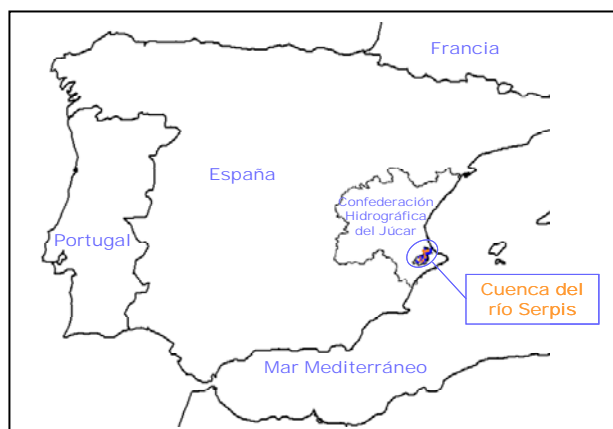


Water scarcity valuation under the EU WFD

SERPIS RIVER BASIN Case Study Report



Technical Univ. of Valencia, Spain

September, 2009

Authors: Manuel Pulido-Velazquez (UPVLC), Julia Martín-Ortega (Basque Centre for Climate Change, C3), Joaquín Andreu Álvarez (UPVLC), Antonio López (UPVLC)

Contact email: mapuve@hma.upv.es (M. Pulido-Velazquez)

Contact information AquaMoney Partners

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Institute for Environmental Studies (IVM),
Vrije Universiteit Amsterdam
De Boelelaan 1087, 1081 HV Amsterdam
THE NETHERLANDS



Institute for International and European
Environmental Policy (Ecologic)
Pfalzburger Strasse 43/44, D - 10717 Berlin
GERMANY



Department of Systems Ecology and Sustainability
University of Bucharest (UNIBUC)
Spl. Independentei 91-95,
Postal Code: 050095 Sector 5, Bucharest
ROMANIA



Norwegian University of Life Sciences (UMB)
Department of Economics and Resource Management
P.O. Box 5003, N-1432 Aas
NORWAY



Instituto de Ingeniería del
Agua y Medio Ambiente

Institute for Water and Environmental Engineering,
Universidad Politecnica de Valencia (UPVLC)
Camino de Vera s/n, 46022 - Valencia
SPAIN



Recherches pour une Terre durable
brgm

Bureau de Recherches Géologiques et Minières (BRGM)
Direction de la Recherche
3, Av. Claude-Guillemin
BP 36009 45060 Orléans, cedex 2
FRANCE



University of the Aegean (AEGEAN)
Faculty of Environment
University Hill 81 100 Mytilini
GREECE



Research Institute for Soil Science and Agricultural
Chemistry (RISSAC),
Hungarian Academy of Sciences
Herman O. street 15. 1022 Budapest
HUNGARY



School of Environmental Sciences
University of East Anglia (UEA)
Norwich NR4 7TJ
UNITED KINGDOM



Center for Environmental Policy (AAEP)
A. Juozapaviciaus 6/2, Vilnius LT-09310
LITHUANIA



Flemish Institute for Technological Research (VITO)
Boeretang 200, B-2400 Mol
BELGIUM



Department of Agricultural Economics and Engineering
(DEIAGRA)
Faculty of Agriculture
University of Bologna,
Viale Fanin, 50, 40127 Bologna
ITALY



Norwegian Institute for Water Research (NIVA)
Brekkeveien 19, 0411 Oslo
NORWAY



Royal Veterinary and Agricultural University (RVAU)
Food and Resource Economics Institute
Rolighedsvej 25, 1958 Frederiksberg C
DENMARK



Institute for Advanced Studies Carinthia (IHSK)
Domgasse 3, 9020 Klagenfurt
AUSTRIA



Corvinus University of Budapest (CUB)
Fovám tér 8., 1093 Budapest
HUNGARY



European Commission
DG Research
Unit I.2 - 'Environmental Technologies and
Pollution Prevention'



This report is part of the EU funded project AquaMoney, Development and Testing of Practical Guidelines for the Assessment of Environmental and Resource Costs and Benefits in the WFD, Contract n° SSPI-022723.

General				
Deliverable	D41-51			
Deadline				
Complete reference				
Status	Author(s): M. Pulido, Martín-Ortega, J., Andreu, J., López, A.	Date Sept. 2009	Comments	Date
Approved / Released				
Reviewed by				
Pending for Review				
Second draft				
First draft for Comments				
Under Preparation				
Confidentiality				
Public				
Restricted to other programme participants (including the Commission Service)				
Restricted to a group specified by the consortium (including the Advisory Board)				
Confidential, only for members of the consortium				
Accessibility				
Workspace				
Internet				
Paper				

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1. Introduction

This report includes the final results of the AquaMoney pilot case study for the Serpis river basin (Jucar River Basin District). The main objective of the case study is to test methodologies for the valuation of components of the environmental and resource costs of water services under conditions of water scarcity, and to come up with best practice recommendations both for the valuation process and the use of the information to inform the policy process. Specifically, we intend to test a methodology to assess:

- The economic value of environmental water use, i.e. allocating water to the environment to ensure good environmental status under conditions of limited water availability.
- The option value of domestic water use, i.e. not using water now, but in the future.

To estimate the value the society places on improvements in water allocation to the environment and in the future reliability of household water supply we resort to Choice Experiments. Choice (CE) experiments are one example of the stated preference approach to environmental valuation, since they involve eliciting responses from individuals in constructed, hypothetical markets, rather than the study of actual behaviour. The CE technique is based on random utility theory and the characteristics theory of value: environmental goods are valued in terms of their attributes, by applying probabilistic models to choices between different bundles of attributes. By making one of these attributes a price or cost term, marginal utility estimates can be converted into willingness-to-pay estimates for changes in attribute levels, and welfare estimates obtained for combinations of attribute changes. The decision to use a CE approach here was driven by the desire to estimate separate values for allocating water to the environment and for reducing uncertainty on household future water supply under water scarcity conditions. Choice experiments (CE) are becoming a popular means of environmental valuation, and have already been applied to deal with other valuations required by the implementation of the WFD (e.g., Hanley et al., 2006).

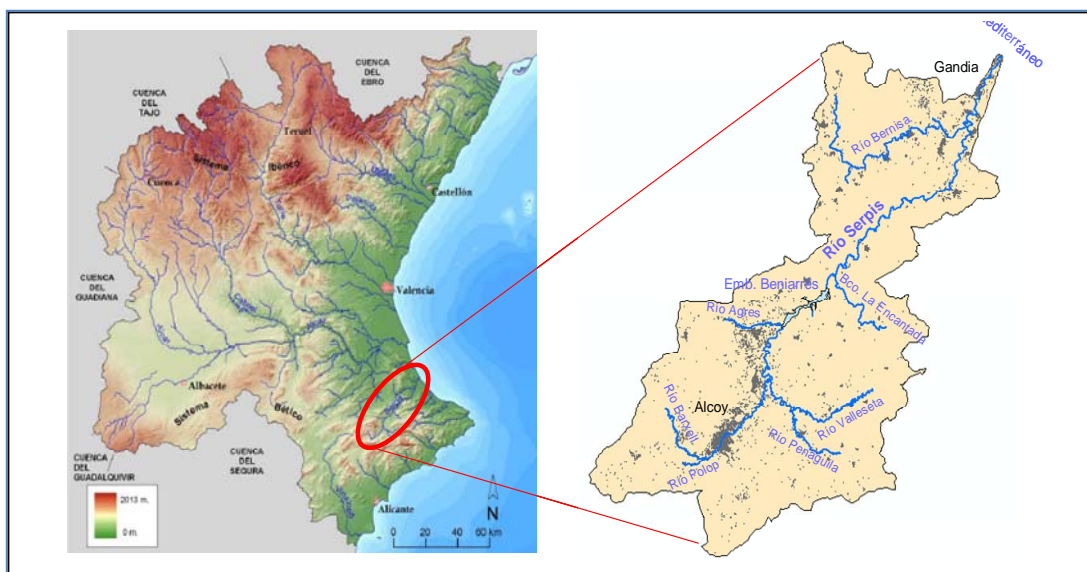
A common design of the CE questionnaire has been developed in cooperation with two other partners of AquaMoney (Univ. of the Aegeon, Greece, and Univ. of Bologna, Italy), Dr. Martín-Ortega (at that moment at IVM, Amsterdam, The Netherlands), Dr. Álvarez-Farizo (CSIC, Spain), and Dr. Roy Brouwer, coordinator of the AQUAMONEY project. The common questionnaire has been applied in four river basins in Southern Europe: the Serpis, Guadalquivir and Tajo river basins in Spain, the Po River basin in Italy and the Lesvos Island in Greece. Valuation exercises are expensive and time consuming, and regulators are very unlikely to have the time or money to commission original valuation studies for every river basin. The common design is done with the purpose of conducting a benefits transfer test across these river basins, to see what errors are likely to be experienced if benefits transfer procedures are used as part of implementing the WFD.

2. Description of the case study

2.1 Location of the case study

The Serpis River Basin is located at the East of Spain, south to Valencia and north to Alicante cities, within the domain of the Jucar River Basin District (see Fig. 1). It is located south to Valencia province, and north to Alicante province, mainly within the municipal districts of Gandía, Llutxent, Villalonga,, Beniarrés, Muro de Alcoy, Cocentaina, Rotova and Alcoy.

Figure 1 Location of the Serpis RB (source: Jucar RBD, art. 5 report)



2.2 Water system characteristics

2.2.1 Total natural runoff and available water resources.

Table 1 Surface and groundwater resources in the Serpis RB (source: Jucar River Basin Mngmt. Plan)

BASIN	TOTAL NATURAL RUNOFF (Mm ³)		
	SURFACE RUNOFF	AQUIFER DISCHARGE	TOTAL
Serpis river until Beniarrés dam	15,69	25,75	41,44
Serpis river between Beniarrés reservoir and Villalonga	11,60	17,11	28,71
Bernisa river	5,74	lp.	5,74
Serpis river, rest of basin	lp.	10,00	10,00
Serpis river, total basin	33,0	52,86	85,89

Table 2 Surface and groundwater resources in the Serpis RB (source: Jucar River Basin Mngmt. Plan)

Characteristics	Description
Conventional resources	

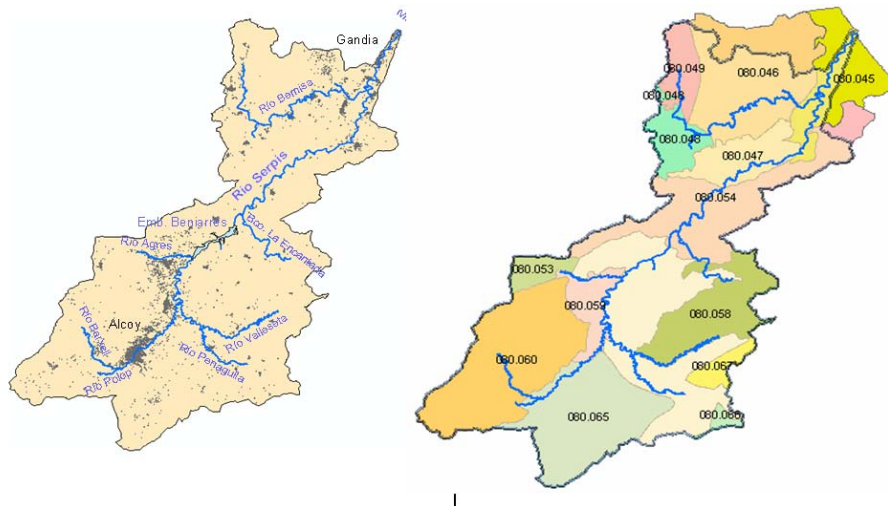
Regulated surface resources	17.0 Mm ³ /year
Groundwater resources	105.0 Mm ³ / year
Irrigation return flow	8.0 Mm ³ / year
Total volume of available resources	130 Mm ³ / year
Marginal (nonconventional) resources	
Wastewater reuse *	4.5 Mm ³

*Projected in the current Jucar RB Hydrological Plan (CHJ, 1999)

2.2.2 Streams and aquifer characteristics.

With a surface area of 990 km² 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).

