

ADVANCED MODELLING TOOLS FOR INTEGRATED ASSESSMENT OF WATER AND AGRICULTURAL POLICIES

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In Spain, as in most Mediterranean countries, water is a strategic resource and a major constraint for agricultural production. Recent trends on EU water and agricultural policies reinforce the integration of sustainability principles in farming and the need of meeting the challenge of reconciling water and agricultural policies.

On the one hand, the Water Framework Directive, approved in 2000, establishes the basics principles for a sustainable water policy in the European Union. According to this Directive, water demand management policies will provide incentives to use water in a more efficient way and therefore contribute to the environmental objectives.

On the other hand, the Mid-Term Review of the Common Agricultural Policy (CAP), agreed on June 2003, represents a complete change in the way the EU support the farm sector. While "decoupling" will make EU farmers more competitive and market oriented, "compliance" will ensure the respect of environmental, food safety and animal welfare standards.

The versatile nature of these new policy measures will lead to a multiplicity of support schemes, rising the interest of developing economic tools flexible enough to take into account the different features and concerns of the rural areas. This motivates the aim of this paper to develop a modelling tool aimed to guide the design of regional or local strategies in the Spanish farming systems.

In this sense, we develop a positive mathematical programming model that allows us to simulate farmers' behaviour and to assess the environmental and socio-economic impacts of different water and agricultural policy options. This modelling tool, well adapted to work with the limited databases available, has been applied to a large number of farming systems representing the heterogeneous characteristics that can be found throughout the Spanish territory. Chosen scenarios focus on some recently envisaged policy alternatives, such as water demand management under the EU Water Framework Directive, or the decoupling scheme in the Mid Term Review of the CAP. Model results allow us to suggest that this modelling approach may be used as a management tool to assist the design of sound policy measures.

Keywords: policy impact analysis, positive mathematical programming, water and agricultural policies