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

Prof. Dr. Rolf-Ulrich Sprenger

Project team

Dr. Johann Wackerbauer
Matthias Egerer
Erich Langmantel
N.N.

Contact (name, tel. no. and email)

Dr. Johann Wackerbauer
Tel.: 0049/89/9224-1277
Fax: 004989/98 53 69
Email: wackerbauer@ifo.de

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