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MIRRA

Methods for Irrigation and Agriculture

Field Training on Climate-Smart Agri-Technologies for Jordanian and Syrian Youth

MIRRA with AZMUD are set to Advance Agri-Tech Solutions for Soilless Greenhouse Agriculture in the Mediterranean Region

MIT GEAR Lab visits MIRRA Climate Smart Farm for field demonstration with Jordan Valley farmers

MIRRA and MIT Partner to Present at the Shoman Foundation on Energy-Efficient Agriculture

Field Training on Climate-Smart Agri-Technologies for Jordanian and Syrian Youth

This past month, participants in MIRRA's **Nuffic - funded Climate-Smart Agriculture Program** completed their classroom sessions and began field trainings. The participants, made up of Jordanian and Syrian youth, learned how smart agri-technologies and irrigation systems operate and the theory behind managing "smart" technologies. The cohort has also completed courses to improve their English and computer skills at the Applied Sciences University, MIRRA's partner on this project.

A young participant from the Jordan Valley investigates a "smart" irrigation controller that is being piloted at MIRRA's Climate-Smart Farm in the Jordan Valley

In their first field day, the Jordanian cohort visited MIRRA's Climate-Smart Farm in the Jordan Valley. The cohort learned how to operate, manage, and monitor drip irrigation systems. This began with a tour of the Climate Smart Farm, where participants saw the difference in operation and manual systems. The cohort then went into the field and took flow measurements to see which portions of the field were being inadequately irrigated. After completing calculations and analysis, they recommended changes and took water quality measurements at the filters to determine if components needed to be changed. Throughout this, participants were also gaining skills and practical knowledge on the maintenance of smart systems and larger piped irrigation networks.

With the ability to monitor and maintain equipment through their field trainings, MIRRA's participants are nearing readiness to enter the agriculture sector.

Youth participants take flowmeter reading to determine the applied irrigation depth during an irrigation event

For the remaining portion of the training, participants will work in apprenticeships to build business relationships and skills. After completion of this training, the cohort will have the skills and tools to start their own businesses or join into companies in the agriculture sector.

This will be beneficial to participants and their families by increasing income, but will be of significant benefit to local agriculture communities who are in need of skilled labor capable of running smart agriculture facilities.

MIRRA's Irrigation Engineer Khalil Bany Mustafa (left) explains the process of sand filter back flushing for a group of young professionals from the Jordan Valley

MIRRA with AZMUD are set to Advance Agri-Tech Solutions for Soilless Greenhouse Agriculture in the Mediterranean Region

MIRRA is working together with eight partners from Jordan, Egypt, Turkey, France and Spain on the **Improvement of Mediterranean Greenhouses Performance using Innovative Plastic Materials, Natural Additives and Novelty Irrigation Technologies** (abbreviated as AZMUD). Project partners are The project partners are AIMPLAS and IdaiNature from Spain, SmartWall from France, MIRRA and PIC from Jordan, TABIT from Turkey, and NRC from Egypt.

Dr. Samer Talozi presents MIRRA's insights to greenhouses and soilless agriculture

AZMUD is developing six innovative technologies to improve greenhouses' perfor mance.
MIRRA's Climate Smart Farm in the Jordan Valley will be utilized for piloting, testing, and validation of these technologies.
In addition, MIRRA is conducting a Life Cycle Assessment (LCA) of the newly introduced innovative technologies to assess the environmental impact of each of them and to also compare the new technologies with the conventional- already in use technologies.

The partner organizations for the AZMUD project meet in Valencia, Spain

The AZMUD project will focus on reducing the cost of greenhouse operations; mainly the cost of energy and pesticides. AZMUD is developing an innovative heating system that is localized for heating the plant roots based on electrically conductive plastics integrated into standard soilless systems.
This innovative heating system will significantly reduce the cost of energy.
Furthermore, AZMUD will adapt and optimize low-energy drip irrigation systems to the soilless greenhouse's conditions to further reduce the energy needs for greenhouse operations. This project is funded by PRIMA.

MIT GEAR Lab visits MIRRA Climate Smart Farm for field demonstration with Jordan Valley farmers

Prof. Amos Winter of MIT GEAR Lab discusses with participants in the field day various agri-technologies that MIT has developed and are being piloted at MIRRA's Climate-Smart Farm in the Jordan Valley

MIT's GEAR (Global Engineering and Research) Lab visited MIRRA to test and demonstrate agriculture technology with local communities. This visit was a part of a partnership between MIRRA and MIT, which began in 2017, under the "Ultra Low Energy Drip Irrigation for MENA Countries" program funded by USAID.

The MIT team gave presentations to farmers and stakeholders from the Jordan Valley at the MIRRA Climate Smart Farm. Dr. Amos Winter, the Principal Investigator of the GEAR Lab, led a discussion with 28 farmers about the possible use of these low-energy technologies in local farms. The MIT team also discussed how weather sensors could be incorporated for more efficient agriculture.

