

A new approach for river exploration : River Mesta case study for qualitative modeling sustainable development

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The general objective of NaturNet-Redime project is to support sustainable development by improving knowledge about all aspects of sustainability and provide education mainly about environmental, social and economic tools for implementation of the EU strategy on sustainable development at both EU and international levels.

This paper describes the progress towards developing a qualitative reasoning model of sustainable development issues in River Mesta Bulgaria, following a standardized framework for conceptual description of qualitative reasoning case studies. (Bredeweg, 2006).

In terms of the Water Framework Directive 2000/60/EC (Annex XIA), River Mesta (RM) is located in the eco-region 7 (Eastern Balkans). It is a transboundary river shared between Bulgaria and Greece. River Mesta has been intensively studied for the last 35 years due to the heavy organic pollution caused by yeast, cellulose and cardboard manufacturing in the town of Razlog. The region is recognized as economically under-developed, with high unemployment. Regional development plans focus on intensifying economic activities based mostly on natural features of the region. This includes further development and diversification

of tourism; modernizing and intensifying agriculture and forestry; increasing energy production from hydropower; construction of new roads and streets, and enhancing infrastructure like sewage systems, wastewater treatment plants, and domestic waste landfills.

One of indicative parameters of aquatic ecosystem health is the amount of dissolved oxygen (DO) in the water. Oxygen is an essential component for all living organisms in the aquatic ecosystem. Water pollution, abstraction, erosion and other human activities can disrupt this balance, worsening ecosystem health and decreasing sustainable use of ecosystem services. The fluctuation of DO – natural and anthropogenic, is potentially of great importance for decision making about sustainable and integrated management of aquatic ecosystems. QR reasoning provides a modeling paradigm that allows explicit representation of the various processes that interact in a water body to affect to affect DO(Bredeweg and Struss 2003).

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