



# SDG 14: Life Below Water

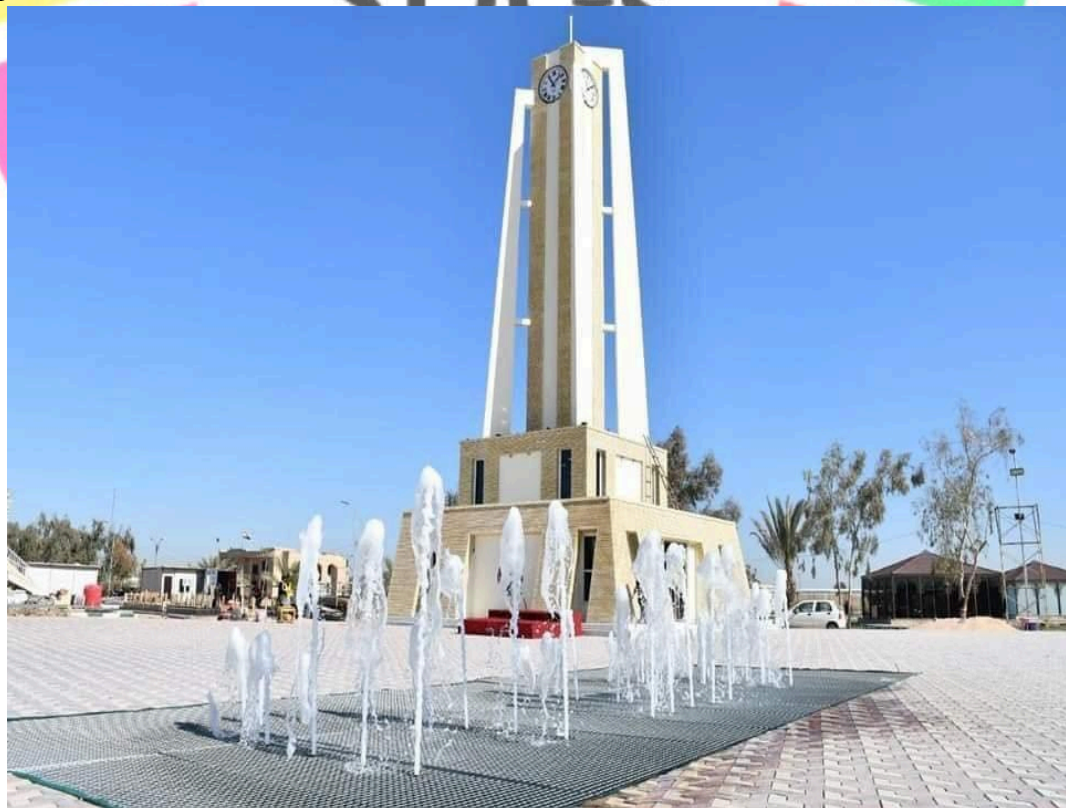
LIFE  
BELOW WATER





### SDG 14: Life Below Water

- The university and all its sites work to rationalize the use of water to meet its needs except for the personal use of associates and students or for watering gardens and agricultural fields and the university has implemented (70) courses and workshops to reduce and rationalize the use of water, as it adopts the policy of using raw water by connecting pumps on rivers and delivering it for the purpose of watering gardens and agricultural fields, especially in formations where there are agricultural specialties.
- The Kufa Technical Institute and the Diwaniya Technical Institute have worked on installing pumps for the purpose of watering gardens, agricultural fields and trees even in the middle islands of the public street adjacent to its borders as a contribution to community service, while in the Technical Engineering College of Musayyib has been established to reclaim the agricultural lands of the College, while the Technical Institute of Karbala follows the policy of reducing the consumption of water quantities through the drilling of artesian and driving wells and reducing the watering of crops by using irrigation with sprinklers and drip
- As for the Technical Institute of Babylon, it uses the water that is mixed with a pull from the rivers by erecting pumps to water the gardens inside the Institute and the residential neighborhood of the Institute, and the Technical Institute of Musaib uses the dampened water as well as watering with sprinklers and drip to reduce the waste of water as well as the use of wastewater after treatment for watering the plantations. The University has held a number of (12) workshops, seminars, and courses on rationalizing the use of water and preserving it from waste, as well as publishing posters on not wasting water and preserving it, and the University's directives emphasize the continuous maintenance of water.





