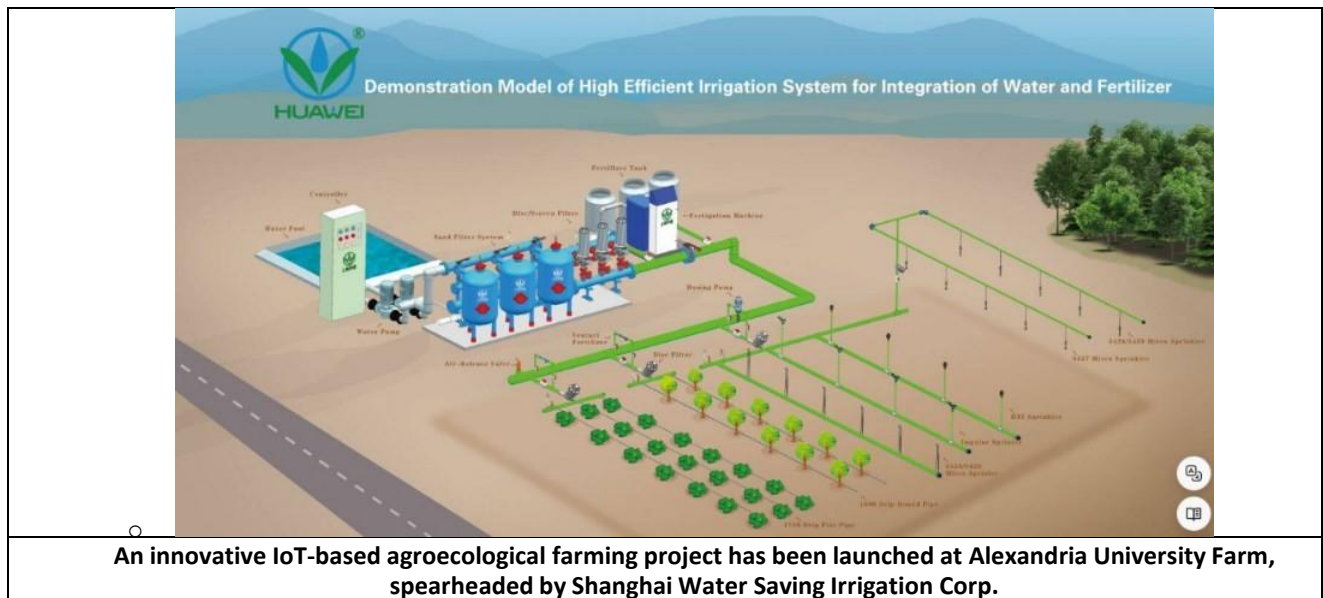


6.3.5 Plant landscapes to minimize water usage

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 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 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 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.
- 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.
- 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 lightingsystems 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.



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 environmental importance 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 it for continuous benefit. Therefore, they have been collected and classified in a book containing approximately 500 plant 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)