



Methods for Irrigation and Agriculture
لتطوير أساليب الري والزراعة

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Establishing Neglected and Underutilized Crops at MIRRA's Climate Smart Farm in Jordan

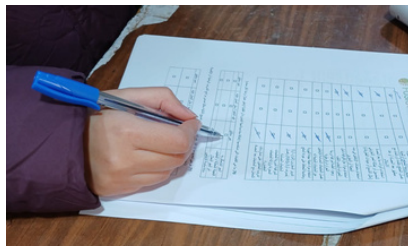
Listening to Retail Voices: Field Evidence on Tomato and Pepper Losses Along the Food Value Chain in Jordan



Picture 1: Different varieties of fresh peppers displayed at a local fruit and vegetable shop.



Picture 2: Sewar Saleh standing inside a fruit and vegetable shop as part of the MIRRA team's fieldwork.



Picture 3: Data collection in action: completing the survey with the shop owner.



Picture 4: Sewar Saleh during a field visit with Abu Abdullah, a local fruit and vegetable shop owner.

As part of our work under the FUSION project which aims to reduce food loss and waste and enhance the efficiency and sustainability of the agri-food value chain, the MIRRA team conducted field visits to retail shops to carry out direct interviews with shop owners and workers. These visits also served to introduce the project and its objectives, within the framework of a study specifically focusing on fresh tomatoes and peppers.

These field tours provided a valuable opportunity to closely listen to the voices of the retail sector. Shop and stall owners shared their daily experiences in handling tomatoes and peppers, starting from sourcing channels, through display and storage practices, and ending with the key challenges affecting product quality and the resulting levels of food loss and waste.

Picture 5: A small pickup truck loaded with vegetables transported directly from the farm to be sold in the city.



Picture 6: Foam boxes used for packing and displaying sweet peppers.



Picture 7: Plastic containers filled with cherry tomatoes.

The interviews further shed light on key challenges faced by the sector, including daily fluctuations in demand, the rapid perishability of tomatoes and peppers, limited storage and cooling facilities, and aesthetic standards related to shape and appearance that often lead to the rejection of products that are still fit for consumption.

These visits underscore the importance of actively engaging retail shop and stall owners in efforts to reduce food loss and waste in tomatoes and peppers. As a central link in the value chain, retailers are essential partners in developing practical, field-driven solutions that align with the objectives of the FUSION project.

Several participants highlighted differences in supply channels and their impact on retail operations. Some vendors rely on receiving tomatoes and peppers directly from farms and offer them for sale on the same day, while others depend primarily on the central wholesale market. This often entails longer transportation and storage periods, leading to variations in product quality upon arrival at the point of sale.

In terms of product display, shop owners explained that tomatoes and peppers are commonly displayed in open crates and in large quantities. This practice increases the risk of damage due to overstacking, frequent handling by customers, or exposure to unsuitable temperatures. They also noted that the sensitivity of these crops to pressure and heat results in higher loss rates compared to other produce.



Picture 8: Sewar Saleh from MIRRA during a field visit with Abu Yousef, a fruit and vegetable shop owner.

Farmer-Led Insights Shaping on-farm Water Harvesting and Promoting Neglected and Underutilized Species cultivation in Jordan

Under the NUSTALGIC project,

which aims to promote practical and sustainable water harvesting techniques and strengthen climate resilience, MIRRA conducted a series of field-based consultations with farmers across several regions in Jordan, including Mafraq, Jerash, Ajloun, and the Northern Jordan Valley. Approximately 50 male and female farmers from diverse agro-ecological contexts participated in these meetings, representing a wide range of farming systems and environmental conditions.

Picture 1: During our field meeting with farmer Ammar Otoom from Jerash, at his farm.



The consultations aimed to raise awareness of water harvesting practices and introduce the techniques proposed under the NUSTALGIC project, while also promoting the use of neglected and underutilized species (NUS) as a means to enhance water-use efficiency, agricultural biodiversity, and the resilience of farming systems in arid and semi-arid areas.

MIRRA adopted a participatory and inclusive approach,

ensuring that the meetings were not delivered as conventional training or awareness sessions, but rather as open platforms for two-way knowledge exchange. Farmers were encouraged to share their practical experiences and insights, particularly regarding water scarcity, rainfall variability, runoff behavior, soil erosion, and existing water management practices.



Picture 2: Eng. Ammar during a farmers' meeting at Nashmiyat Ghadeer Al-Tair Association.



Picture 3: A group photo featuring some of the young women and men farmers we met at Al-Ard Al-Taybeh Association.

Special attention was given to gender diversity, with MIRRA actively engaging both men and women farmers and ensuring that their perspectives, challenges, and priorities were equally represented. This inclusive approach recognized the vital role of women in agricultural production and emphasized the importance of integrating their voices into the design and adaptation of sustainable water and farming solutions.

The sessions included introductory presentations on water harvesting concepts and NUS, followed by interactive and constructive discussions among farmers on the opportunities and challenges related to their adoption. These discussions were complemented by field visits and direct observations of local farming conditions, which helped bridge theoretical knowledge with practical application and supported the contextualization of NUSTALGIC solutions to real on-farm settings.



Picture 4: Engaging with farmers on the ground as they complete the survey.

To systematically capture farmers' feedback, structured questionnaires and group discussions were used throughout the consultations. The collected data will support future project activities and ensure that planned interventions are grounded in field realities and aligned with the needs and priorities of local farming communities.



Picture 5: Farmer Awad during a farmers' meeting at Al-Zakiya Charitable Association, sharing his experience with rainwater harvesting.

