Short presentation of GLOWA projects for website of GLOWA Stakeholder Project

Title of the project

GLOWA – DANUBE II: Developing the regional economic model RIWU into a "deep" actors model

Project period

March 2004 to December 2006

Institution

Ifo Institute for Economic Research
Department: Environment, Regions, Transportation

Project co-ordination

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Brief description:

- **Tasks**

The aim of the economic component of DANUBIA is to model industrial activity and water use. For this purpose, the regional economic model RIWU (Regional Industrial Water Use) was developed.

- **Methodology**

The regional economic model RIWU is suitable to analyze decisions of different actors regarding the use of water resources. RIWU is based on the assumption of a representative profitmaximising industrial firm which uses two local inputs, land and water. Industrial production and the local service

sector dynamics determine the overall level of economic activity in the district, which in turn determines household income and population density. The model consists of nine model equations with which seven endogenous variables are forecast (value-added in industry, gross domestic product, price of land for construction, population, household income, industrial water demand and industry own-water supply). The exogenous variables are foreign sales and the area of land.

- **Current results**

The model equations have been developed drawing on current results in the field of empirical regional-economic research. Data have been collected and the model equations have been estimated on the district level. In the outcome industrial activity depends positively on local exports and negatively on the prices of land and water use. The analysis of the simulation properties of the model shows satisfactory results. The regional economic model RIWU proved to be an appropriate tool to forecast regional economic development and industrial water use. It turned out that water scarcity and raising water prices have only a small impact on the Upper Danube region's industrial growth. The reason is that industry will substitute water extraction by increased water recycling in the case of water scarcity or increasing water prices. In this context of interdisciplinary research and modelling, RIWU can be used for as tool for questions of water resource management and can be transferred to other river basins.

- **Continuation**

The macroeconomic RIWU-model will be accomplished by a "deep" actors model in the second project period showing the decision-making processes of the actors involved. RIWU will further on provide the framework of the macroeconomic regional development. For the microeconomic modelling of corporate decision-making processes data from remote sensing and the results of a survey amongst industrial firms will be used. Data from remote sensing are showing the regional distribution of companies with water intensive production processes. The results of the survey shall provide information about the specific water demand of the single industries. This deep actors model will be integrated into the interdisciplinary model DANUBIA to enable the modelling of different scenarios from natural and social sciences.

Publications

Langmantel, E. (2004), Industrial Growth and Water Demand - An Empirical Analysis for the Upper Danube Catchment, Jahrbuch für Regionalwissenschaft Vol. 24, Nr. 2 (forthcoming).

Langmantel, E., Wackerbauer, J. (2003), RIWU - A Model of Regional Economic Development and Industrial Water Use in the Catchment Area of the Upper Danube, in: International Journal of River Basin Management, Vol. 1, Nr. 2 (2003), p. 1 – 5.

Wackerbauer, J. (2003) Regulierungsmodelle für die öffentliche Wasserversorgung und ihre Wettbewerbseffekte, in: ifo Schnelldienst 21/2003, p. 9 – 17.