Geophysical Research Abstracts,
Vol. 11, EGU2009-11328, 2009
EGU General Assembly 2009

Modelling tools to support the harmonization of Water Framework Directive and Common Agricultural Policy

A. Tediosi (1), C. Bulgheroni (2), G. Sali (2), A. Facchi (1), and C. Gandolfi (1)
(1) University of Milan, Dept. Agricultural Engineering, Milan, Italy, (2) University of Milan, DEPAAA, Milan, Italy

After a few years from the delivery of the EU Water Framework Directive (WFD) the need to link agriculture and WFD has emerged as one of the highest priorities; therefore, it is important to discuss on how the EU Common Agricultural Policy (CAP) can contribute to the achievements of the WFD objectives. The recent CAP reform - known as Mid Term Review (MTR) or Fischler Reform - has increased the opportunities, offering to farmers increased support to address some environmental issues. The central novelty coming from the MTR is the introduction of a farm single payment which aims to the Decoupling of EU Agricultural Support from production. Other MTR important topics deal with the Modulation of the payments, the Cross-Compliance and the strengthening of the Rural Development policy. All these new elements will affect the farmers' behaviour, steering their productive choices for the future, which, in turn, will have consequences on the water demand for irrigation.
Indeed, from the water quantity viewpoint, agriculture is a large consumer and improving water use efficiency is one of the main issues at stake, following the increasing impacts of water scarcity and droughts across Europe in a context of climate change. According to a recent survey of the European Commission the saving potential in the agricultural sector is 43% of present abstraction and 95% of it is concentrated in southern europe.
Many models have been developed to forecast the farmers' behaviour as a consequence of agricultural policies, both at sector and regional level; all of them are founded on Mathematical Programming techniques and many of them use the Positive approach, which better fits the territorial dimension. A large body of literature also exists focusing on the assessment of irrigation water requirements. The examples of conjunctive modelling of the two aspects are however much more limited.
The work presented has got some innovative aspects: not only does it couple an economical model and a spatially distributed hydrologic model, but also embodies the two models in a wider procedure aiming at supporting the process of water resources planning at basin scale, based on the IWRM (Integrated Water Resources Management) paradigm. In practice, the economical model defines different land use scenarios deriving from the effects of the CAP on the farmers' productive choices; the hydrological model assesses the crop water requirements and determines the consequent variations of irrigation water demand at the basin scale; finally, the modified pattern of irrigation demand of each land use scenario is incorporated into a multi-objective optimisation procedure, which generates a set of efficient water management policies. Stakeholders involvement is a central component in all the phases of the procedure, including setting the optimization objectives and selecting the performance indicators for the different uses of the water resources within the basin.
The presentation will focus on the first two phases of the process, describing the characteristics of the economical and hydrological models; moreover it will illustrate the results of their application to a pilot study basin in Northern Italy, the 6,500 sqaure kilometers wide Adda river basin, which includes the regulated Como lake and is characterized by a broad range of conflicting water related issues: irrigation of a 3,500 square kilometers wide district, navigation and tourism, environment protection, flood protection, hydropower production.