MIRRA

Methods for Irrigation and Agriculture

لتطوير أساليب الري والزراعة

NEWSLETTER

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Global Water Partnership Mediterranean

AMERICAN UNIVERSITY OF BEIRUT

MIRRA Methods for Irrigation and Agriculture

INRGREF

INRA Institut National de la Recherche Agronomique

ICARDA Science for resilient livelihoods in dry areas

CATÓLICA CBQF - CENTRO DE BIOTECNOLOGIA E QUÍMICA FINA LABORATÓRIO ASSOCIADO

Oxfam

LAU الجامعة اللبنانية الأميركية Lebanese American University

CSIC Consejo Superior de Investigaciones Científicas

Kicking-Off with EU PRIMA

The Partnership for Research and Innovation in the Mediterranean (PRIMA) is a program that funds research and development into innovative solutions for climate resilience in the Mediterranean region. Funded by the European Union, EU-PRIMA has a long history supporting projects in water management, agriculture, and the Water-Energy-Food-Ecosystems nexus in the Mediterranean region. On the north coast of Portugal in the city of Porto, a new phase of cooperation between EU-PRIMA and Jordan began during the kick-off meeting for the project **NUSTALGIC** (**N**eglected and **U**nderutilized **S**pecies for Wat**e**r h**a**rvesting and Bui**l**din**g** Cl**i**mate **C**hange Resilience). This two-day event inaugurated the beginning of a three-year project to strengthen food security and water efficiency in Mediterranean countries by reintroducing traditional crops and hydro-technologies.

Project Donor

PRIMA PARTNERSHIP FOR RESEARCH AND INNOVATION IN THE MEDITERRANEAN AREA

Co-funded by the European Union

Picture 1: The NUSTALGIC KOM was held at the Universidade Católica Portuguesa in Porto, Portugal where consortium partners had the opportunity to meet and discuss their roles in the project and share their insights for moving forward in the initial program steps.

With a consortium representing Jordan, Lebanon, Portugal, Spain, Tunisia, Italy, Greece, Morocco, NUSTALGIC is an interdisciplinary team of researchers with specializations in biology, plant genetics, agriculture, climate change, gender studies, economics, and hydrology.

Between July 7th and July 8th, MIRRA joined partners from around the Mediterranean region to discuss the initial phase of NUSTALGIC. The first day began with welcoming remarks from Dr. Marta Vasconcelos from the Universidade Católica Portuguesa (UCP), followed by a presentation of the project's overarching vision. All consortium partners introduced their roles through an engaging "Partner Map" activity and interactive sessions focused on underutilized crops and water technologies. A dedicated roundtable was held on "Strategies for Collaboration Within and Beyond the NUSTALGIC Project," emphasizing the interdisciplinary and participatory nature of the initiative.

Day two featured introductions to the project's advisory board and sessions on communication strategy, financial administration, and a forward-looking schedule of NUSTALGIC events. The meeting concluded with a visit to Quinta da Aveleda, offering participants cultural immersion through garden tours. Consortium partners had ample opportunity to discuss their own work, get to know the other partners, and build a stronger understanding of each organization's specialty.

MIRRA's Goals and Objectives under NUSTALGIC

The NUSTALGIC project recognizes the intersectionality of climate change's impact on agriculture, society, and the environment. To this end, NUSTALGIC has several objectives that will promote the cultivation of neglected and underutilized species (NUS) with water harvesting technologies in a manner that engages with farmers and stakeholders as a method of awareness-building, capacity-building, and co-designing technologies to increase local ownership of all implemented technologies.

Objective 1: Increase on-farm water harvesting and efficiency

Objective 2: Diversify agricultural Systems, improve soil health and resilience to climate change

Objective 3: Create new job opportunities and develop new products and value chains using NUS species

Objective 4: Implement a robust multi-stakeholder engagement strategy across diverse sectors and levels

A core goal of NUSTALGIC is programming that targets women, youth, farmers, and urban consumers. NUSTALGIC places special emphasis on empowering women farmers and providing guidance on how to promote new cooking patterns that encourage the cultivation and purchasing of NUS species. Farmers will participate in project events for hands-on experience with these alternative farming techniques.

