Economic analysis in RBMP in Spain

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of the Water Framework Directive

Issues

- Economic Analysis of water uses
- Pricing and cost recovery of water services
- Cost of WFD measures and Cost effectiveness analyss of programs of measures
- Costs and Financing Strategies of Current actions: sanitation and modernization of irrigation

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Economic Analysis of Water Uses

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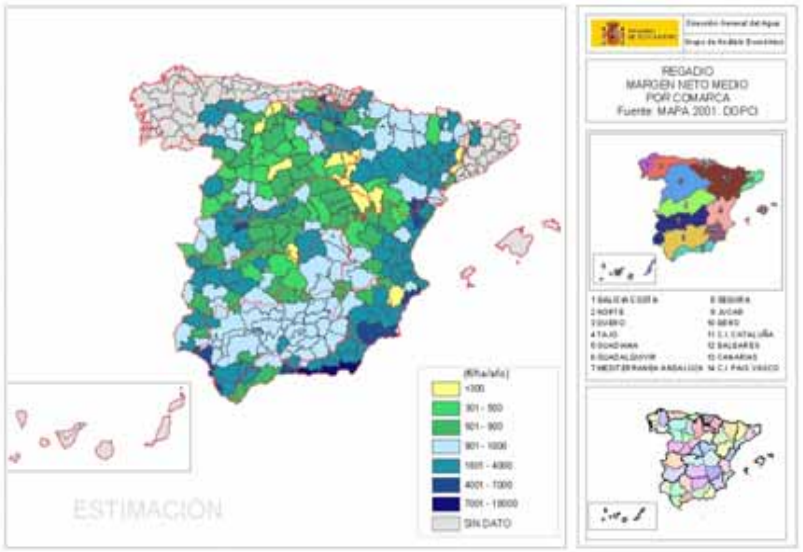
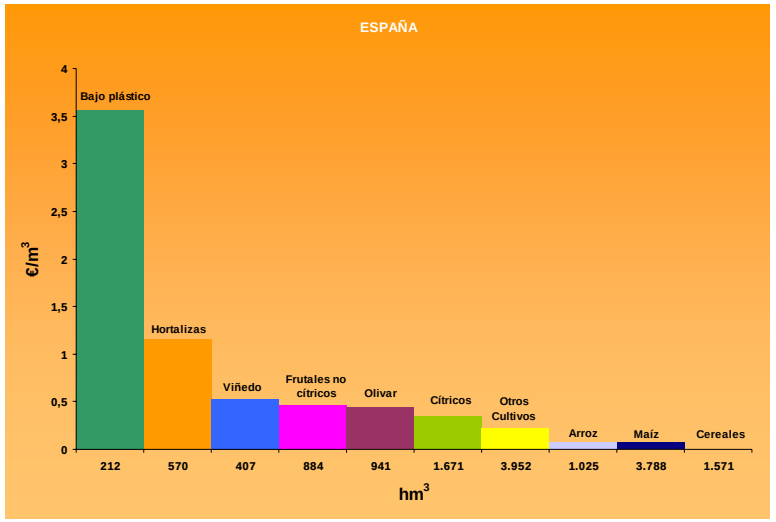
Economic analysis of water use

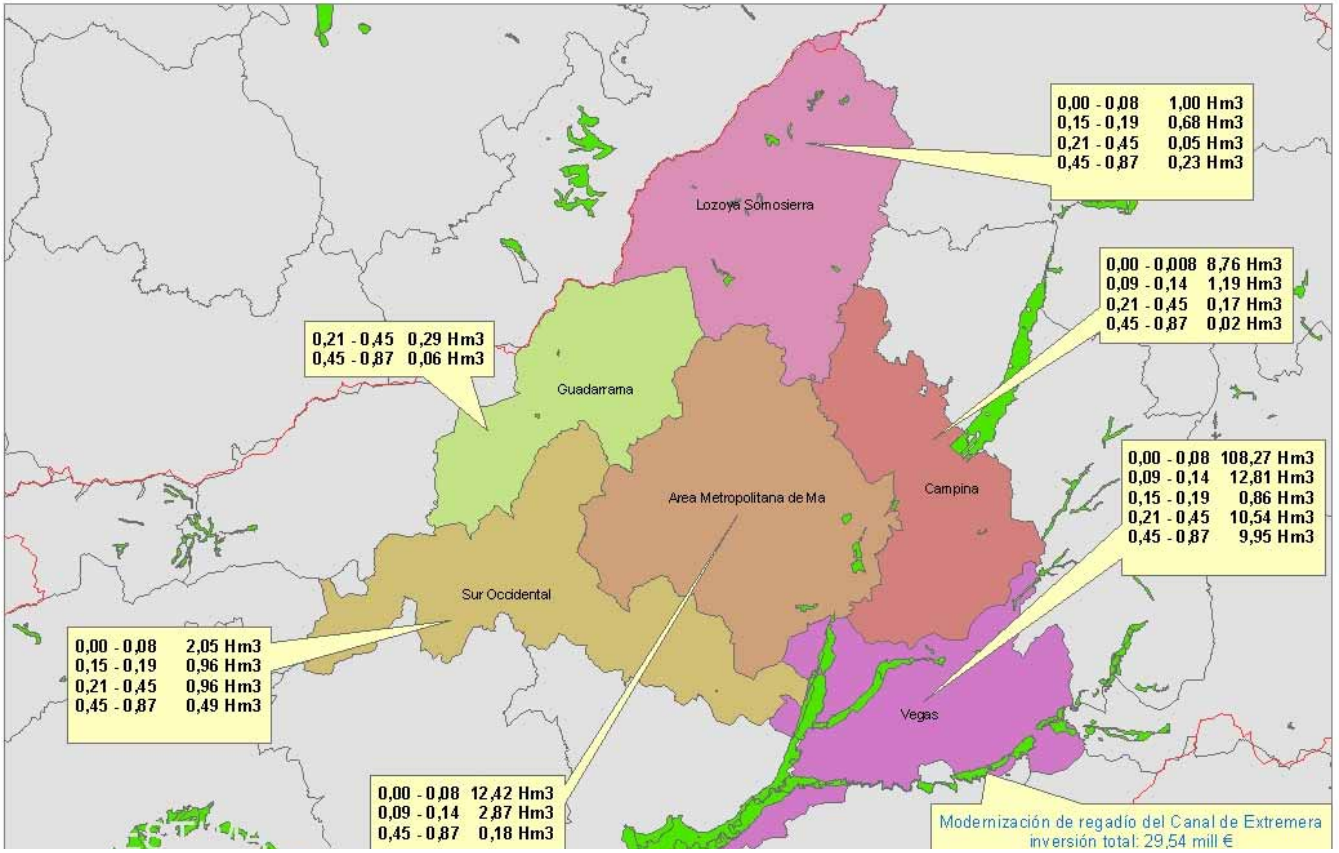
The spatial analysis of productivity of irrigation agriculture



