Background

The average annual precipitation in the area is 690 mm and the climate is classified as subhumid. Average annual temperature is 17.5 oC with 7 months below 18 but above 5, thus classifying the area as subtropical. In the location where the technology is applied, land is mostly individually owned and distributed among a few families of a community of about 100 inhabitants. Although the financial means of the land user who applies this technology are more or less on par with those of the rest of the community, he has a wider empirical education and relatively higher social status acquired thought his

Contact

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REACT4MED

Land degradation such as soil erosion and desertification, along with climate change, are serious threats to agriculture in the Mediterranean. In order to restore degraded soils, we need solutions that pay off and which are good for the people and the environment.

The REACT4MED project aims to improve agricultural productivity, promote innovation, restore soils, and thus improve livelihoods in Mediterranean communities.

In eight pilot areas situated in Turkey, Morocco, Israel, Egypt, Cyprus, Greece, Spain, and Italy, large-scale land restoration actions are initiated and monitored. These actions include combating soil erosion through conservation agriculture, terracing, cover crops, reforestation, mulching and improved irrigation practices.

Stay in touch through our website:
www.react4med.eu

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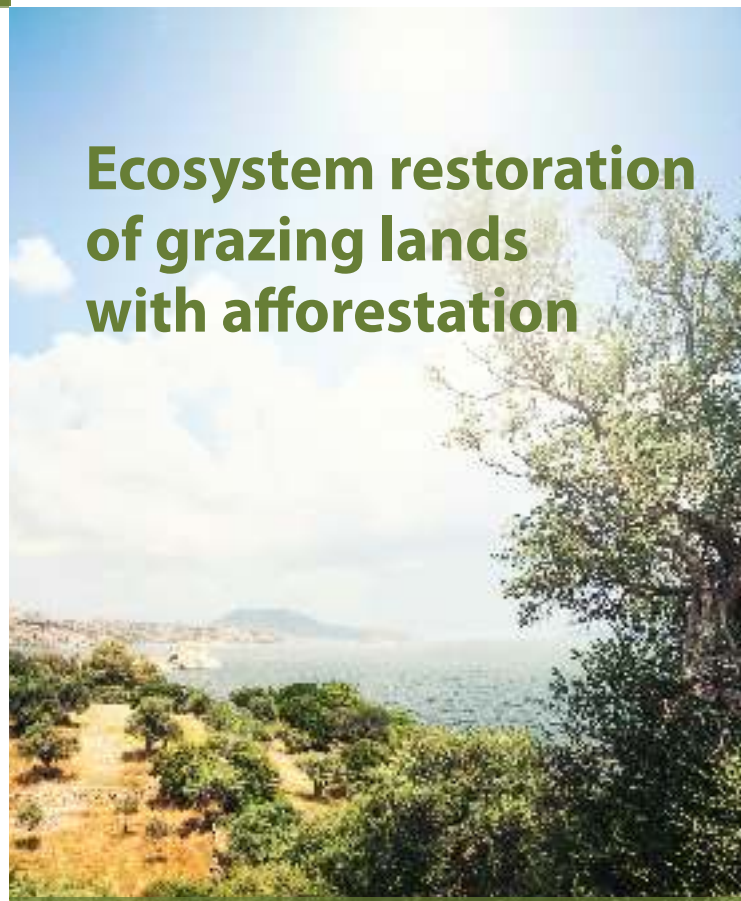
Project duration:
May1 2022 to October 31 2025

