



A GIS based watershed information system for water resources management and planning in semi-arid areas

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The overall objective of this work is the development of an Information System which could be used by stakeholders for the purposes of water management as well as for planning and strategic decision-making in semi-arid areas. An integrated modeling system has been developed and applied to evaluate the sustainability of water resources management strategies in Lake Karla watershed, Greece. The modeling system, developed in the framework of "HYDROMENTOR" research project, is based on a GIS modelling approach which uses remote sensing data and includes coupled models for the simulation of surface water and groundwater resources, the operation of hydrotechnical projects (reservoir operation and irrigation works) and the estimation of water demands at several spatial scales. Lake Karla basin was the region where the system was tested but the methodology may be the basis for future analysis elsewhere. Two (2) base and three (3) management scenarios were investigated. In total, eight (8) water management scenarios were evaluated:

i) Base scenario without operation of the reservoir and the designed Lake Karla district irrigation network (actual situation)

- Reduction of channel losses
- Alteration of irrigation methods
- Introduction of greenhouse cultivation

ii) Base scenario including the operation of the reservoir and the Lake Karla district irrigation network

- Reduction of channel losses
- Alteration of irrigation methods
- Introduction of greenhouse cultivation

The results show that, under the existing water resources management, the water deficit of Lake Karla watershed is very large. However, the operation of the reservoir and the cooperative Lake Karla district irrigation network coupled with water demand management measures, like reduction of water distribution system losses and alteration of irrigation methods, could alleviate the problem and lead to sustainable and ecological use of water resources in the study area.

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