Productivity per m^3 and total water use by crops (for 78% of Has)



Market opportunities in Madrid for urban users to engage in transactions with agricultural users without increasing allocative efficiency without increasing pressures on the water ecosystems



0,00-0,08	0,08-0,14	0,14-0,21	0,21-0,45	0,45-0,87
130,44	17,72	3,69	11,85	11,07

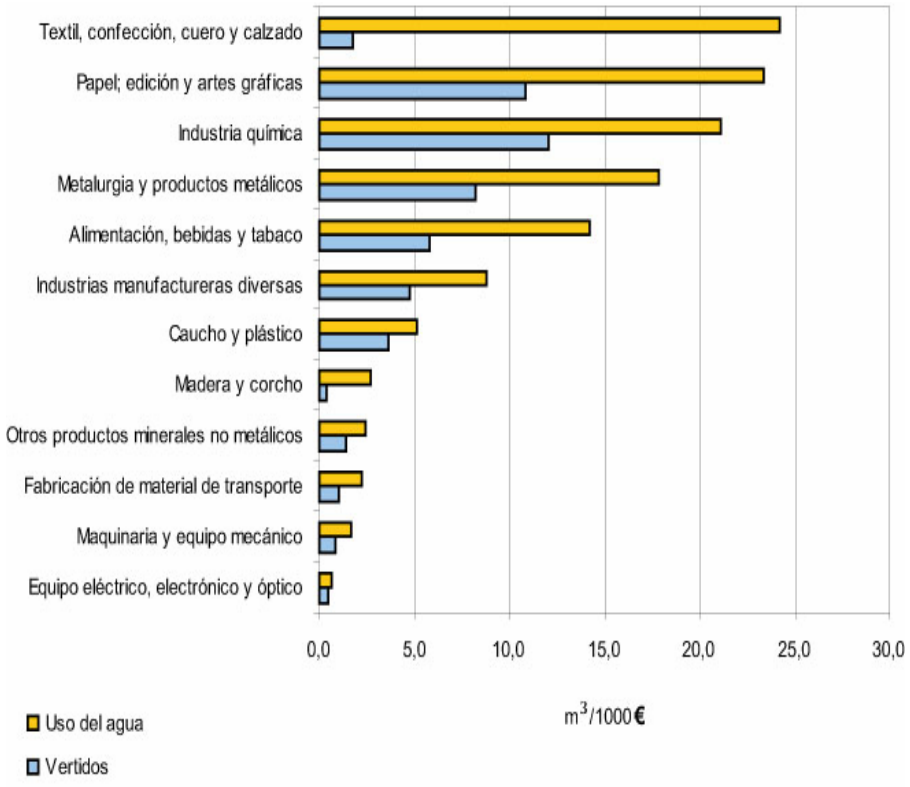
Economic analysis of water use and implications

Given the present industrial structure to produce 1.000€ of GDP in the industry requires 10 m^3 of water.

