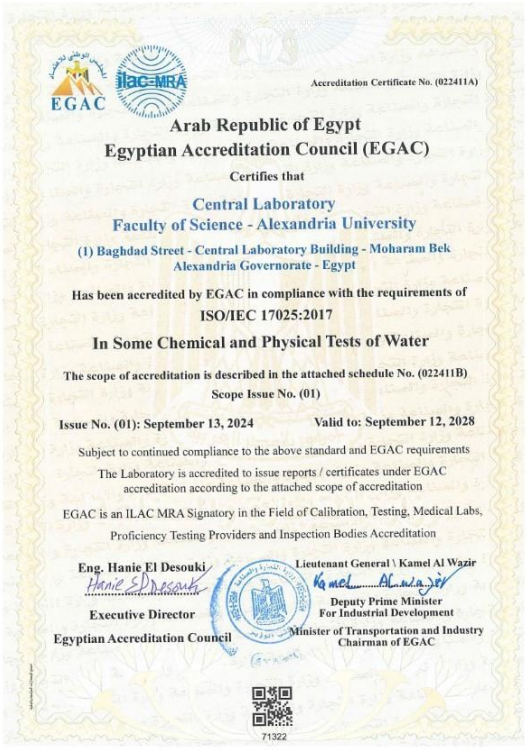
Water pollution control in campus area

The campus water pollution control to prevent polluted water from entering the water system is performed. Alexandria University has two accredited laboratories for the regular check water quality (Physical, Chemical parameters) on your campus. In addition, the biological parameters are analyzed by the Microbiology Professor and staff members regularly.

- Accreditation Certificate of Central Laboratory – Faculty of Science (Alexandria University).
- Accreditation of Institute of Graduate Studies and Research (Alexandria University)

Guideline standard

Standard Methods for the Examination of Water and wastewater 22 edition (APHA).



Accreditation Certificate No. (022411A)

Arab Republic of Egypt
Egyptian Accreditation Council (EGAC)

Certifies that

Central Laboratory
Faculty of Science - Alexandria University

(1) Baghdad Street - Central Laboratory Building - Moharam Bek
Alexandria Governorate - Egypt

Has been accredited by EGAC in compliance with the requirements of
ISO/IEC 17025:2017

In Some Chemical and Physical Tests of Water

The scope of accreditation is described in the attached schedule No. (022411B)
Scope Issue No. (01)

Issue No. (01): September 13, 2024 Valid to: September 12, 2028

Subject to continued compliance to the above standard and EGAC requirements

The Laboratory is accredited to issue reports / certificates under EGAC accreditation according to the attached scope of accreditation

EGAC is an ILAC MRA Signatory in the Field of Calibration, Testing, Medical Labs, Proficiency Testing Providers and Inspection Bodies Accreditation

Eng. Hanie El Desouki
Executive Director
Egyptian Accreditation Council

Lieutenant General \ Kamel Al Wazir
Deputy Prime Minister
For Industrial Development
Minister of Transportation and Industry
Chairman of EGAC

71322

Water quality analysis and monitoring at Alexandria University
Accreditation Certificate of Central Laboratory – Faculty of Science (Alexandria University)

Ministry of
Trade and Industry
Egyptian Accreditation Council
EGAC

وزارة التجارة والصناعة
المجلس الوطنـــي للإعتمـاد
إيجـاك

EGAC

Schedule of Accreditation

for Testing Laboratory According to ISO/IEC 17025

Issued to

ICP-OES Labaratory

Institute of Graduate Studies and Research Alexandria Univeristy

(163) Horryia Avenue Shatby
Alexandria Governerate – Egypt

Schedule No.:0222210B **1st Accreditation date: July 29, 2022** **Issue No. (1): July 29, 2022** **Revision No. (-):** **Valid to: July 28, 2026**

Materials / Products Tested	Types of Tests / PropertiesMeasured / Range of Measurements		Standard Specifications / Techniques Used	
Water	Element	LOQ (ppb)	EPA method 200.7:2001 EPA method 6010 C:2007	**Inductivity Coupled Plasma Optical Emission Spectrometer (ICP-OES)** Model 5100 ICP-OES VDV S.N AU16020119
	Al	26.6		
	As	73.4		
	Ag	4.00		
	Ba	4.32		
	Co	7.13		
	Cr	4.40		
	Cu	6.94		
	Fe	24.0		
	Mo	19.0		
	Ni	22.5		
	Pb	28.2		
	Zn	104		
	Sb	42.9		
	Se	101		
	Sr	7.93		
	K	25.9		
	Na	66.6		
	Cd	4.00		
	Mn	2.97		
	Mg	18.9		

Kornish El-Maadi, Riad El-Maadi Tower 1 - Cairo - Egypt
Tel.: (202) 25275220/5/6/7
Fax: (202) 25275224

F4WI4TCL
1 / Dec 2018

كورنيش المعادى – برج رياض المعادى١ – القاهرة – مصر
تليفون : ٢٥٢٧٥٢٢٠/٥/٦/٧ (٢٠٢)
فاكس : ٢٥٢٧٥٢٢٤ (٢٠٢)

Accreditation of Institute of Graduate Studies and Research (Alexandria University)

Ministry of
Trade and Industry
Egyptian Accreditation Council
EGAC

وزارة التجارة والصناعة
المجلس الوطنـــي للإعتمـاد
إيجـاك

EGAC

Schedule of Accreditation
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Soil	Element	LOQ (ppb)	EPA method 200.7:2001 EPA Method 3051 A:2007 EPA Method 6010 C:2007	**Inductivity Coupled Plasma Optical Emission Spectrometer (ICP-OES)** Model 5100 ICP-OES VDV S.N AU16020119
	Ag	43.2		
	As	52.8		
	Ba	11.1		
	Cd	12.3		
	Co	8.78		
	Cr	42.8		
	Cu	12.7		
	Mg	48.5		
	Mn	12.6		
	Mo	18.5		
	Ni	46.5		
	Pb	29.1		
	Zn	30.5		
	Se	21.8		
	Sr	2.31		
	Sb	46.5		
	Ti	15.6		
	Na	228		
	Fe	202		

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F4WI4TCL
1 / Dec 2018

كورنيش المعادى – برج رياض المعادى١ – القاهرة – مصر
تليفون : ٢٥٢٧٥٢٢٠/٥/٦/٧ (٢٠٢)
فاكس : ٢٥٢٧٥٢٢٤ (٢٠٢)

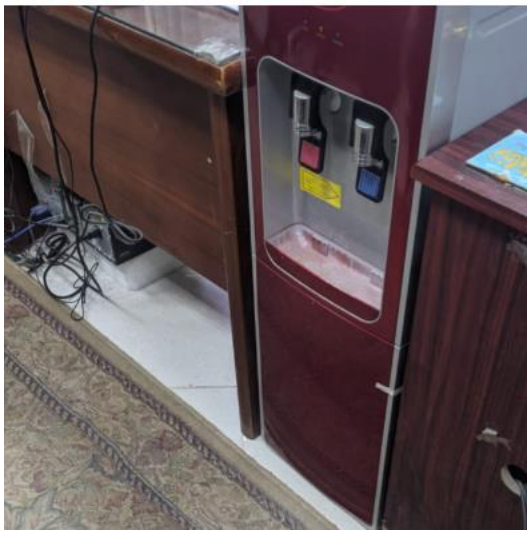
Industrial Investment Map: http://invegypt.com: الصفحة الرسمية لخريطة الاستثمار الصناعي في مصر

Accreditation of Institute of Graduate Studies and Research (Alexandria University)

6.3.3 Free drinking water for students, staff and/or visitors

- Alexandria University provides free drinking water for the students residing on Dorms. This water is stored on the roof of each dorm and a filter is installed to ensure the safety of water for human consumption.
- **Water Tank Cleaning:** Regular cleaning and disinfection of water tanks were carried out.
- Alexandria University provides bolted water free for visitors during meetings and official gatherings
- Alexandria university provides free drinking bottled water to staff in the administration building of the university where official employees reside.
- Fo the rest of the staff, water dispensers are provided, and the water tanks are purchased by each faculty members.

Study room at the faculty of Medicine



Water dispenser in Offices

- The University has applied a strategy in the faculties to decrease water consumption through installation of special parts on water taps, showers, toilette, and bathroom bidet which can conserve about 50% of water consumption. Water saving devices are used instead of traditional devices. For example, the use of a hand-washing faucet with automatic control via a sensor, and high-efficiency bathroom devices. Supplying water taps with water conservation units. Adopting a mechanism to maintain water pipes to prevent waste resulting from leaks.

	
Supplying water taps with water conservation units (Alexandria University, Egypt)	Adopting a mechanism to maintain water pipes to prevent waste resulting from leaks (Alexandria University, Egypt)

6.3.4 Building standards to minimize water use

Alexandria University is keen to minimize water use according to the target identified to the strategic plan of 2030. The university is carrying out projects to install water faucet equipment for this purpose and at the same time hold awareness workshops for students to spread knowledge on water conservation and minimum usage among them. Such projects are annually monitored and adapted to exciting conditions.

