Serpis Case Study Fact Sheet

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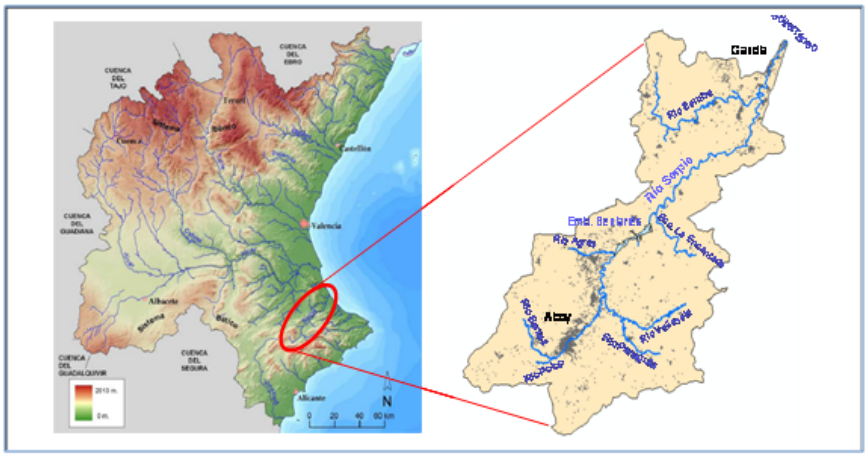
The heart of AquaMoney (see Policy Brief No. 1) are 11 case studies from different European countries. Based on these case studies, AquaMoney developed guidelines for benefit transfer. This policy brief will present the main results of the Serpis case study. The idea is to give policy makers an overview of the range of values that can appear and how the perception of environmental problems in the different countries differs.

Serpis Case Study

The Serpis river basin is located in Eastern Spain, south to Valencia and north to Alicante cities, within the domain of the Jucar River Basin District. With a surface area of 990 km^2 and a river length of 75 km, the Serpis river basin domain comprises 12 surface water bodies, 13 groundwater bodies, and 1 heavily modified water body (Beniarrés reservoir). The main water use is agriculture (75%; mainly fruit trees, especially citrus, and vegetables), followed by urban supply (21%; mainly from groundwater) and industry (4%; basically, textile industry). 30 WWTPs treat wastewater from the main urban and industrial areas, and wastewater discharge represents a high percentage of the total streamflow (up to 50% during winter, and 90% during summer time), and it is responsible for up to a 90% of the annual load of solids, organic matter and nutrients. Water quality is better in the upstream water bodies, while in the middle and lower basin water it gets worse, mainly due to the polluted discharges from the urban and industrial areas. Most surface water bodies in the basin are at very high or high risk of failing to achieve the environmental objectives of the Water Framework Directive (WFD). The most important water quality problem is the severe eutrophication process in Beniarres reservoir, which provokes fish kills, deterioration of aesthetic conditions, unpleasant odour and colour, and the impossibility of recreation uses. The WFD programme of measures aims to reduce pollutant discharges, mainly by: more advanced wastewater treatments, control of direct industrial and urban wastewater discharges and illegal water abstractions, better irrigation management practices, and wastewater reuse for agriculture and industrial applications.



Valuation of environmental and resource cost under scarcity conditions.

The valuation study was conducted with a common design for the “water scarcity group”, based on choice experiment (CE). A non-labeled fractional factorial orthogonal design was elaborated with the combination of two attributes: the

likelihood of water use restrictions in households (defined in terms of restriction for sprinkling gardens, washing machines and other secondary uses of water during certain hours in dry summers), and different environmental quality levels (poor, moderate, good and very good) due to water flow in the river, plus a monetary attribute (amount of money to be added to the water bill per year per household). The improved environmental conditions and the reduction of the likelihood of restrictions could be obtained in exchange of an increase of the water bill for households in the next 10 years. Respondents from a representative sample of the river basin population were asked to select the most preferred alternative out of three (in four choice occasions per person), in which different scenarios of water allocation to the environment and different probabilities of water restrictions to the households were presented. One of the options was always the baseline situation (future expected probability of water restrictions to households and poor environmental status in the river basin if no measures are taken in 10 years). The survey was made by random face-to-face interviews (394 interviews) in the main cities of the basin (Alcoy and Gandía), which represent together about 80% of the basin population. The response rate was 33%, and 2% of protest answers was obtained.

Social perception and attitudes

A 10% of the sample identified water problems like the most important problems in their area (economic and traffic problems were ranked first). However, a large share of respondents (93%) considered the environment as important/very important. Water scarcity is considered as a (big) problem in the region for a 62% of the respondents, although only 21 % of the sample has suffered restrictions in their households in the past (last 10 years). Although only 38 % considered that their households would face any water restrictions in the years to come, 75 % believes that the environmental quality is affected by water scarcity. A 60 % considered that water scarcity will increase in the river basin in the next 10 years. Finally, over 70 % considered that, if no additional water saving measures are taken, future water and environment problems are possible. According to the respondents, when water is scarce, the priority should be given after household supply to agriculture (53%), environment (35%), and industry (12%).

Willingness-to-Pay (WTP)

A Multinominal Logit Model (MNL) was estimated, including the different levels of improvement of environmental quality as dummy variables and the attribute 'reduction of household water supply' as a continuous variable reflecting the probability of water restrictions. The results of the MNL were used to calculate the consumer surplus for the different attributes:

	Consumer Surplus (€ per household/year)	**Standard Error**
Domestic Supply	297.6	43.5
Good Environm. Quality	64.1	10.1
Very Good Environm. Quality	104.0	13.1

In order to aggregate the individual (household) values for the whole population in the study area, we considered the estimated 172,388 inhabitants (2007 population census) and an average of 2.73 persons per household. Taking in to account the 2% of protest answers, we obtained the aggregated values (social cost) for costs due to restrictions in the domestic supply of 18.42 million € and 3.96 million € for environmental cost (economic value of achieving the WFD environmental objective), which sum up for a total cost of 22.38 million € per year (24.86 M€ for very good conditions) from water scarcity conditions. A multivariate model was developed to analyze demand heterogeneity and which variables influence the WTP for the attributes. People in general want a change. Young people and people with higher income show greater WTP for improving the environmental quality. People having suffered water restrictions in their households have higher WTP for reducing the probability. The results show "sensitive to scope" in WTP for better environmental conditions.

Summary

The study has shown the clear social interest in the area for water scarcity issues and the need of allocating flow for improving the environmental conditions, translated into a significant WTP for reducing supply restrictions and enhancing water quality in the basin. These non-market social benefits (or avoided costs) should be considered in the implementation of the WFD as an useful input for cost recovery analysis and cost-benefit analysis of water management options and possible disproportionate costs.

Further information can be found in the Case Study Reports and in further Policy Briefs on: www.aquamoney.org