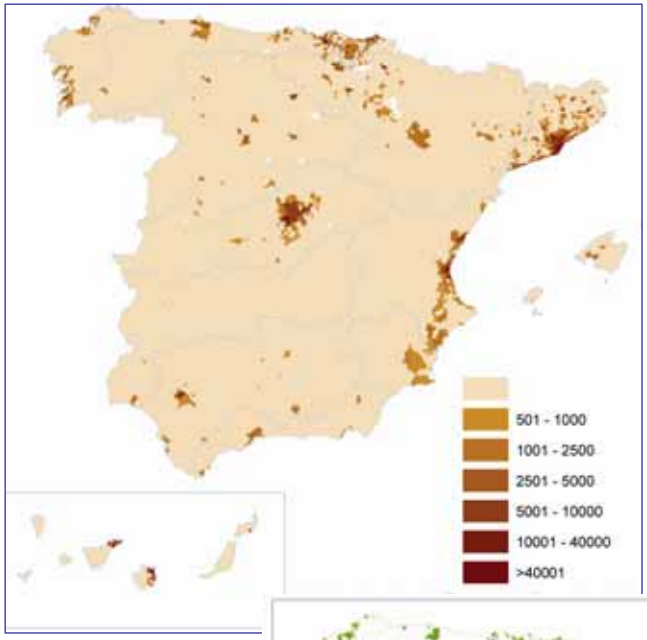
A 1% increase in industrial production requires 12 hm^3 of water.

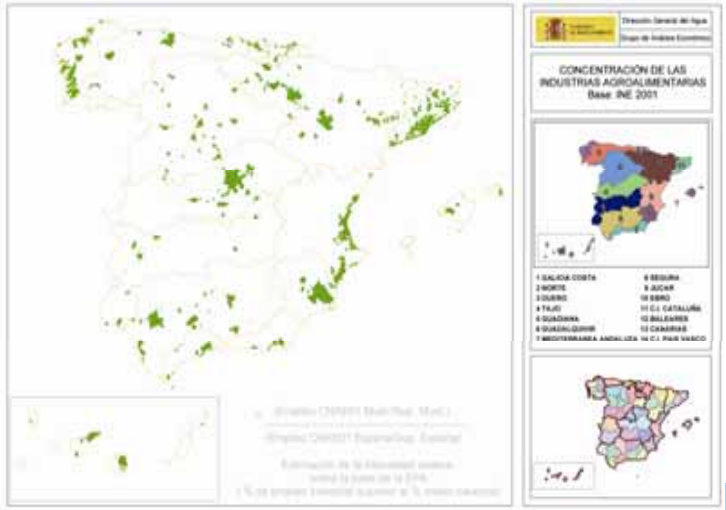
Spanish industry grows at 3% p.a. but in less water intensive sectors.

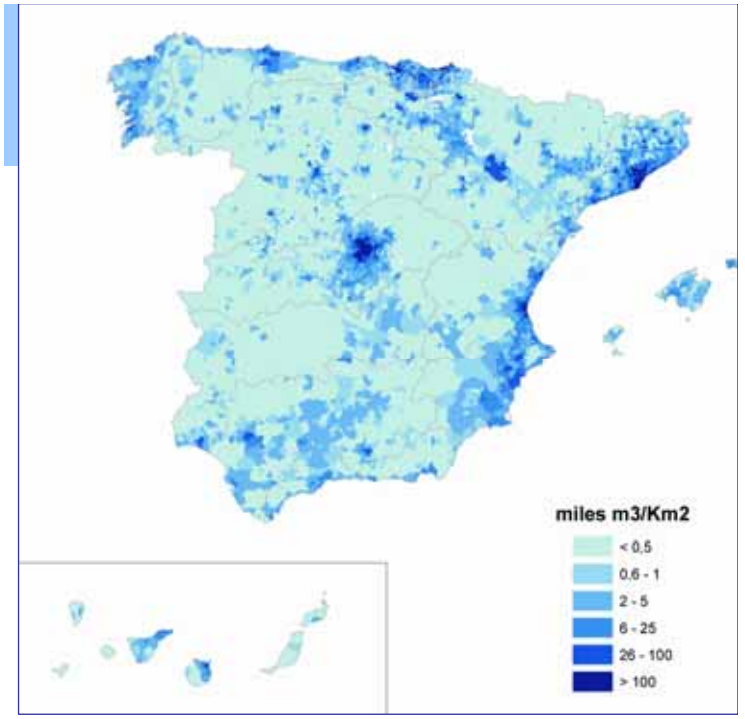
Intensity of water use per industrial sector m3/1000 €