The MIRRA team and MIT students have installed a variety of weather-tracking sensors at the Smart Farm. The data from these sensors are fed into controllers which increase the water and electric efficiency of irrigation through the farm. There were many questions from the farmers who were interested in seeing more demonstrations of the irrigation equipment and weather controls. Their feedback was useful for understanding how energy-saving techniques like those produced at the GEAR Lab might be better incorporated into Jordanian agriculture. Following these field demonstrations, the MIT GEAR Lab remained at the MIRRA Climate Smart Farm to continue running experiments and setting up future projects.

To hear more about MIRRA's work with partners at the GEAR Lab, please see our LinkedIn page!

MIRRA's Eng. Ammar Namarneh and MIT's Georgia Van de Zande explain a new climate-smart irrigation controller system that is currently being tested at MIRRA's Climate-Smart Farm in the Jordan Valley to a farmer and a young professional from the Jordan Valley.

MIRRA and MIT Partner to Present at the Shoman Foundation on Energy-Efficient Agriculture

MIRRA's partnership with MIT's GEAR Lab continued with a joint presentation at the Shoman Foundation in Amman, Jordan. Dr. Susan Amrose of MIT and Dr. Samer Talozi of MIRRA presented on "Low-Cost Renewable-Powered Electrodialysis Desalination and Drip Irrigation." This collaboration is a part of the MIT "International Science and Technology Initiative" (MISTI) program between MIT and the Abdul Hameed Shoman Foundation.

Their presentation covered MIT's development of energy-efficient technologies for irrigation and on-farm water treatment, as well as MIRRA's observations while using some of these technologies in the field. The presenters concluded with thoughts of how these systems could be integrated into Jordanian agriculture given the need for high-efficiency technologies.

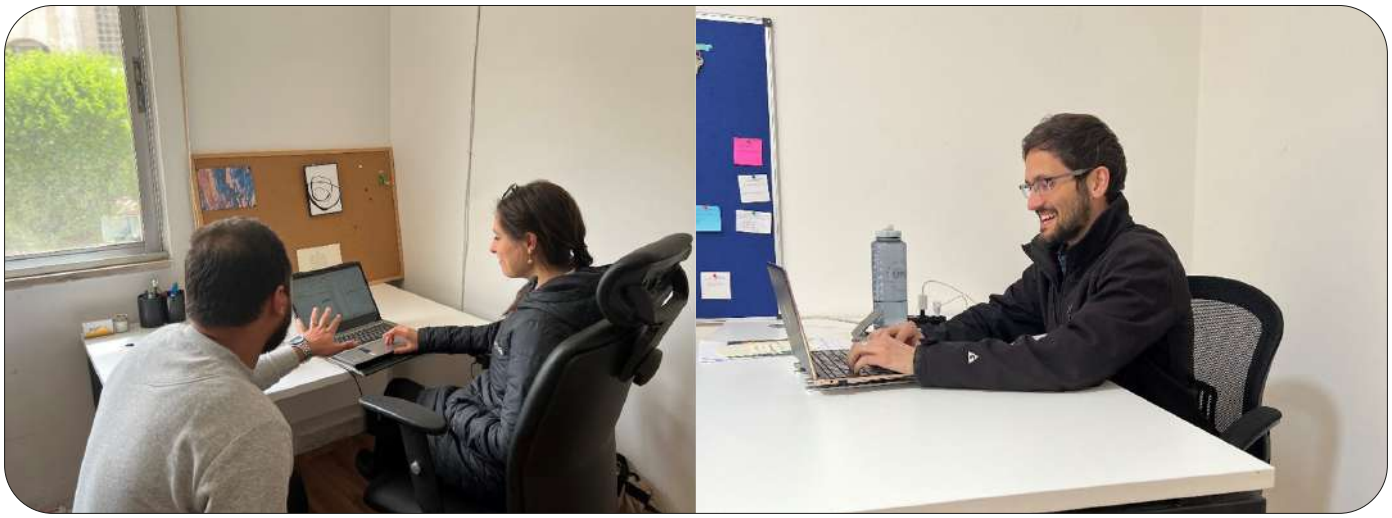
The presentation was well attended, with many businesses and organizations working on agriculture and sustainability being present. Following the presentation, attendees discussed how they thought these technologies might succeed or fail in implementation around Jordan. Their input has helped to plan the next round of conversations with stakeholders.

Dr. Samer Talozi from MIRRA and Dr. Susan Amrose from MIT at the Shoman Foundation in Amman, Jordan present their findings on energy efficient agri-technologies that could be used in Jordan and the MENA region.

MIRRA hosts two Fulbright Researchers

MIRRA has been joined this winter by two Fulbright Researchers, Timothy Purvis and Zoe Robbin. The Fulbright Program is a cultural exchange, where researchers from the United States are hosted by Jordanian organizations to conduct research for 9 months. During their time, both Timothy and Zoe are working on their own projects and supporting MIRRA with additional research.

Timothy is studying the As-Samra wastewater treatment plant in Zarqa, Jordan, and its impacts on water recycling programs in the region. He joins us from UNC Chapel Hill, where he received a Master's degree in environmental engineering. Zoe is studying the history of the Jordan River and the impact of different infrastructures on its water quality and quantity. She joins us from Emory University, where she received Bachelor's degrees in Quantitative Science and Arabic Studies.



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