

ECOSYSTEM SERVICES AND DYNAMIC MODELING: INTEGRATING BIODIVERSITY INTO SOCIOECONOMIC PROCESSES IN DEPRESSED RURAL AREAS IN SPAIN



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INTRODUCTION

Biodiversity Conservation is an essential requirement to turn sustainable development into reality. Ecosystem Services are one of the most important new paradigms of nature conservation. Systems Dynamic Modeling is a promising approach that has the potential to integrate the driving forces and stakeholders of the socio-economic framework that often threatens biodiversity. Using not only the tools-ecosystems services approach but also dynamic modeling could qualify us to design sustainable development scenarios.

RESEARCH AREA DESCRIPTION

Our work is located inland in two small rural villages, surrounded by forests and areas of outstanding natural value – such as the Sierra Nevada National Park – but also by a depressed and dependent economy.

Agricultural land abandonment, growing scattered urban development, bad management of natural resources, low social participation level, growing demand of water due to agricultural intensification as well as landscape degradation are the main challenges for the sustainability of this area.

A rich local tradition linked to natural resources is disappearing and the potential of local resources is not being appropriately assessed and utilized.



Location of the villages, South of Spain (Andalucía)

OBJECTIVES

- To set an interaction between local ecosystem services and the main socio-economic forces in motion
- To reveal the value of ecosystem services and its maintenance or increase
- To design a tool that empowers local authorities to make sustainable decisions
- To integrate an indicator system that controls the system long-term

WORKING TEAM AND METHODS

We are six people working within a multidisciplinary group- an ecologist, a biologist, two economists a consultant and an environmentalist.



Participation workshop in Abia, June 2007

Geographic Information Systems (GIS), Participation Workshops, Ecosystem Services approach and Dynamic Modeling (Stella software) are our main working tools.



Board of problems, one of the four used in the workshops

PRELIMINARY OUTCOMES

- Environment preliminary report
- Local Socio-economic Diagnosis
- First Approximation to Ecosystem Services
- Biodiversity Indexes in river beds

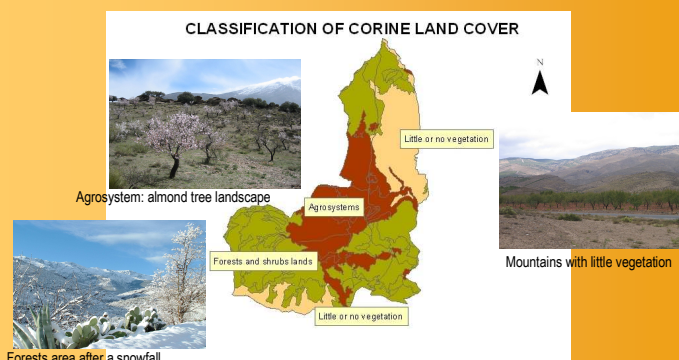


Taking macroinvertebrates samples

MAIN ECOSYSTEM GOODS AND SERVICES

Classification of CORINE LAND COVER 2000 (Agrosystem, Forest areas, Shrub associations, Spaces with little or no vegetation, River beds):

- Goods: water supply for agriculture and households, recreational hunting (small game), pasture for livestock, wild shrubs for feeding and aroma industry, esparto grass for fiber, honey.
- Services: landscape, CO₂ capture, soil retention by shrubs, wind power, soil resilience and biodiversity support.



SYSTEMS DYNAMIC MODELING

Population, its demand of resources and its well-being level, together with the maintenance of flows and stocks of ecosystem services and goods, closely related to land use change patterns, are the main aspects to be included into the local dynamic model. Biodiversity conservation and balance of demand and supply determinate the state of sustainability within the system.

