



Science for Environment Policy

Expansion of greenhouse horticulture in Spain seen to compromise conservation and the revitalisation of rural areas

Land-use changes in the arid south-eastern Iberian Peninsula impact on the supply of various ecosystem services that support human well-being.

Research into perceptions of the rapid expansion of greenhouse horticulture and the abandonment of rural and mountainous areas has highlighted trade-offs between conservation efforts and economic development.

This study aimed to examine the perceptions among residents regarding land-use and land-cover (LULC) changes and their impact on ecosystem services (ES) in the Almeria and Granada provinces of south-eastern Spain.

LULC changes can directly affect the status and integrity of ecosystems. For example, natural and multifunctional landscapes can be converted into areas of intensive farming, altering the main land-use type and natural character of a region. Management decisions should, therefore, promote a transition towards [sustainable](#) landscape strategies which result in human needs being satisfied while simultaneously maintaining important ecological processes responsible for the delivery of ecosystem services.

Ecosystems in south-eastern Spain are high in [biodiversity](#) and are, because of their location in the driest region in continental Europe, vulnerable to global change impacts. The region has undergone major LULC changes over the preceding decades due to the expansion of intensive greenhouse horticulture, making the area one of the most economically prosperous in the country. The region now holds the largest concentration of greenhouses in the world and is known locally as *The Plastic Sea of Almeria*.

The expansion in horticulture is associated with increasing [urbanisation](#) and population growth, as well as abandonment of rural areas and agrarian landscapes, as people have moved to coastal areas to work in the industrial and tourism sectors. The region has also seen the declaration of protected area networks¹ in order to conserve the unique ecological value of the area. Protected areas, such as the Cabo de Gata Natural Park or Sierra Nevada National Park, cover around 20% of the study area.

The researchers interviewed randomly selected local residents from a range of stakeholder backgrounds using an ecosystem services preference survey. Questionnaires were designed to identify the arguments for and against each land-use type, analyse the perception of the impacts of LULC change on ES, and determine the social importance of different ES that are essential in dryland areas. The eight ES considered were: food production from traditional methods; food production from intensive [agricultural](#) methods; air quality; climate regulation; [water](#) regulation; erosion control; tourism; and local identity. Overall, 402 questionnaires were completed and social sampling was conducted covering a wide range of local stakeholder profiles (including producers, workers in the tertiary sector, and public administration staff).

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1. Designated under Natura 2000: http://ec.europa.eu/environment/nature/natura2000/index_en.htm

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(continued)

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2. Council Regulation (EC) No. 1698/2005: <http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:32005R1698>

Protected areas were the land-use type with the most public support (72% of residents expressed support), followed by greenhouse agriculture (69% of residents expressed support). However, the horticultural expansion was the most controversial LULC change (69% of residents expressed arguments in favour, but almost 68% of them also expressed arguments against). The growth of greenhouse horticulture is supported socially, due to links with improvements in quality of life and economic development. For example, respondents considered greenhouse agriculture important for employment and lifestyle (42% of residents) and for economic development (28% of residents). The respondents also reported several perceived negative impacts of greenhouse horticulture, including pollution (from burning agricultural plastics and chemical contamination of soil and water from pesticides: 30% of residents), ecological impacts (10% of residents), aesthetic impacts (16% of residents) and soil erosion (5% of residents).

In terms of ES, the general public recognised the importance of regulating services, and also perceived severe adverse impacts following greenhouse horticulture and urban intensification.

Thirty-six per cent of residents mentioned negative impacts associated with the rural abandonment occurring in the region, compared with the 25% who saw its benefits, mainly related to the search for a higher quality of life (27% of residents) and job opportunities (34% of residents). Arguments against rural abandonment were mainly related to the loss of important cultural and traditional values in rural and agrarian areas. One of the priorities of the EU's Rural Development Policy programme² is "restoring, preserving and enhancing ecosystems related to agriculture and forestry". The importance placed on traditional agriculture by residents is, therefore, relevant for valuing and revitalising these areas.

A current policy challenge involves analysing the links between ecosystem services supply, drivers of change and drivers of human well-being. The researchers argue that studies which take into account the social perspectives of local residents can lead to higher-quality and more reliable decision-making with regard to land management.