Figure 2 Serpis river and main tributaries (left) and groundwater bodies (right) (source: Art. 5, Jucar RBD)



2.2.3 Hydraulic infrastructure.

The most important hydraulic infrastructure is:

- A dam, located in Beniarrés, with an active storage capacity of 29.5 Mm³.
- Hydropower plants:

Table 3 Hydroelectric plants (source: CHJ, 1999)

Hydropower Plants	Power (Mw)	Hydraulic jump (m)
Lorcha	0.68	31.0
Rincón del Duque	0.12	-
Ullals	0.13	-
Reprimala	0.34	18.3

(-) Not in use any more

- **Irrigation canals:**

Table 4 Irrigation canals (source: CHJ, 1999)

Canals
<i>Acequia Real de Gandía (Canales Bajos del Serpis)</i>
<i>Canales Altos del Serpis</i>
<i>Riegos de Bernisa</i>
<i>Huerta de Beniarrés y Lorcha</i>
<i>Pequeños regadíos del Bajo Serpis</i>
<i>Pequeños regadíos del Alto Serpis</i>

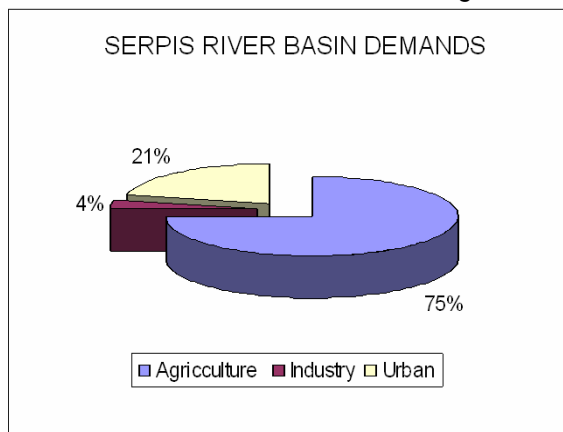
- **Wastewater Treatment Plants (WWT):**

There are 30 WWT plants that get wastewater from the main urban and industrial areas, and treat around 29 Mm³/year. The three more important are: Font de la Pedra (18.5%; discharges to the river); Alcoy (25.6%; discharges to the river); and Gandía (49.8%; discharges to the river). 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.

2.3 Water use and water users

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).

Figure 3 Water uses in the basin



WATER DEMANDS (Mm³)	
Total	122
Agriculture	91
Industry	5
Urban	26

The next table shows the most important sources of supply for the main water uses in the basin:

Table 5 Origins of water use (source: CHJ, 1999)

Use	Origin
Urban supply	Groundwater - springs
Agriculture	Mix (surface and groundwater)
Industry	Groundwater (municipal supply network and wells)
Hydropower	Surface water

2.4 Main water management and policy issues in the context of the WFD

2.4.1 Institutional framework

The Serpis river basin belongs to the Júcar RBD. The Júcar River Basin Authority (Confederación Hidrográfica del Júcar, CHJ) belongs to the chart of the Ministry of Environment, within the national Administration but works as functionally autonomous.

2.4.2 Legal and water rights issues

- The 1985 Water Law brought groundwater into the system of water use regulation along with surface water.
- The 1999 Amendment regulates water rights transfer contracts.
- There is a restriction on transfers, depending on the order of priority: domestic water supply, irrigation, industrial uses, and others.

2.4.3 Droughts and water scarcity problems

The basin often suffers droughts, which can be classified as moderate, severe, and critical. Some of the mitigation policies to solve this problem are: regulation through Beniarrés reservoir, wastewater reuse, and better conjunctive use management of surface and groundwater resources.

2.4.4 Flood risk issues

The Serpis is a Mediterranean river, with a very irregular streamflows and prone to flood problems. Fortunately, the dam is providing an important mitigation of the flood risk.

2.4.5 Water quality issues

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 Beniarrés 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.

2.4.6 Resources overexploitation

Some aquifers in the basin are currently overexploited, mainly in the lower basin. According to the River Basin Hydrological Plan, a minimum of groundwater discharge to the sea of 21 Mm³/year is required to stabilize the fresh-salt water interface.

2.4.7 Water use efficiency

Reducing water losses for irrigation by improving the applications techniques, upgrading the infrastructure and moving to drop irrigation in some Districts that still apply surface furrow irrigation, would increase water conservation and efficiency in the basin.

3. Set up of the survey

3.1 Questionnaire design

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 ten 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 a horizon of 10 years).

Respondents were informed that securing future water supply for the environment means that water levels in rivers and aquifers increase, reducing the risk that they will dry out forever and improving living conditions for a variety of fish, plants and other animals living in and near the water. Three possible levels of improvement were proposed, corresponding to the WFD categorization and compared to the expected 'poor' situation (status quo) with low water levels and environmental quality:


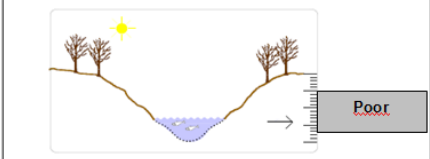

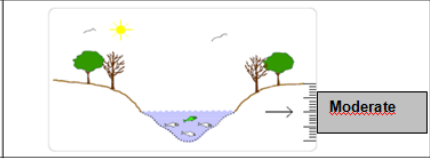

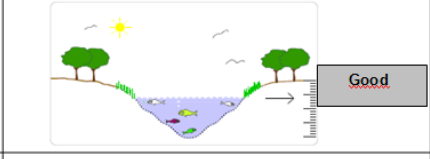

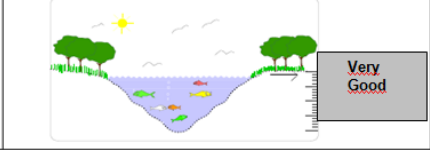
- **Poor** (status quo): Expected future situation of low water levels and environmental quality status. This is a large deviation from the natural situation due to the increased water scarcity conditions. Many fish species will disappear and riverbanks will lose most of their vegetation. As a result most birds and insects will disappear too.
- **Moderate**: less than average water levels and environmental quality status under natural conditions. This is still a substantial deviation from the natural situation. A limited number of fish species are present. Riverbanks have some vegetation supporting a limited number and variety of birds and other wildlife.
- **Good**: water levels and environmental quality status are close to their average natural levels. This is a small deviation from the natural situation. Under these

conditions riverbanks have a lighter than natural vegetation cover. As a result the breeding and nesting conditions for a number of species are limited.

- **Very good:** water levels and environmental quality status are in their natural state where there is almost no pressure from human activities. Conditions for wildlife are optimal under these circumstances.

Household water restrictions were defined in terms of restriction for sprinkling gardens, washing machines and other secondary uses of water during certain hours in dry summers. 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 ten years. Fig. 4 shows the attributes.

Figure 4 Attributes in the CE

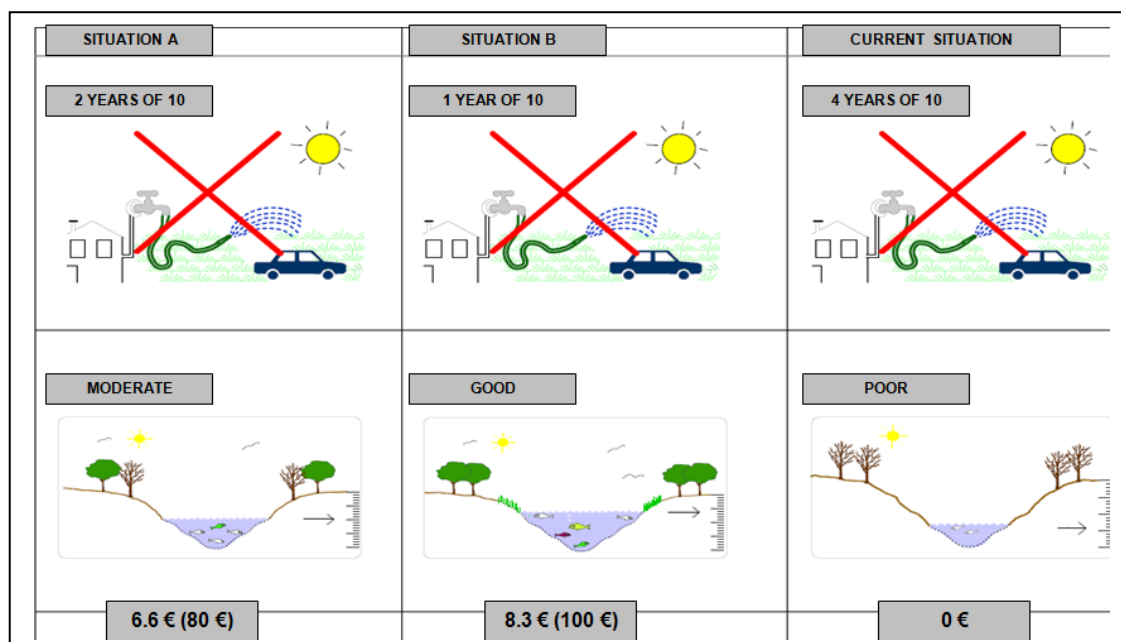
CURRENT SITUATION		
1		
2		
3		

The questionnaire contains three parts:

- First part: questions reference to environment, water use and experiences with water restrictions, in order to infer social perceptions and attitudes.
- Second part: choice experiment. Two attributes with different levels plus the price attribute are considered:
 - *The likelihood of household facing outdoor water use restrictions*: as a household you currently face a likelihood of water use restrictions during 4 of the next 10 years until and including 2018. Depending on the water saving measures, the likelihood of outdoor water use restrictions during any one summer over the next 10 years can be reduced to 3 years, 2 years or 1 year.
 - *Environment*: three possible environmental situations (moderate, good and very good) are presented versus the current poor situation with low water levels and poor environmental quality.
 - *Cost prices* have been defined in view of the fact that taking additional measures to secure future water supply for households and the environment costs money: 20, 40, 60, 80,100,120 €

The CE consisted of 6 block, each block with 4 cards. Fig. 5 shows an example of choice card.

Figure 5 Example card



-
- Third part: socio-demographic characteristics of the respondent. This information is useful in utility/preference formation, but also for checking that the sample collected matches known characteristics of the population of interest.

3.2 Sampling procedure and response rate

Sampling procedure

The population of the Serpis basin is 172,388 inhabitants (according to the 2007 population census). A total number of 394 interviews were carried out in the cities of Alcoy and Gandía, the main urban areas in the basin. The survey was carried out by random face-to-face interviews in the streets by four trained students over the months of June and July of 2008. The interviews took on average about 20 minutes to be completed.

To carry out the survey, we prepared the following material:

- The set of questionnaires
- Some books with the following information:
 - A map of the basin.
 - The cards of the choice experiment (show cards)
 - The card of income levels
 - Auxiliary cards showing the options for some questions.

The interviewers had to read the questions and explain the cards. A briefing was organized to ensure that the interviewers knew exactly what the study was about and how they were supposed to conduct the interview.