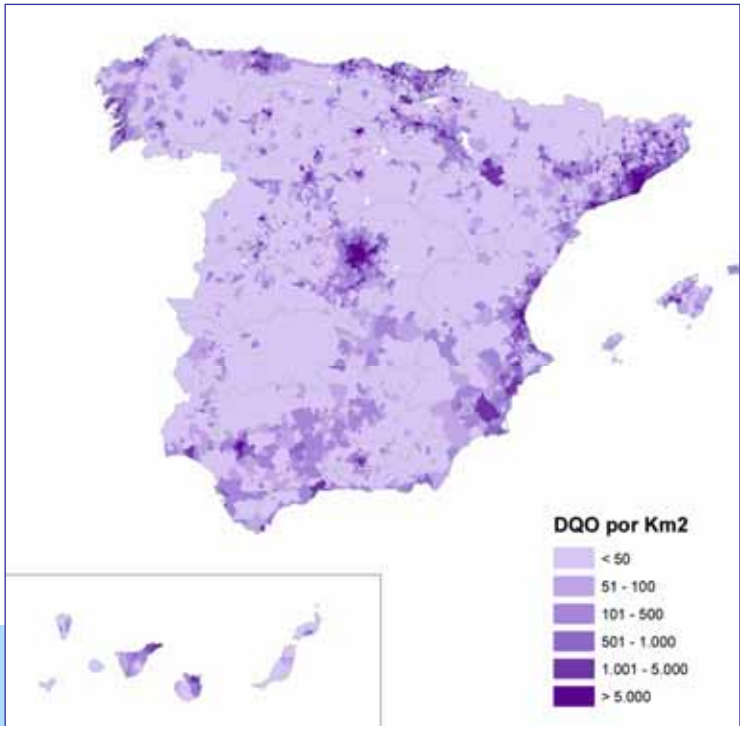


Spatial distribution of Industrial GDP in Spain and the geography of water use and pollution









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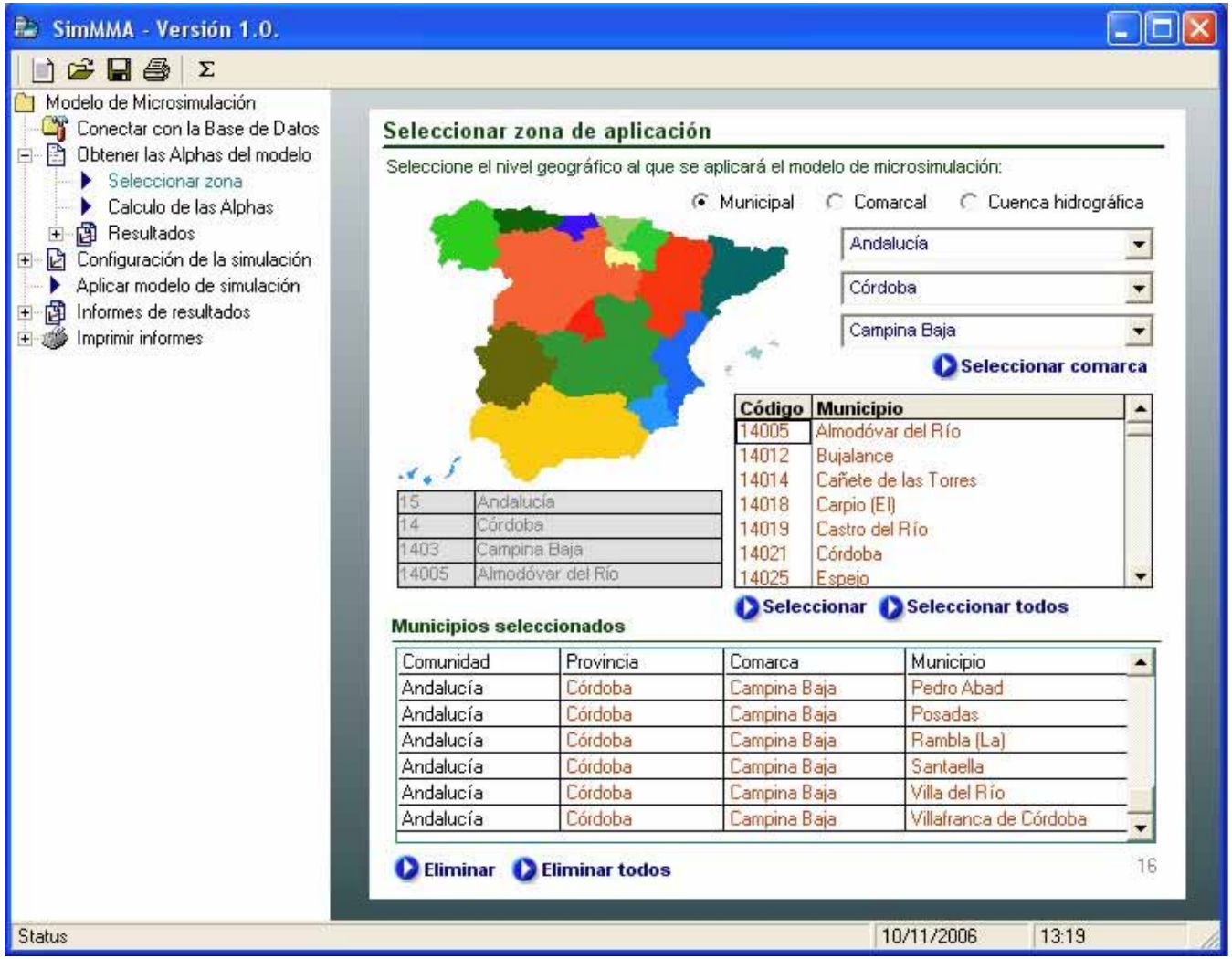
Development of economic analysis modelling and computer tools

- Software application for baseline scenario in agriculture
- Software application for baseline scenario industry
- Software application for baseline scenario urban uses.
- Model of irrigators' decisions (MODERE)

Model of irrigators' decisions (MODERE)



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Pricing and Cost Recovery of Water Services