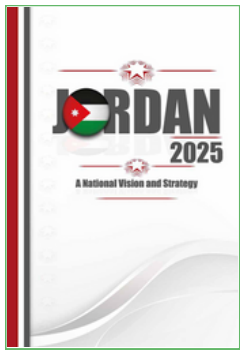
The Porto Kick-off Meeting successfully unified all project partners around a shared mission: revitalizing forgotten crops, traditional water technologies to address agricultural challenges, and gender-transformative programming that empowers rural communities. As the project progresses, NUSTALGIC promises to deliver impactful, nature-based solutions for climate-smart agriculture across the Mediterranean.

Picture 2: NUSTALGIC partners share their roles, experiences, and the initial planning for project activities

Catalyzing Sustainable Development in Jordan: MIRRA's Project Portfolio and its Support of Jordan's National Strategies

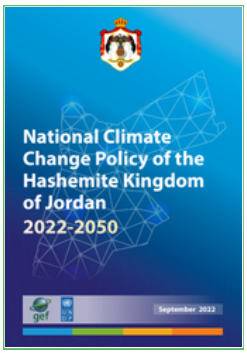
Introduction

MIRRA's project history is closely aligned with Jordan's national priorities and strategic policy frameworks. From climate resilience to digital transformation, water security to inclusive governance, MIRRA is contributing directly to the achievement of the country's ambitious goals. This article illustrates how each of MIRRA's projects aligns with specific national strategy plans for greater insight into how MIRRA is contributing to Jordan's developmental goals.



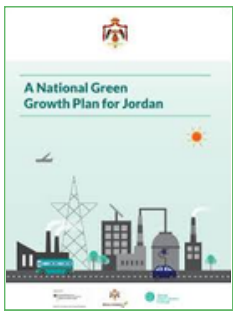
Jordan Vision 2025

National Water Strategy 2023–2040



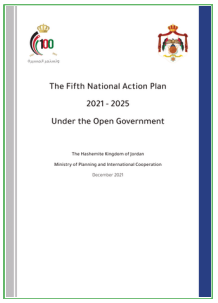
National Climate Change Policy 2022–2050

Economic Modernisation Vision 2023–2025

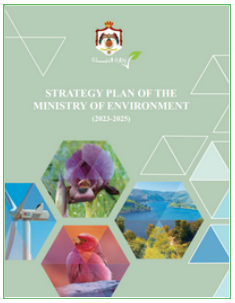


Green Growth National Action Plan (GG-NAP) 2021–2025

National Digital Transformation Strategy 2021-2025



Open Government National Action Plan 2021–2025



Strategy Plan for the Ministry of Environment 2023–2025

Picture 1: Jordan's National Strategic Plans

Strategic Alignment Overview

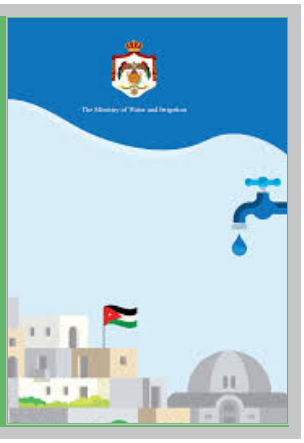
We mapped MIRRA's key initiatives against the most relevant national strategies, including:

Jordan Vision 2025

A comprehensive, long-term roadmap aiming to transform Jordan into a resilient, competitive, and inclusive economy. It emphasizes governance reform, economic development, job creation, environmental sustainability, and improved public services.

National Water Strategy 2023-2050

Focuses on sustainable water resource management, improved efficiency, alternative water sources (like treated wastewater), and resilience to climate change impacts. It also targets institutional reforms and capacity development.