The next distribution of the sample was considered:

Figure 6 Interviews Distribution

Gandia + Alcoy, 80 % of population

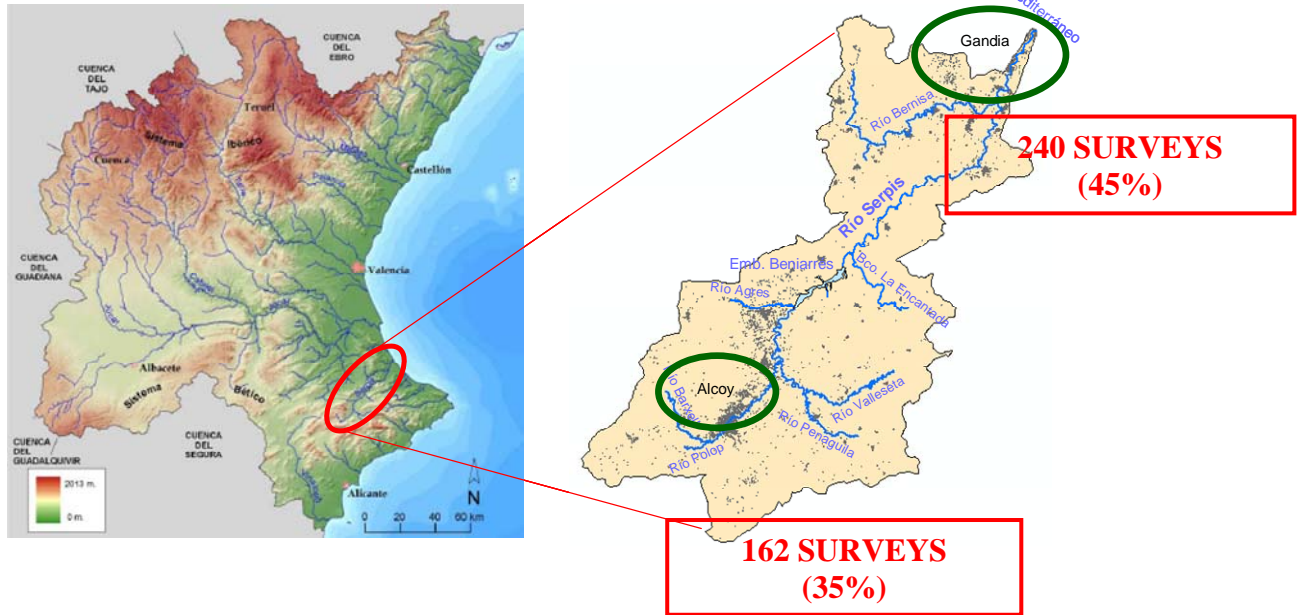
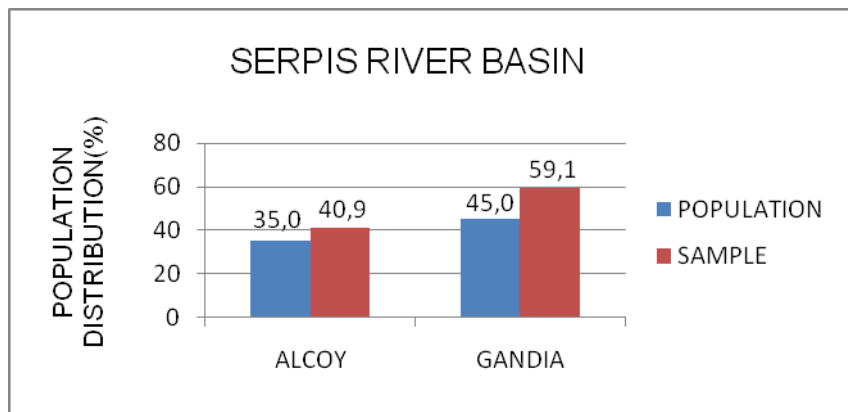


Figure 7 Population Distribution (source: Instituto Valenciano de Estadística, IVE,2008)



The average response rate was 33 %, and it varies a lot with the location of the survey within the city.

4. Valuation results

4.1. Respondent characteristics and sample representativeness

4.1.1. Demographic characteristics

The interviews were carried out between the cities of Alcoy and Gandía, which represent together a 80% of the basin population. The sample collected matches the characteristics of the population of interest in terms of age and gender distribution.

ALCOY

Table 6. Data of Alcoy (Source: IVE)

City	ALCOY
Code	03009
Province	ALICANTE
Region	L'ALCOIÀ
Distance to the capital of province (km)	54
Area (km ²)	129,9
Population's density (hab/km ²)	466,6
Coastal	NO

Figure 8. Alcoy. Age distribution

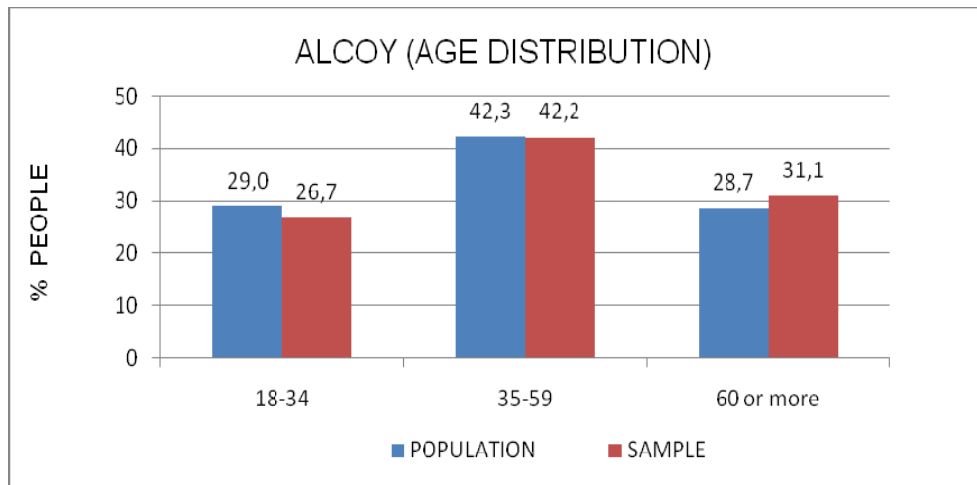
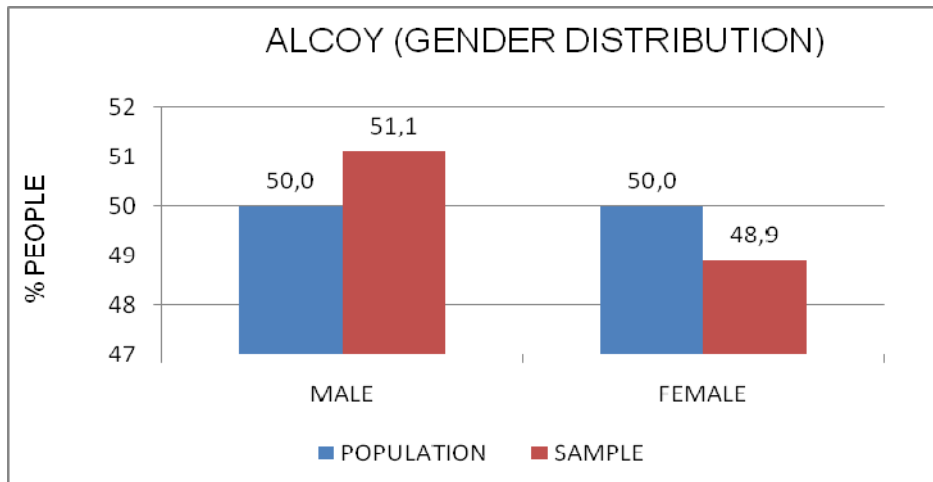


Figure 9. Alcoy. Gender Distribution



GANDIA

Table 7. Data of Gandía (Source: IVE)

City	GANDIA
Code	46131
Province	VALENCIA
Region	LA SAFOR
Distance to the capital of province (km)	69,9
Area (km ²)	60,8
Population's density (hab/km ²)	1230
Coastal	SI

Figure 10. Gandía. Age distribution

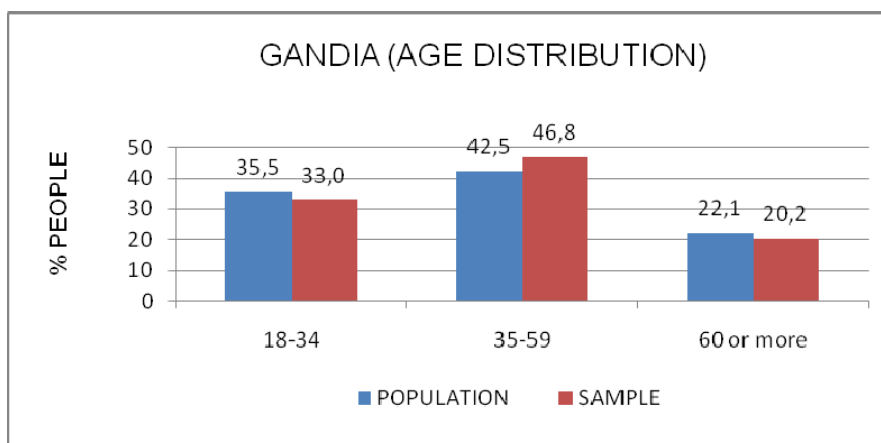
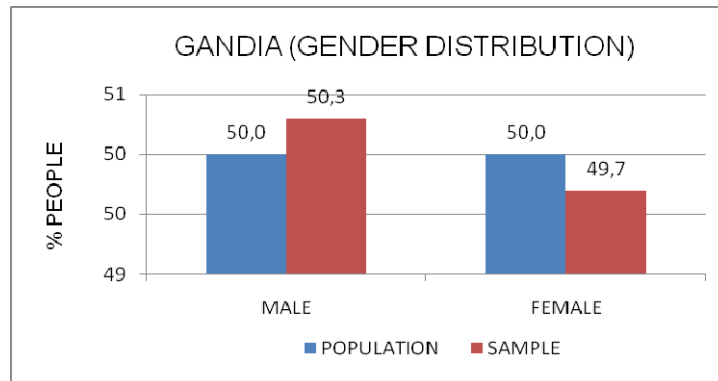


Figure 11. Gandía. Gender Distribution.



4.1.2. Socio-economic characteristics

The following characteristics are analyzed: studies, income, and jobs. The sample collected matches the characteristics of the population of interest

Studies

Figure 12. Studies in Alcoy.

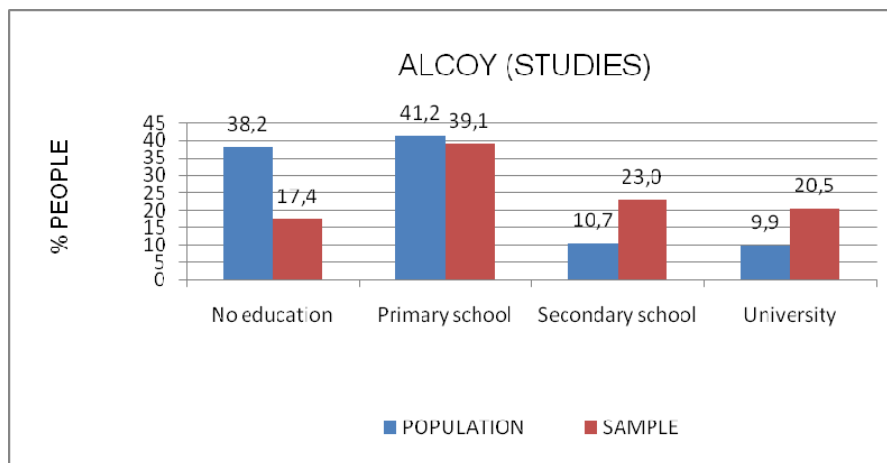
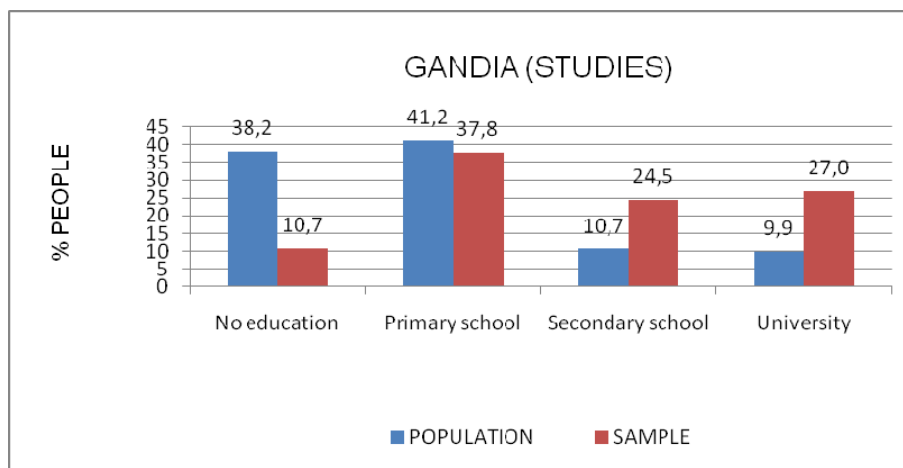


Figure 13. Studies in Gandia.

