Food and Agriculture Organization of the United Nations

ICARDA
Science for Better Livelihoods in Dry Areas

Water Scarcity Initiative (WSI)

INCREASING WATER AND LAND PRODUCTIVITIES
UNDER RAINFED AGRICULTURE

BACKGROUND

Nearly 80 percent of seasonal crop areas in the Near East and North Africa Region are rainfed, a system whose water source is highly variable, insufficient to satisfy the crop water demand, and often exposed to drought. These conditions make farming in rainfed areas highly risky and unpredictable, with negative implications for farmers' livelihood and national food security as well.

Depending on the expected rainfall regime, there are two major farming practices that can be adopted to reduce the production uncertainty: Supplemental Irrigation (SI) and Conservation Agriculture (CA).

Supplemental Irrigation (SI)

ACTION

This project scaled-up a supplemental irrigation package, originally developed under the Water Benchmark Project led by the International Center for Agricultural Research in the Dry Areas (ICARDA) and national partners in Morocco and Tunisia. The package combined supplemental irrigation with appropriate agronomic management practices, such as sowing times and fertilizer recommendations. The project improved water resource management and land productivity at the farm level and subsequently increased farmers' incomes. The project also highlighted that the SI package is most beneficial when rainfall is above 350-400 mm per year.

COUNTRY

- **Morocco**
  Tadla
- **Tunisia**
  Bousalem and Chebika

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RESULTS

934 farmers and **44** technicians trained

18-32%
Wheat yield increased

27%
Yield water productivity increased

29-37%
Applied water reduced as compared to full irrigation

BENEFICIARIES

> Farmers
> Extension-service technicians

NEXT

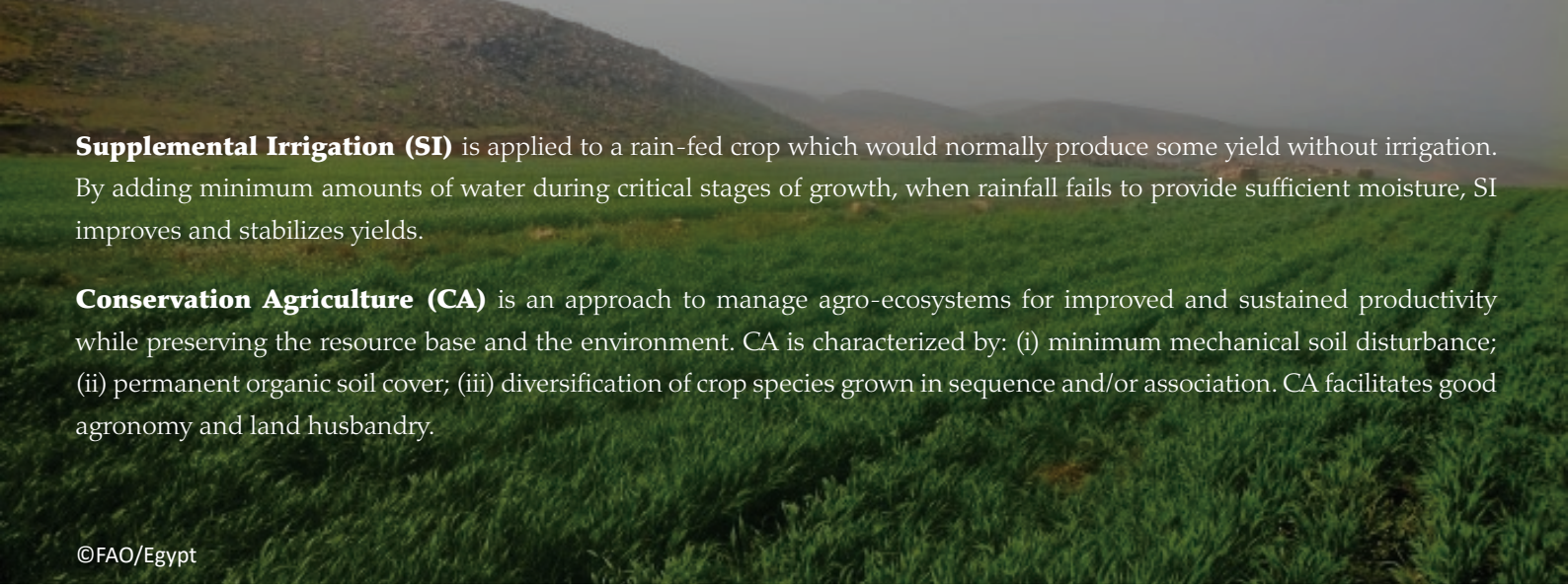
A regional analysis will be conducted to evaluate the business model for the SI package when applied on a larger scale.

PARTNERS

Institute National de la Recherche Agronomique from Morocco and from Tunisia

CONTRIBUTING DONORS

> International Fund for Agriculture Development
> The OPEC Fund for International Development



Supplemental Irrigation (SI) is applied to a rain-fed crop which would normally produce some yield without irrigation. By adding minimum amounts of water during critical stages of growth, when rainfall fails to provide sufficient moisture, SI improves and stabilizes yields.

Conservation Agriculture (CA) is an approach to manage agro-ecosystems for improved and sustained productivity while preserving the resource base and the environment. CA is characterized by: (i) minimum mechanical soil disturbance; (ii) permanent organic soil cover; (iii) diversification of crop species grown in sequence and/or association. CA facilitates good agronomy and land husbandry.

Conservation Agriculture (CA)

ACTION

This project built on previous CA initiatives developed by ICARDA in Morocco and in Tunisia and aimed at achieving sustainable intensification of cereal-based farming systems. The main objective was to scale-up the adoption of CA by small-holder family-farmers of the two countries; the focus was on the production of more food and feed with less inputs under rainfed conditions and no supplemental irrigation. Mechanized no-tillage seeding, mulching with crop residues, and crop rotation were the CA practices adopted to cultivate wheat, barley, chick peas, fava beans and forage. Additionally, farmers were trained in pest and disease control, nutrient management, and other expertise, through farmers' field schools. Extension services technicians participate in the training as well.

COUNTRY

Morocco
Meknes

Tunisia
Chouarnia

RESULTS

Over **150** farmers and **75** technicians trained

15-30% Wheat yield increased above conventional rainfed agriculture

More than **120** ha cultivated

7% Overall organic matter in the top soil increased

BENEFICIARIES

- Family-farmers
- Farmers' cooperatives and associations
- Extension-service technicians

PARTNERS

- Institute National de la Recherche Agronomique from Morocco and from Tunisia
- Institute Agronomique et Vétérinarie Hassan II
- University of Science in Rabat

NEXT

- The Ministry of Agriculture of Morocco intends to promote CA to reach 100 000 ha during the seasons 2017-2019.
- The Ministry of Agriculture of Tunisia intends to develop a CA strategy to reach 500 000 ha in the next 10 years.

CONTRIBUTING DONORS

- International Fund for Agriculture Development