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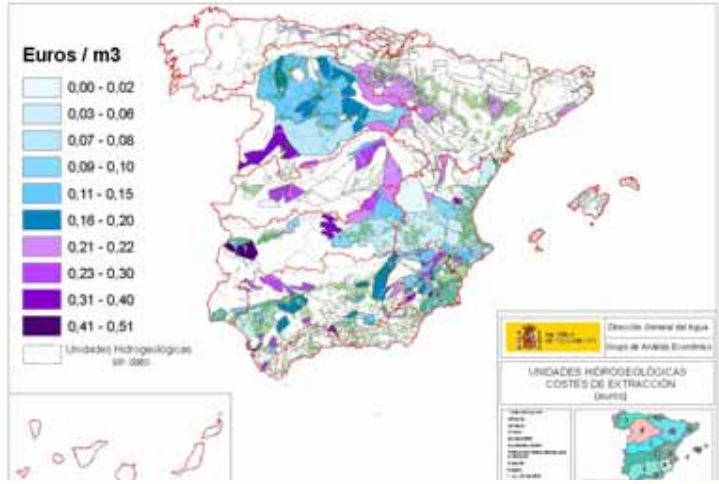
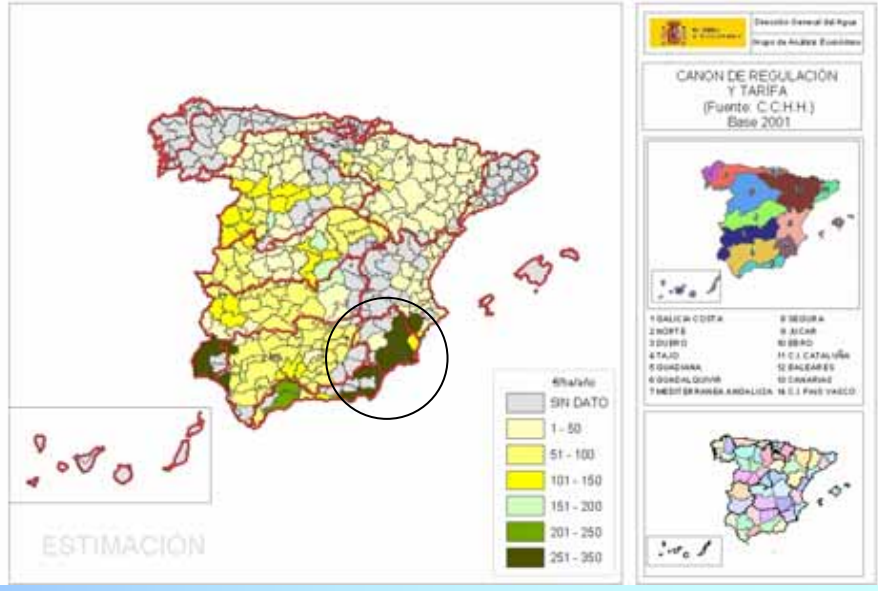
Pricing and cost recovery of water services

In Mediterranean agriculture in Spain groundwater use is important
Pumping costs are related to volume whilst surface water is mainly charged per hectare

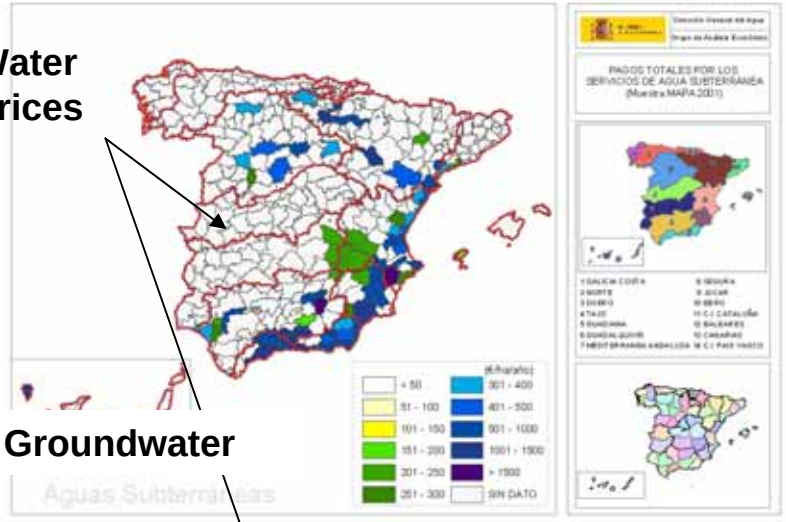
- **The highest cost of ground water in the Segura River basin (0,74 €/m³)**
- **In average costs for groundwater abstraction for farmers is 0,12 €/m³**
- **Costs of bulk surface water around 0,02 €/m³ although higher costs where there are water transfers (0,14 €/m³)**



