

Project pilot Areas: Upper Galilee, Hula Valley (Israel)

INNOVATIVE SOLUTIONS ASSESSMENT IN THE HULA VALLEY: AGRIVOLTAICS

Desalinated water as an alternative has increased the price of water for farmers, and climate change-induced water scarcity has evolved in the Upper Galilee in recent decades, apart from pressures on food security, resulting in changing cropping patterns; therefore, innovative strategies that integrate water, energy and food security are needed. The goal should be to offer novel solutions, with innovative thinking, for the sustainable use of agricultural land. One such solution is Agrivoltaics. This technology will improve energy availability in the Water-Ecosystem-Food-Climate Nexus and enable the sustainable development of the rural ecosystem by adding a source of income.

GENERAL CHARACTERIZATION

The Hula Valley →

- ✓ **Location:** Northern part of the Dead Sea Valley.
- ✓ **Area:** 177 km².
- ✓ **Mountains of the valley:** The Golan Heights and the Naftali Mountains of the Upper Galilee.
- ✓ The valley occupies most of the course of the **Jordan River (length of 25 km)**.
- ✓ **Agriculture:** **Winter crops** ☐ Wheat, oats, alfalfa, clover, onions, garlic / **Summer crops** ☐ Sunflower, peanuts, cotton, chickpeas, watermelon / **Crops for the food industry** ☐ Potatoes, carrots, peas, tomatoes, corn, beans / **Perennial crops** ☐ Avocado, apples, pears, stone fruits and citrus.

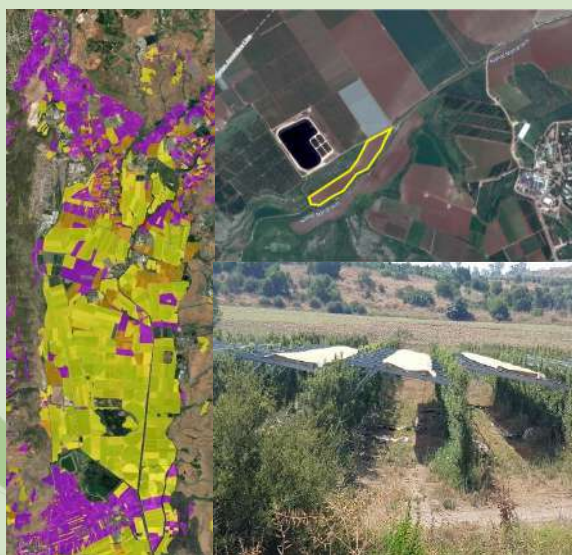


LENSES GOALS

One of the main objectives of LENSES is to improve the understanding of the Nexus, which is Solutions that integrate the different domains are key. The need for more efficient production, minimizing water use and environmental impact will be addressed.

Main objectives ☐

- ✓ Improve the use of water resources.
- ✓ Reduce carbon footprint, GHG emissions and local electricity consumption.
- ✓ Integration of new methodologies.
- ✓ Reducing the use of fertilizers, pesticides and herbicides.
- ✓ Implementation of Earth Observation (EO) and drones to monitor crop productivity.
- ✓ The pilot consider various temporal and spatial scales in assessing value chain dynamics and their relationship with agricultural systems.



HOW WILL LENSES WORK?

Ecosystem Approach □

Strengthening renewable energy resilience and food security in the face of climate change by creating a hybrid of agriculture and photovoltaic infrastructure.

The Agrivoltaics concept will be key to the Nexus approach by simultaneously controlling the physical and biological dimensions.

Benefits to Ecosystem Services □

- ✓ Maximise the Water Use Efficiency (WUE).
- ✓ Avoiding photosynthesis depression due to heat and light stress, and in turn.
- ✓ The Agrivoltaic system increases CO₂ uptake and fruit production.



“EXPERIMENTAL WATER-ENERGY-FOOD-CLIMATE PILOT” □ monitoring and participating in the orchard-voltaic experiment documenting and evaluating the technological solutions, the agronomic feasibility to achieve desirable yields and quality, the financial results and future economic sustainability, and some of the regulatory aspects.



FUTURE PERSPECTIVE “CALL TO ACTION”

“The Galilee pilot ambitions to make diversity a more integral part of farming, as reflected in several European policies and global commitments. Translating this ambition into practice will require the necessary know-how and a range of options for optimizing the joint delivery of economic, environmental, and social services by farming. We suggest that this energy- and food-generating ecosystem may become an essential mechanism for maximizing fruit yields, efficiently delivering water to plants and developing renewable energy in dryland environments.”

MIGAL Team



PILOT TEAM



MIGAL is involved in many innovative approaches in agriculture, irrigation and energy-saving and in applying research results on experimental farms distributed from -200 meters below sea level to +1200 meters above sea level. Precision Agriculture is implemented with drones, equipment, AI researchers, and algorithms supporting farmers using satellite images and irrigation controls. This allows the analysis and demonstration of all types of fruits and crops.