

THE ROLE OF INTEGRATED WATER MANAGEMENT MODELS IN IMPROVING THE COST-EFFECTIVENESS OF AGRI-ENVIRONMENTAL POLICIES

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ABSTRACT

The application of water management models becomes increasingly relevant in catchment-based water policies. In the EU Water Framework Directive (WFD) the significance of models as an important decision support tool is explicitly emphasised. However, the confidence of many water managers and authorities with respect to the practicability of models is limited. There is a need to improve the methodologies, software and data bases. Especially, the incorporation of socio-economic issues is rare. But integrated models can essentially help to improve water management decisions. One important role of integrated water management models is to facilitate the implementation of the WFD by considering also socio-economic and political elements in the future EU water policy. Over the past years considerable progress has been achieved in developing water management models for various domains (such as e.g. in flood management). Actually, the state-of-the-art in river basin modelling has advanced dramatically with the rapid improvement in computer hardware and software. There are some prototypes of especially integrated hydrologic-agronomic-economic models. The interactions between water allocation, farmer input choice, agricultural productivity, non-agricultural water demand, and resources degradation are modelled to estimate the social and economic benefits from improvement in the allocation and efficiency of water use.

The key questions are: How can the quality of model based river basin management be improved? Which role play socio-economic issues in the models? What are the relevant socio-economic elements with respect to modelling of agri-environmental policies? How can hydrological models be linked with socio-economic models? The advantage of integrated water management models is that they provide a comprehensive framework by considering simultaneously various domains. This type of modelling ensures that the problems of diffuse water pollution are analysed in an integrated fashion at the watershed level. With regard to the agriculture-related water pollution such models can contribute to develop guidelines how to enhance the cost-effectiveness of agri-environmental policies.

KEYWORDS: Water management, integrated models, EU water policy, agriculture, socio-economic issues, agri-environmental policies.