REACT4MED

Ecosystem restoration of grazing lands with afforestation



PRIMA
PARTNERSHIP FOR RESEARCH AND INNOVATION
IN THE MEDITERRANEAN AREA

In practice: The example of Kostas Karatzis

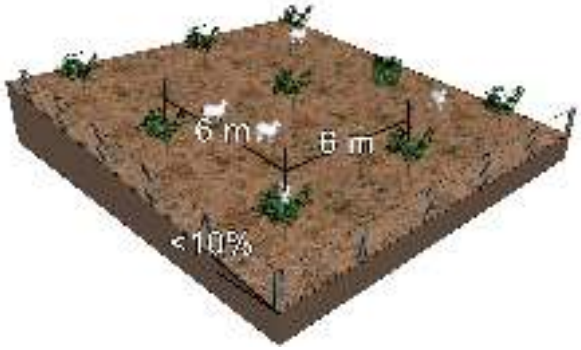
Kostas Karatzis co-owns Karatzis Estate, a 50-hectare silvopastoral farm in Melidochori. Since 1995, he and his team have planted over 10,000 trees, including broad-leaf, carob, mulberry, pine, cypress, and others like walnut and fig. This chin land use has revitalisd degraded land affected by drought and overgrazing, turning it into a thriving ecosystem, rich in biodiversity.

The restored landscape now supports improved grazing through nuanced soil stability, enables new business opportunities through the production of new crops like carob, and serves as a model of sustainable land management for the local community. Though Kosta's financial resources are similar to those of his peers, his practical knowledge and strong engagement in community projects make him a local leader and role model.

Agroforestry: Implementation steps

A stand of Ceratonia siliqua (carob trees) is planted in grazing areas, typically in a six-metre grid. Initial structural measures are required, mostly related to preparing slopes and soil for sapling planting and establishing irrigation infrastructure. A protective fence must be maintained for the first 10 years to prevent livestock from damaging young trees. During the first three years, the two-year-old saplings are actively managed. This includes watering, fertilisation and replacement of dead or weak trees. Once established, intensive irrigation is no longer needed and grazing can resume with minimal restrictions.

The main drawback of this technology is a temporary reduction in livestock and other crop yields during the first decade of application until trees are mature.



The pilot area in Heraklion: A profile

In the past, the European Common Agriculture Policy supported an adequate income for farmers on Crete through structural policies, contributing to regional economic development, particularly in less favoured areas. However, these very subsidies also accelerated the agricultural intensification and specialisation, which in turn led to increasing degradation of agricultural soils. Production became export-oriented and homogenised, resulting in the loss of the island's self-sufficiency in products such as cereals, fruits, and vegetables. The rising market value of animal products further incentivised free-range livestock farming. Statistical figures for some of the mountainous communities show an increase of the total number of sheep and goats by over 200 percent between 1980 and 1990. The ecological impact of the introduction of domestic grazers on native species on Mediterranean islands since prehistoric times has been well documented.

Since the 1950s, large-scale migration from rural to urban areas took place, while the rural land was over-exploited by the few remaining farmers. Today, the rural population continues to decline, even though Crete's total population, especially around Heraklion, has grown significantly over the past four decades, increasing the pressure to convert agricultural land into residential or industrial areas.

In the Melidochori Area, the effects of overgrazing are particularly evident, disrupting the agricultural system and limiting its potential. The region has a sub-humid climate, with an average annual rainfall of 690 mm and average temperatures of 17.5°C. For about seven months each year, temperatures range from 5°C to 18°C, contributing to a subtropical climate.

Benefits

Silvopastoral systems offer significant environmental and economic benefits to land users, especially for grazing systems. They do not only combat land degradation but also promote soil health and local biodiversity. In particular, carob trees provide:

- Fodder from carob pods and cuttings for livestock
- Shade during hot summer months
- Increase in soil stability, organic matter content and water retention

The economic benefits extend beyond grazing. Carob can be utilised to create alternative income sources, such as carob honey and flour, serving as a viable business diversification strategy for farmers. Their moisture-rich trunks also make carob trees resistant to wildfires.

Aside from agricultural benefits, silvopastoral practices maintain high habitat quality for local wildlife, including birds and bees, enriching biodiversity. Native to the Mediterranean, Ceratonia siliqua blends well into the rugged agro-pastoral landscapes of the Mediterranean islands. The enhanced natural beauty of the landscape, coupled with ties to Cretan traditions, enrich the community's cultural and aesthetic values and make the area more attractive for agritourism and recreational activities.