- **Al-Furat Al-Awsat Technical University...a quest to achieve sustainable development and an embodiment of the concept of a productive university...: <https://atu.edu.iq/?p=21731>**



Within the framework of the directives of Al-Furat Al-Awsat Technical University to embody the concept of a productive university and work to achieve sustainable development goals, the follow-up of the President of the University continues for the Al-Bustan model project within the university campus in Kufa. The Al-Bustan project includes various types of palm trees, as it has currently been restored Rehabilitating it and installing an irrigation system that uses modern irrigation technology, in addition to other agricultural activities surrounding the project. The project also includes a lake for raising fish wealth, with a surface water area of (700) seven hundred square meters and a depth of (6) six meters. It should be noted that the project was implemented from Before the technical staff in the Department of Diwan Affairs at the University Presidency, in coordination with the Department of Construction and Projects and with continuous field follow-up by the President of the University, Al-Zuhairi, for his part, indicated in an interview with the university that the project aims, in addition to what was mentioned above, to improve the university environment by increasing the spaces. Green spaces and water bodies on campus.

- **Investing in clean energy is our path towards sustainable development: <https://atu.edu.iq/?p=23220>**

The College of Health and Medical Technologies, Kufa, one of the formations of Al-Furat Al-Awsat Technical University, organized a scientific symposium on (clean water and sanitation) with the participation of researchers and specialists. The symposium aims to focus on clean water, sanitation and water sources, which is one of the goals of sustainable development, identifying the types of water and adopting methods for using sanitary hygiene

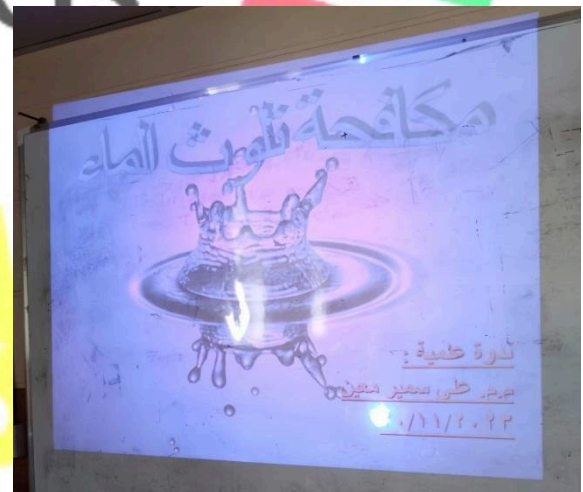


methods. It was delivered by Mr. Prof. Dr. Ahmed Adnan Abdel Amir. It included several topics, including water, types of water, healthy water and hygiene.

Conservation and sustainable use of oceans, seas and marine resources for sustainable development

Objectives include reducing marine pollution; conserving coastal ecosystems, coastal marine areas, and fish stocks; Ensuring small-scale fishermen's access to markets; Protecting marine biodiversity and Environmental sustainability aims to ensure adequate protection of watersheds, groundwater, freshwater resources and their ecosystems. To achieve this goal, the university implemented the following activities:

The university's formations organize various activities to educate about the life of living organisms, urging the subject and the necessity of dealing with water sources through fishing operations in proper ways and not using unfair methods because they negatively affect living organisms and waste fish wealth by addressing the laws, regulations and instructions related to this and distributing posters in volunteer campaigns inside and outside the corridors of the university. Preparing theses and dissertations on life under water. The number of activities, including seminars and workshops, reached (12) activities and research on life under water, and (2) master's theses.



Workshop on life under water



2- He resided The Department of Plant Production Technologies, in cooperation with the Continuing Education Unit at Al-Musayyib Technical College, held a course on (Tigris and Euphrates water pollution, its causes and treatment), The course, which lasted for five days, dealt with knowing the importance of water and what pollution is, knowing the natural and industrial sources of pollution, and the effect of pollutants on water. The course also touched on methods of treating pollution, using modern technologies, and following several recommendations to reduce the problem of pollution.

Both attended the session

Prof. Dr. Ibrahim Mardi Radi

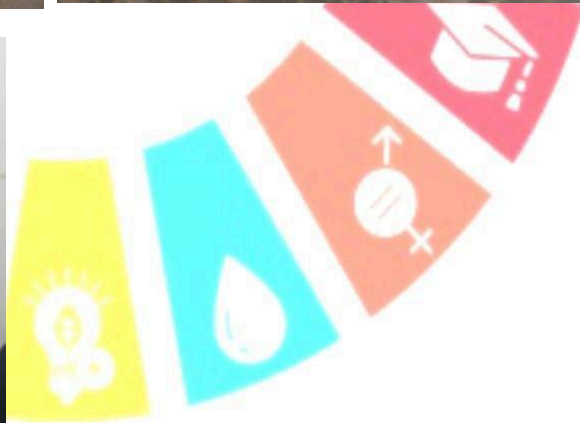
M. Heba Ali Hussein

M. Magda Mohamed Hassan

3- Publishing a number of research papers concerned with water and environmental management, as shown below:

Environmental Assessment Using Canadian Water Quality Index for Hilla River in Babylon Governorate, Iraq	1
Estimations of chemical contents of the musculoskeletal system in two cyprinid fishes Arabibarbus grypus and Leuciscus vorax	2
Potential impact of drought on Mikkes River flow (Morocco)	3
The Effect of Irrigation Water Salinity, Organic Matter, and Zinc Nano-Fertilizer on the Productivity of Sunflower ( Helianthus annuus L.)	4
Efficiency of Silver Nano Particles in Removing Escherichia coli ATCC 25922 from Drinking Water Distribution Pipes Escherichia coli ATCC 25922 from drinking water distribution pipes	5
SOIL POLLUTION STANDARDS WITH HEAVY METALS IN SOILS OF DIFFERENT USES IN BABYLON PROVINCE	6
SOIL POLLUTION STANDARDS WITH HEAVY METALS IN SOILS OF DIFFERENT USES IN BABYLON PROVINCE	7
A new framework for assessing the sustainability of municipal solid waste treatment techniques applying multi-criteria decision analysis	8
Estimation of Muskingum's equation parameters using various numerical approaches: food routing by Muskingum's equation	9

4- Establishing an awareness campaign to raise awareness of World Water Day, targeting students and employees of Al-Musayyib Technical College. The Department of Building and Construction Technologies held an awareness campaign in order to raise the awareness of Iraqi citizens about the critical situation their water resources are going through, and to enhance their sense of responsibility to alleviate the severity of this crisis.





5- A researcher from Al-Musayyib Technical College (Zeina Hussein Ali) obtained a master's degree for her thesis entitled (Improving the quality of drinking water using distribution pipes coated with silver nanoparticles). The thesis dealt with the use of the latest techniques for treating and disinfecting drinking water, which is the technique of partial coating with silver nanoparticles. The study aims to test the performance and capabilities of AgNPs as antibacterial disinfectants, as two types of bacteria most prevalent in drinking water pipes were tested: Escherichia coli and Pseudomonas aeruginosa. This study dealt with the use of the latest drinking water treatment and disinfection techniques, which is the technique of partial coating of drinking water pipes with silver nanoparticles (AgNPs) (as drinking water may be exposed to contamination when it passes through water distribution pipes due to cracks in the pipes or repair, construction and connection processes. The results obtained from the laboratory work showed The AgNPs coating had clear effects against both of these types of bacteria, as high rates of inhibition were recorded, reaching 100% after a few minutes of



passing the bacteria-laden water through PVC pipes partially coated with silver nanoparticles. The exposure time and AgNps concentration had a direct effect. On the rate of bacterial inhibition. In her study, the researcher recommended emphasizing the need to conduct further studies on the long-term work efficiency of tubes coated with AgNPs, in addition to developing a feasibility study to determine the economic cost of the coating process with silver nanoparticles.



6- A research study was prepared on water technologies and the drip irrigation organization in Al Salam Residential Complex, and this study was submitted to Al-Sabtain Contracting Company.

7- The Department of Building and Construction Technology Engineering, in cooperation with the Continuing Education Unit at Al-Musayyib Technical College at Al-Furat Al-Awsat Technical University, and in cooperation with Tanaka University in Malaysia, organized an electronic workshop on Empowering the Future: Innovations in Sustainable Power Generation  
Empowering the Future: Innovations in Sustainable Energy Generation

**The workshop aimed** To introduce participants to the latest innovations and developments in the field of sustainable energy generation and to promote knowledge exchange, cooperation and communication among participants with the ultimate goal of promoting and accelerating the transition towards a more sustainable and environmentally friendly energy generation system.

**The workshop included several topics, the most important of which are:** Presenting innovative technologies and solutions, discussing policies and regulatory frameworks, in addition to addressing challenges and obstacles, enhancing cooperation and partnerships, raising awareness and disseminating knowledge.

Dr. Firas Bassem Ismail, Head of the Energy Research Department from Tanaka University in Malaysia, and Dr. Haider Fawzi Al-Shukarji from Al-Musayyib Technical College, lectured in it, and it touched on various topics related to sustainable energy generation and renewable energy, energy storage solutions, grid integration and smart grids, policies and regulatory frameworks, Sustainable energy generation in developing countries, social and environmental impacts, financing and investment opportunities, as well as future innovations and trends.