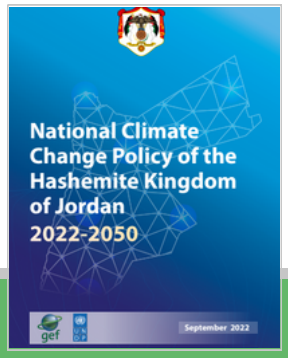


Green Growth National Action Plan (GG-NAP) 2021–2025

This plan promotes sustainable economic growth by integrating environmental considerations into sectors such as energy, agriculture, transport, and water. It supports low-emission, resource-efficient practices to reduce environmental degradation and climate vulnerability.

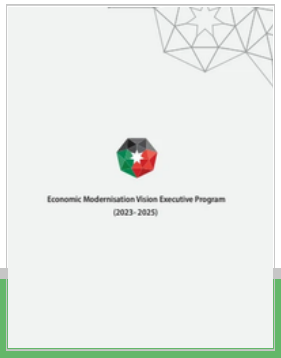
Strategy Plan for the Ministry of Environment 2023–2025

Outlines goals for environmental protection, biodiversity conservation, pollution reduction, and promotion of environmental education and sustainable resource use.



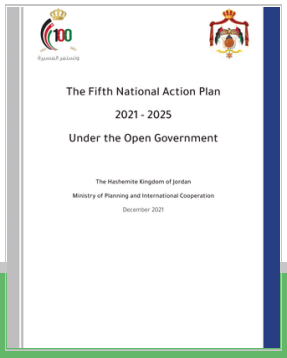
National Climate Change Policy 2022–2050

A long-term policy to enhance climate resilience and reduce greenhouse gas emissions. It includes sectoral adaptation strategies, promotes clean energy, and supports community-based climate action



Economic Modernisation Vision 2023–2025

Aims to revitalize Jordan's economy through innovation, digitalization, green growth, job creation, and investment in key sectors including agriculture, tourism, and information technology.



Open Government National Action Plan 2021–2025

Focuses on transparency, citizen engagement, and accountability in public institutions. It includes measures to enhance access to information, participatory policy-making, and responsive governance.

National Digital Transformation Strategy 2021-2025

Guides Jordan's shift toward a digital economy. It supports e-governance, digital literacy, innovation, and smart technology adoption across sectors, especially agriculture, education, and public services.

Project Contributions to Jordan's National Strategies

Several of our initiatives have made important steps towards translating Jordan's national strategies into a lived reality. Read below how each of our recent projects have supported Jordan's policies and strategic goals:

Training of Trainers (ToT) on Irrigation Techniques and Practices through Theoretical and Practical Approaches Using Technology-Mediated Education (TMEs)

Description: A 5-day training program organized by MIRRA to equip agricultural engineers with practical and theoretical knowledge in reuse irrigation, fertigation, and smart irrigation systems using TMEs, held at MIRRA's Climate-Smart Farm.

Impact: The project enhances national capacity in wastewater reuse, smart irrigation, and climate-resilient agriculture, enabling large-scale knowledge dissemination through trained trainers.

WIT: Advancing Water Innovative Technologies at Selected Farms

Description: A 12-month project implemented by MIRRA and funded by USAID/Mercy Corps, aimed at improving water efficiency on 17 farms across northern Jordan by optimizing irrigation systems and training recent agricultural engineering graduates.

Impact: The project improved irrigation infrastructure, reduced water and energy consumption, and enhanced the employability of young engineers in sustainable agriculture.

FUSE Project: Food-Water-Energy for Urban Sustainable Environments

Description: A 3-year research and policy project (2019–2021) focused on modeling the interconnected food-water-energy (FWE) systems in Amman, using participatory workshops and sustainability visioning to develop data-driven strategies for long-term urban planning.

Impact: FUSE introduced an integrated systems model and participatory planning tools to inform national decisions on urban resilience, resource sustainability, and climate adaptation in Amman.

Project Highlights and Policy Linkages

Water-Wise Schools

Description: A 4-month initiative led by MIRRA to train schoolteachers and maintenance staff on greywater treatment, rainwater harvesting, and efficient water use through workshops in 9 schools across Jordan.

Impact: The project strengthened awareness and technical capacity in water reuse and environmental education in public schools, contributing to sustainable water practices at the grassroots level.