- Under the Water Conservation Program, Alexandria University has implemented a wide range of high-efficiency fixtures, including sensor-activated faucets, low-flow toilets, and bidets, resulting in an estimated 50% reduction in potable water consumption across its faculties. A proactive leak detection and preventive maintenance program helps minimize losses associated with aging infrastructure. To further reduce demand, the University utilizes innovative irrigation technologies such as drip systems and soil moisture sensors across its landscaped areas, complemented by the introduction of drought-tolerant plant species. Comprehensive awareness campaigns, organized in collaboration with the *Alexandria Drinking Water Company* and the *Holding Company for Water and Wastewater*, engage students, faculty, and staff in adopting sustainable water-use practices.
- 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.
- Implementation of *Water-Efficient Appliances* has expanded substantially, with 80.1% of all fixtures on campus now classified as water-saving devices. These include 90.97% of bathroom faucets, 50.48% of toilets, and 57.69% of urinals that have been retrofitted with flow-control mechanisms. The University enforces institutional policies mandating water-efficient design standards in all new buildings and major renovations. The *Abis Campus* exemplifies these efforts, with green infrastructure now covering 52% of its total site area, integrating sustainability principles into the built environment.
- 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.
- Also, faculty of Pharmacy is seriously seeking to 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 theflushing bins in the toilets after work. Filtration and primary treatment and taking advantage of rainwater for use in irrigation and regulatory operations. The grey water recycling initiative has a significant impact on rationalizing water use and thus saving the college's monthly water bills, which constitute a burden on the budget.

Adopting a mechanism to maintain water pipes to prevent waste resulting from leaks (Alexandria University, Egypt)

Supplying water taps with water conservation units (Alexandria University, Egypt)

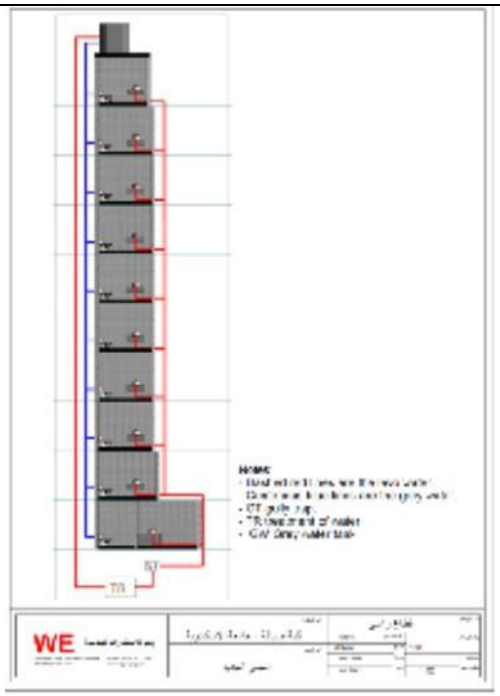
Supplying water taps with water conservation units (Alexandria University, Egypt)

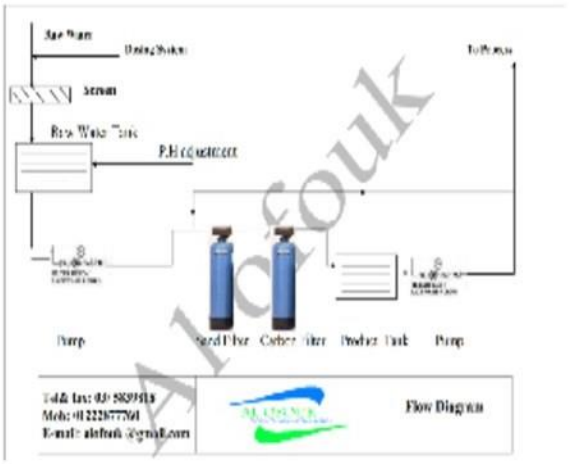
Air conditioning water collection and reuse unit - Faculty of Engineering

Wastewater treatment unit at the Faculty of Engineering

The sewage water will be treated and reused in the irrigation of green areas in the project (Alexandria University)

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





Grey water recycling system organized by Faculty of Pharmacy (Alexandria University)

Smart Building in Alexandria University

No.	Name	Place	automation		safety				energy		water		Indoor environment				lighting				Building Area (m^2)
			B1	B2	S1	S2	S3	S4	E1	E2	A1	A2	I1	I2	I3	I4	L1	L2	L3	L4	
1	University Alexandria; Abis Campus, Buildings 1-11	Alexandria, Egypt			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	667,730.988
2	University administration building	Alexandria, Egypt		x		x	x		x	x	x	x	x	x	x	x	x	x	x	x	1940
3	Faculty of Physical Education for Boys	Alexandria, Egypt		x		x	x		x	x	x	x	x	x		x	x	x	x	x	113311.93
4	Faculty of Physical Education for Girls	Alexandria, Egypt		x		x	x		x	x	x	x	x	x		x	x	x	x	x	2891
5	The medical complex	Alexandria, Egypt		x		x	x		x	x	x	x	x	x		x	x	x	x	x	91216
6	Faculty of Science in Horia Street	Alexandria, Egypt		x		x	x		x	x	x	x	x	x		x	x	x	x	x	22197
7	Faculty of Science in Moharram Bek	Alexandria, Egypt		x		x	x		x	x	x	x	x	x		x	x	x	x	x	5485
8	Faculty of Engineering	Alexandria, Egypt		x		x	x		x	x	x	x	x	x		x	x	x	x	x	111034
9	Campus of Humanities and Social Sciences	Alexandria, Egypt		x		x	x		x	x	x	x	x	x		x	x	x	x	x	80707
10	Faculty of fine Arts	Alexandria, Egypt		x		x	x		x	x	x	x	x	x		x	x	x	x	x	2569
11	Faculty of Specific Education	Alexandria, Egypt		x		x	x		x	x	x	x	x	x		x	x	x	x	x	1194
12	Faculty of Early Childhood Education	Alexandria, Egypt		x		x	x		x	x	x	x	x	x		x	x	x	x	x	1407
13	Medical Research Institute (Horia Street - Smouha)	Alexandria, Egypt		x		x	x		x	x	x	x	x	x		x	x	x	x	x	2500

14	Higher Institute of Public Profession	Alexandria, Egypt		x		x	x		x	x	x	x	x	x		x	x	x	x	x	**700**
15	University land in Smouha (College of Nursing - Children's Hospital - Faculty members residences)	Alexandria, Egypt		x		x	x		x	x	x	x	x	x		x	x	x	x	x	**105218.22**
16	Land of Mouwasat Hospital	Alexandria, Egypt		x		x	x		x	x	x	x	x	x		x	x	x	x	x	**20234.27**
17	Institute of Graduate Studies and Research	Alexandria, Egypt		x		x	x		x	x	x	x	x	x		x	x	x	x	x	**2764**
18	Faculty of Agriculture Saba Pasha	Alexandria, Egypt		x		x	x		x	x	x	x	x	x		x	x	x	x	x	**144200.934**
	Total																				**1,377,300.34**

6.3.5 Plant landscapes to minimize water usage

Alexandria University have specialized centers, farms and botanical gardens to produce drought tolerant plant species to be provided and planted in the university landscapes. The botanic gardens at the faculty of science contains very rare species of plants that are adapted to drought heat and salinity. These species are replicated each year and distributed accordingly. The botanic garden also includes a seed bank to preserve such drought tolerant plants. This is regarded as a water management procedure to minimize water use for planting landscapes. Another method that is used in some landscapes of the university is using the water refuse of aircondition equipment to compensate the use of water for irrigation.

- Under the Water Conservation Program, Alexandria University utilizes innovative irrigation technologies such as drip systems and soil moisture sensors across its landscaped areas, complemented by the introduction of drought-tolerant plant species.
- 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.
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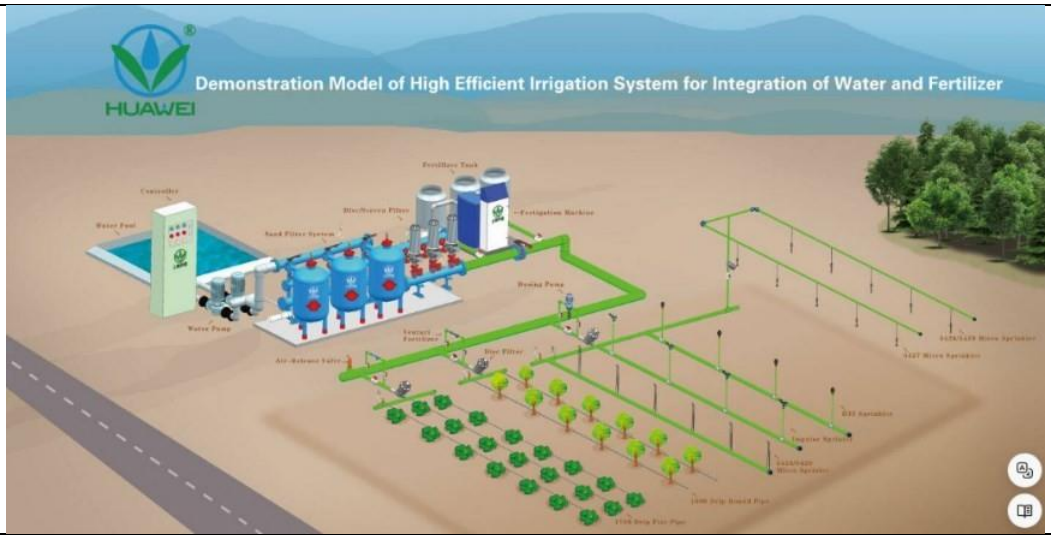
- Green buildings of Alexandria University are designed to reduce environmental impact through efficient use of resources and sustainable practices. The main elements of green building include:
  - Site Selection,
  - Landscaping and plantations,
  - Water Efficiency (Water Conservation, Rainwater Harvesting, and Greywater Recycling),
  - Energy Efficiency (Integrating Renewable Energy, and Lighting systems: Installing energy-efficient lighting systems such as LED)
  - Waste Management (waste reduction, and composting).