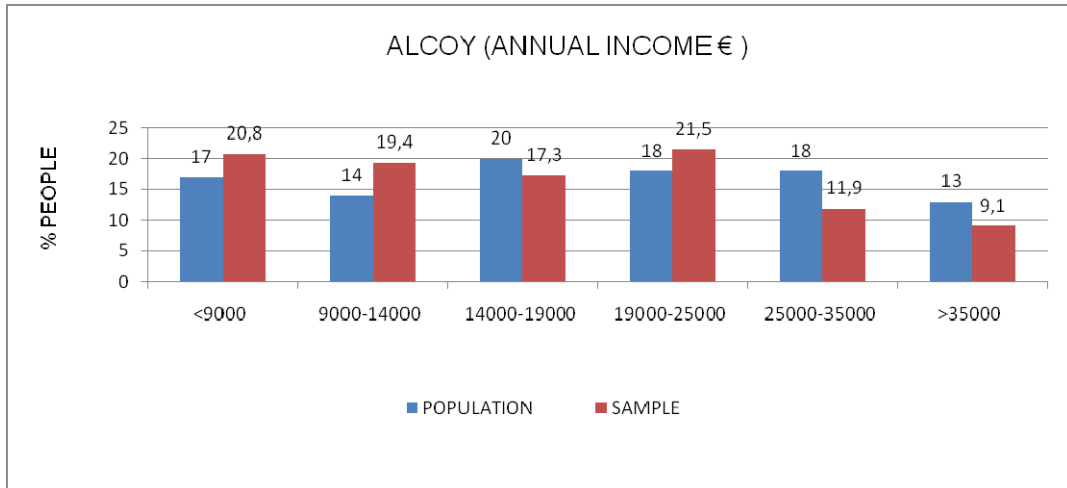


More than 50 % have completed primary and secondary school in both, Gandia and Alcoy.

Income

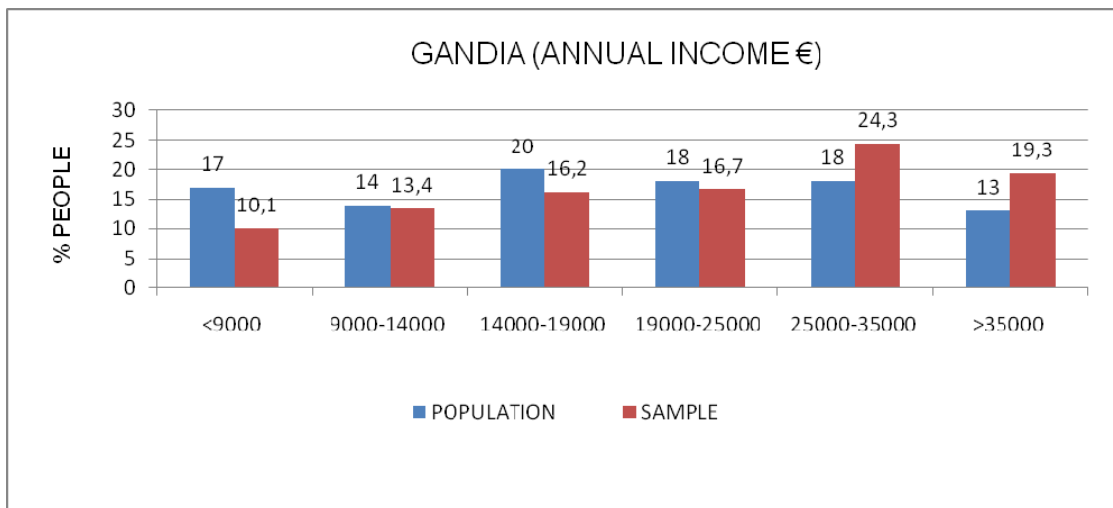
Figures 14 and 15 show the annual family income distribution in Alcoy and Gandia.

Figure 14. Annual Family Income in Alcoy.



70 % of people have an annual income between 9000 euros and 25000 euros.

Figure 15. Annual Income in Gandia.



Jobs

The sample and the population job distribution in Alcoy and Gandia are shown in Figures 16 and 17.

Figure 16. Jobs distribution in Alcoy

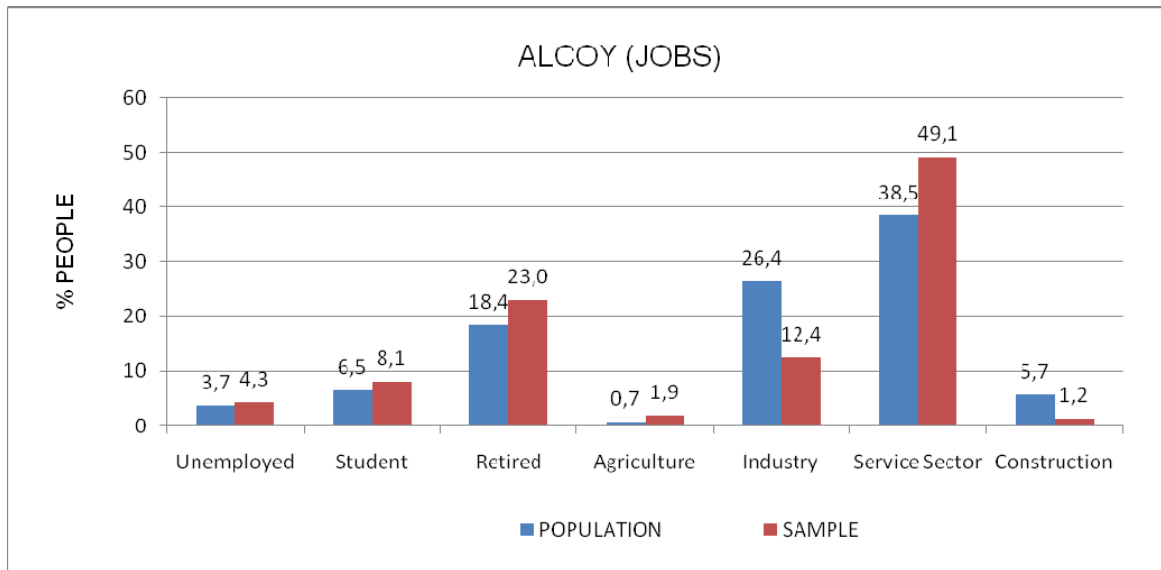
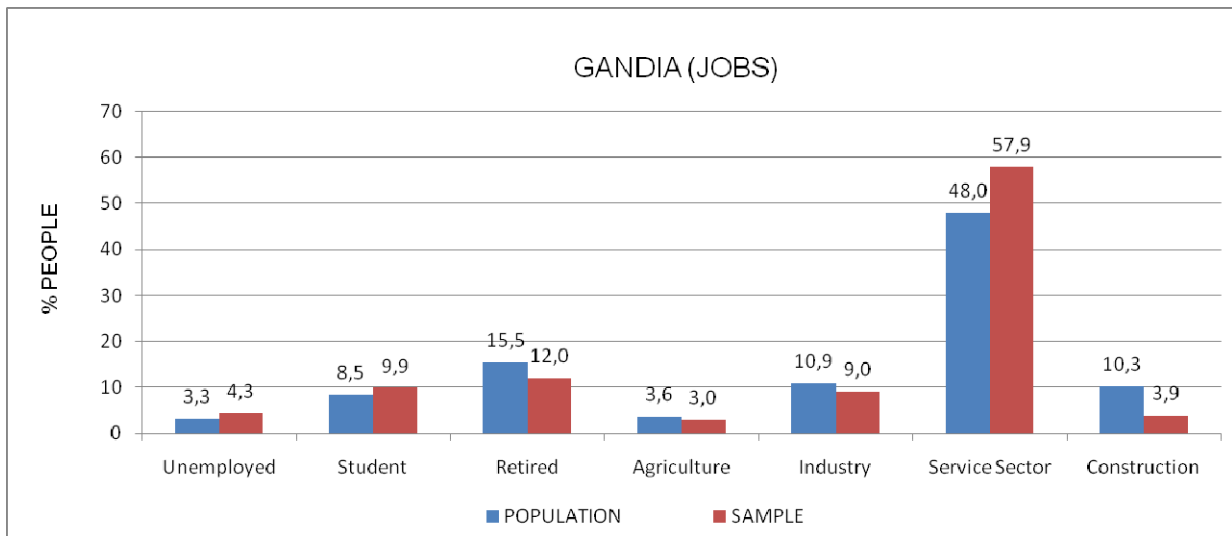


Figure 17. Jobs distribution in Gandia



4.1.3. Public perception of the environment and water use characteristics

Only few people, 10% of the sample, identified water problems like the most important problems in their area. Instead, economic and traffic problems were first.

Table 8. Most important problems. Question 1.

	First Problem (%)	Second Problem(%)	Third Problem(%)
Economic Problems	39,34	25,63	22,84
Traffic	17,26	8,12	7,87
Housing Problems	4,57	4,06	2,79
Safety	4,57	8,38	7,87
Water	5,08	2,79	2,54
Public Services	8,88	4,82	7,11
Infrastructure	0,76	1,78	0,51
Pollution	3,55	5,33	8,63
Inmigration	5,08	4,82	3,05
Any problem	3,81	0,00	0,00
Environment	2,54	2,28	2,03
Climate Change	0,25	1,27	2,28
Culture	0	2,54	3,05
Demography	0,25	0,51	1,02
Any option	0	25,89	26,14
Public constructions	0,76	1,77	2,28
Others	3,3	0,00	0,00

However, a large share of respondents (93%) considered the environment as important/very important. A 75 % believes that the environmental quality is affected by water scarcity (Table 9).

Table 9. Environment influenced by water availability. Question 9.

	Percent
No	15,48
Yes	74,37
Don't Know / Don't know	10,15

In the survey, the relationships of the respondents with water uses in the basin are investigated. In particular, for water recreation activities, considering frequency, type of activities, and water bill. Most of the respondents (83%) do not practice any recreation water activity. From those who practice water recreation, these are the activities they have chosen (Fig. 18) and the type of water body (Fig. 19).

Figure 18. Distribution of activities near open freshwater. Question 4.