SAHARA Project: Innovative and Food Production inside the Water-Energy-Food Nexus inside Jordan

Description: A capacity-building training program implemented in partnership with Hussein Technical University, aimed at empowering 15 unemployed female agricultural engineers with hands-on technical and entrepreneurial skills in climate-smart agriculture and irrigation systems.

Impact: The project bridged the skills gap in Jordan's agriculture sector by preparing female engineers for green jobs, enhancing national capacity in sustainable food and water systems, and fostering inclusive labor market access.

NUFFIC I: Enhancing Capacities of Syrian and Jordanian Youth on Smart Agriculture

Description: A 12-month hybrid training initiative implemented by MIRRA and Applied Science University, aiming to equip 40 Syrian refugees and underprivileged Jordanian youth with practical skills in smart agriculture, digital literacy, and entrepreneurship to increase employability and self-reliance.

Impact: The project bridged the gap between education and labor market needs in the agriculture sector, empowered youth (especially women), and promoted sustainable, tech-driven agricultural practices.

NUFFIC 2: Empowerment of Syrian Refugee Widows and Capacity Development in Plumbing, Greywater Treatment, and Reuse in Agriculture (ESWP)

Description: A 12-month vocational training project implemented by MIRRA and partners in Ramtha and Irbid, targeting Syrian refugee widows and underprivileged Jordanian youth to develop skills in plumbing, greywater treatment, irrigation reuse, and life skills for income generation.

Impact: The project enhanced employability and self-reliance for marginalized women while promoting sustainable water practices through greywater reuse and leak reduction.

Enhancing Food Security through Piloting Agroecology Practices and Capacity Building

Description: A 9-month project implemented in Azraq by MIRRA and UNDP, introducing sustainable agroecology practices such as intercropping, crop rotation, and drip irrigation to improve soil health, water efficiency, and farmers' capacity in an arid and climate-stressed region.

Impact: The project helped restore soil productivity and reduce water and energy consumption while building farmer knowledge and gender-inclusive participation in climate-resilient agriculture.

Project Highlights and Policy Linkages

Tuning Water Delivery to Evapotranspiration using Ultra-Low Energy Drip Irrigation and Commercializing it in the MENA Region

