



## **Ultra-Low Energy Drip Irrigation for MENA Countries**

MIT-MIRRA Quarterly Report

Year 1, Quarter 1: October – December 2016

## PROJECT FACT SHEET

**PROJECT TITLE:** Ultra-Low Energy Drip Irrigation for MENA Countries

**FUNDING AGENCY:** United States Agency for International Development (USAID),  
Middle East Water Security Initiative (MWSI) - BAA- MWSI-  
ME-2015

**START DATE:** September 20<sup>th</sup>, 2016

**END DATE:** September 19<sup>th</sup>, 2019



### IMPLEMENTING PARTNERS IN JORDAN:

**Methods for Irrigation and Agriculture (MIRRA)** - a Jordanian non-governmental organization that specializes in the development of water and agricultural sectors including optimizing pressurized irrigation networks at field and network levels, wastewater reuse in agriculture and capacity-building activities for individuals and institutions.



<http://mirra-jo.org>

**MIT Global Engineering and Research (GEAR) Lab**, the lead organization and creator of the drip irrigation emitters capable of maintaining a constant flow rate and matching the pressure of competing products at 50% of the energy required of conventional drippers.



<http://gear.mit.edu>

**Jain Irrigation, Ltd.**, is the second largest micro irrigation company in the world, based out of India. Its role in the project is producing the prototype emitters so that they can be installed in the field by MIRRA.



<http://www.jains.com/>

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The collaborative efforts of Massachusetts Institute of Technology's Global Engineering and Research ([GEAR](#)) Lab, Jordan-based Methods for Irrigation and Agriculture ([MIRRA](#)) and India-based [Jain Irrigation, Ltd.](#) are underway with the goal of **reducing the amount of energy used to pump water in irrigation systems**, allowing drip systems to run on low-pressure municipal water and pave the way for the introduction of low-cost, solar-powered drip irrigation.

Between October and December 2016, MIRRA, operating as the research facilitator and coordinator of the project's on-the-ground investigative role as an MIT sub-contractor in Jordan, recruited staff, visited potential project sites, and held discussions with MIR, International Center for Agricultural Research in the Dry Areas ([ICARDA](#)) and Jordan's National Center for Agricultural Research and Extension ([NCARE](#)).

Also, the principal investigator of the project, Dr. Amos Winter of MIT, visited Jordan to discuss project plans, finalize the corresponding terms of agreement between MIT and MIRRA and outline the specifications of potential farms to be included the project.

Reducing the energy used to pump water is the primary objective of the project. However, there are also larger implications of this collaboration as discussed during Dr. Winter's visit that further highlight the potential impact of the project:

- With ultra-low drip irrigation emitters, farmers should be able to use wastewater with drip irrigation systems.
  - Currently farmers avoid using wastewater with drip irrigation systems because drippers are prone to clogging which can be avoided by installing filtration systems. However, in Jordan, many farmers avoid using filtration systems because it lowers the pressure in the system. Therefore, **we believe that the MIT's ultra-low pressure emitters will allow Jordanian farmers to use drip irrigation with wastewater combined with a filtration system.** This, however, must be tested in the field.
- Installing the low-pressure systems could improve the performance of irrigation systems in the water-poor country of Jordan, where about half of the country's water supply is used in irrigation (Ministry of Water and Irrigation) <sup>1</sup>.

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<sup>1</sup>Jordan's Ministry of Water and Irrigation (2016). *National Water Strategy of Jordan 2016 2025*. Pdf: [http://www.mwi.gov.jo/sites/en-us/Hot%20Issues/Strategic%20Documents%20of%20The%20Water%20Sector/National%20Water%20Strategy\(%202016-2025\)-25.2.2016.pdf](http://www.mwi.gov.jo/sites/en-us/Hot%20Issues/Strategic%20Documents%20of%20The%20Water%20Sector/National%20Water%20Strategy(%202016-2025)-25.2.2016.pdf)

- Gaining an understanding of the types of crops widely used across the MENA (Middle East and North Africa) region is to enable MIT to design a generalized technology to save energy, enable water uniformity to ensure less clogging, and standardize uniformity of irrigation and quality.
- Additionally, the project's partnership with Jain Irrigation, Ltd. in India is to help facilitate the development of the low-pressure emitters for eventual distribution.

In preparing for the next stage(s) of the project, Dr. Samer Talozi, MIRRA board member, visited both private and state farms to assess their applicability as test sites. Dr. Talozi met with NCARE as a potential partner with which to do project work and had visited several of NCARE's field units in Mafraq, Irbid, and Ajloun.

Officially recognizing the project in Jordan started with MIRRA submitting the paperwork for approval by several Jordanian authorities during the second quarter. Submissions were sent to the Ministry of Social Affairs, the Ministry of Interior, the Ministry of International Planning and Cooperation, the Ministry of the Environment, and the Ministry of Water and Irrigation.



METHODS FOR IRRIGATION  
AND AGRICULTURE

