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

LEBANON, Shouf Biosphere Reserve
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

Lebanon’s 3rd National Communication to the UNFCC - 2016
Assessment of Water Resources & Climate Change in the SBR - 2017
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 the management, maintenance and governance of the ponds and securing the distribution of water resources
Thank you for your attention!