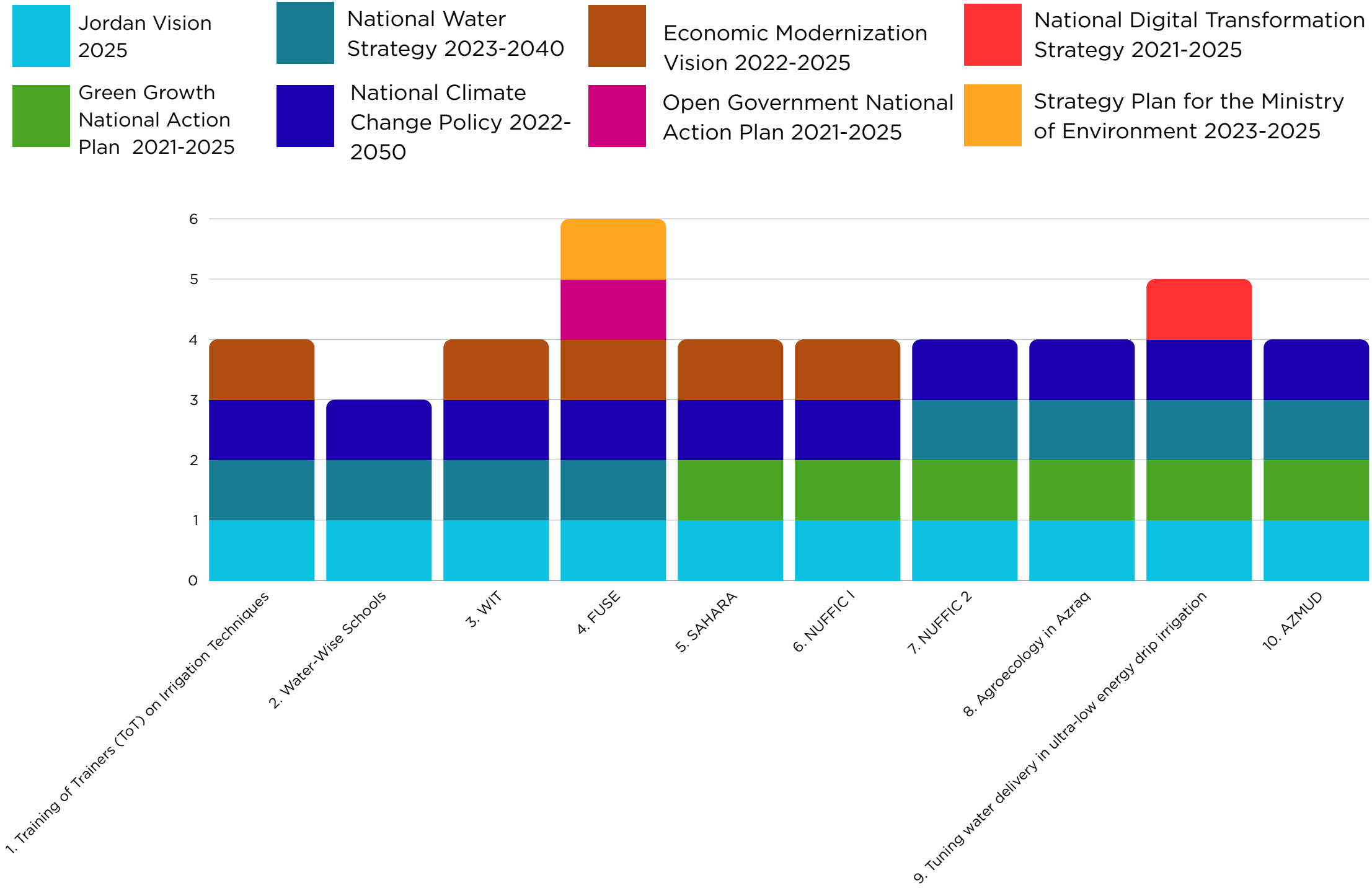
Description: This project pilots a smart irrigation system using real-time sensor data, an irrigation app, and the Grafana Control Panel to optimize water use and crop performance in grape and okra trials at MIRRA's Climate-Smart Farm.

Impact: This project introduced a smart irrigation system tailored to crop water needs, significantly improving water use efficiency and reducing emitter clogging in grape, potato, and okra fields at MIRRA's Climate-Smart Farm. It also demonstrated potential cost savings and sustainability benefits to farmers through low-pressure, low-energy emitters and data-driven irrigation management.

AZMUD: Smart Fertigation and Wastewater Reuse for Sustainable Agriculture in the Mediterranean

Description: AZMUD is a PRIMA-funded project that develops and tests smart fertigation systems and low-cost wastewater reuse technologies tailored for Mediterranean agriculture, aiming to increase resource efficiency and reduce environmental impacts across pilot sites in Jordan, Spain, Tunisia, and Turkey.

Impact: The project promotes sustainable water reuse, energy-efficient fertigation, and climate-resilient practices in arid farming systems, contributing to water security and innovation in agricultural management.



MIRRA projects are aligned with national strategies according to the defined objectives:

OPINION ARTICLE

Water Scarcity, NGOs, and Innovation Through Knowing What We Don't Know

Any visitor entering Jordan's capital city of Amman becomes acquainted with the country's water scarcity crisis almost immediately. One of the city's most striking features is its deep orange sunsets that reflect the city's limestone visage. However, any bystander admiring the city's skyline is presented with more than just a sea of beige, blue, and orange: white water containers dot the landscape – an oddity to most outside observers – and a stark reminder of the country's perennial water challenge.

These containers are a useful entry point into understanding Jordan's water scarcity for two reasons First, their simple presence is often the first encounter for people to see water scarcity in the form of supplementary structures that embodies the, often ad hoc, solutions to addressing water scarcity. The second reason, and perhaps more important, is that their simplicity is a physical metaphor for how we misunderstand water scarcity, or at the very least, misjudge the scope of the issue.

