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Integrated water resources management in the hydrological basin of Volos, Greece: incorporating social and economic aspects of the water supply policy

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Sustainable water resources management refers to an integrated management and coordination of the entirety of the actions and interventions, which regard the water ecosystem, within the hydrological basin. Thus, the sum of the ecological, social and financial parameters is also taken into consideration. This procedure is completed through the development and application of an overall Management Plan at the hydrological basin level. Such a plan provides a broad and integrated perception of the function of the ecosystem and suggests the appropriate actions for its sustainable management.

This concept was followed by the water resources management plan of the city of Volos' watershed, which is presented in this paper. The main objective is the choice of the best set, among others, of measures, which will be able to reestablish the balance in the basin's deficient water budget, satisfying at the same time future urban water demand. Decision-making was carried out using a GIS tool and had to do with the traditional water capture hydraulic projects on the one hand and the sustainable water saving measures on the other (water demand management). The whole procedure is being developed in an area having serious environmental problems, concerning mainly the groundwater resources. The particularity here is that the alternative solutions are strongly depending on administrative agreement and consensus between relevant authorities.

The steps followed were:

- Registration of the water resources of the hydrological basin as well as the total

water demands in this area (water supply and irrigation) including predictions for the future

- Data processing, which lead to a total water budget for the basin,
- Development of alternative management scenarios. Each scenario is based on specific (realistic) acceptances and suggests a variety of specific hydraulic projects, which are expected to provide the extra water supply, able to cover future demand.

As far as the sustainable water saving measures are concerned, a survey has been performed in the city of Volos, in order to evaluate social and economic aspects of the water supply policy, investigate the perspectives of water saving and explore new approaches toward sustainable water management in the water supply sector. Water quality, water demand and water availability issues, water related problems, as well as public information concerning water and environmental issues, public reactions in price changes and public willingness to pay in the residential sector are the main aspects examined and analyzed. Data analysis is based on descriptive statistics (relative frequencies, deviations etc.) as well as on the analysis of the relationships between the survey variables using the method of "the construction of double entrance matrices of absolute and relative frequencies". From the double entrance matrices the qualitative relationships among all the variables under examination are derived. The influence of some selected variables was examined using a mixed within-between subject analysis of variance and discovering the statistically significant variables. Finally, public preferences concerning pricing policies, information and education are being incorporated in the formulation of a demand oriented water policy.