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# **HARNESSING MARKET SYSTEMS FOR WATER CONSERVATION IN JORDAN**

LUIS E. OSORIO-CORTES - SEPTEMBER 2022



# Executive Summary

The Water Innovation Technologies (WIT) program is one of the first large-scale applications of the Market Systems Development (MSD) approach to water conservation, and the first one of its kind in Jordan. It was funded by the United States Agency for International Development and implemented between 2017 and 2022 by Mercy Corps, in collaboration with the International Center for Biosaline Agriculture, the International Water Management Institute, the Jordan River Foundation and the Royal Scientific Society.

WIT's main objective was to save water through the sustainable adoption of water-saving technologies (WSTs) and practices by farmers and households. The program led to total savings of 28 million cubic meters (MCM) of water in the agricultural sector and at community and household levels. These savings exceeded the original target of 18.5 MCM by 51% and are equivalent to 11,000 Olympic pools.

Agriculture water savings amounted to 24 MCM, which represent almost 10% of all the underground water consumed by the agriculture sector in 2017. The program achieved these results at extremely low costs per MCM, compared to other initiatives. Furthermore, the rate of return for farmers who invested in WSTs and approaches was approximately 450%.

The WIT program worked on two market systems: agricultural irrigation and domestic consumption. This report focuses exclusively on the former, mainly because agriculture is the biggest user of water globally. In addition to the impacts mentioned above, the report also discusses WIT's evolution and the main areas of intervention from an MSD perspective.

**Regarding WIT's evolution**, the program design was based on a combination of institutional knowledge of the local context, experience from previous programs and market analyses commissioned by the program. During the initial stages of implementation, the team invested heavily in stakeholder engagement and partnership building. This was followed by an effort to better align interventions with MSD principles, and a shift towards co-creation, piloting and improvement of the partners' business models. As the program matured, it continued deepening its partnerships, and promoting business innovation, adoption of WSTs and crowding-in through a combination of financial incentives, technical support and awareness-raising.

WIT's evolution shows the importance of a team that can adapt quickly to market requirements and unforeseeable challenges and opportunities (including the Covid pandemic). For example, dropping interventions that have little traction (e.g., training of farmers on financial literacy), using market actors' feedback to promote innovation, and monitoring structural changes in the market. This enabled the team to adjust their strategies based on evidence, identify and engage strategic partners, find leverage points, and deliver impressive impacts at very low costs compared to other water-saving initiatives.

WIT's experience confirms that highly adaptable teams who can put MSD principles into practice require specialized MSD expertise, a senior leadership committed to building the right staff competencies and promoting a learning culture, discipline to avoid resorting to direct delivery and handouts, and the support of donors who understand and value the MSD approach.

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**Regarding WIT's intervention areas**, the report identifies four main areas that significantly contributed to structural improvements in the WST market and water saving:

- › **Access to information on benefits and availability of WSTs:** This section covers interventions to increase farmers' access to information through WST providers and mass media. A key element was to avoid producing and disseminating the information itself; instead WIT emphasized working with and through partner market actors, such as irrigation equipment suppliers and the media. To support suppliers

with their marketing strategies, WIT worked with a research firm to survey hundreds of 400 farmers on what would encourage or hold them back from adopting WSTs. After learning that some farmers who adopted WSTs were frustrated by the maintenance of the irrigation systems, WIT worked with suppliers to improve their after-sales services and set up demonstration sites to promote good maintenance techniques among farmers. While the MSD approach was new to farmers, used to receiving subsidized support from NGOs, WIT trained field staff as “influencers” to explain WIT’s approach and brokered relationships between the farmers and WST providers.

In tandem, WIT trained journalists, government officials, utilities media staff and social media activists on key water conservation issues and solutions and promoted a network of water journalists in Jordan. This resulted in the trainees proactively reporting on water conservation issues and raising awareness about the water situation in Jordan.

**Facilitation principle at play:** *Help private sector actors improve or find sustainable business models to provide inputs and services to the target groups.*

- › **Building capacity for engagement between market actors:** This section shows how WIT built the capacity of financial institutions and WST providers to engage with their core customers more effectively. The program organized a workshop for banks on the business potential of financial products to promote farmers’ investments in WST, and trained loan officers on the latest WSTs and strengthened their skills to evaluate loan applications related to irrigation investments. It also helped WST providers transition from a mindset of short-term sales to one of long-term value addition and customer satisfaction and loyalty.

In an effort to promote more efficient irrigation practices, WIT worked with suppliers’ staff on WSTs and technical areas related to pre- and post-sale services, such as water accounting, irrigation management, marketing, water auditing and safe pesticide use. WIT also designed and implemented the Results-Based Service Package (RBSP) to motivate suppliers to improve their services to farmers by reimbursing them for each cubic meter of water saved by farmers as a result of supplier’s support. The RBSP included support to suppliers to adopt irrigation systems design software, produce awareness-raising materials, improve their marketing strategies, establish client feedback mechanisms, and conduct field sales and servicing activities. By the end of the program, after only one year of implementation, it is estimated that the RBSP contributed to improved irrigation services that helped farmers save 2.7 MCM of water.