Visualizing Jordan's water crisis as simply an issue of supply – either not having enough or needing to store more water – misrepresents the full scope of what causes water scarcity and who is affected by it. What is unseen is crucial to understanding, and this is where NGOs like MIRRA can play a significant role.

Picture1: White water tanks standing tall under the warm glow of an orange sunset.

Water scarcity is often imagined exclusively as a domestic water issue: families running out of water for laundry, or going to great lengths for conserving every drop for cooking or drinking. However, it is important to recognize that **water scarcity** is about consumption patterns. Even water scarce countries like Jordan may have large amounts of water available, but consumption dictates how and where water scarcity may be felt in society.

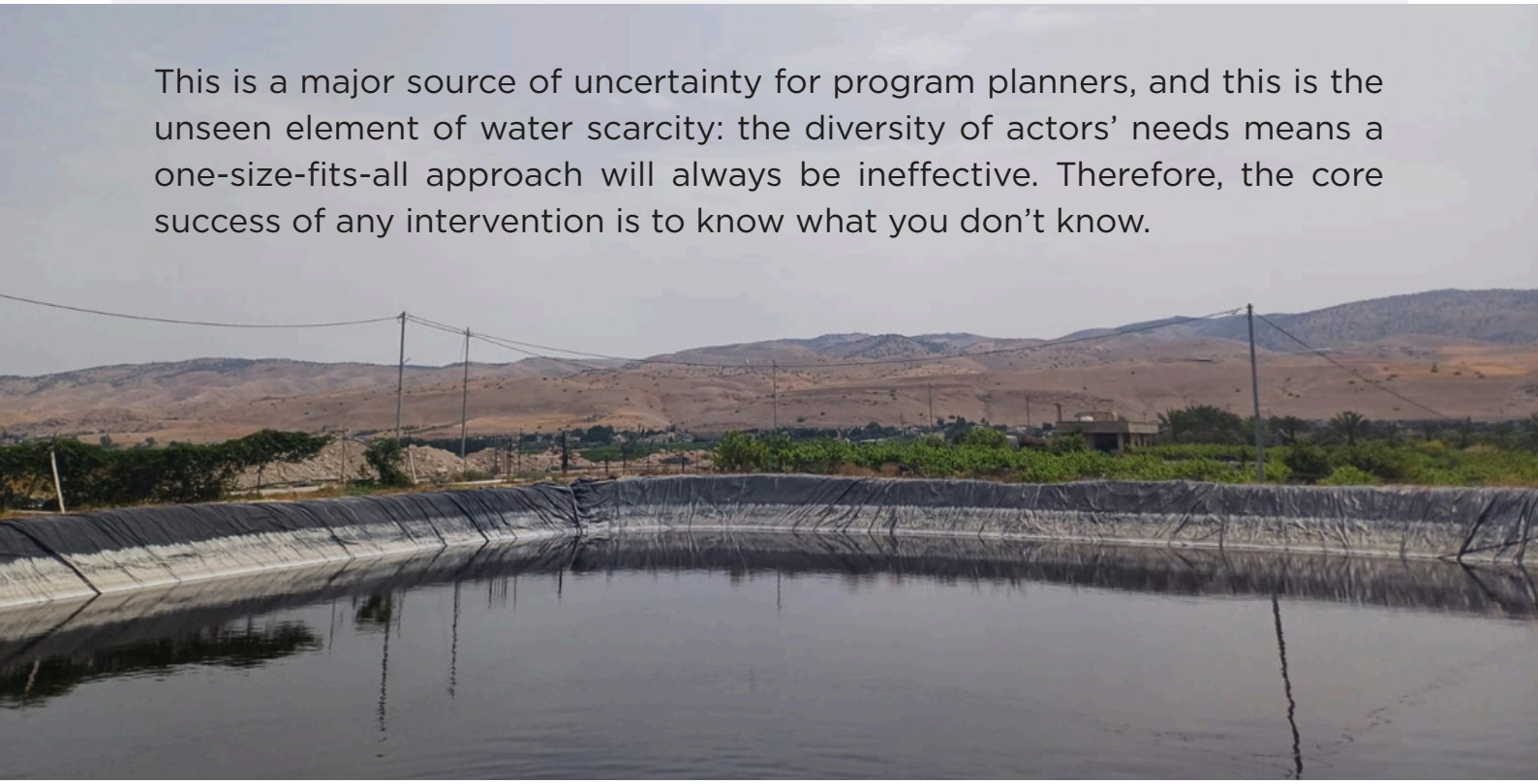
For most of the world, agriculture consumes the vast majority of water resources. The global water footprint of agriculture is around **70%,** and in Jordan, around **51%** of the country's scarce water resources are currently being used in irrigation.