- All pedestrians must use designated pathways for walking, which are clearly marked and maintained. All covered walkways are lined with cultivated plants, not only increasing the greenery on campus but also providing a refreshing environment for students and staff as they walk through.
- Alexandria University new initiative is to use all the roofs of Alexandria University buildings that are suitable for the implantation of the new Solar Station is completed.
- IoT-based agroecological farming project has been launched at Alexandria University Farm, spearheaded

by Shanghai Water Saving Irrigation Corp.



An innovative IoT-based agroecological farming project has been launched at Alexandria University Farm, spearheaded by Shanghai Water Saving Irrigation Corp.

Parks Management Center in Alexandria University

Objectives:

- Carrying out the process of establishing, maintaining, renovating, and developing the university's gardens and green spaces for the various colleges at the university.
- Producing ornamental plants to cover the needs of the university's green spaces.
- Marketing plant products inside and outside the university.
- Participate in providing and presenting scientific plant models to some practical faculties.

The botanical garden (ALEX) at the Faculty of Science

- The Botanical Garden (ALEX) at the Faculty of Science in Moharram Bey, Alexandria University, was established in 1942. It is one of Egypt's richest scientific gardens, with over 500 plant species from various global regions. The garden supports both education and research, serving students from multiple faculties by providing hands-on learning in plant sciences like morphology, anatomy, and classification. It also houses four greenhouses, allowing cultivation of tropical and foreign plants.

- In the open areas of the garden, various trees and seasonal annuals are planted, providing students with a complete opportunity to study these different plant types. What makes the garden of heritage and environmentalimportance is that it contains plants from different geographical regions: tropical, subtropical, temperate, and some Egyptian and Arab species. Some of these species are rare, and others are threatened with extinction and degradation. The botanical garden's activities are not limited to education but extend to scientific research. The garden provides researchers from the departments of Botany, Zoology, and Marine Sciences with the facilities to conduct their research, continuing its mission of serving science.
- Currently, the garden is one of the richest scientific gardens in Egypt, with its diverse plant species. Internationally recognized and registered with the International Association of Botanical Gardens, ALEX actively participates in global conservation efforts, including preserving endangered species and maintaining a seed bank. A comprehensive inventory of species is underway, along with conservation efforts for rare plants. The garden holds significant environmental and heritage value due to its collection of rare and diverse species.
- A book cataloging 500 species is being published, supporting the garden's educational and research mission. Therefore, scientifically cataloging and identifying them is a preservation of this heritage. This is in addition to the primary goal for which the garden was established: educating students, scholars, and researchers in basic sciences, practicing and observing them practically to understand the value of this natural wealth and preserve itfor continuous benefit. Therefore, they have been collected and classified in a book containing approximately 500plant species, including ferns, conifers, gymnosperms, and angiosperms, in more than 540 pages supported by original colored photographs, which is now under publication.

Green House (Faculty of Veterinary Medicine)

Plantation (Faculty of Veterinary Medicine)

	
Green House (Faculty of Veterinary Medicine)	Plantation (Faculty of Veterinary Medicine)
	
Botanic Garden (Faculty of Science in Moharram Bek)	Botanic Garden, Green House (Faculty of Science in Moharram Bek)

6.4.1 A policy to maximize water reuse across the university

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

- 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.

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).
- Towards a green Economy Farm: Innovative Solar Collector for Biochar Production from Agricultural & Food Industry Wastes, Power Generation, and Crops Drying, (2021-2023).
- 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).

Alexandria University program for Sewage Disposal

- Providing a sewage treatment plant at the university to make it suitable for irrigating green areas and gardens inside the university campus.
- The irrigated water supplied to the fish farm at the Agriculture Experimental Research Station of the Faculty of Agriculture is recycled to irrigate the crops, vegetables, and fruits of the land farm. The recycled water is rich withnatural fertilizers and enhances the crops production.
- In addition, the water recycling in Fish Aquaculture of the Faculty of Agriculture, Alexandria University: The watersewage of the Aquaculture of the Faculty of Agriculture, Alexandria University which consist of eight ponds (one acre and quarter/each) in Abis region. Alexandria University used the recycled water for crops culturing in the adjacent agriculture research center in Abis.
- The use of biochar produced from Agricultural waste and waste Forests in residual removal chlorpyrifos pesticide Imidacloprid is from water agricultural drainage. Cooperation project between the Egyptian Academy of ResearchScience and Technology and the Czech Academy of Sciences.
- The sewage water will be treated and reused in the irrigation of green areas in Alexandria National University.
- Faculty of Pharmacy is seeking to implement a grey water (wastewater) recycling system that depends on reusingwastewater from sewage basins only (without using wastewater from laboratory basins) by repumping it into theflushing bins in the toilets after work. Filtration and primary treatment. The grey water recycling initiative has a significant impact on rationalizing water use.

The water sewage of the Aquaculture of the Faculty of Agriculture (Alexandria University, Egypt) The irrigated water supplied to the fish farm at the Agriculture Experimental Research Station of the Faculty ofAgriculture is recycled to irrigate the crops, vegetables, and fruits of the land farm.

Wastewater treatment unit at Faculty of Engineering

The sewage water will be treated and reused in the irrigation of green areas in the project (Alexandria University)

Treatment of Alexandria University Sewage by Alexandria Sanitation Company

An amount of water of **1,240,575 m^3** is consumed by all faculties and institutes affiliated with the Alexandria University, of which the amount of sewage is **1,116,625.26 m^3**, which is lifted through a group of lifting stations to be treated through treatment stations affiliated with the Alexandria Sanitation Company.

1. Secondary biological treatment, where solid waste is separated from liquid waste.
2. **Treated water:** As for the water resulting from first treatment, it is reused within the New Delta Project (the valueof the reused water for Alexandria University represents **1,116,625.26 m^3**).
3. The Tertiary treatment for use in land reclamation with a design capacity of 7.3 million m^3, include 1.7 million cubic meters of treated wastewater form the secondary treatment.

Second treatment of Alexandria University Sewage by Alexandria Sanitation Company

Reclaiming 800 thousand acres in the new delta using treated water from sewage

Green Cycle Project in Faculty of Pharmacy – Alexandria University

The Faculty is advancing the “Green Circle” project, which is a non-profit project that seeks to keep the environment clean and green in a sustainable way by separating waste for recycling and establishing charitable markets to benefit from used clothes. Also, the faculty is seriously seeking to 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.

Water Desalination Activities at Alexandria University

Renewable Energy Center site is a host of different RE technologies and different RE-Desalination technologies. The site "East of EL-Gaar Village" at Wadi El-Natroon has both predictable wind energy as well as an abundance of sunlight. Thus, this is a natural application for a hybrid system. The modular hybrid power supply concept proposes the coupling of all sources of energy, storage media and loads on the AC-side.

Advantages of the Modular Hybrid RE systems:

- Simplicity in System Design
- Expandable, can be run autonomously or be connected to a larger grid
- Offer higher reliability and supply security
- Lower power cost for the consumers
- Production of AC single phase or three phase
- The AC-side structure provides standardization, quality assurance and serial production
- The coupling on the generation technologies on the AC side offers the possibility of placing the generators farapart from each other (distributed generation).

REC site is planned to be a host of different RE technologies and different RE-Desalination technologies such as:

- Hybrid RE technologies (solar, wind, biomass, Hydrogen and fuel cell)
- Hybrid Desalination technologies (RO, MSF, NF,…. Etc)
- Different types of solar cell technologies (thin film, Mono crystalline, Polycrystalline cells)
- Different solar energy technology (PV, CSP, Solar water heating systems, solar dryers)
- Solar Greenhouses.

Activity: Innovative Renewable Energy (RE) Driven - Multi Stage Flash (MSF) System with Salts Precipitator and NanoFiltration (NF) Feed Water pre Treatment (RE-NF-MSF)-, contract # RDI - C2/S1/148.

6.4.2 Measure the reuse of water across the university

At Alexandria University, Water and Wastewater Treatment are central to improving Water Quality, protecting Water Resources, and ensuring a reliable Water Supply for Drinking Water, Irrigation, and research Areas across the campuses. This Study analyzes Waste Water, Groundwater, and treated Effluent using Methods such as Adsorption, Membrane filtration, Activated Sludge systems, and Desalination, evaluating the Removal of Pollutants, Heavy Metal contaminants, and changes in Concentration to enhance Sustainable Water Management and Environmental Protection within the University.