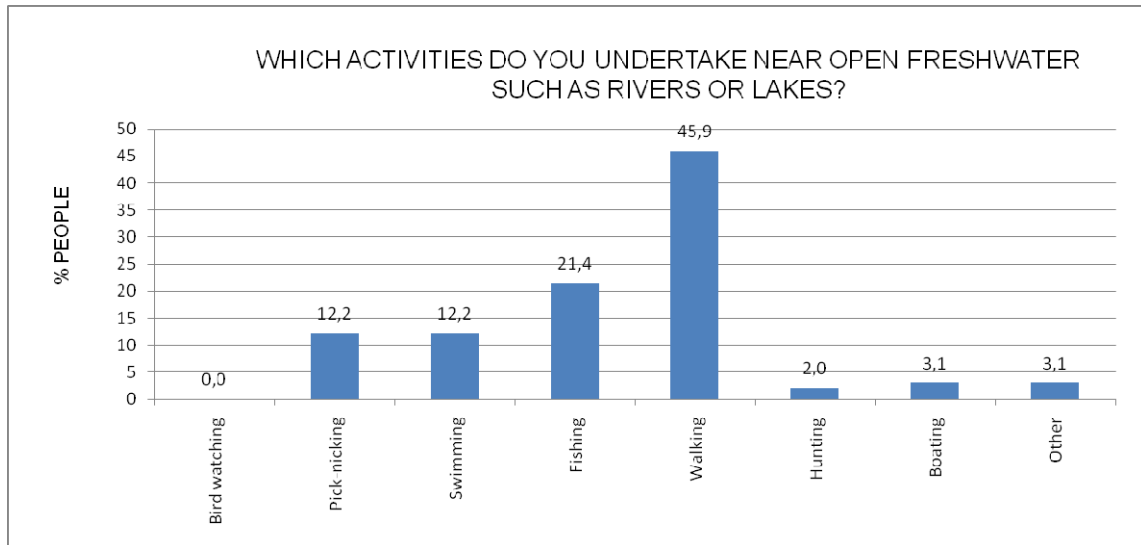
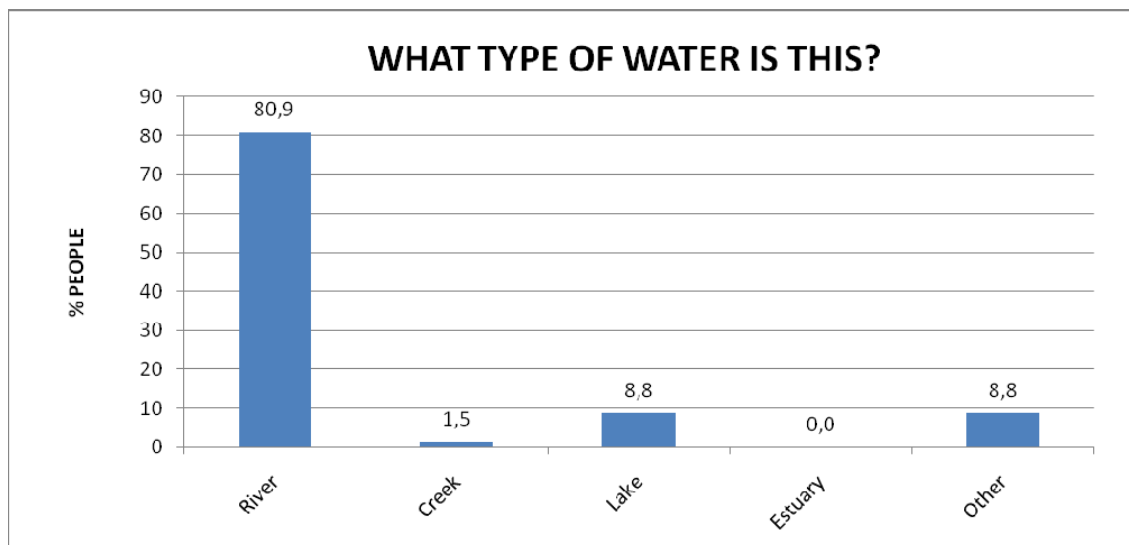


Figure 19. Type of water body. Question 7.



On the other hand, most people (92%) are professionally or workwise affected by water availability or water restrictions.

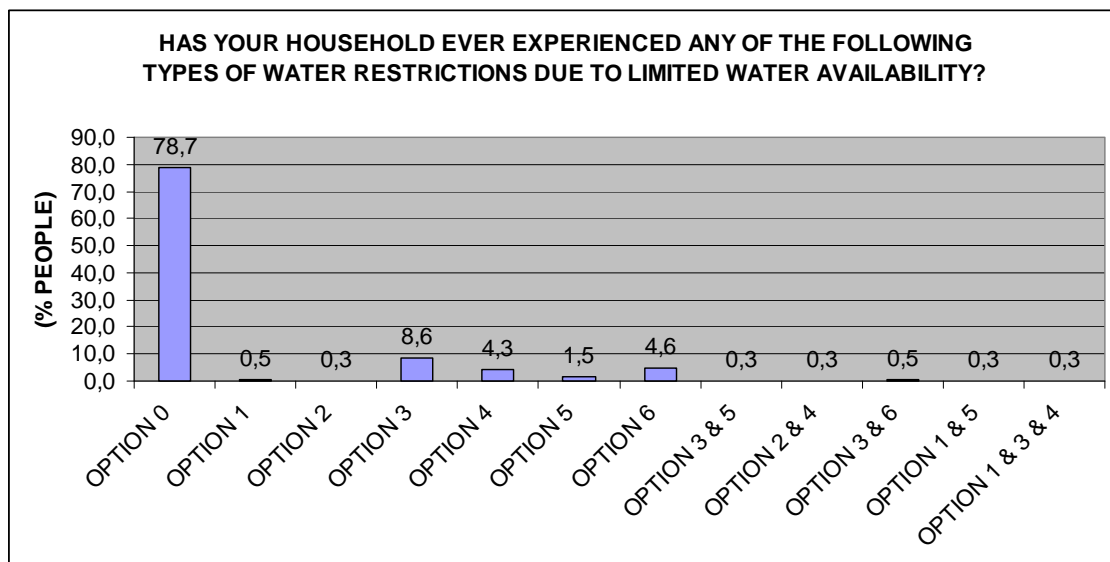
Finally, the respondents were asked about their water bill. The majority (62%) remember the amount that they pay, and the mean amount obtained was 36.2 euros.

4.2. Public perception of water management problems

This part contains information about the water management problems as perceived by the respondents. This also allows assessing the credibility of the baseline conditions that are presented to the respondents.

Although water scarcity is considered as a (big) problem in the region for a 62% of the respondents, only 21 % of the sample has suffered restrictions in their households in the past (last 10 years) for different reasons (including pipe cuts for public works or pipe breakdowns) (Fig. 20).

Figure 20. Previous experience on water restrictions. Question 10



0 = my household never experienced any water use restrictions due to limited water availability

1 = my private well ran low on water

2 = households in my area were prohibited from using water for washing cars, watering gardens, and so on.

3 = households in my area had water pipe cuts in the past

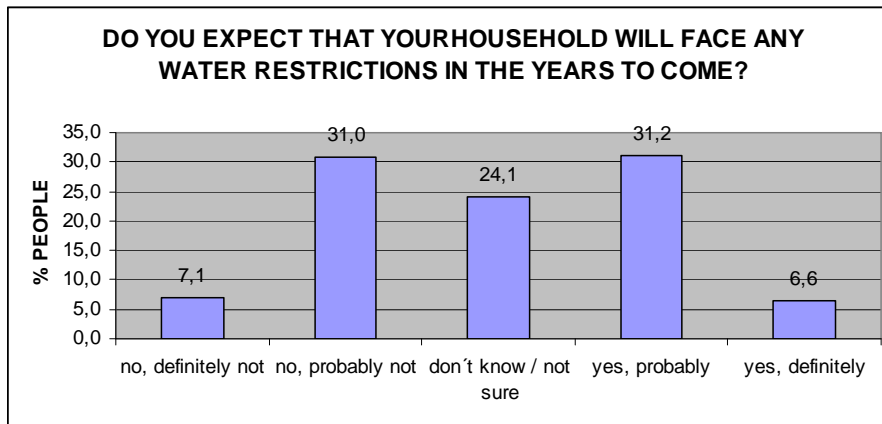
4 = households in my area were prohibited from using tap water due to water pollution

5 = information campaigns were organized to voluntarily reduce water consumption

6 = others

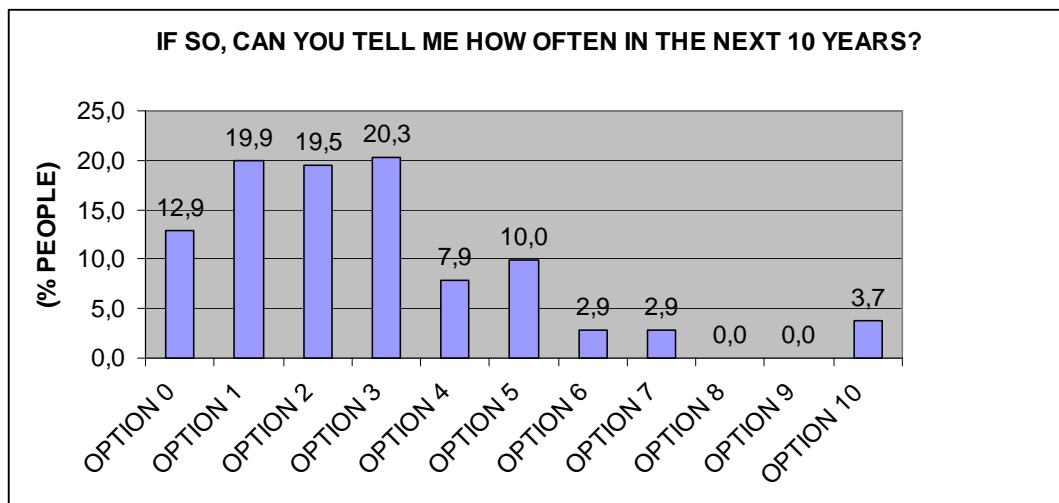
A higher percentage, 38 %, consider that their households would face any water restrictions in the years to come (“yes, probably” and “yes, definitively”; Fig. 21).

Figure 21. Expected future restrictions. Question 14



In a follow-up question, when people were asked about how severe the restrictions would be, we obtained that a 73% believes that they will suffer from water restrictions at least 3 times in the next 10 years (Fig. 22).

Figure 22. Expected future restrictions. Question 15



0 = none of these years

1 = 1 of the next 10 years

2 = 2 of the next 10 years

3 = 3 of the next 10 years

4 = 4 of the next 10 years

5 = 5 of the next 10 years

6 = 6 of the next 10 years

7 = 7 of the next 10 years

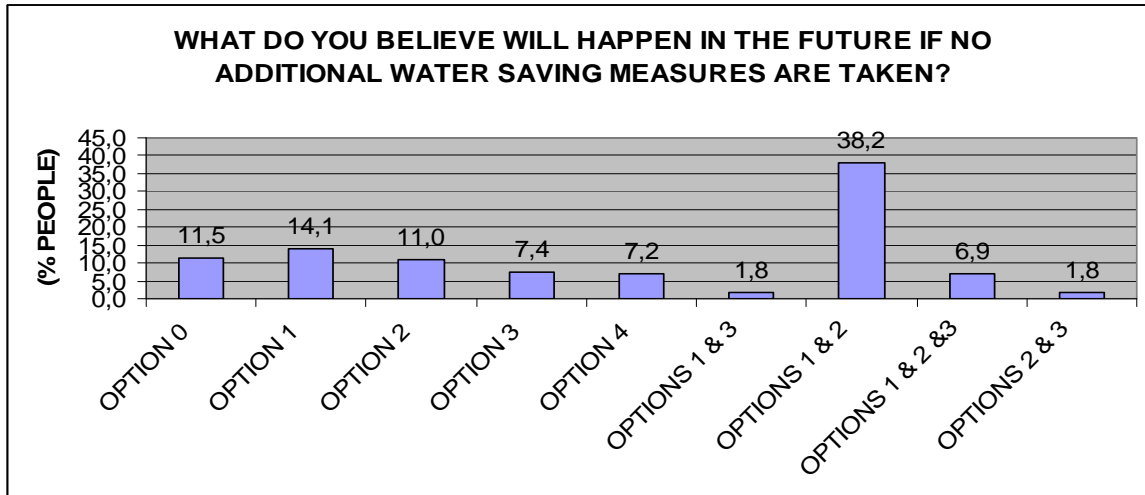
8 = 8 of the next 10 years

9 = 9 of the next 10 years

10 = every year

A 62 % considered that it is (very) credible 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 (Fig. 23).