This means two things: the most dire consequences of **water scarcity** will impact food and farmers first with significant social and economic consequences. The full extent of how this challenge will manifest, however, is not always clear.

Water is a highly interconnected resource whose management is correlated with many other natural and human resources. Moreover, farmers are not a homogenous group.

The socio-economic conditions of farmers will vary across geography, and the needs of small farmers are very different from larger, commercial farms. Therefore, we cannot always anticipate how and where water scarcity will impact the agriculture sector.

This is a major source of uncertainty for program planners, and this is the unseen element of water scarcity: the diversity of actors' needs means a one-size-fits-all approach will always be ineffective. Therefore, the core success of any intervention is to know what you don't know.



Picture 2: A plastic-lined pond commonly used in the Jordan Valley to store water

The good news is that there is a very effective, low-cost solution to managing this risk: talking to farmers. Sustainable solutions are a two-way road with the most impactful pathways being built for end-users. This naturally creates a knowledge gap. While many technical solutions may exist to address challenges related to water, energy, or agriculture, these must be tailored to the unique context to adequately address the lived experiences of farmers.

Therefore, farmers' experiences and knowledge must be integrated into the creation of technical or policy solutions. These relationships are not incidental: they are the very foundation of successful projects. Without trust, no intervention –no matter how well-designed – can succeed.

MIRRA operates at this junction of knowledge dissemination and co-creation which sets them apart from many other international organizations or governmental agencies. They have the unique ability to navigate rural civil society, establish connections with farmers, and bring together international researchers with local representatives for more effective co-creation of solutions. What makes MIRRA so effective is that it doesn't just ask the right questions – it asks the right people. Its staff and leadership understand that real solutions come from communities themselves.

Picture 3: Trainees examine soil samples during the practical training at MIRRA's Climate Smart Farm

Farmers know their land, their water sources, their cropping cycles, their constraints. MIRRA doesn't need to conduct months of background research just to "learn the community." It already has that knowledge embedded in its work. This embeddedness allows MIRRA to launch projects with more speed and relevance than many organizations, even larger organizations with higher budgets. It means programs aren't starting from scratch. They are building on lived realities, existing relationships, and long-term engagement. This is an asset whose value cannot be overlooked.

Welcome

Introducing MIRRA's Newest Intern: Desirae Krzeczkowski joins our Team!

Hello! My name is Desirae Krzeczkowski. I am a student at the University of Michigan studying Environmental Engineering and Engineering Physics with a minor in Energy Science & Policy, and I am enthusiastic about this opportunity to intern with MIRRA.

My interest in working for MIRRA stems from my desire to improve access to drinking water and sustainable food systems. I am particularly interested in understanding water challenges here in Jordan and the surrounding region.

I look forward to learning from MIRRA's multifaceted approach which focuses on not only understanding the technical aspects of sustainable agriculture and irrigation, but also the social elements. To reach successful solutions, MIRRA actively engages with relevant stakeholders to ensure that interventions will meet the end-user's needs. This is a valuable strategy and one that I aim to exhibit as an engineer. While working with MIRRA, a few of my goals are to become well-versed in sustainable irrigation systems, methods of utilizing water resources optimally, and regional water agreements.

I thank all of the kind staff at MIRRA for being incredibly welcoming. It is an honor to be working with and learning from this team of skilled experts. I have already learned a great deal during my first couple of weeks here and I look forward to continuing this summer with MIRRA.

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