



Ensure availability and sustainable management of water and sanitation for all.

Ambassador of SDG 6:

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The challenge of water and sanitation in Tunisia



Tunisia’s aridity combined with its Mediterranean climate variability makes water a resource that is both scarce and unevenly distributed across time and space. Tunisia is one of the North African countries with the scarcest water resources. In 2020, the availability of renewable water was estimated at 359 m³/inhabitant/year, which is below the water stress threshold of 1000 m³/inhabitant/year. A recent report by the World Resources Institute (World Resources Institute, 2021) ranks Tunisia 30th out of 164 countries in terms of exposure to “high” water stress. The dominant sector in terms of consumption is agriculture with about 80%. As in most southern Mediterranean countries, agriculture is providing employment for 20 to 30% of the population, hence the importance of water-food nexus.

Students of Tunis El Manar University (UTM) are sensitized and trained to meet this important challenge by :

- Making economy of water by fighting against waste and leakage and by the return to the relative old tradition of rainwater collecting,
- Using non-conventional resources especially desalination of brackish and sea waters and wastewater reuse,

- Developing virtual water trade.

UTM contribution is ensured by the introduction of teaching modules, the conduct of research work, the supervision of thesis, masters and engineering projects and by the organizing scientific events.



An innovative master's degree on water management

This is a Master project on Agricultural and hYdrological Approaches to a better and sustainable development MAYA, co-funded by the Erasmus+ program involving UTM with three European universities (Sassari-Italy, Gerona-Spain, Aristote-Greece), the Union of Mediterranean Universities and two Tunisian Universities (Carthage, Sfax). UTM's contribution to this project, which covered the period October 2017- April 2021, was coordinated by Professor Béchir HAMROUNI. The master called "Integrated Water Management and Sustainable Agriculture" was developed and accredited in July 2019.

The main innovations of the master's degree

The innovation in the implementation of the master's degree called "Integrated Water Management and Sustainable Agriculture" can be summarized as follows:

- An updated needs assessment of the curricula of the involved Tunisian universities related to water and agroecosystem management has been done at project beginning.
- MAYA project proposed and promoted an innovative learning and teaching modality thanks to the use of a e-learning platform and of a Virtual Reality (VR) educational game developed on water analysis in a scientific virtual laboratory, enhancing students' cognitive capacities.
- The choice of promoting these digital technologies has been very pioneristic and visionary, above all in the light of what happened in 2020, with the COVID-19 pandemic which forced all academic institution to suspend face-to-face lessons.
- The e-learning platform supported teachers and students in learning processes and in developing critical and analytical skills, representing also an interuniversity space where students and teachers from European Union and Tunisia worked together towards a common objective.





Training and research activities

Through its pedagogical structures and its representatives in the National Sectoral commissions on Chemistry, teaching modules have been integrated at the level of masters, licenses and engineering training. Many doctoral and master theses were defended and many papers were published in specialized journals with impact factor.

For the 2017-2021 period, the Number of publications, views and citations were respectively 61, 2373 and 701.

For example the "Desalination and Water Treatment" Research Laboratory supported 11 doctoral theses, published 5 books and 37 papers including the following in a journal whose impact factor is equal to 16,744:

“Single and simultaneous adsorption of Cr(VI) and Cu (II) on a novel Fe₃O₄/pine cones gel beads nanocomposite: Experiments, characterization and isotherms modeling

Manel Touihri, Fatma Guesmi, Chiraz Hannachi, Béchir Hamrouni, Lotfi Sellaoui, Michael Badawi, Jordi Poch, Núria Fiol.

Chemical Engineering Journal, 2021, 416, 129101”.



Organization and contribution to national and university Events

- Participation in the project to develop the vision and strategy of the water sector by 2050 for Tunisia (EAU 2050), led by the Ministry of Agriculture, Hydraulic Resources and Fisheries/ Hydraulic Planning and Balance Office (BPEH).
- Contribution to the launch of the report on the water and sanitation sector in Tunisia (The Water and Sanitation Sector in Tunisia: Baseline Report and Action Plan).
- Scientific events addressed to students, researchers and teachers are organized regularly:
 - Celebration every March 22 of each year the world Water Day by organizing face-to-face or webinar awareness conferences.
 - Workshop on water economy and policy.
 - Maghreb conference on Water Treatment and Desalination organized by the Tunisian Desalination Association in collaboration with the European Desalination Society.