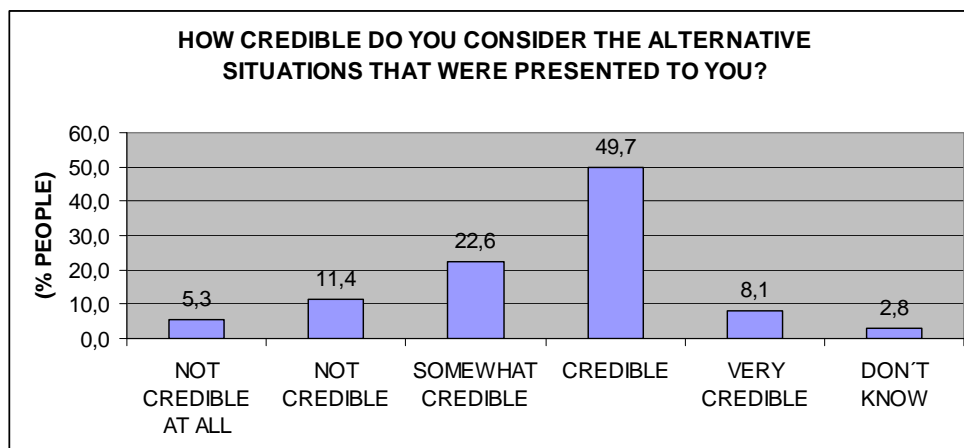
Figure 23. Future conditions if we do nothing. Question 23



- 0 = nothing, I don't believe there will be any water problems in the future
- 1 = the environment will remain in a poor state
- 2 = my household will (still) face water restrictions in the future
- 3 = other
- 4 = don't know

People who think they will not suffer restrictions in the future, answer subsequent questions hypothetically (i.e. “if there were restrictions I would think it would be important to take measures”). This hypothetical way of thinking might affect the results of the choice experiment (CE). After the CE, the respondents were asked about the general credibility of the alternative situations that were presented to them. About a 60% of the respondents consider “credible” or “very credible” the options presented.

Figure 24. Credibility of the scenarios. Question 22.



A question about their priorities in water allocation was also included in the questionnaire. According to the respondents, when water is scarce, the priority should be given after household supply to agriculture (53%), environment (35%), and industry (12%).

4.3 Estimated economic values for water resources management.

A simple **Multinomial Logit Model** (MNL) was estimated by including the different levels of improvement for the environmental quality as dummy variables, and the attribute ‘reduction of household water supply’ as a continuous variable reflecting the probability of water restrictions (from the baseline, 4 years out of 10, to 1 year out of 10). The results of the MNL were used for assessing the consumer surplus of the attributes, and the standard error of the estimates:

<i>Attributes</i>	<i>Consumer Surplus</i> (€/per household/year)	<i>Standard Error</i>
Domestic Supply	297.6	43.50
Good Environm. Quality	64.1	10.09
Very Good Environm. Quality	104.0	13.13

Table 10. Consumer surplus for the attributes.

In the Serpis study, the poor environmental level and restrictions in 4 out of 10 years are treated as the baseline status, whose credibility was analyzed in the previous section. The value of improving the environmental quality of the river basin by assuring a certain water flow in the river basin has been estimated in the model as 64 € per household per year from the ‘poor’ level to the ‘good’ level (the one required by the Water Framework Directive), and 104 € per household per year from the poor level to the very good level. This means that the costs in terms of public’s welfare losses of not meeting the environmental standards of the WFD (specifically related here to environmental streamflow conditions) are 64 € per household per year.

The value of reducing the probability of water restrictions for secondary uses in the households in one year out of ten is 297.65 € per household per year. We assume that the WTP for reducing the probability of restrictions is a reasonable approximation of the value of the foregone benefits in case of restrictions. This argument is arguable and of course subject to critics. At least it gives an illustrative idea of what the welfare losses of the restrictions to secondary uses of water can be, at least to show how far this is from the estimates by the avoided costs method.

4.4. Factors explaining economic values for water resources management.

A **multivariate model** was developed to analyze demand heterogeneity and which variables influence the WTP for the attributes. The interactions included in the model were:

- Int1: income * costs
- Int2: income * domestic supply
- Int10: age* environment
- Int13: experience * domestic supply
- Int16: credibility* domestic supply
- Int 19: member ecologist organization * environment
- Int20: remember bill * cost

Variable	Coefficient	Standard Error	b/St.Er.	P[Z >z]
ASC	1.49224050	.18540515	8.049	.0000
DOM	-8.96678084	.88727599	-10.106	.0000
ENV3	.85584499	.09372516	9.131	.0000
ENV4	1.74923789	.20985436	8.335	.0000
COST	-.03408502	.00390799	-8.722	.0000
INT1	.609110D-06	.823410D-07	7.397	.0000
INT10	-.00746599	.00405244	-1.842	.0654
INT13	-1.51449957	.67940501	-2.229	.0258
INT16	1.95073241	.26015458	7.498	.0000
INT19	-.88974775	.46031534	-1.933	.0532
INT20	.00457176	.00170207	2.686	.0072

Table 11. Multivariate model for analyzing interactions.

The value of R^2 of 20% indicates a good fit of the model.

ASC positive and significant indicates that people in general want a change. The variable **Dom** is negative and significant showing people willingness to pay to reduce probability of restrictions. **Env3** is positive and significant, indicating people WTP to improve environmental status from poor to good. **Env4** is positive and significant, what refers to people **WTP** to improve environmental status from poor to very good. **Env3** and **Env4** are significantly different between them according to Wald test, implying sensitivity to scope, i.e., WTP more for a better improvement, as theoretically expected. **Bcost** is significant and negative, which means negative utility associated with cost: people are less WTP for a more expensive option, as theoretically expected. **Int1** is significant and positive: people with higher income are WTP more than people with lower income, as theoretically expected. **Int10** is significant and negative: younger

people are more WTP for the environment. **Int13** is significant and negative: people having suffered water restrictions in their households are more WTP for reducing the probability. **Int16** is significant and positive, which means that the more people believe there would be restrictions in the future the more they are WTP to reduce restrictions in the future. **Int19** is significant and positive, which means that members of ecologist organizations are WTP more for the environment. **Int20** is significant and positive, which means that people who remember their water bill are WTP more.

In a nutshell, people want in general a change. Young people and people with higher income show greater WTP for the environment. 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 (higher environmental flows generate higher benefits).

4.5. Total Economic Value.

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.

Table 12. Aggregated non-market costs of water scarcity in the Serpis Case Study

<i>Total number of households</i>	63,146
<i>Protest answers</i>	2%
<i>Total number of WTP households</i>	61,882
<i>Costs due to restrictions in the domestic supply (million €)</i>	18.42
<i>Environmental costs (million €)</i>	3.96 - 6.44
<i>Total non-market costs due to the drought (million €)</i>	22.38 -24.86

5. Conclusions.

The study has shown the clear social interest in the Serpis river basin 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 for enhancing water quality in the basin. Two types of non-market costs have been identified: those related to the decrease of the ecological status of the river basin due to the lowering of water flows (reduction of the provisioning of ecosystem services) and those related to the social welfare losses due to the restrictions of water supply in the households for secondary uses (outdoor use, use of washing machines, etc.). These costs have been estimated on the basis of a stated preference valuation (choice experiment), and add up for 22.4 million Euros for both types of costs. These social benefits or avoided costs should be considered in the implementation of the WFD as a useful input for the cost recovery analysis, and for the development of the cost-benefit analysis of water management options and possible disproportionate costs.

The experience in the definition of the common survey design, conditioned by the requirement for testing transferability of the results, showed the difficulties and challenges in finding a common design that adapt to different local conditions. The estimates are expected to be subject to significant transfer errors, due to the differences on the environmental conditions of the policy and study site and the socio-demographic differences of the involved, but also due to the fact that the valuation exercise was not explicitly designed for the purposes for which is used here, and thus some adjustments and assumptions have been made. This is why these estimates should be interpreted with caution. However, we believe that they can provide a very illustrative idea of the magnitude and importance of these costs, which are normally not accounted for in the estimation of costs, and the under-estimation normally incurred in when calculating them by the approach of the avoided costs of the measures.

In order to come up with resource opportunity costs, we need to confront the economic value of water for all the competing uses in the basin. State-preference (SP) techniques can provide some input for that, but there is a bunch of complementary approaches that could be applied (combining SP with revealed preferences and other environmental valuation approaches) into integrated river basin hydro-economic models that can assess opportunity cost. Although it has not been done in this study, we can relate the units of quantity (e.g., river discharge) with economic values. On the other hand, quantity and quality problems are often interrelated, and are difficult to separate. Water

scarcity problems lead also to water quality and environmental problems. Other issues that are not addressed in the study are substitution and uncertainty.

6. Best practice recommendations.

A successful valuation exercise requires an extensive and complete pretest. A pretest was developed (40 interviews), in which we found that the questionnaire was too long, with an average duration of the interviews of 20 minutes. Particularly, we had the feelings that there were too many show cards. After that pretest, we reduced the length of the questionnaire (from 41 questions to 35 questions), mainly removing the contingent valuation questions and redesigning the choice experiment with 6 blocks of 4 cards, in order to reduce the number of cards. Another pretest was developed and we were able to reduce the average duration from 20 minutes to 15 minutes. People were more concentrated, especially when they asked the CE, than in the other design.

With regards to the CE design, we suggest:

- The credibility of the baseline is a fundamental issue in the validity of the valuation exercise, and need to be carefully tested in the pretest. The requirement of the common questionnaire for all the participants in the “water scarcity group” (as discussed in the previous section) reduces the flexibility to adapt to the local conditions. In any case, our results shown that the scenario created in the survey was considered credible by most of the respondents.
- The pictures of the choice experiment, to show to the respondents the different levels of the attributes, must be very clear. People have to be able to distinguish the difference among the different levels. This should be tested carefully.
- In the income question, we recommended that each category was identified with a non consecutive letter.
- We suggest to translate the annual payment into cost per month for a better understanding of the magnitude of the offered quantity (given also that the water bill is monthly or bi-monthly in most cases, and that it would make it easier for taking into account the budget limitations).
- Use of a map to show the basin and the location of the cities where the survey is taking place.

Another interesting issue is the influence of the seasonal status of the resources at the time of conducting the survey. Given that the issue under question is water scarcity, the

perceptions and attitudes of the respondent are affected by the current situation of resource availability in the basin.

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ANNEX

Questionnaire and cards of Choice Exp. UPVLC

(Spanish)



Buenos días/tardes. Mi nombre es....., estoy realizando unas entrevistas de parte de la Universidad Politécnica de Valencia. Estamos interesados en escuchar la opinión pública sobre temas relacionados con el agua en su región. La entrevista no durará más de 15 minutos. Todas las respuestas son anónimas, serán tratadas de manera confidencial y no serán utilizadas para ningún otro propósito que el científico.

