



1- Legislation and strategy

Water recycling and reuse is done with great care and follows international regulations set by the US Environmental Protection Agency: <https://www.epa.gov/sites/default/files/2019-08/documents/2012-guidelines-water-reuse.pdf>

Water scarcity is a pressing challenge both for urban and rural communities in Iraq. Climate change is an increasingly challenging prospect to water supply and resources; therefore, Al-Mustaqbal University has set a policy that requires both staff and students should follow to achieve water conservation. Al-Mustaqbal University views water from four inter-related dimensions of efficient conservation, responsible consumption and restoring and retaining surface and groundwater. Therefore, the university has adopted four main principles to fulfill the requirements of the SDG6 (Figure 1), as shown below.

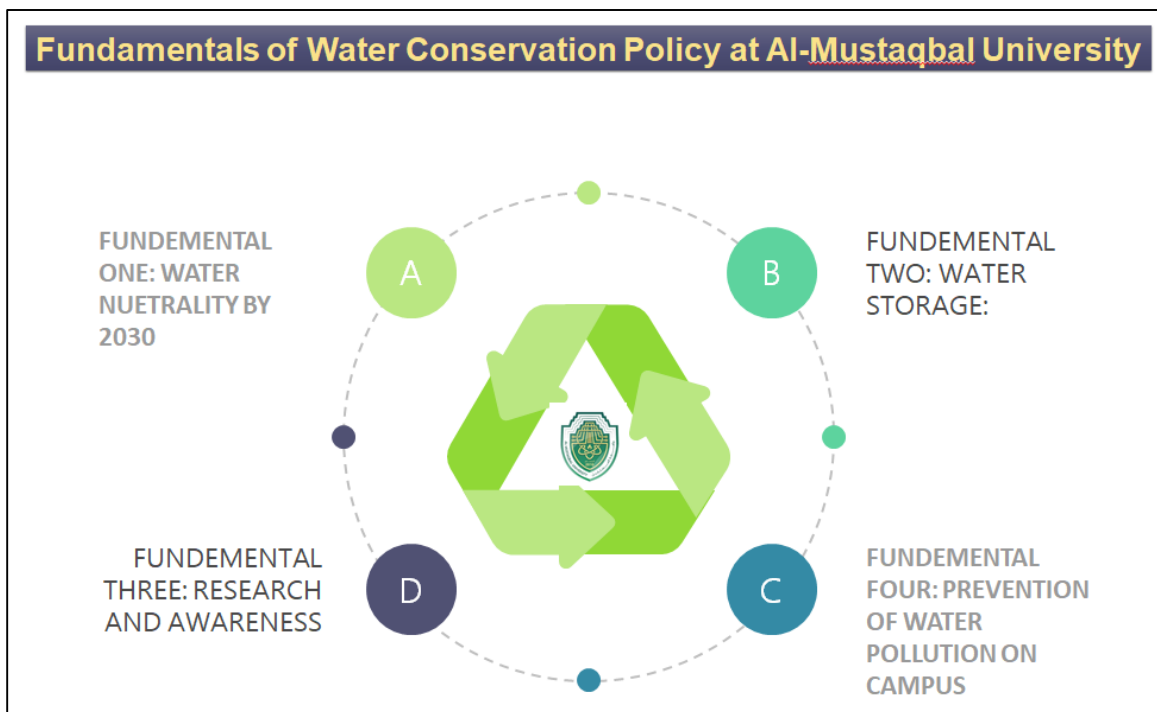


Figure 1: Fundamentals of Water Conservation Policy at Al-Mustaqbal University

A- FUNDEMENTAL ONE: WATER NUETRALITY BY 2030

- All buildings constructed or under construction should be fitted with water-efficient fixtures.
- Ensuring a 100% treatment and recycling of greywater and 50% of sewage by 2030. Sewage will be treated by state-of-the-art technologies that ensure an efficient recycling process.



- Rainwater should be harvested using efficient methods to implement water neutrality.

B- FUNDAMENTAL TWO: WATER STORAGE:

- By 2030, all conserved water that is in excess from need should be stored through ponds, wells and tanks. Seeking methods that minimise the evaporation of stored water is highly recommended.
- Increasing the number of water meters to identify the areas in which water usage is the greatest.
- Taking special attention to improve water governance by building awareness among staff, students, and implementing constant maintenance procedures to minimise waste.

C- FUNDAMENTAL THREE: RESEARCH AND AWARENESS

- Water conservation education to all the stakeholders.
- Research and implementation of practices that promote efficient water use.
- Provide incentives to students and teachers for efficient water use and conservation.
- Provide training on adopted water conservation measures by the university to all students, and staff of the colleges and nearby communities and local authorities.
- Ensure awareness about the water conservation policy of the colleges and other sections among all staff and students.

D- FUNDAMENTAL FOUR: PREVENTION OF WATER POLLUTION ON CAMPUS

- Washing should be done using non-toxic materials.
- The prevention of throwing litter, chemicals or solvents into sewer drains.
- Annual inspection of the campus septic systems.
- Prevention of pesticide and fertilisers seepage into water systems.
- The constant look for new methods for preventing water pollution.
- Constant testing of water used on campus for any existing pollution.