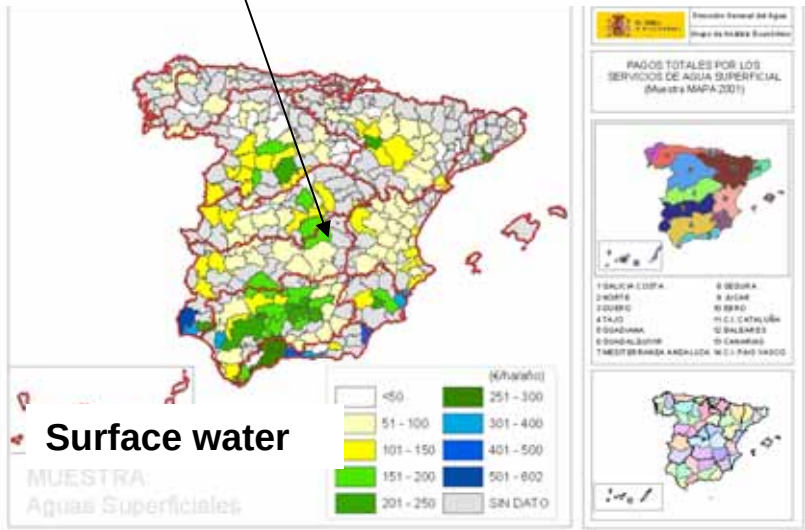


Pricing and cost recovery of water services

Water prices

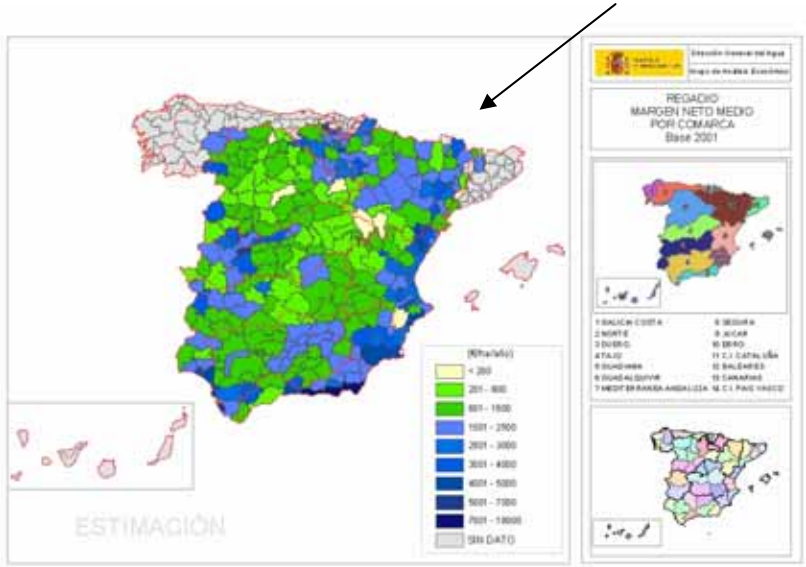


Groundwater



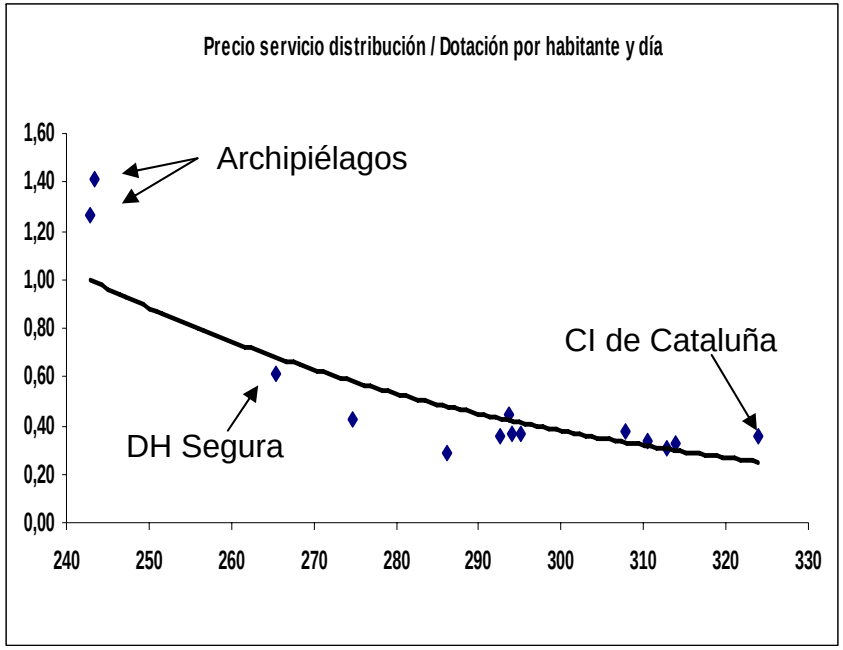
Surface water

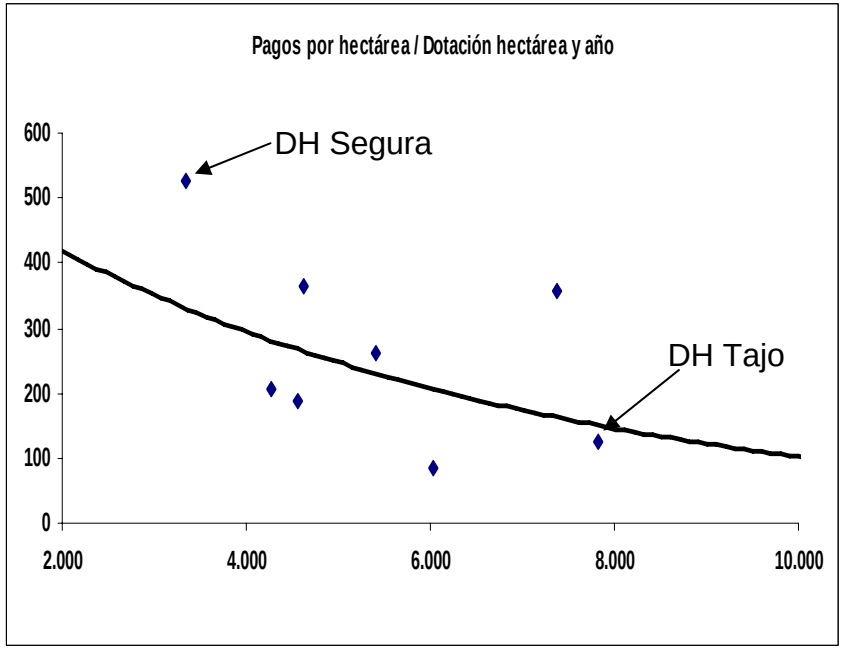
Rents



Agricultural areas with higher water prices specialize in more profitable crops

Prices and water use vary in different areas of Spain