1. 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.
2. 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.
3. The irrigated water supplied to the fish farm at the Agriculture Experimental Research Station of the Faculty of Agriculture is recycled to irrigate the crops, vegetables, and fruits of the land farm. The recycled water is rich with natural fertilizers and enhances the crops production.
4. In addition, the water recycling in Fish Aquaculture of the Faculty of Agriculture, Alexandria University: The water sewage of the Aquaculture of the Faculty of Agriculture, Alexandria University which consist of eight ponds (one acre and quarter/each) in Abis region. Alexandria University used the recycled water for crops culturing in the adjacent agriculture research center in Abis.
5. **Elements of Green Building Implementation as Reflected in all new construction and renovation policies in the new buildings in Abis campus:**
    - The area of the project is 160 acres, a general site for educational buildings, and 120 acres are complementary activities. The percentage of green areas and lake is about 52% in addition to 25% streets and lanes.
    - Water-saving plots are used, which will reduce water consumption by about 30%. The

sewage water will betreated and reused in the irrigation of green areas in the project.

- Wastewater will be treated and reused to irrigate green areas in the project.
- Rainwater is collected in the main lake and used for irrigation.
- The use of plants with few water rationed plants to reduce irrigation needs in addition to absorbing quantitiesof rainwater to reduce the severity of rain spells.

6. An amount of water of 967,694.74 is consumed by all faculties and institutes affiliated with the Alexandria University, of which the amount of sewage is 870,925,266 m3, which is lifted through a group of lifting stations to be treated through treatment stations affiliated with the Alexandria Sanitation Company.
   - Secondary biological treatment, where solid waste is separated from liquid waste.
   - Treated water: As for the water resulting from first treatment, it is reused within the New Delta Project (the value of the reused water for Alexandria University represents 870,925.266 m3).
   - The Tertiary treatment for use in land reclamation with a design capacity of 7.3 million m3, include 1.7 million cubic meters of treated wastewater form the secondary treatment.

The water sewage of the Aquaculture of the Faculty of Agriculture (Alexandria University, Egypt)
The irrigated water supplied to the fish farm at the Agriculture Experimental Research Station of the Faculty of Agriculture is recycled to irrigate the crops, vegetables, and fruits of the land farm.

Wastewater treatment unit at Faculty of Engineering

Grey water recycling system organized by Faculty of Pharmacy (Alexandria University, Egypt), and reused in rooftop cultivation.

Air conditioning water collection and reuse unit - Faculty of Engineering

The sewage water will be treated and reused in the irrigation of green areas in the project (Alexandria University)

Reclaiming 800 thousand acres in the new delta using treated water from sewage

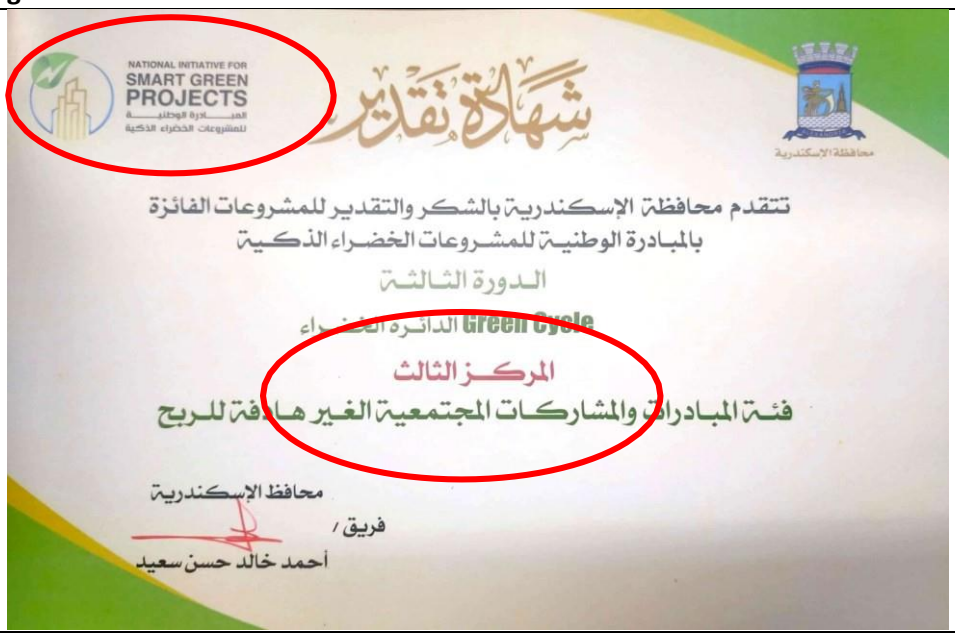
6.5.1 Educational opportunities for local communities to learn about good water management

Alexandria University offers educational opportunities for local communities to learn good water management through awareness programs, workshops, and practical training on water quality and wastewater treatment. These activities teach simple methods such as greywater recycling, rainwater harvesting, and efficient irrigation to help reduce water waste and protect water resources. By introducing basic water testing and pollutant removal concepts, the university strengthens community understanding of clean surface water and groundwater. These efforts empower residents to adopt sustainable practices that support environmental protection and a more resilient water supply.

- Alexandria University has organized in collaboration with the Alexandria Drinking Water Company and the Holding Company for Water and Wastewater comprehensive awareness campaigns, engage students, faculty, and staff in adopting sustainable water-use practices.
- The University's pivotal role in advancing research and innovation for the protection of Mediterranean coastal ecosystems is exemplified through collaborative projects such as the EU-funded *"Circular Economy: From the Beach to the Lab"* initiative and the *Erasmus+* programs on the blue economy and sustainable aquaculture.
- Recent initiatives of the Center of Excellence for Water include student training in wastewater treatment operations, entrepreneurship bootcamps on water innovation, and workshops on EU-funded research opportunities. These activities have positioned Alexandria University as a national and regional leader in sustainable water governance, demonstrating how academic excellence, technological advancement, and environmental responsibility can be effectively integrated to address Egypt's water and climate challenges.

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.

An environmental impact assessment was conducted by academic members of the Faculty of Science - Alexandria University to evaluate the rate of shoreline erosion caused by urbanization in Alexandria's North Coast region.



The Faculty of Pharmacy won third place in the Alexandria Governorate for the 2024 National Initiative for Green Smart Projects with its 'Green Cycle' project, competing in the non-profit community initiatives category. This marks the project's second consecutive year of recognition, having previously secured first place last year.

Egyptian Journal of Aquatic Biology & Fisheries
Zoology Department, Faculty of Science,
Ain Shams University, Cairo, Egypt.
ISSN 1110 – 6131
Vol. 28(4): 221 – 242 (2024)
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Monitoring of Microplastics in the Marine Environment and Their Ecological Risks; the Coastline of Alexandria, Egypt as a Case study

Nourhan Hamdy, Amany M. Osman, Hassan Awad, Nashwa A. Shaaban*
Oceanography Department, Faculty of Science, Alexandria University, Egypt
***Corresponding Author:** Nashwa.shaaban@alexu.edu.eg

Researchers at Alexandria University are conducting studies to conserve the marine environment near the university campus

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.

The Center of Excellence for Water at Alexandria University is organizing a training program for scholarship students in collaboration with EPROM Company. This initiative aims to equip students with practical skills in water management including training courses about Water Treatment for Industrial Applications, and Wastewater Plant Operations and Troubleshooting, ensuring they are well-prepared for the business sector and aligned with labor market requirements (March, 2024).

Students from the Faculty of Sport Education at Abu Qir took part in a week-long initiative to clean the eastern harbour of Alexandria, starting on July 8, 2024. The initiative aims to promote sustainable tourism, improve waste disposal practices, and raise awareness about the dangers of plastic waste to marine life, while encouraging recycling efforts and maintaining clean beaches. The project included the Alexandria university, El-Raml Rotary Club, and the Egyptian Diving and Rescue Federation.

Students from various schools in Alexandria, alongside those from the French Institute, participated in a large-scale cleanup campaign at Anfouchi beach titled “Our Sea is Clean Without Trash .” Following the cleanup, participants explored the process of transforming plastic waste into usable materials through 3D printing at the Fab Lab at Alexandria University. This initiative is part of the "Circular Economy: From the Beach to the Lab" project, led by the French Consulate and the French Institute, with financial backing from the European Union and collaboration with the Alexandria Governorate. The project aims to foster partnerships for sustainability and actively engage the local community in environmental efforts.

Water Excellence Center - Alexandria University

The Center of Excellence for Water is a USAID- funded program, managed by the American University in Cairo. Its goal is to catalyze long-term improvement in Egyptian water resources management by improving its innovative applied research and educated enterprise.

Located at Alexandria University, and in cooperation with four Egyptian Universities (Ain Shams University – Aswan University – Beni Suef University – Zagazig University) and four U.S. Universities (University of California, Santa Cruz, Temple University, Utah State University, and Washington State University).

The Center of Excellence for Water is designed to be a state-of-the-art center that raises the quality of all aspects of higher education, including curriculum, teaching, and applied research to international standards.

The Center supports the Egyptian government, academia, and industry to address water challenges, and prepare a new generation of graduates and entrepreneurs to be change agents that stimulate economic growth.

Leveraging on the public-private partnerships established, the Center of Excellence for Water will be the hub for research and a vibrant network of Egyptian industries, research centers, and ministries.

