

# OLIVERO: The project analysing the future of olive production systems on sloping land in the Mediterranean basin <sup>☆</sup>

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## Abstract

From 2003 to 2006, a consortium of six European partners analysed the future of olive production systems on sloping land in the Mediterranean basin. Olive production on such land dates back to pre-Roman times, but the production systems (known by the acronym SMOPS, for “Sloping and Mountainous Olive Production Systems”), are under threat. Many are unsustainable environmentally (erosion hazard), socially (exodus of young people) or economically (high labour costs).

The OLIVERO research project was possible thanks to a grant of €1.5 million from the European Union, which gives out €2.5 billion in subsidies annually for olive production. An extended survey conducted by the project in five sites in Portugal, Spain, Italy and Greece revealed the diversity and multifunctionality of SMOPS. Four main systems were identified as important for the future: traditional, organic, semi-intensive and intensive. The conceptual framework of OLIVERO involved six phases, ranging from the initial survey up to policy recommendations. In all phases there was intensive contact with stakeholders and institutions. End-users were identified at three levels: local, intermediate and regional, and national/international. This paper presents the highlights of the physical analysis of land and water resources, crop and land management, and economics and policies.

Scenario studies gave insight into the possible future: some SMOPS will be gradually abandoned or transformed into nature conservation areas, others will exploit drip irrigation and follow the intensification patterns of agriculture in the valleys, and a third group will continue to be managed more extensively, perhaps augmenting their income with other activities (possibly off-farm) or turning to organic production systems.

At the five international OLIVERO meetings held from 2003 to 2006, knowledge, experience and ideas on the future of olive production systems were intensively exchanged. A network was established for ongoing and future cooperation. Two end-user seminars were held in Matera (Italy) and Lisbon. Over 70 scientific papers have been published.

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## 1. Introduction

Olive production on sloping land in the Mediterranean basin predates the Roman period. Many of these so-called Sloping and Mountainous Olive Production Systems

(SMOPS) production systems are currently under threat. They are unsustainable environmentally (e.g. because of erosion), socially (e.g. because of the exodus of young people) or economically (e.g. because of the high labour costs). This raises questions about the future of such systems and how this future is affected by European Union (EU) policy. It was to answer such questions that a research project on olive production systems on sloping land in the Mediterranean basin started in 2003. Known by the acronym OLIVERO, the project was run by a consortium of six European partners. It terminated in 2006.

<sup>☆</sup> For more information, see: [www.olivero.info](http://www.olivero.info).

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## 2. Justification of OLIVERO

### 2.1. Historical development of olive growing on sloping land in the Mediterranean basin

The origin of olive growing is lost in time. All we know is that it started in the Mediterranean basin. There are three main ways of growing olive trees: (1) on the edges of cultivated land or within a polycultural system; (2) on large areas of flat land; and (3) in sloping and mountainous areas. Various olive production systems on sloping land can be distinguished on the basis of their technology and their natural, economic and social environments. These SMOPS include the traditional system that originated in antiquity.

The biggest increase in olive tree plantations on sloping land occurred at the transition from the 19th to the 20th century. With the technology current at that time, neither irrigation nor large-scale mechanisation were possible on the slopes. Instead, soil- and water-conservation measures like terracing, dry mulching and clean weeding were practised.

The most dominant feature of the Mediterranean ecosystem is its particular climate: rain falls in autumn and winter, the non-growing season, and large inter-annual variations in water availability are the rule rather than the exception. The conservation and cropping systems that have developed here since antiquity are well adapted to the rainfall pattern. Water is conserved in the topsoil during wintertime, with an eye to its subsequent use in the following cropping season. Another common practice is to store water in deeper layers, out of reach of annual crops. Olive trees can survive the large inter-annual variations in climate thanks to their ability to exploit this stored water (Xiloyannis et al., 1996). The many different opportunities to store water and the high variation in other natural resources have created a multitude of complex olive production systems. The future of most of them relies on the economic sustainability of farming, a sustainability that must be seen not only through the analysis of their economic functions but also through the social and environmental functions of olive-growing systems.

SMOPS will change over time: some will be abandoned while others will be intensified with irrigation and new technologies. Some have become organic production systems.

### 2.2. Degradation of SMOPS

For centuries, olive orchards on sloping and mountainous land were economically and environmentally sustainable, but recent developments have affected them so badly that in some cases they have become unproductive and environmentally disastrous. Several factors may be responsible for this:

- The ongoing migration of rural population to coastal and urban areas.
- Cheaper seed oils are taking an increasing market share in the Mediterranean, causing per capita consumption of olive oil to fall in countries such as Portugal, Turkey and North Africa except Morocco (Grigg, 2001).
- EU support to the olive sector (€2 billion per year in the 1990s) in the form of production subsidies favoured farms on flat areas more than hillside farms and did not provide incentives for more sustainable land and water use (De Graaff and Eppink, 1999).
- Increasing competition from countries outside Europe, where in the last decade production has increased and the area under olives has expanded by 9% compared with 3% in the EU (FAOSTAT, 2001).
- The start of intensive irrigated olive cultivation on flat land
- As a result of losing competitiveness, SMOPS are no longer well managed and pose a severe threat to the environment (annual soil erosion losses of 80 t ha<sup>-1</sup> are no exception and flood hazards are now tremendous) (Laguna, 1989; López-Cuervo, 1990; Raglione et al., 2000). These detrimental effects have been enhanced by mechanisation and herbicide use in recent years.
- The abandonment of SMOPS has sharply increased the incidence of wildfires in southern Europe (Beaufoy, 2001; Allen et al., 2006).

The main contribution of the OLIVERO project is expected to be to avert the consequences of these multiple factors, that is to say, to prevent the degradation of SMOPS.

### 2.3. Functions of SMOPS

Rapid economic development has meant that many of the traditional systems are no longer considered sustainable, at least not under classical free market principles. The disadvantages are lower returns to labour compared with off-farm employment, the increased prices for other farming inputs, and the low prices for most commodities. Nevertheless the other social and environmental functions SMOPS perform create pressure for retaining them and require policy measures.

One of the aims of OLIVERO is to enhance the relative importance of the different functions—productive, ecological, social and economic—performed by SMOPS. Aware that there are various types of SMOPS in different countries, in the OLIVERO project each type was analysed (Metzidakis (Ed.), 2004), using a purpose-built typology of SMOPS.

Some SMOPS are still strong in productive terms: for instance, those claimed to be semi-intensive and oriented at producing table olives. Others are relevant because of their role in social cohesion in rural areas (representing a target seasonal activity, even for people living in towns). Still others perform ecological functions to preserve biodiversity and reduce the risk of wildfires.

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