**Permanent maintenance of the RO water filtration stations at the institute. There are two unit stations that provide a thousand liters per hour and another that provides 250 liters per hour in the internal departments of the**





institute, and also provides a large number of water sprinklers for the gardens.



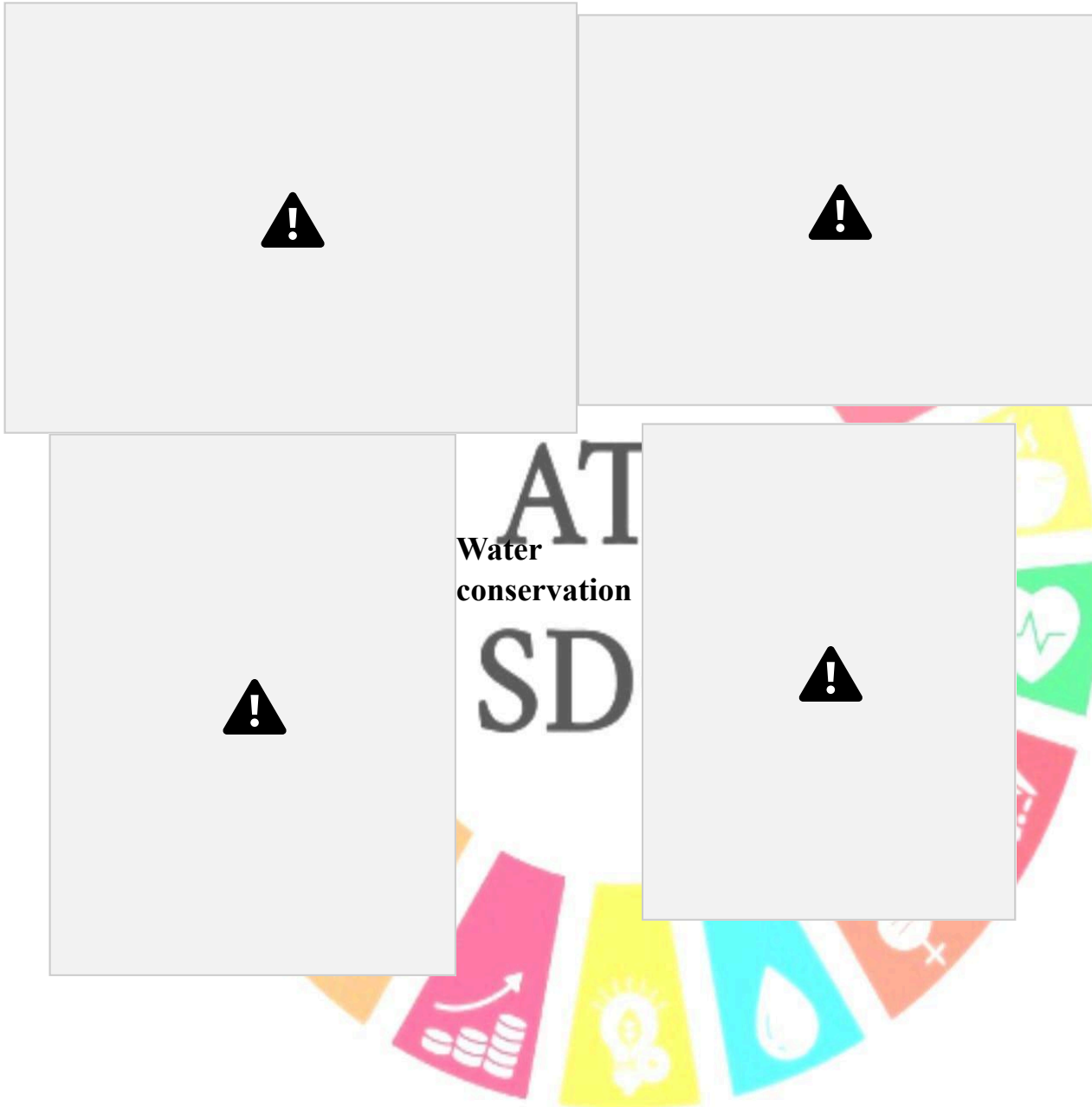
Interest in afforestation campaigns aimed at expanding green spaces and improving the local environment at the institute