**Facilitation principle at play:** *Build the capacity of strategic market actors to increase the frequency and quality of their interactions with their core customers.*

- › **Access to finance to enable investments in WSTs:** This section shows how WIT worked with financial institutions to help them tailor their products to make them more relevant for farmers interested in WSTs. It also describes how the program introduced financial incentives to encourage irrigation suppliers to improve sales and after-sales services. Due to challenges in collaborating with private sector banks, WIT pivoted to work with a government-owned bank, Agricultural Credit Corporation (ACC), to earmark almost USD 3 million for loans to help farmers invest in WSTs. To train loan officers on WSTs, WIT partnered with NARC (National Agriculture Research Center), an agency under the Ministry of Agriculture, to design and deliver a training course. WIT also influenced the Central Bank of Jordan (CBJ) to enable ACC to expand their credit line for WST loans. This led ACC to earmark USD 14 million in the second year (2021) of the program. This resulted in a win-win for all: the ACC expands its activity in the agriculture sector, NARC’s research and knowledge benefits farmers, the bank’s agents improve the relationships with their clients, and farmers get the advice needed to invest in WSTs.

WIT developed an Investment Fund (IF) to encourage WST suppliers to innovate by providing co-financing and technical assistance to carry out innovative solutions designed to overcome market constraints and promote farmers' adoption of WSTs. Eight companies received support from the IF to install and automate irrigation systems, test weather and soil-humidity sensors, and assess the effects of promotional and educational campaigns, to name a few innovations. The IF led to savings of approximately 13 MCM by the end of 2021 and made participating farmers more aware of the benefits of efficient irrigation systems and practices, such as higher yields and quality, and reductions in operational costs.

**Facilitation principle at play:** Provide support and create incentives for strategic market actors to improve the relevance and affordability of their services.

- › **Creation of spaces for interaction and learning:** This section shows how WIT created spaces, such as sectoral meetings and multi-stakeholder dialogues, to enable market actors to connect, share their views on opportunities and risks, identify common interests and come up with ideas to overcome sectoral challenges. For instance, WIT hosted the first Jordan Irrigation Industry Meeting to bring irrigation equipment suppliers together to learn from each other and find common ground for collaboration. The meeting led to the implementation of demonstration sites and partnership agreements with irrigation companies to promote the demand of WSTs. This was followed by dialogues that convened financial institutions, community based organizations, irrigation suppliers and farmers on financial services for agriculture with the ACC, which resulted in the Jordan Loan Guarantee Corporation (JLGC) agreement to guarantee loans for financial institutions.

Supplier-led field days and demonstration sites were additional interventions that led to improved relationships between WST suppliers and farmers with benefits for both parties through increased sales and farm productivity. Demonstration sites, in particular, helped farmers to resolve their doubts about WSTs and convinced them to invest their own money to install additional WSTs on their farms.

- › **Facilitation principle at play:** Create opportunities for diverse types of market actors to meet, share information and explore opportunities for collaboration and win-win outcomes.

The analysis of the main areas of intervention shows how MSD principles - such as systems thinking, facilitation and stakeholder-driven change, informed WIT's interventions. For example, the engagement of non-sectoral but strategic market actors (e.g., journalists); the facilitation of relationships between farmers and WST providers, and between banks and research institutions; and the emphasis on information flows, post-sales services and farmers' awareness of WSTs' economic benefits. These interventions led, not only to impressive water savings during the program, but also to structural transformations in the irrigation market system that are likely to continue delivering impacts well beyond its end. External evaluators calculate that ex-post water savings will amount to 65 MCM by 2029 (3.5 times the original target).

WIT generated important lessons on how to use MSD to save water at a large scale, and its outcomes are crucial to achieving the goal of sustainable water management. However, higher irrigation efficiency can contribute to intensification of water scarcity through increased water consumption. In order to continue moving closer to this vital goal, future initiatives of this kind will have to deepen their collaboration with the government and community leaders to create and enforce policies that strike a balance between water use and conservation. In the context of climate change and increasing food insecurity, similar MSD programs that incorporate WIT's lessons are urgently needed around the world.

## CONTACT

LUIS E. OSORIO-CORTES  
Sr Advisor - Market Systems | Markets and Cash  
[losoriocortes@mercycorps.org](mailto:losoriocortes@mercycorps.org)

ALISON HEMBERGER  
Director | Markets and Cash  
[ahemberger@mercycorps.org](mailto:ahemberger@mercycorps.org)

DARIUS RADCLIFFE  
Country Director | Mercy Corps Jordan  
[dradcliffe@mercycorps.org](mailto:dradcliffe@mercycorps.org)

EMMA MÉNDEZ  
Director | Program Performance and Quality  
[emendez@mercycorps.org](mailto:emendez@mercycorps.org)

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45 SW Ankeny Street  
Portland, Oregon 97204  
888.842.0842  
[mercycorps.org](http://mercycorps.org)