Lower prices are correlated with higher per capita and per hectare use





There has been increases in Prices of urban services (at current prices) above inflation

Average price in 2005 1,14 €/m³ for domestic uses (1,44 €/m³ for industrial uses)

Annual increases in prices have been **above 4%** during the last decade. **Greater increases in sanitation**

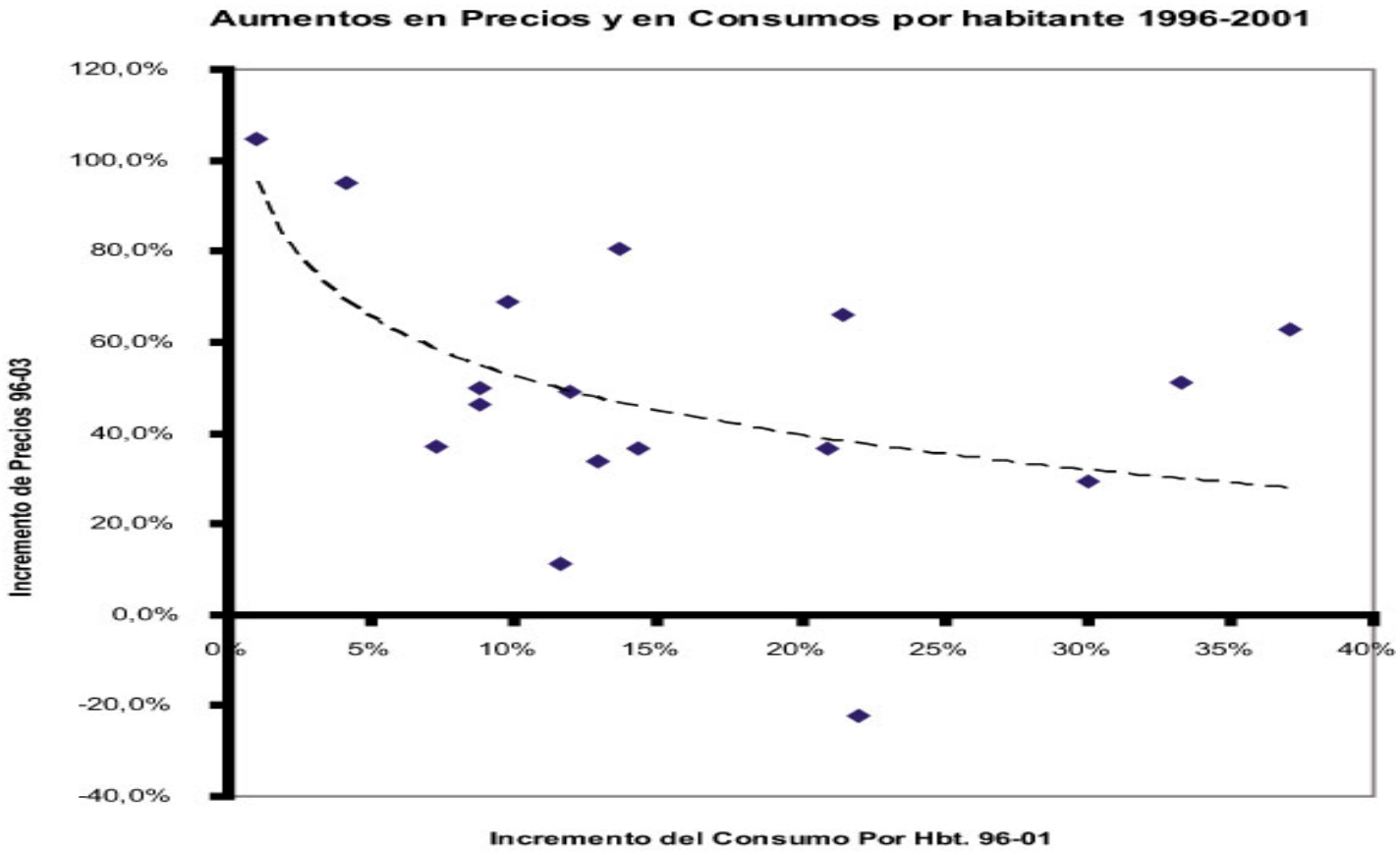
Higher prices paid in the Islands and Murcia

