



# Remote-controlled irrigation system to address water scarcity: the SWat Project

LEBANON, *Shouf Biosphere Reserve*



Funded by the  
European Union



SHOUF BIOSPHERE RESERVE  
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# The Shouf Biosphere Reserve

- Nature Reserve in 1996
- UNESCO Man and Biosphere Reserve in 2005
- Green Listed by IUCN in 2018
- 50,000 hectares, one of the largest protected areas in the East Mediterranean area
- 5% of Lebanese territory





# Climate Change effects in the SBR

- ❖ Annual precipitation decreased by 43% over 30 years
- ❖ Increase in average monthly temperature (1°C in January and February; 4 °C in August)
- ❖ 40% reduction of snow coverage



Reduction of the total volume of  
water resources from 6 to 8%

Water deficit for irrigation purposes





# The SWat Project

## Objective

Increase the adaptation capacity to economic losses and freshwater depletion induced by climate change through an efficient use of water resources in the Shouf District



## Beneficiaries

116,000 inhabitants of the SBR, highly vulnerable to the availability of freshwater and to climate change

## Technologies

Smart precision irrigation solution





## The target area of the project

1. Municipality of **Mrusti**, located in the Development zone of the Reserve (22 ha)
2. Bekaa valley – study area (9 ha) in Skaff wine estate

### Target groups

- Mrusti cooperative members (93)
- 7 cooperatives of the SBR
- Municipality of Mrusti and members of the Water Committee
- Rural population
- Governmental officials at the regional and national level (110) - Ministry of Water and Energy, Ministry of Agriculture, Green Plan, Ministry of Environment, Mount Lebanon Water Establishment
- Universities and Research Institutes



# Actions of the SWat Project

- **Improving water catchment and distribution**  
Rehabilitation of hill lakes
- **Reducing water and energy consumption**  
Rehabilitation and upgrade of the irrigation system:  
drip and smart irrigation
- **Promoting sustainable water use and management**  
Technical trainings targeting local authorities,  
cooperatives, farmers and all relevant stakeholders
- **Disseminating best practices**  
Communication campaign and awareness raising  
program targeting Universities, Research Institutes,  
Policy makers and Farmers





# The X Farm solution

## The 3 pillars of Smart Irrigation

1. Monitoring
2. Irrigation Advice
3. Automation





# The X Farm solution

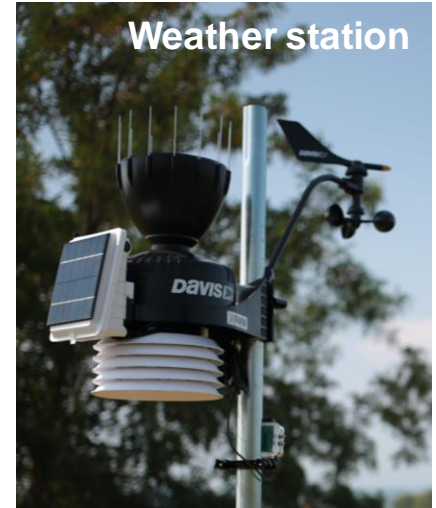
Data collected from

- Soil sensors
- Weather station
- Weather forecast
- Sentinel satellite

are combined and analysed through an algorithm.

An **irrigation advice** is provided based on:

- Type of crop
- Type of soil



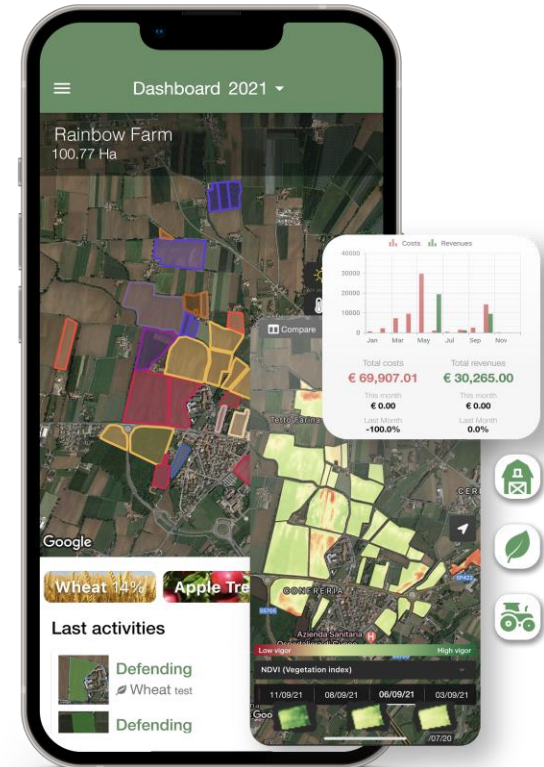
The **irrigation advice** is sent to controllers for the opening and closing of the hydro valves. The farmer can control his irrigation system remotely





# The X Farm platform

- User-friendly application
- Map of agricultural fields
- Field activities planning
- Records of field production
- Agronomical decision support





# OUTCOMES

- 30% water saving
- +10% production
- 15% admin time saving
- 80 small-scale farmers benefitting from the precision solution
- Committee of trained farmers responsible for the management of the system





# Sustainability

- Trainings to accompany the shift to the new irrigation technology, at both users and governance levels
- Dialogue promoted between producers and potential private service providers
- Local private service providers involved and trained for providing a basic support to the system as needed
- Municipality of Mrusti entitled for for the management, maintenance and governance of the ponds and securing the distribution of water resources



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 **SAVING  
WATER,  
GROWING  
CROPS**

**Thank you for your attention!**