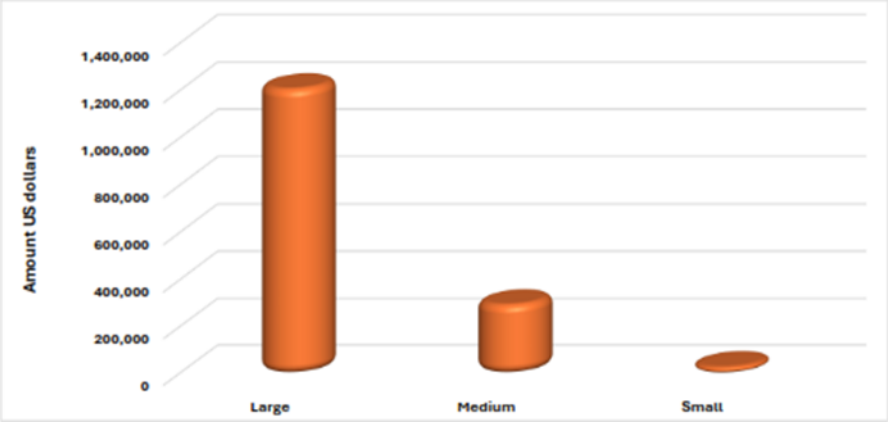
Water Excellence Center - Alexandria University
Training for civil and environmental engineering students at the Eastern Wastewater Treatment Plant Alexandria

The following tables illustrate the projects funded through the Water Excellence Center – Alexandria University.

Center of Excellence for Water

First Call Projects

Type	No.	Amount in US dollars	Amount in Egyptian pound
Large Size Projects	5	1,209,183	37,275,726
Medium Size Projects	6	296,245	9,132,404
Small Size Projects	3	29,500	909,402.4
Total	14	1,534,928	47,317,532



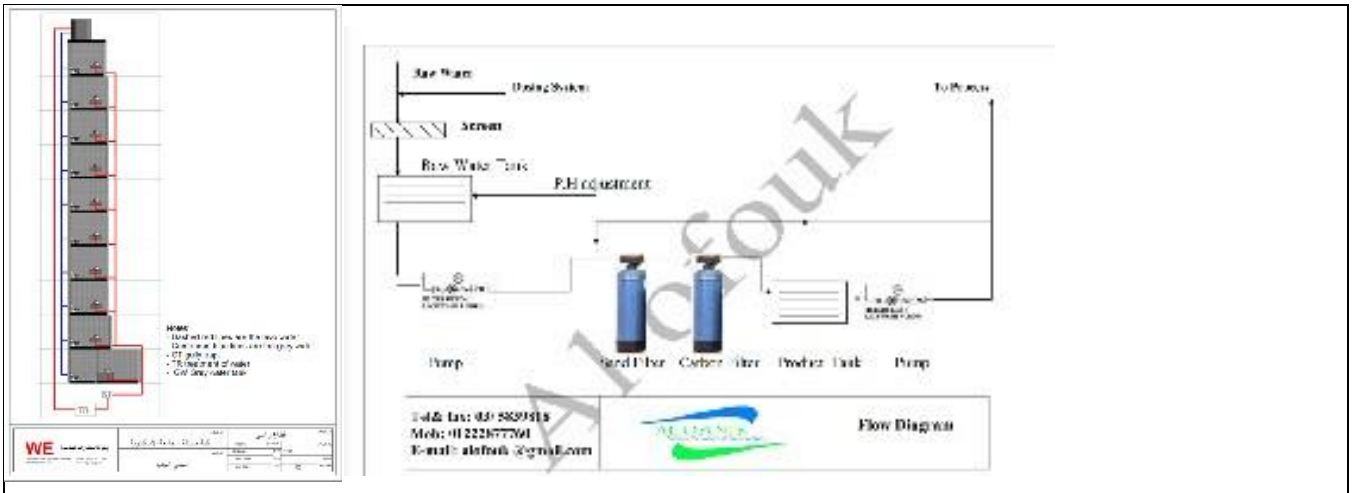
No.	Name of Egyptian PI	Name of US PI	Project Title	Budget	Size
Large size projects					
1	(Ain Shams University)	(American University in Cairo)	Sustainable Low-cost Solution for Decentralized Sanitation System in Rural Egypt	215,000	Large
2	(Ain Shams University)	(American University in Cairo)	Using AI Tools to Optimize the Development of Novel Nano-enhanced Membranes for Water Desalination	250,000	Large
3	(Ain Shams University)	(Washington State University)	SMART Irrigation for Maximizing Water Use Efficiency (SIMWUE)	250,000	Large
4	(Beni Suef University)	(American University in Cairo)	Tailored enzymatic and nano-based treatment of wastewater to detoxify heavy metals and degrade antibiotics	250,000	Large
5	(Zagazig University)	(American University in Cairo)	Reducing pollution intensity in Egyptian drains using innovative techniques of electric coagulation using Direct Current by solar cell	244,183	Large
Medium size projects					
6	(Ain Shams University)		Low Cost Technology for Treating Industrial Wastewater for Irrigation Purposes	50,000	Medium
7	(Ain Shams University)		Optimizing Crop-Water Productivity Using Remote Sensing and Multi-Sources Data (WatSens)	46,400	Medium

8	(Ain Shams University)		Solar Driven, Low Cost, Water Desalination Unit with Minimum Environmental Impact SLoW ME	50,000	Medium
9	(Alexandria University)		Domestic Greywater Treatment and Reuse Prototype	49,845	Medium
10	(Beni Suef University)		Fabrication of hybrid treatment and desalination system for oily wastewater treatment using MOFs composites - Experimental and computational studies	50,000	Medium
11	(Beni Suef University)		For an Integrated Brackish Water Desalination System - The Application of Water Incompatibility in Siwa Oasis as an Innovative strategy for the Production of Low-Cost Irrigation Water using Eco-Friendly Nano-Filtration Self-Cleaning System	50,000	Medium
Small size projects					
12	(Beni Suef University)		Large-scale and sustainable synthesis of commercially feasible TiO2/GO nanostructured thin-film composite-based forward osmosis membranes for water desalination (TG-PES-Memb)	9,500	Small
13	(Beni Suef University)		Sensing heavy metals in drinking water using nanophotonic structure	10,000	Small
14	(Beni Suef University)		Salinity sensor for desalination method using photonic crystals	10,000	Small

Alexandria University Project (Accepted but didn't get administration approval)					
1	(Alexandria University)		Continuous Membrane Fabrication Module via Solvent or Emersion Casting technique for Desalination system by the application of Pervaporaton (PV) or Membrane Distillation(MD) techniques. (CMFM)	47,000	Medium
2	(Alexandria University)		Treatment of refinery waste by a novel supported solar photocatalyst system enabling zero liquid discharge	37,100	Medium
3	(Alexandria University)		Design of thermally-localized successive evaporation-condensation desalination unit (TSEC)	10,000	Small

Green Cycle project in the Faculty of Pharmacy - Alexandria University

The project began in October 2022 by organizing a number of events in cooperation between the Community Service and environmental Development Committee, ASPSA, and the Alexandria Rotary Clubs, under the supervision and organizationof Faculty of Pharmacy - Alexandria University.
Also, the faculty is seriously seeking to 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. The grey water recycling initiative has a significant impact on rationalizing water use.
Also, taking advantage of rainwater for use in irrigation and regulatory operations.
Alexandria University have generalized this initiative in some of the faculties of Alexandria University in gradual stages.



Grey water recycling system by Faculty of Pharmacy (Alexandria University)

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).
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- 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).

6.5.3 Water conservation off campus

Alexandria University is advancing water conservation and water management through a data-driven model that analyzes rain patterns and water resources using remote sensing data and environmental analysis. The system supports better water supply, wastewater handling, and reduced pollution across campus and surrounding areas. By integrating modern technology and sustainable methods, the university enhances performance, strengthens environmental protection, and supports long-term sustainable development. This integrated approach helps improve drinking water quality, manage runoff, and protect local ecosystems.

Integrated strategy Project for rainwater management in Alexandria Governorate in cooperation with Alexandria University

Remote sensing technology was used to know the current values of Rain and assess the current situation with thehelp of satellites. This is done with the help of the following artificial satellites:

-TRMM and GPM are two of the NASA satellites. (Administration National Aeronautics and Space Administration,United States of America)

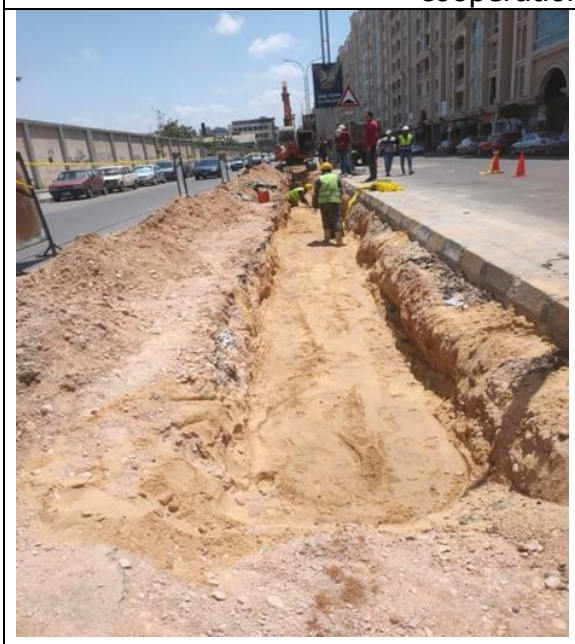
- NOAA (National Oceanic, Atmospheric, and Space Administration, United States of America)
- NCEI (National Center for Environmental Information in the United States of America)

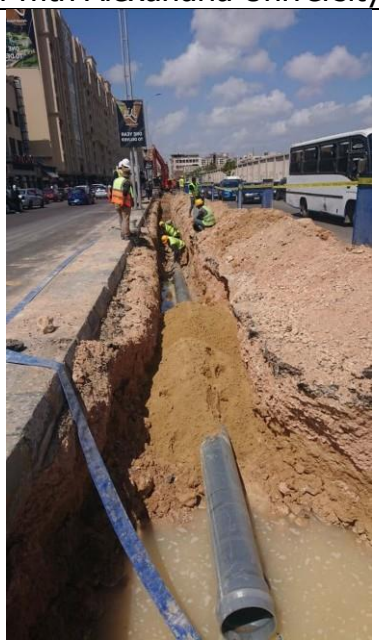
Proposed rain management strategy

A separate network will be created to drain rainwater for the nearest body of water for areas close to the body ofwater. The first area is the Corniche, where rainwater is collected and discharging it into marine estuaries. The second area is on both sides of the Mahmoudiyah and Beheira axis near the airport. The rainwater is collected and part of it is drained on the canal and the other part on the airport lake. In the third stage of the project, the two projects on the airport lake to exploit rainwater will be linked to the New Delta project. The rainwater will beused to irrigate the crops, vegetables, and fruits in the New Delta.