0. ¿Reside usted en esta ciudad?

0 = No **(le das las gracias a la persona y paras la entrevista)**

1 = Sí. ¿Cuál es su código postal?.....

1. ¿Cuáles son en su opinión los asuntos o problemas más importantes en su región? (ordene por orden de prioridad)

1).....

2).....

3).....

2. ¿Cómo de importante es para usted el Medio Ambiente en general? (muestra tarjeta)

0 = No importante en absoluto

3 = Importante

1 = No importante

4 = Muy Importante

2 = No importante/ No sin importancia

5 = No lo sé

3. ¿Realiza alguna actividad recreativa en ríos o lagos?

Nota: no se incluye la playa o el mar

0 = No **(VE A LA CUESTIÓN 8).**

1 = Sí

4. ¿Qué actividades realiza en ríos o lagos? (varias respuestas son posibles)

1 = Avistamiento de aves.

4 = Pescar

2 = Pic-nic / merienda

5 = Paseo y/o senderismo

3 = Nadar

6 = Cazar.....

7 = Pasear en barca

8 = Otro. ¿Cuál?.....

5. ¿Con qué frecuencia ha practicado estas actividades de media durante el año pasado? (muestra tarjeta)

0 = Una o dos veces al año

3 = Una vez a la semana

1 = Una vez cada tres meses

4 = Más de una vez por semana

2 = Una vez al mes

5 = Otra frecuencia. ¿Cuál?.....

6. ¿Qué distancia tiene que recorrer desde su casa hasta el lugar que visita con mayor frecuencia para realizar esas actividades?km (en un único sentido).



7. ¿Qué tipo de masa de agua es? (sólo una) (muestra tarjeta)

- 1 = Río
- 2 = Arroyo
- 3 = Lago
- 4 = Estuario
- 5 = Otro. ¿Cuál?.....

8. Ahora voy a hacerle algunas preguntas relacionadas con el agua en la Cuenca del Serpis, de la que se suministra el agua a la zona donde usted vive (Muestra el mapa). La Cuenca del Serpis cubre un área de unos 700 km², y proporciona agua para unas 200 mil personas.

¿Hasta qué punto considera la disponibilidad de agua en la Cuenca del Serpis como un problema? (muestra tarjeta)

- 0 = No es un problema en absoluto
- 1 = No es un problema
- 2 = Un pequeño problema
- 3 = Es un problema
- 4 = Es un gran problema
- 5 = No lo sé

9. ¿Piensa que el medio ambiente se ve afectado de alguna manera por la disponibilidad del agua en la Cuenca del Serpis?

- 0 = No.
- 1 = Si.
- 2 = No lo sé/No estoy seguro

10. ¿Ha experimentado su hogar alguno de los siguientes tipos de restricciones de usos del agua debidos a la disponibilidad limitada de la misma? (varias respuestas) (muestra tarjeta)

0= Mi hogar nunca experimentó restricción alguna de usos de agua debida a la disponibilidad limitada de la misma **(VE A LA CUESTIÓN 12)**

1= Mi pozo privado prácticamente se ha secado o está próximo a secarse.

2= En los hogares de mi zona se ha prohibido usar el agua para lavar el coche, regar los jardines, etcétera

3= Los hogares en mi zona sufrieron cortes de agua por la rotura de tuberías.

4= En los hogares de mi zona fue prohibido el uso del agua del grifo debido a la contaminación de la misma.

5= Se organizaron campañas de información para reducir voluntariamente el consumo del agua.

6= Otras, nómbralas.....



11. ¿Con qué frecuencia ha sufrido restricciones de agua en su hogar en los últimos diez años? (muestra tarjeta)

0= Mi hogar no ha sufrido restricciones de agua en ninguno de estos últimos 10 años.

Las restricciones de agua fueron impuestas:

- 1= 1 de los últimos 10 años 6= 6 de los últimos 10 años
- 2= 2 de los últimos 10 años 7= 7 de los últimos 10 años
- 3= 3 de los últimos 10 años 8= 8 de los últimos 10 años
- 4= 4 de los últimos 10 años 9= 9 de los últimos 10 años
- 5= 5 de los últimos 10 años 10= cada año

12. ¿Se ve profesionalmente o en su ámbito de trabajo afectado de alguna manera por la disponibilidad o restricciones del agua?

- 0 = No **(VE A LA CUESTIÓN 14)**
- 1 = Sí

13. ¿Puede explicar brevemente en qué sentido?.....
.....
.....
.....

14. ¿Cree que su hogar sufrirá alguna restricción de agua en los próximos años?

- 0 = No, sin duda **(VE A LA CUESTIÓN 16)**
- 1 = Probablemente no **(VE A LA CUESTIÓN 16)**
- 2 = No lo sé/ No estoy seguro
- 3 = Probablemente sí
- 4 = Sí, sin duda

15. Si es así, ¿podría decirme con qué frecuencia se producirán en los próximos 10 años? (muestra tarjeta)

0= En ninguno de los próximos 10 años

Las restricciones ocurrirán:

- 1= 1 de los próximos 10 años 6= 6 de los próximos 10 años
- 2= 2 de los próximos 10 años 7= 7 de los próximos 10 años
- 3= 3 de los próximos 10 años 8= 8 de los próximos 10 años
- 4= 4 de los próximos 10 años 9= 9 de los próximos 10 años
- 5= 5 de los próximos 10 años 10= cada año



16. ¿Está usted de acuerdo o en desacuerdo con las siguientes afirmaciones? (muestra tarjeta)

16.1. “El medio ambiente tiene derecho a ser protegido independientemente de su coste”

0 = Completamente en desacuerdo 3 = De acuerdo
1 = En desacuerdo 4 = Completamente de acuerdo
2 = Ni de acuerdo/Ni en desacuerdo 5 = No lo sé

16.2. “La escasez del agua es un fenómeno natural más allá del control humano”

0 = Completamente en desacuerdo 3 = De acuerdo
1 = En desacuerdo 4 = Completamente de acuerdo
2 = Ni de acuerdo/Ni en desacuerdo 5 = No lo sé

16.3. “La calidad del agua en mi región es muy baja”

0 = Completamente en desacuerdo 3 = De acuerdo
1 = En desacuerdo 4 = Completamente de acuerdo
2 = Ni de acuerdo/Ni en desacuerdo 5 = No lo sé

16.4. “La calidad del agua es un asunto más importante que el de las posibles restricciones o cortes de agua”

0 = Completamente en desacuerdo 3 = De acuerdo
1 = En desacuerdo 4 = Completamente de acuerdo
2 = Ni de acuerdo/Ni en desacuerdo 5 = No lo sé

⇒ **Ahora me gustaría informarle de lo siguiente. Actualmente, la limitada disponibilidad de agua da como resultado, de vez en cuando y durante los periodos de sequía, niveles bajos de agua en los ríos, arroyos, lagos y acuíferos, afectando al estado ambiental de estas aguas de un modo negativo.**

Los expertos en cambio climático predicen que la escasez de agua en España se incrementará en los próximos 10 años debido a condiciones climáticas más extremas como son las sequías y una disminución general de las precipitaciones. Al mismo tiempo se espera que la demanda de agua de los hogares, agricultura e industria se mantenga al mismo nivel actual o incluso se incremente.

Suponiendo que este escenario se materializara, la probabilidad de restricciones en diferentes usos de agua aumentaría, pudiendo afectar a zonas donde hasta ahora nunca se han sufrido.



En los hogares, una restricción en usos de agua significa limitaciones en los usos de agua puertas afuera, es decir: usted no podría por ejemplo lavar su coche, regar el jardín o llenar las piscinas. Los usos de agua en el interior del hogar como beber agua o el agua necesaria para su higiene personal estarán siempre garantizados.

⇒ Además de los hogares, la agricultura y la industria, el medio ambiente también necesitan agua. Cuando el agua es escasa, no hay suficiente agua en los ríos y acuíferos para mantener el medio ambiente en buen estado. El número y la diversidad de peces y otros animales que viven en o cerca del agua se reducen, la vegetación de la ribera desaparece y los ríos y acuíferos podrían secarse.

17. ¿Cómo de familiarizado está usted con esta información? (muestra tarjeta)

- 0 = No familiarizado en absoluto/ Nunca había escuchado esto
- 1 = No familiarizado
- 2 = Algo familiarizado
- 3 = Familiarizado
- 4 = Muy familiarizado

18. ¿Cómo de creíble es para ti que la escasez de agua se incremente en la Cuenca del Serpis en los próximos 10 años? (muestra tarjeta)

- | | |
|----------------------------|-----------------|
| 0 = No creíble en absoluto | 3 = Creíble |
| 1 = No creíble | 4 = Muy Creíble |
| 2 = Algo creíble | 5 = No lo sé |

⇒ Para informar a los gestores del agua, nos gustaría escuchar su opinión acerca de las garantías de suministro de agua en los próximos 10 años para diferentes usos, incluyendo el medio ambiente.

Para ello, le voy a presentar una serie de tarjetas como ésta (muestra la tarjeta ejemplo), mostrando cada vez dos situaciones futuras diferentes caracterizadas por la probabilidad de que usted pueda sufrir restricciones en usos de agua, un cambio en los niveles de agua en los ríos y acuíferos, sus consecuencias en el medio ambiente y un precio para los hogares, en vista de que tomar medidas adicionales para asegurar el suministro futuro de agua para hogares y medio ambiente cuesta dinero.

Las medidas para ahorrar agua tendrían que ser asumidas por todos los usos del agua, esto es: agricultura, industria y hogares, y si se adoptan medidas más estrictas para ahorrar agua, se dispondría de una mayor cantidad de agua pero el coste sería mayor.

Cada uso del agua contribuiría a este coste de una manera equilibrada en función de la cantidad que consume, y en el caso de los hogares, el coste sería pagado cada año a través de un incremento en el recibo actual del agua desde el próximo año hasta los próximos 10 años, es decir hasta el año 2018 (inclusive) para anticiparnos a la futura escasez de agua.

⇒ Supongamos también que, si no se hiciera nada, en el hogar usted se enfrentaría actualmente a la probabilidad de sufrir restricciones en los usos de agua durante 4 de los próximos 10 años, hasta el año 2018 (inclusive), basado en las predicciones de expertos en cambio climático. Esto significa que durante los próximos 10 años usted se enfrentaría a posibles restricciones en usos de agua puertas afuera en 4 años diferentes. Esto es, que usted no podría regar su jardín, lavar su coche o llenar las piscinas durante



ciertos días en el verano de aquellos años. Este déficit de agua podría durar hasta 20 días, con restricciones de usos del agua durante 5 ó 6 horas por día.

Dependiendo de las medidas de ahorro de agua, esta probabilidad de restricciones de agua en 4 veranos en los próximos 10 años podría verse reducida a 3, 2 ó 1 año de 10. **(muestra la tarjeta con los dos atributos).**

⇒ Por otra parte, asegurar el suministro de agua futura para el medio ambiente significa que los niveles de los ríos y los acuíferos se incrementen en los próximos 10 años, hasta el 2018 (inclusive), reduciendo el riesgo de que se sequen y aumentando las condiciones de vida para peces, plantas y otros animales que viven en el agua o cerca de ella. Dependiendo de las medidas para ahorrar agua que se adopten, podemos distinguir 3 niveles de situación ambiental respecto a la mala situación esperada con niveles bajos de agua y calidad ambiental pobre en los próximos 10 años en la cuenca del Serpis:

-Mala: esta es la situación prevista en los próximos 10 años, con niveles de agua y calidad ambiental bajos. Esto supone una gran brecha respecto a la situación natural del río, por el aumento de la escasez de agua. Muchas especies de peces desaparecerán y en las riberas de los ríos se perderán la mayoría de la vegetación. Como resultado de ello la mayoría de aves desaparecerán también.

