AN INTEGRATED DECISION SUPPORT SYSTEM FOR DESERTIFICATION MITIGATION

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In order to alleviate desertification and its effects, and to promote sustainable land-use and development, a holistic view of natural and human system interactions is required. Models dealing with desertification issues should therefore seek to integrate several components to enable a full exploration of the effects of land management practices, government policies and climatic change. Models to date have typically dealt with the physical or socio-economic aspects separately.

As part of the EC MEDACTION project (EVK2-2000-22032) we have combined three such components into a single Decision Support System (DSS). SHETRAN provides physically based simulations of hydrology and soil erosion at the river catchment scale for a given climatic forecast; a vegetation model simulates crop growth and yields resulting from various agricultural practices; a simple socio-economic model determines the change in land use resulting from farmers' decisions to select crops which maximise profit. The combination of these three components into the DSS, allows a feedback loop to be established between physical conditions, land use, farmer decisions and subsidy policy.

The DSS can be used as a predictive tool to determine the type of agriculture sustainable under future scenarios, and to explore the effects of different agricultural practices and policies. During the course of the project, the model will be used to develop guidelines on sustainable land use in liaison with local stakeholders, and to assist decision makers from the local to the European scale in policy making. Preliminary results will be presented with application to the 1700km^2 Agri basin in Southern Italy and the 701km^2 Cobres (Alentejo) basin in Portugal.