م	البيان	الوحدة	الكمية	ما تم تنفيذة	المتبقى
١	خطوط إنحدار (٢٠٠ ـ ٨٠٠ مم)	متر	٣٥٠٠	٢٣٣٦	١١٦٤
٣	خط طرد (٧١٠ مم)	متر	٢٥٠	-	٢٥٠
٤	محطات رفع	عدد	١	-	١
٥	مطابق	عدد	٢٤	٢٤	٠
٦	شنايش مطر	عدد	٩٨	٥٠	٤٨
٧	أسفلت	م٢	٥٢٠٠٠	-	٥٢٠٠٠

Integrated strategy project for rainwater management in Alexandria Governorate in cooperation with Alexandria University






Integrated strategy project for rainwater management in Alexandria Governorate in cooperation with Alexandria University

Before performing the integrated strategy project


After performing the integrated strategy project
Mahmoudiyah Axis Project before and after performing the project

- The Center of Excellence for Water is organizing a training program for scholarship students. This training is conducted in collaboration between the Water Excellence Center at Alexandria University and EPROM Company to provide a course for a group of students from the Water Excellence Center. This initiative reflects Alexandria University's commitment to equipping its students with practical skills related to water management, ensuring they possess the competencies needed by the business sector while aligning their studies with labor market requirements. The Center of Excellence for Water at Alexandria University has organized a training program for students in the Water Excellence Center

Scholarship and the Civil and Environmental Engineering Program. Alexandria University, EPROM Company, and the students are participating in the following two training programs:

- Water Treatment for Industrial Applications
- Wastewater Plant Operations and Troubleshooting.

- Evaluate the effectiveness of water conservation programs by leveraging data analysis tools and feedback systems to assess performance and outcomes.
- By integrating ICT into water management, university campus can promote sustainability, reduce water waste, and ensure the reliable supply of high-quality water. These systems not only improve efficiency but also support long-term environmental and financial goals.

The Center of Excellence for Water at Alexandria University is organizing a training program for scholarship students in collaboration with EPROM Company. This initiative aims to equip students with practical skills in water management including training courses about Water Treatment for Industrial Applications, and Wastewater Plant Operations and Troubleshooting, ensuring they are well-prepared for the business sector and aligned with labor market requirements (March, 2024).

Students from the Faculty of Sport Education at Abu Qir took part in a week-long initiative to clean the eastern harbour of Alexandria, starting on July 8, 2024. The initiative aims to promote sustainable tourism, improve waste disposal practices, and raise awareness about the dangers of plastic waste to marine life, while encouraging recycling efforts and maintaining clean beaches. The project included the Alexandria university, El-Raml Rotary Club, and the Egyptian Diving and Rescue Federation.

An environmental impact assessment was conducted by academic members of the Faculty of Science - Alexandria University to evaluate the rate of shoreline erosion caused by urbanization in Alexandria's North Coast region.


EcoFab

Students from various schools in Alexandria, alongside those from the French Institute, participated in a large-scale cleanup campaign at Anfouchi beach titled “Our Sea is Clean Without Trash .” Following the cleanup, participants explored the process of transforming plastic waste into usable materials through 3D printing at the Fab Lab at Alexandria University. This initiative is part of the "Circular Economy: From the Beach to the Lab" project, led by the French Consulate and the French Institute, with financial backing from the European Union and collaboration with the Alexandria Governorate. The project aims to foster partnerships for sustainability and actively engage the local community in environmental efforts.

6.5.4 Water is extracted (for example from aquifers, lakes or rivers), utilize sustainable water extraction technologies on associated university grounds on and off campus

Alexandria University applies an integrated water management approach that combines sustainable water extraction from local sources with advanced treatment, recycling, and irrigation systems to protect regional water resources. Through continuous analysis, innovative models, and modern technology, the University enhances wastewater reuse, reduces pollution, and improves the environment on and off campus. These efforts support high-efficiency processes such as greywater recovery, effluent reuse, desalination, and controlled rain harvesting, while strengthening performance and long-term sustainability. This integrated system demonstrates Alexandria University's leadership in developing solutions that enhance water supply, support agriculture, and improve ecosystem conditions across the region.

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.
Recent initiatives of the Center of Excellence for Water include student training in wastewater treatment operations, entrepreneurship bootcamps on water innovation, and workshops on EU-funded research opportunities. These activities have positioned Alexandria University as a national and regional leader in sustainable water governance, demonstrating how academic excellence, technological advancement, and environmental responsibility can be effectively integrated to address Egypt's water and climate challenges.

1. Air conditioning water collection and reuse unit in Faculty of Engineering.
2. Wastewater treatment unit at the Faculty of Engineering
3. Providing a sewage treatment plant at the university to make it suitable for irrigating green areas and gardensinside the university campus.
4. Innovative Renewable Energy RE-Multi-stage flash system (MSF) with salt precipitator and nanofiltration (NF-MSF) to pre-treat feedwater (RE-NF-MSF) by Faculty of Agriculture, Alexandria University
5. A 100 m^3 desalination unit in Wadi Natroun (Faculty of Agriculture, Alexandria University)
6. The irrigated water supplied to the fish farm at the Agriculture Experimental Research Station of the Faculty of Agriculture is recycled to irrigate the crops, vegetables, and fruits of the land farm. The recycled water is rich withnatural fertilizers and enhances the crops production.
7. In addition, the water recycling in Fish Aquaculture of the Faculty of Agriculture, Alexandria University: The watersewage of the Aquaculture of the Faculty of Agriculture, Alexandria University which consist of eight ponds (one acre and quarter/each) in Abis region. Alexandria University used the recycled water for crops culturing in the adjacent agriculture research center in Abis.
8. IOT Pilot Project in Egypt by Shanghai Water Saving Irrigation Corp. Etd performed an automatic

controlled irrigation systems IOT project for modern irrigation technology. The company implanted the IOT platform projectto irrigate economic crops and facilitate irrigation systems to overcome the water shortage problems in Egypt. This project will be performed in Alexandria University Farm for agroecological farming in Egypt.

9. 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).
10. **Green Cycle project in the Faculty of Pharmacy - Alexandria University**
    The faculty is seeking to 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. The grey water recycling initiative has a significant impact on rationalizing water use. Also, taking advantage of rainwater for use in irrigation and regulatory operations. Alexandria University have generalized this initiative in some of the faculties of Alexandria University in gradual stages.
11. **Integrated strategy Project for rainwater management in Alexandria Governorate in cooperation with Alexandria University**
    Remote sensing technology was used to know the current values of Rain and assess the current situation with thehelp of satellites. This is done with the help of the following artificial satellites:
    -TRMM and GPM are two of the NASA satellites. (Administration National Aeronautics and Space Administration,United States of America)
    - NOAA (National Oceanic, Atmospheric, and Space Administration, United States of America)
    - NCEI (National Center for Environmental Information in the United States of America)

    Proposed rain management strategy

    A separate network will be created to drain rainwater for the nearest body of water for areas close to the body ofwater. The first area is the Corniche, where rainwater is collected and discharging it into marine estuaries. The second area is on both sides of the Mahmoudiyah and Beheira axis near the airport. The rainwater is collected and part of it is drained on the canal and the other part on the airport lake. In the third stage of the project, the two projects on the airport lake to exploit rainwater will be linked to the New Delta project. The rainwater will beused to irrigate the crops, vegetables, and fruits in the New Delta.