2- Reuse of wastewater

Al-Mustaqbal University undergoes annual expansion, with the green spaces notably benefiting from this growth. Given Iraq's challenging climate, these green areas necessitate ongoing irrigation. The Engineering Unit has effectively implemented both sprinkler systems and drip irrigation methods to attain optimal irrigation efficiency while conserving water resources. The primary water source for irrigation is treated sewage water. In this direction, sewage water is collected in primary tank, after which it is pumped to the treatment plant where the purification process takes place. Upon completion of sewage treatment, it is directed to an irrigation channel branching off from the Euphrates River. This procedure conserves significant amounts of reuse water for agricultural irrigation purposes, especially during dry periods and when water levels in the irrigation channel are low. It's worth noting that the treated water undergoes daily testing to meet the specific irrigation standards. Irrigation of crops usually occurs in the early evening when there are no students or faculty members present at the university. Key areas irrigated with reuse water include sports fields and green parks. In the case of fruit-bearing plants, untreated water is often used for irrigation.

Likewise, a study was conducted on the primary water uses within the university, identifying water reuse opportunities as illustrated in the Figure below.

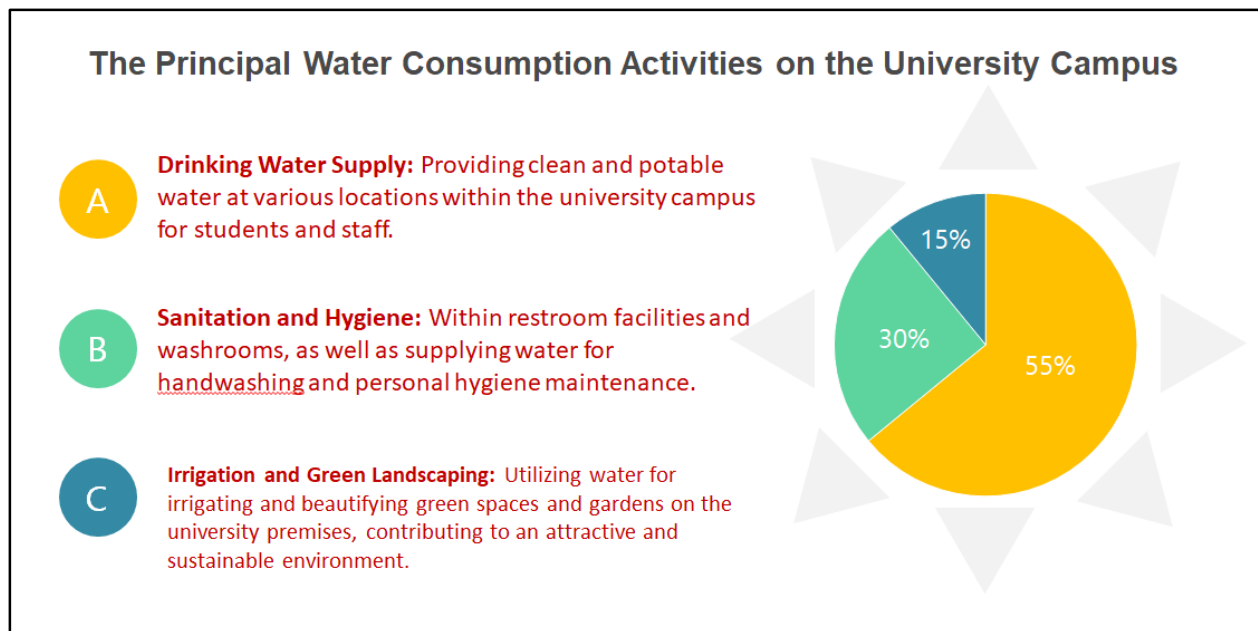


Figure 2: The Principal Water Consumption Activities on Al-Mustaqbal University Campus

In addition, Figure 3 depicts the irrigation canal, highlighting the existence of several conduit sewers that are indeed utilized for conveying treated water to the irrigation channel.

In addition, [Water conservation policy](#): The water conservation policy aims on creating a water neutral campus by the year 2030.





Figure 3: Three photos showing the Irrigation channel with pipes conveying treated water in AL-Mustaqbal University

To drain wastewater into the sewage network, the university employs faucets equipped with low-flow features and fitted with sensors that automatically turn off when hands are removed. This ensures the minimum possible flow of water into the sewage network.

This year, a campaign was carried out to plant a variety of date palms, flowers and ornamental plants in several locations across the university. Plants were carefully selected for their compatibility with treated water irrigation and their ability to withstand arid environments. This initiative was aligned with the requirements of SDGs 6, 13 and 15.

The university adheres to strict policies regarding water usage and recycling, as it has formulated multiple plans for the year 2022 aimed at optimizing water consumption. Here are several points followed by the university to achieve sustainable development goals, particularly SDG6:



- Adopting a modern approach in designing and implementing buildings sustainably, ensuring reduced energy and water consumption.
- Measuring water consumption in the university's faculties and providing means to reduce consumption by 5% annually from 2022 to 2023.
- Enhancing the efficiency of the treatment plant, which will consequently increase the amount of water that can be recycled for agricultural use.
- Using efficient methods to collect rainwater and storing it in suitable tanks, aiming to reach a utilization rate of 70% by the end of 2025.
- Expanding the uses of recycled water to include activities such as road cleaning, toilet flushing, and irrigating areas outside the university campus.