



Food and Agriculture  
Organization of the  
United Nations

# Water Scarcity Initiative (WSI)

## SOLAR POWERED WATER LIFTING FOR IRRIGATION IN THE NILE DELTA

### BACKGROUND

In the Nile Delta, Egypt, irrigation canals are frequently located below ground level, necessitating the use of pumps to lift water to the fields. This pumping is dependent on the use of fossil fuels, directly with diesel and indirectly with electricity. Recently, the agricultural sector is facing an energy crisis, as increasing electricity demand from urban areas results in frequent shortages and blackouts. This results in disrupting the regular irrigation scheduling to satisfy the crop-water requirements with the consequence of crop yields decline. In addition, the cost of pumping is expected to increase. Therefore, a low-cost alternative source of energy is required to ensure farmers have a reliable system to pump and irrigate.

### COUNTRY

#### Egypt

#### Nile Delta

El-Souria and El-Afeer

Al Baheria Governorate



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Solar Panel Pumping Station  
©FAO/Egypt



Solar Panel Pumping Station  
©FAO/Egypt



Diesel Fueled Portable Pump  
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### ACTION

Our project supports Egypt by bringing solar energy, a renewable and sustainable solution, for lifting water from below-ground conduits to irrigate crop fields. This green technology reduces the Delta's agriculture vulnerability to energy supply, shocks and shortages, and water scarcity concerns. The implementation of solar energy, to provide reliable pumping capabilities at the farm-level, reinforces efforts for optimal irrigation-water resource management. The nexus of food-water-energy is overall strengthened.

### RESULTS

**2** solar-powered sites for lifting irrigation water installed for a total capacity of **100.8** Kw



Irrigation scheduling fully operated on-demand with no disruptions



Trained farmers and Water User Associations on use and maintenance of the solar-powered irrigation system



**14** pumps functioning on solar energy and irrigating **488** feddan



Solar energy sold to the 'Electric Utility' when not utilized for irrigation



Reduced negative environmental impact, less soil pollution from diesel spill-over, less green-house gas emission





Solar Panel Pumping Station ©FAO/Egypt

## BENEFICIARIES

- > In the Nile Delta, 196 farmers and their Water User Association.
- > Ministry of Water Resources and Irrigation.
- > Ministry of Agriculture and Land Reclamation.
- > Ministry of Electricity.

## PARTNERS

- > Ministry of Water Resources and Irrigation.
- > National Water Research Center.
- > Ministry of Agriculture and Land Reclamation.
- > Agricultural Research Center.
- > Heliopolis University.
- > SunEdison.

## NEXT

- > The Ministry of Water Resources and Irrigation is elaborating a plan to scale-up the use of solar energy to all other pumping stations in the Nile Delta.
- > Assessments of solar energy applications for irrigated agriculture will be carried out in other countries of the region.

## CONTRIBUTING DONORS

Italian Cooperation.

## COMPARISON OF THE OVERALL PROJECT COSTS