م	البيان	الوحدة	الكمية	ما تم تنفيذة	المتبقى
١	خطوط انحدار (٢٠٠ ـ ٨٠٠ مم)	متر	٣٥٠٠	٢٣٣٦	١١٦٤
٢	خط طرد (٧١٠ مم)	متر	٢٥٠	٠	٢٥٠
٤	محطات رفع	عدد	١	٠	١
٥	مطبق	عدد	٢٤	٢٤	٠
٦	شنايش مطر	عدد	٩٨	٥٠	٤٨
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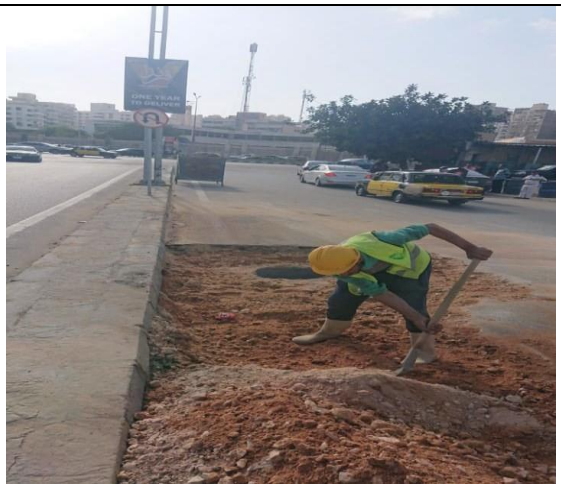
Integrated strategy project for rainwater management in Alexandria Governorate in cooperation with Alexandria University




Integrated strategy project for rainwater management in Alexandria Governorate in cooperation with Alexandria University

Before performing the integrated strategy project

After performing the integrated strategy project

Mahmoudiyah Axis Project before and after performing the project

12. Elements of Green Building Implementation as Reflected in all new construction and renovation policies in thenew buildings in Abis campus:

- The area of the project is 160 acres, a general site for educational buildings, and 120 acres are complementaryactivities. The percentage of green areas and lake is about 52% in addition to 25% streets and lanes.
- Water-saving plots are used, which will reduce water consumption by about 30%. The sewage water will betreated and reused in the irrigation of green areas in the project.
- Wastewater will be treated and reused to irrigate green areas in the project.
- Rainwater is collected in the main lake and used for irrigation.
  The use of plants with few water rationed plants to reduce irrigation needs in addition to absorbing quantitiesof rainwater to reduce the severity of rain spells.


Air conditioning water collection and reuse unit - Faculty of Engineering

Wastewater treatment unit at the Faculty of Engineering

Grey water recycling system organized by Faculty of Pharmacy and reused in rooftop cultivation

6.5.5 University cooperate with local, regional, national or global governments on water security

Alexandria University strengthens water security through active cooperation with local, regional, and national authorities, integrating scientific analysis, modern water management systems, and sustainable environmental practices. By partnering with governmental agencies on wastewater treatment, rain management, and water resources planning, the University supports high-impact projects, enhances capacity building, and promotes long-term sustainability across the region. These collaborations improve water supply, reinforce infrastructure, advance technology adoption, and expand joint training programs that prepare skilled professionals. Through its integrated approach, Alexandria University plays a leading role in developing effective solutions for Egypt's water and climate challenges.

1. Raising awareness among university staff and students about water conservation through seminars and workshops organized in collaboration with the Alexandria Drinking Water Company, in order to strengthen the means of implementation and revitalize the global partnership for sustainable development.
2. The faculty members from the Faculty of Engineering are offering their expertise and advice on the construction of the Mahmoudiyah axis. These engineering consultations may include technical guidance, design recommendations, structural assessments, and other professional input to ensure the project's success, safety, and efficiency throughout the construction process.
3. 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.
4. An amount of water of **1,240,575 m^3** is consumed by all faculties and institutes affiliated with the Alexandria University, of which the amount of sewage is **1,116,625.26 m^3**, which is lifted through a group of lifting stations to be treated through treatment stations affiliated with the Alexandria Sanitation Company. **Treated water:** As for the water resulting from first treatment, it is reused within the New Delta.
5. 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).
   - **Faculty of Science:** Theoretical training introduced the role of the Sewerage Company, while practical training involved visits to treatment plants, central laboratories, and lectures on occupational safety and industrial sewage.
   - **Faculty of Arts (Surveying, mapping, and GIS):** Training included surveying applications, urban planning, andthe practical use of leveling instruments, total stations, and GPS devices, concluding

with lessons on ArcGIS and sewage system design.

- **Engineering Colleges:** Civil Engineering students trained in network renewal and design, while Mechanical and Mechatronics students learned about pump components, welding, and electrical generators, with visitsto various workshops.
- **Fine Arts (Architecture):** Students received training on project design drawings and estimating costs.

6. The Center of Excellence for Water is organizing a training program for scholarship students. This training is conducted in collaboration between the Water Excellence Center at Alexandria University and EPROM Company to provide a course for a group of students from the Water Excellence Center. This initiative reflects Alexandria University's commitment to equipping its students with practical skills related to water management, ensuring they possess the competencies needed by the business sector while aligning their studies with labor market requirements. The Center of Excellence for Water at Alexandria University has organized a training program for students in the Water Excellence Center Scholarship and the Civil and Environmental Engineering Program. Alexandria University, EPROM Company, and the students are participating in the following two training programs:
   - **Water Treatment for Industrial Applications**
   - **Wastewater Plant Operations and Troubleshooting.**
7. **Green Cycle project in the Faculty of Pharmacy - Alexandria University**
   The project began in October 2022 by organizing a number of events in cooperation between the Community Service and Environmental Development Committee, ASPSA, and the Alexandria Rotary Clubs, under the supervision and organization of Faculty of Pharmacy - Alexandria University.
   Also, the faculty is seriously seeking to implement a grey water (wastewater) recycling system that depends onreusing 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. The grey water recycling initiative has a significant impact on rationalizing water use.
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   Proposed rain management strategy
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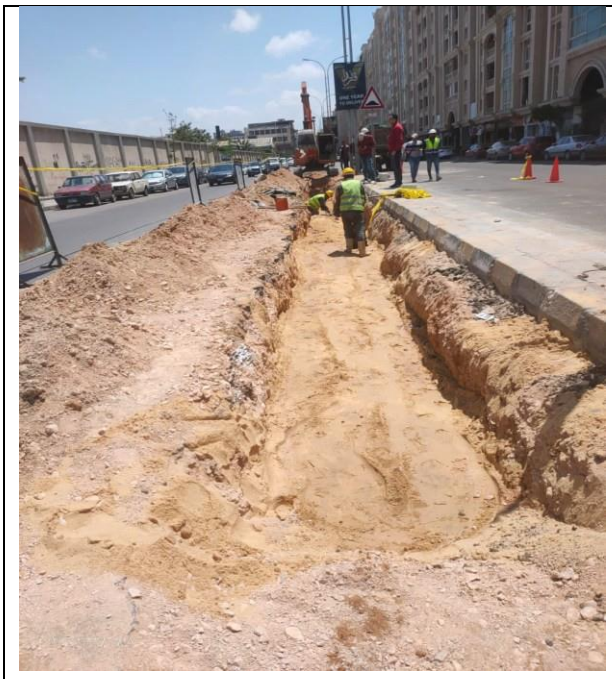
Integrated strategy project for rainwater management in Alexandria Governorate in cooperation with Alexandria University




Integrated strategy project for rainwater management in Alexandria Governorate in cooperation with Alexandria University

Before performing the integrated strategy project

After performing the integrated strategy project
Mahmoudiyah Axis Project before and after performing the project

9.

6.5.6 University actively promote conscious water usage on campus

Alexandria University actively promotes conscious water usage by integrating sustainable water management systems, expanding conservation programs, and improving wastewater treatment and recycling across campus. Through awareness campaigns, technical training, and collaborative initiatives with local water authorities, the University enhances responsible use of water resources, reduces environmental impact, and strengthens long-term sustainability. This integrated approach combines analysis, innovation, and community engagement to improve campus performance, advance modern technologies, and support national goals for efficient water use.

- Campus water use is an important indicator in the sustainability scale. The aim is to urge universities to reduce water use, increase water conservation programs, and protect the environment. Among these criteria:
    - The water conservation program,
    - The water recycling program
    - The use of water-saving equipment
    - The treatment of wastewater
    - The rainwater collection program
- Raising awareness among university staff and students about water conservation through seminars and workshops organized in collaboration with the Alexandria Drinking Water Company, in order to strengthen the means of implementation and revitalize the global partnership for sustainable development.
- 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).
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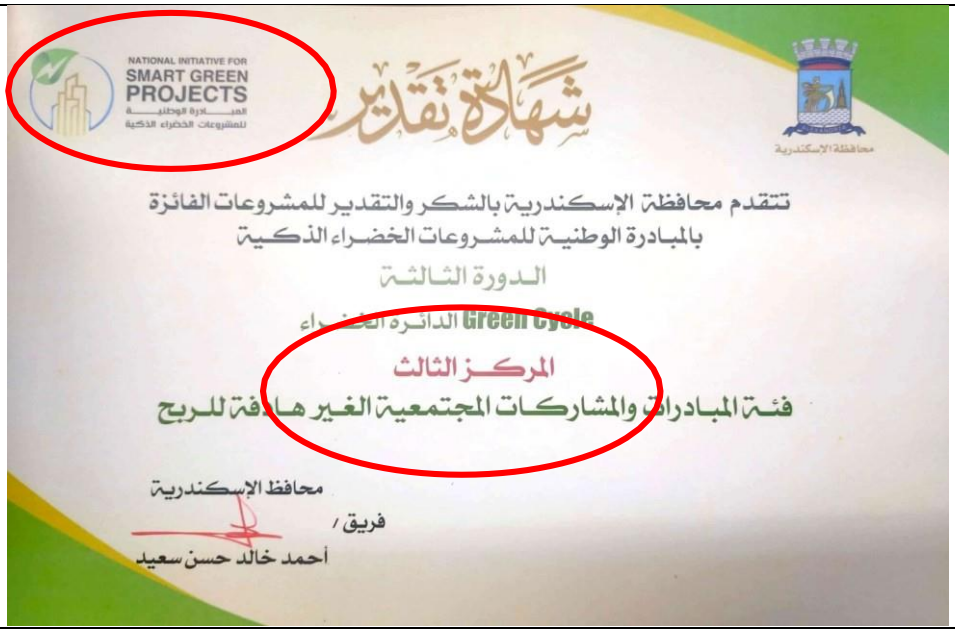
    - **Fine Arts (Architecture):** Students received training on project design drawings and estimating costs.
- Alexandria University has organized in collaboration with the Alexandria Drinking Water Company and the Holding Company for Water and Wastewater comprehensive awareness campaigns, engage students, faculty, and staff in adopting sustainable water-use practices.
- The University's pivotal role in advancing research and innovation for the protection of Mediterranean coastal ecosystems is exemplified through collaborative projects such as the EU-funded *"Circular Economy: From the Beach to the Lab"* initiative and the *Erasmus+* programs on the blue economy and sustainable aquaculture.
- Recent initiatives of the Center of Excellence for Water include student training in wastewater treatment operations, entrepreneurship bootcamps on water innovation, and workshops on EU-funded research opportunities. These activities have positioned Alexandria University as a national