-Moderado: los niveles de agua y la calidad ambiental se encuentran todavía bastante por debajo de las condiciones naturales medias. Hay una brecha considerable entre la situación moderada y la natural.

Un número limitado de especies de peces están presentes.
Los márgenes tendrían algo de vegetación, sirviendo ésta de soporte para un número y variedad limitada de aves y otros animales.

-Bueno: los niveles de agua y la calidad ambiental están próximos a los niveles medios naturales. Hay una pequeña brecha entre la situación buena y la natural. Bajo estas condiciones las riberas tienen una cubierta vegetal más ligera que la natural. Como resultado la reproducción y las condiciones para anidar para algunas aves son limitadas.

-Muy bueno: los niveles de agua y la calidad ambiental están en su estado natural. No existe brecha entre la situación muy buena y la natural.

Las condiciones para la vida animal y la flora son óptimas bajo estas circunstancias.

Basándonos en estas alternativas, le voy a preguntar a usted que situación es la que más prefiere, teniendo en cuenta el incremento que sufrirá su recibo del agua. No le estoy preguntando que valore ninguna medida específica necesaria para lograr garantizar un suministro futuro de agua. Usted también puede elegir ninguna de las dos situaciones. En ese caso usted estaría diciendo que no desearía pagar ninguna cantidad extra en su recibo del agua y que aceptaría la probabilidad de tener que afrontar un aumento de restricciones de usos de agua en los próximos 10 años y el deterioro de la calidad ambiental de los ríos y acuíferos. En primer lugar le voy a enseñar un ejemplo. **(muestra la tarjeta ejemplo)**



19. Por favor mire las siguientes tarjetas e indíqueme que opción prefiere.



SEÑALA QUÉ VERSIÓN DE CUADERNILLO ESTÁS USANDO

Versión:

1		2		3
4		5		6

	Situación A	Situación B	Ninguna de los dos
Tarjeta ejemplo	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a. Tarjeta 1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Tarjeta 2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Tarjeta 3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Tarjeta 4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



SI LA PERSONA ELIGE 4 VECES "NO SE TOMA NINGUNA MEDIDA" VE A CUESTIÓN 20, SINO A LA CUESTIÓN 21

20. ¿Puede explicar por qué ha elegido las 4 veces "No se toma ninguna medida"?

- 1 = No estoy interesado en asegurar el suministro futuro de agua para mi o para el medio ambiente.
- 2 = La situación actual es suficientemente buena.
- 3 = No puedo permitirme pagar un dinero extra.
- 4 = Prefiero gastar mi dinero en otras cosas importantes.
- 5 = Otra razón. ¿Cuál?.....

AHORA VE A LA CUESTIÓN 22

21. ¿Puede explicarme brevemente cual es la principal razón de sus elecciones? **(Sólo 1 respuesta, Nombre la razón más importante)**

- 1 = Reducir la probabilidad en las restricciones de usos de agua.
- 2 = Aumentar la calidad ambiental de ríos y acuíferos.
- 3 = El coste (demasiado alto, bien de precio, aceptable, razonable) **(marca el apropiado)**
- 4 = Otra razón. ¿Cuál?.....

22. ¿Le han parecido creíbles las alternativas que le he presentado?**(No leer) (muestra tarjeta)**

0 = No creíbles en absoluto	3 = Creíbles
1 = No creíbles	4 = Muy creíbles
2 = Algo creíbles	5 = No sabe



23. ¿Qué cree que sucederá si no son tomadas medidas adicionales para ahorrar agua? (varias respuestas son posibles)

- 0= Nada, no creo que haya problemas de agua en el futuro.
- 1 = El medio ambiente permanecerá en un mal estado
- 2 = Mi hogar también sufrirá restricciones de agua en el futuro.
- 3 =Otra, nómbrela.....
- 4= No lo sé

24. ¿Le importaría decirme cuánto paga actualmente en su recibo del agua?

- 0 = No tengo recibo del agua/ No pago por el agua
- 1 = No lo recuerdo
- 2=.....euros por mes/ 2 meses/ 3 meses/ 6 meses /año **(Marca la apropiada)**

25. Después de los hogares, que usuario debería de tener siempre la mayor prioridad, en su opinión, cuando el agua es escasa y hay que tomar una decisión de distribuir el agua disponible limitada entre la agricultura, el medio ambiente y la industria.

Señalar número en el ranking

Agricultura IndustriaMedio Ambiente

26. El entrevistado es:

- 0=Hombre
- 1=Mujer

⇒ Finalmente me gustaría hacerle algunas preguntas sobre su situación personal para propósitos estadísticos, sólo es para evaluar la representatividad de la encuesta. Por favor, tenga en cuenta que todos los datos serán tratados de forma confidencial.

27. ¿Cuál es su año de nacimiento? 19...

28. ¿Cuántas personas viven en su hogar incluyéndole a usted?..... personas

29. ¿Cuántos niños (menores de 18) hay en su hogar?.....

30.¿Cuáles son los estudios de mayor nivel que ha completado?

- 0= Sin estudios.
- 1= Secundaria/E.G.B./F.P.
- 2 = Bachiller/BUP y COU.
- 3 = Universidad.
- 4= Otros, Nómbrelos.....



31. ¿Cuál es su profesión? *(dejar que conteste solo y después señalar la opción más adecuada)*

- 0 = Sin empleo, buscando trabajo. 6 = Empleado en Sanidad
- 1 = Agricultor 7 = Empleado en Educación
- 2 = Sector del turismo 8 = Retirado
- 3 = Pescador 9 = Estudiante
- 4 = Empleado en el sector servicios 10 = Ama-o de casa/sus labores
- 5 = Empleado en la industria 11 = Otro. ¿Cuál?.....

32. ¿Podría indicarme a qué letra de esta tarjeta *(enseñar tarjeta con los niveles de ingresos)* corresponde el total de ingresos conjuntos de su hogar al mes? Ingresos netos, después de impuestos. *(Esta información será tratada de manera confidencial)*

J	H	C	S	X
N	A	F	L	R

33. ¿Es miembro de alguna organización ecologista o ambiental?

- 0 = No *(fin de la entrevista)*
- 1 = Sí. ¿Cuál?:
- 1 = WWF/Adena 3 = Organización de Protección de aves
- 2 = Greenpeace 4 = Otra. ¿Cuál?.....

(AHORA VE A LA CUESTIÓN 34)

34. ¿Podría decirme cuánto paga de media cada año en esta organización?..... euros al año.




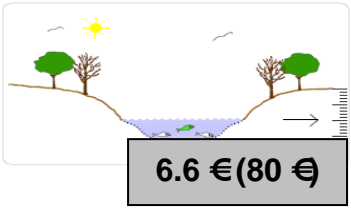
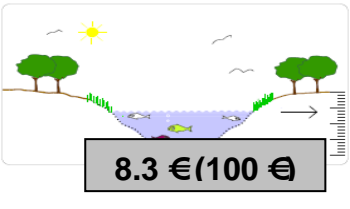
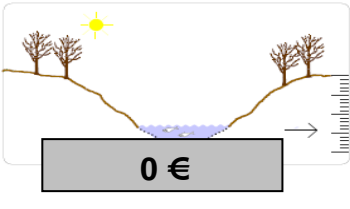
ESTA ENTREVISTA SE HA BASADO EN EL PLANTEAMIENTO DE UN ESCENARIO HIPOTÉTICO PARA EL ESTUDIO, QUE NO IMPLICA NECESARIAMENTE QUE SEA EL QUE SE DARÁ EN LA REALIDAD EN LA CUENCA.

**ESTE ES EL FINAL DE LA ENTREVISTA.
MUCHAS GRACIAS POR SU COLABORACIÓN**



CARD 1 (CHOICE EXPERIMENT)

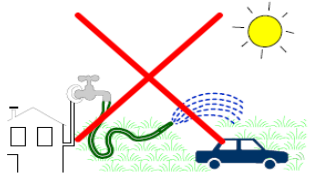


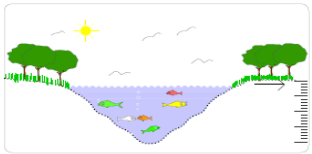
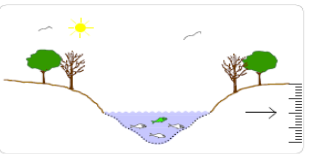
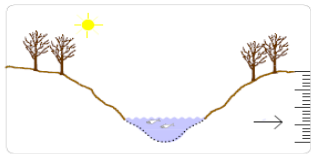
2.1

situación A	situación B	Situación actual
<p>2 años de 10</p> 	<p>1 año de 10</p> 	<p>4 años de 10</p> 
<p>moderada</p>  <p>6.6 € (80 €)</p>	<p>buena</p>  <p>8.3 € (100 €)</p>	<p>mala</p>  <p>0 €</p>
<p>80 €</p>	<p>100 €</p>	<p>0 €</p>



CARD 2 (CHOICE EXPERIMENT)


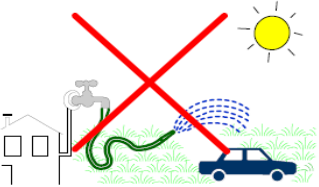

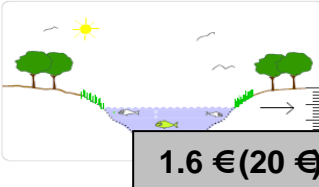

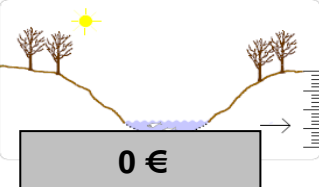
2.2

situación A	situación B	Situación actual
<p>1 año de 10</p> 	<p>3 años de 10</p> 	<p>4 años de 10</p> 
<p>muy buena</p> 	<p>moderada</p> 	<p>mala</p> 
<p>10 € (120 €)</p>	<p>5 € (60 €)</p>	<p>0 €</p>



2.3

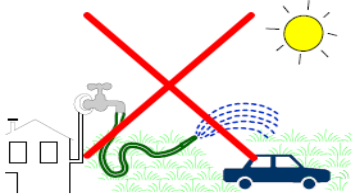



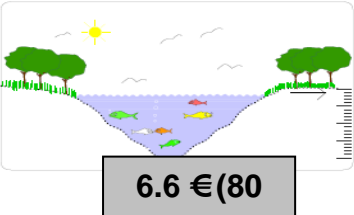
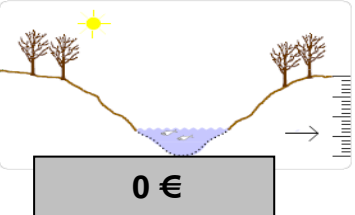
CARD 3 (CHOICE EXPERIMENT)

situación A	situación B	Situación actual
<p>2 años de 10</p> 	<p>1 año de 10</p> 	<p>4 años de 10</p> 
<p>buena</p>  <p>1.6 € (20 €)</p>	<p>muy buena</p>  <p>3.3 € (40 €)</p>	<p>mala</p>  <p>0 €</p>
<p>20 €</p>	<p>40 €</p>	<p>0 €</p>



2.4

CARD 4 (CHOICE EXPERIMENT)

situación A	situación B	Situación actual
<p>1 año de 10</p> 	<p>3 años de 10</p> 	<p>4 años de 10</p> 
<p>buena</p> 	<p>muy buena</p> 	<p>mala</p> 
<p>60 €</p>	<p>80 €</p>	<p>0 €</p>