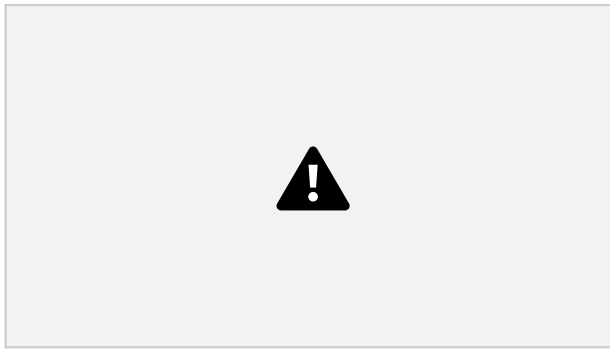
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# SDGs

- **Opening the Zamzam Potable Chilled Water Square and Station project and the computing laboratories building on the university campus in Kufa: <https://atu.edu.iq/?p=22565>**



Within the framework of the university's directions and its endeavor to improve the educational and service infrastructure, the President of Al-Furat Al-Awsat Technical University and in the presence of the Governor of Najaf Al-Ashraf, Dr. Majid Al-Waeli, inaugurated the Zamzam square and station for potable chilled water on the university campus in Kufa and the computing laboratories building at the Institute Kufa.. The project was started at the beginning of July of this year by the engineering staff in the Department of Construction and Projects at the University

Presidency and the Kufa Technical Institute. The project includes construction and



installation of a water filtration system using RO technology and a cooling system to provide chilled water for students with a capacity of 1000 liters in clock, in addition to rehabilitating a square surrounding the station with an area of 1,600 square metres, in addition to other accessories such as student seating terraces, which were equipped with sockets for charging electrical devices, in addition to night lighting for the site. It should be noted that the project is the second of its kind on the university campus in Kufa, where it was previously opened. Al-Kawthar potable water station at the end of 2021. The computer laboratories building was also opened at the Kufa Technical Institute, which includes four laboratories that were equipped with all the necessary requirements of devices, furniture, and equipment that make them model laboratories that provide high-quality training. This was witnessed by the opening ceremony, which was attended by Messrs. Assistants, a number of deans of formations and department directors at the University Presidency, and members and students of the Kufa Technical Institute... witnessed the honoring of the Mr. Dean of the Kufa Technical Institute, Professor Dr. Fadel Sami, the Mr. Director of the Construction and Projects Department at the University Presidency, Dr. Muhannad Al-Khaqani, the Mr. Director of Internal Departments, Dr. Hassan Hadi, and the Director of Diwan Affairs, Mr. Muhammad Abbas and the engineering and technical staff that participated in implementing the project.

- It should be noted that the university has implemented several infrastructure relying on self-financing, namely the establishment of a rainwater drainage network, the project of roofing the middle space and the main gates, the project of roofing the garage, the work of sidewalks in the garage for the streets surrounding the buildings, the project of making fountains and gardens and the establishment of the external fence of the headquarters of the university presidency
- At the campus, all sites of the university have separate sewerage systems. to collect water from different sources and then treat it to be ready to use on the campus.
  - 1- Rainwater harvesting: is a perfect and easy source to collect rainwater in the university by certain systems of pipes to store it in big tanks and then treat it to use later.
  - 2- Lake ( area: 500m<sup>2</sup>): is used for three purposes in the university; first: to water the plants & animals  
second: to keep the environment and third: to conserve water from different sources.
  - 3- Ground Water Tank: Is an additional program to conserve water from different sources as underground water, rainwater ..etc in the university.
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Water Conservation (Al-Furat Al-Awsat Technical University,IRAQ)



Water Conservation - In Ground Water Tank  
(Al-Furat Al-Awsat Technical University,IRAQ)



Water Conservation – Lake (Al-Furat Al-Awsat Technical University,IRAQ)

- The university relies on programs to reduce water consumption in the toilets and buildings by switching faucets to automatic faucets to ensure that the amount of water used is reduced and that it is automatically closed after use and that water is not wasted.



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Water Efficient Appliances Usage (Al-Furat Al-Awsat Technical University,Iraq)



Drip Irrigation (Al-Furat Al-Awsat Technical University,Iraq)

- Establishing fish lakes at university formation sites in accordance with international standards for fish farming
- Holding seminars, workshops, and discussion panels on the necessity of preserving living organisms in water in university formations and in reality.
- Education about stopping overfishing because of the harm it causes to the rest of the living organisms that live in the waters of the oceans, seas and rivers.
- Cleaning the rivers near the university's formations for the purpose of preserving the water and the diversity of organisms in it