and regional leader in sustainable water governance, demonstrating how academic excellence, technological advancement, and environmental responsibility can be effectively integrated to address Egypt's water and climate challenges.

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.

An environmental impact assessment was conducted by academic members of the Faculty of Science - Alexandria University to evaluate the rate of shoreline erosion caused by urbanization in Alexandria's North Coast region.



The Faculty of Pharmacy won third place in the Alexandria Governorate for the 2024 National Initiative for Green Smart Projects with its 'Green Cycle' project, competing in the non-profit community initiatives category. This marks the project's second consecutive year of recognition, having previously secured first place last year.

Regional Studies in Marine Science
Volume 66, 15 December 2023, 103160

Shoreline displacement along the Mediterranean coast of Egypt between El-Dabaa – Ras El-Hekma

Esraa A. El-Masry [a], Asmaa Magdy [b], Baher Mahmoud [a], Ayman El-Gamal [b], Mahmoud Kh. El-Sayed [a]

[a] Department of Oceanography, Faculty of Science, Alexandria University, Alexandria, Egypt
[b] Marine Geology Department, Coastal Research Institute, National Water Research Center, Alexandria, Egypt

Home > SN Applied Sciences > Article

Water quality indices as tools for assessment of the Eastern Harbor's water status (Alexandria, Egypt)

Research Article
Volume 5, artick

Alaa A. El-Dahhar
Faculty of Agriculture (Saba Basha), Alexandria University, Alexandria, Egypt
View author publications
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Monitoring of Microplastics in the Marine Environment and Their Ecological Risks; the Coastline of Alexandria, Egypt as a Case study

Nourhan Hamdy, Amany M. Osman, Hassan Awad, Nashwa A. Shaaban*
Oceanography Department, Faculty of Science, Alexandria University, Egypt
*Corresponding Author: Nashwa.shaaban@alexu.edu.eg

Alexandria Science Exchange Journal

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Sustainable Water Research Funding and Water Quality Challenges in Agricultural Practices: An Economic Analysis in Egypt

Document Type : Original Article

Authors

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10.21608/ASEJAIQJSAE.2023.316410

Researchers at Alexandria University are conducting studies to conserve the marine environment near the university campus

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.

The Center of Excellence for Water at Alexandria University is organizing a training program for scholarship students in collaboration with EPROM Company. This initiative aims to equip students with practical skills in water management including training courses about Water Treatment for Industrial Applications, and Wastewater Plant Operations and Troubleshooting, ensuring they are well-prepared for the business sector and aligned with labor market requirements (March, 2024).

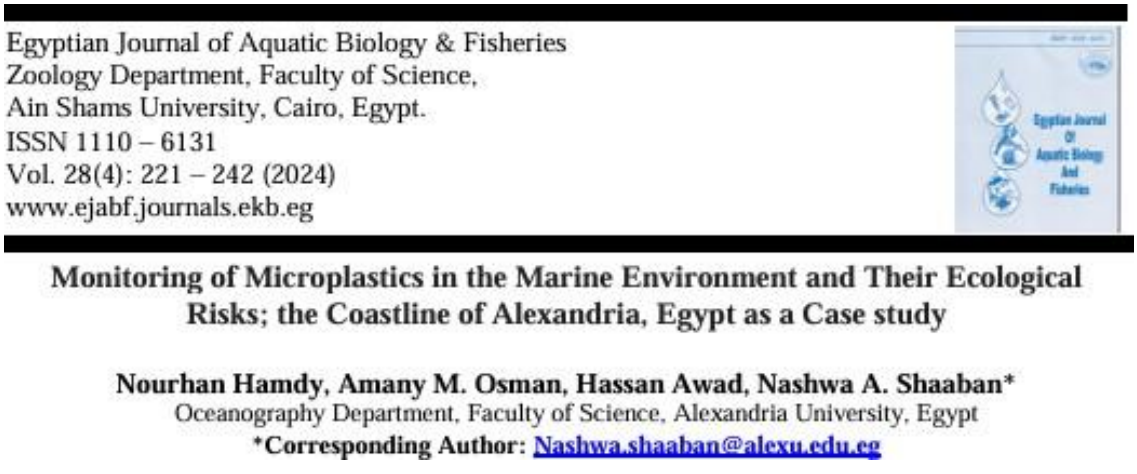
Students from the Faculty of Sport Education at Abu Qir took part in a week-long initiative to clean the eastern harbour of Alexandria, starting on July 8, 2024. The initiative aims to promote sustainable tourism, improve waste disposal practices, and raise awareness about the dangers of plastic waste to marine life, while encouraging recycling efforts and maintaining clean beaches. The project included the Alexandria university, El-Raml Rotary Club, and the Egyptian Diving and Rescue Federation.

Students from various schools in Alexandria, alongside those from the French Institute, participated in a large-scale cleanup campaign at Anfouchi beach titled “Our Sea is Clean Without Trash .” Following the cleanup, participants explored the process of transforming plastic waste into usable materials through 3D printing at the Fab Lab at Alexandria University. This initiative is part of the "Circular Economy: From the Beach to the Lab" project, led by the French Consulate and the French Institute, with financial backing from the European Union and collaboration with the Alexandria Governorate. The project aims to foster partnerships for sustainability and actively engage the local community in environmental efforts.

6.5.7 University actively promote conscious water usage in the wider community

Alexandria University actively promotes conscious water usage in the wider community by supporting environmental management initiatives, conducting scientific studies on coastal ecosystems, and engaging the public in reducing pollution and protecting shared water resources. Through community clean-up campaigns, awareness programs, and partnerships with local and international organizations, the University enhances regional sustainability, strengthens environmental responsibility, and encourages practical solutions that improve the environment and support long-term water security.

- Researchers at Alexandria University are working on studies aimed at protecting and preserving the marine environment located close to the university's campus. Their research likely involves efforts to prevent pollution, protect marine biodiversity, and maintain the health of the coastal ecosystem. The focus is on ensuring that the nearby marine environment remains sustainable and unharmed by human activities or other environmental threats.



Researchers at Alexandria University are conducting studies to conserve the marine environment near theUniversity Campus

- On July 8, 2024, the students from the Faculty of Sport Education, Abu Qir, participate in Initiative to Clean the Eastern Harbour of Alexandria. In line with Alexandria University's commitment to community service and under the auspices of Professor Dr. Abdelaziz Konsowa, President of Alexandria University, and Dr. Yasmine Fouad, Minister of Environment, students from the Faculty of Sport Education in Abu Qir participated in a week-long initiative to clean the eastern harbour of Alexandria. The initiative includes the participation of the El-Raml Rotary Club and the Egyptian Diving and Rescue Federation. The initiative aims to promote sustainable tourism and improve beach enjoyment while supporting local communities in enhancing their waste disposal practices. It also encourages citizens to reduce their use of single-use plastic products and increase recycling efforts. Additionally, the project seeks to educate the public on the importance of maintaining clean and healthy beaches, raising awareness about the threats that plastic and chemical waste pose to marine life, as well as focusing on collecting, classifying, and recycling waste to improve the quality of the coastal environment.

Students from the Faculty of Sport Education at Abu Qir took part in a week-long initiative to clean the eastern harbour of Alexandria, starting on July 8, 2024. The initiative aims to promote sustainable tourism, improve waste disposal practices, and raise awareness about the dangers of plastic waste to marine life, while encouraging recycling

- On June 18, 2024, Students from various schools in Alexandria, along with students from the French Institute in Alexandria, collaborated with Alexandria University to participate in a large-scale cleanup campaign titled **"Our Sea is Clean Without Trash."** for Anfouchi beach. After cleaning the beach, the students discovered the process of transforming plastic waste through 3D printing at the Fab Lab at Alexandria University. This initiative is part of the "Circular Economy: From the Beach to the Lab" project, led by the French Consulate and the French Institute in Alexandria, with financial support from the European Union and in cooperation with the Alexandria Governorate and Alexandria University. The project aims to achieve partnerships for sustainability goals and to engage the local community in these efforts.

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