



## Topic 5

### **Economic instruments: what is their effectiveness to reduce groundwater use and pollution? In which context?**

Public water managers and stakeholders are increasingly aware of the role economics can play in designing groundwater management plans and policies. There is a growing recognition that the definition of sustainable groundwater qualitative and quantitative objectives as well as the identification of technical actions needed to achieve these objectives require investigating trade-offs between economic and environmental considerations. Also, water managers and planners increasingly recognise that market based instruments such as prices, taxes and tradable water rights should also be included in their operational tool box.

Groundwater planners can expect three distinct types of contributions from economists. The first one is the description of the hydro-economic system to better capture the interactions between, and dynamics of, economic activities and groundwater resources. This involves the construction of hydro-economic models which can be used to simulate plausible futures for economic activities and resulting pressures on groundwater resources, or vice versa.

The second type of contribution from economists consists in assessing and comparing the economic cost and/or benefits of different groundwater management options. The role of economics can either be to identify the least costly way to achieve a given environmental objective (cost-effectiveness analysis) or to assess the net benefit (i.e. total benefits minus total costs) of alternative management options (cost-benefit analysis).

The third type of contribution consists in the design of economic instruments such as prices, (abstraction/pollution) charges or taxes that might influence water users' behaviour. The need to influence users' behaviour for enhancing the sustainability of groundwater resources is increasingly recognised by water planners. And they call for the design and implementation of economic instruments aiming at regulating water demand or pollution.

The main purpose of this session is to show how practical economics can help providing some light on these different demands. It is also to discuss the needs for, and challenges in, integrating economics with technical expertise and knowledge, an element that is essential to the relevance of economics for policy making in the field of (ground-) water management. Empirical contributions based on real case studies are particularly encouraged. The session will be organised around the three following topics:

- 1- Hydro-economic modelling. We invite papers presenting models that integrate hydro-geological and economic approaches, either through complex system modelling approach or external model coupling. Papers should focus also on issues related to the use of models as decision support systems (communication of uncertainty, use of models to explore possible scenarios, etc.).
- 2- Groundwater policy evaluation. Contributions presenting results of Cost-Effectiveness and Cost-Benefit analyses are invited. The session should cover the issue of groundwater quality valuation, discussing the usefulness and limitations of various methods (stated preference techniques and other methods such as damage cost). A link will be established with the session dedicated to the implementation of the European Water Framework Directive.
- 3- Economic instruments. Three types of contributions are invited: (1) empirical papers presenting economic instruments which have already been implemented in specific regions of the world (pollution or abstraction taxes, water markets); (2) papers which assess the impacts of economic instruments through microeconomic model simulations; (3) and papers which explore the potential impact of innovative economic instruments through experimental approaches (experimental economics, policy exercise, games).