Overall, these consultations reflect the commitment of MIRRA and the NUSTALGIC project to a collaborative, gender-responsive approach that integrates local knowledge with innovative, sustainable practices, empowering farmers as key partners in building more resilient and water-efficient agricultural systems.

Establishing Neglected and Underutilized Crops at MIRRA's Climate Smart Farm in Jordan

Under the PRIMA-funded NUSTALGIC project, MIRRA has initiated the cultivation of Neglected and Underutilized Crops (NUS) at its Climate Smart Farm in Jordan, which serves as the national Inspirational Site within the project's DRy-farming system multi-actor Innovation Platforms (DRIPS). This activity marks an important step in translating the project's objectives into practical, field-based action aimed at strengthening climate resilience in arid and semi-arid environments.



Picture 1: Aerial view of the 4-donum planting layout at MIRRA's Climate Smart Farm, showing the organized field design for cultivating five Neglected and Underutilized Crops.

Field Preparation and Planting Activities

To host the first NUS cultivation cycle, MIRRA prepared a 4-donum area at the Climate Smart Farm. The site was carefully planned and laid out to allow proper crop management, monitoring, and future demonstration activities. The layout was designed to support comparative observation between crops and to facilitate farmer learning events foreseen under the DRIPS approach.

Planting was carried out over three consecutive days, from 24 to 26 December, taking advantage of suitable soil and weather conditions. This planting window was selected to ensure uniform germination and early crop establishment, which are critical for evaluating crop performance under local climatic conditions.

The Five NUS Crops Introduced in Jordan

In this first implementation phase, MIRRA planted five NUS crop types that are prioritized under NUSTALGIC for their drought tolerance, agronomic value, and potential contribution to resilient farming systems in Jordan.

These crops are:

Lentil

Faba Bean

Chickpea

Grass pea

Barley

These crops represent a mix of traditional legumes and cereals that have historically been cultivated in dry environments but have become increasingly underutilized. Their reintroduction supports diversification of agricultural systems, improves nitrogen fixation and soil fertility, and reduces dependency on water-intensive crops, in line with the objectives of NUSTALGIC.



Picture 2: Field planting activities at MIRRA's Climate Smart Farm, with Eng. Ammar Namarneh on site supervising the work and guiding the planting team to ensure proper implementation of the NUS layout under the NUSTALGIC project.

Early Establishment and Initial Observations

Following planting, the crops showed successful germination, and crop emergence above the soil surface is now clearly visible across the planted plots. This early establishment phase confirms the suitability of the site preparation, planting timing, and crop selection.

At this stage, the field serves as a baseline for upcoming agronomic monitoring activities, including crop development, resilience to water stress, and interaction with soil and moisture conditions. These observations will later contribute to the evaluation of NUS performance at the Inspirational Site and inform future demonstration activities with farmers.

Role of the Inspirational Site within NUSTALGIC

The MIRRA Climate Smart Farm functions as more than a production field; it is a living demonstration site where research, innovation, and farmer engagement intersect. According to the NUSTALGIC framework, Inspirational Sites are designed to showcase climate-resilient practices, host regular farmer visits, and support knowledge exchange before scaling interventions to demonstration farms.



Chickpea



Faba Bean



Barley



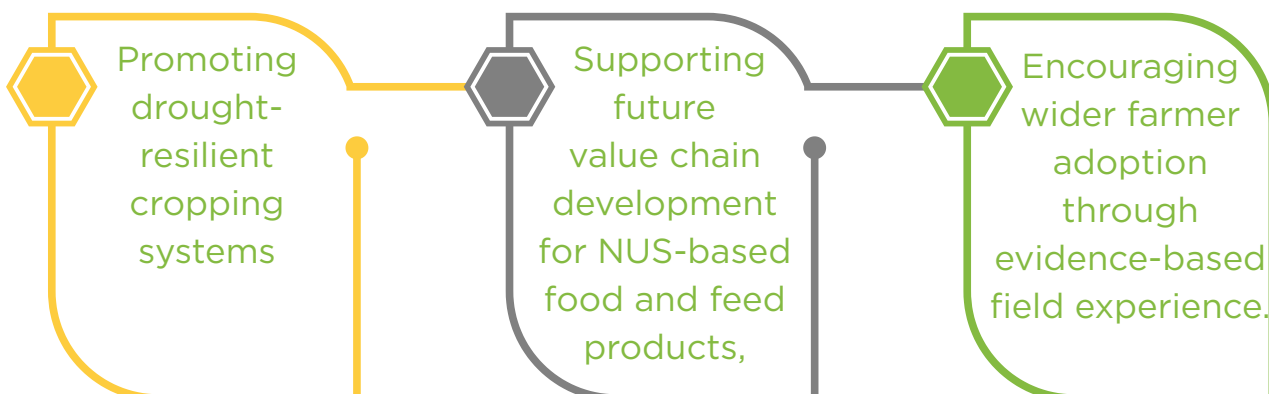
Grass pea

Picture 3: The five Neglected and Underutilized Crops introduced at MIRRA's Climate Smart Farm under the NUSTALGIC project—lentil, faba bean, chickpea, grass pea, and barley—successfully emerging after planting.



Lentil

By establishing these five NUS crops, MIRRA is laying the foundation for:



This initial planting represents a concrete step toward strengthening climate-smart agriculture in Jordan and contributes directly to the broader Mediterranean goals of NUSTALGIC in enhancing resilience, sustainability, and food system diversification.



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