Lower prices in Cantabria (0,56), Navarra (0,78), Castilla-León (0,81) y Castilla La Mancha (0,81)

	2003	2004	2005
Comunidad Autónoma	**Doméstico**	**Doméstico**	**Doméstico**
Andalucía	1,01	1,06	1,15
Aragón	0,69		0,78
Asturias	0,68	0,86	1,00
Cantabria	0,53	0,54	0,56
Castilla-La Mancha	0,74	0,85	0,81
Castilla-Leon	0,72	0,74	0,81
Cataluña	1,27	1,32	1,47
Extremadura	0,87	1,00	1,27
Galicia	0,75	0,78	0,94
I Baleares	1,70	1,74	1,76
I Canarias	1,56	1,55	1,60
La Rioja	0,71	0,75	0,88
Madrid	0,92	0,97	0,98
Murcia	1,57	1,72	1,74
Navarra	0,67	0,73	0,78
Pais Vasco	0,82	0,88	0,92
Valenciana	0,82	0,96	1,00
Población encuestada	1,03	1,08	1,14

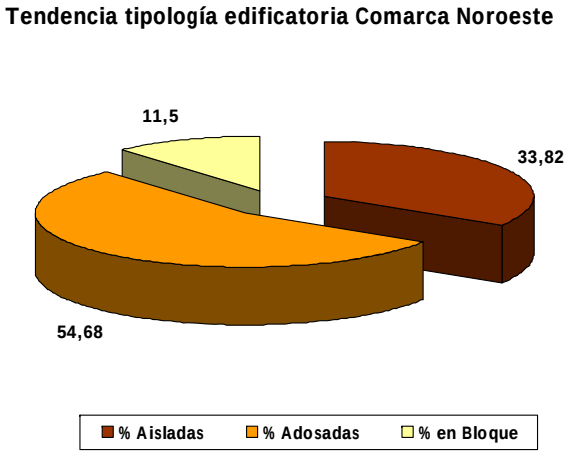
Fuente: AEAS : Encuestas de Tarifas 2003, 2004 y 2005.

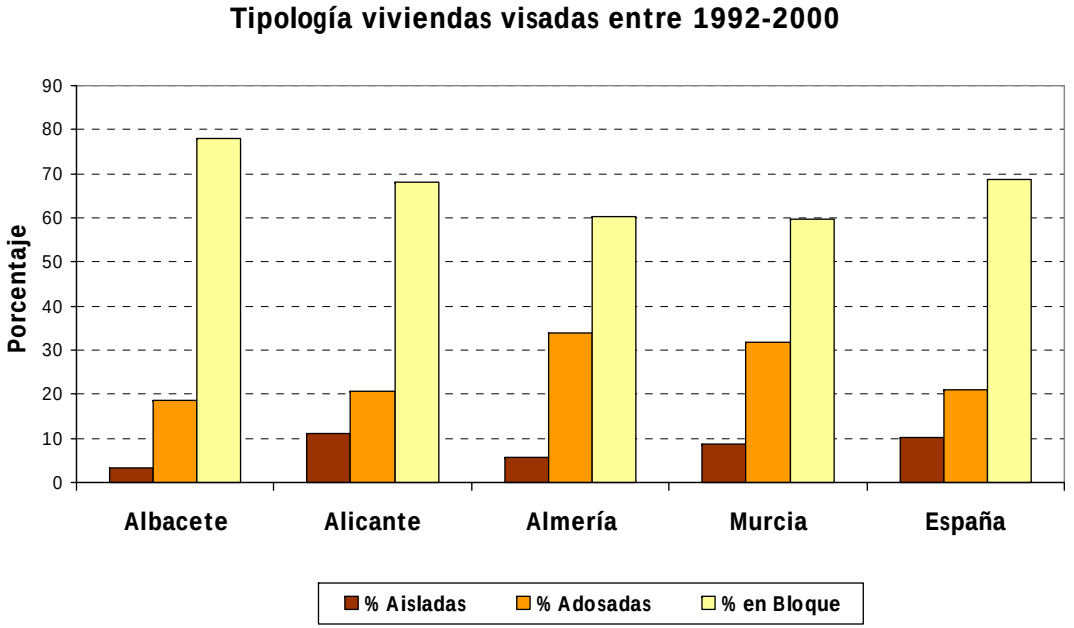
Greater increases in prices are correlated with lower increases in per capita consumption



Fuente: INE. Datos 1991-2001

Increases in income and changes in housing patterns is leading to greater water use in urban areas





Cost of WFD and cost-effectiveness analysis of the programs of measures

Estimates in the UK, Scotland and Holland (per capital annual costs)

Case study	Minimal	Maximal
United Kingdom	€ 5	€ 20
Scotland	€ 25	€ 30
Netherlands	€ 25	€ 70

Source: EC cost-benefit study of the WFD

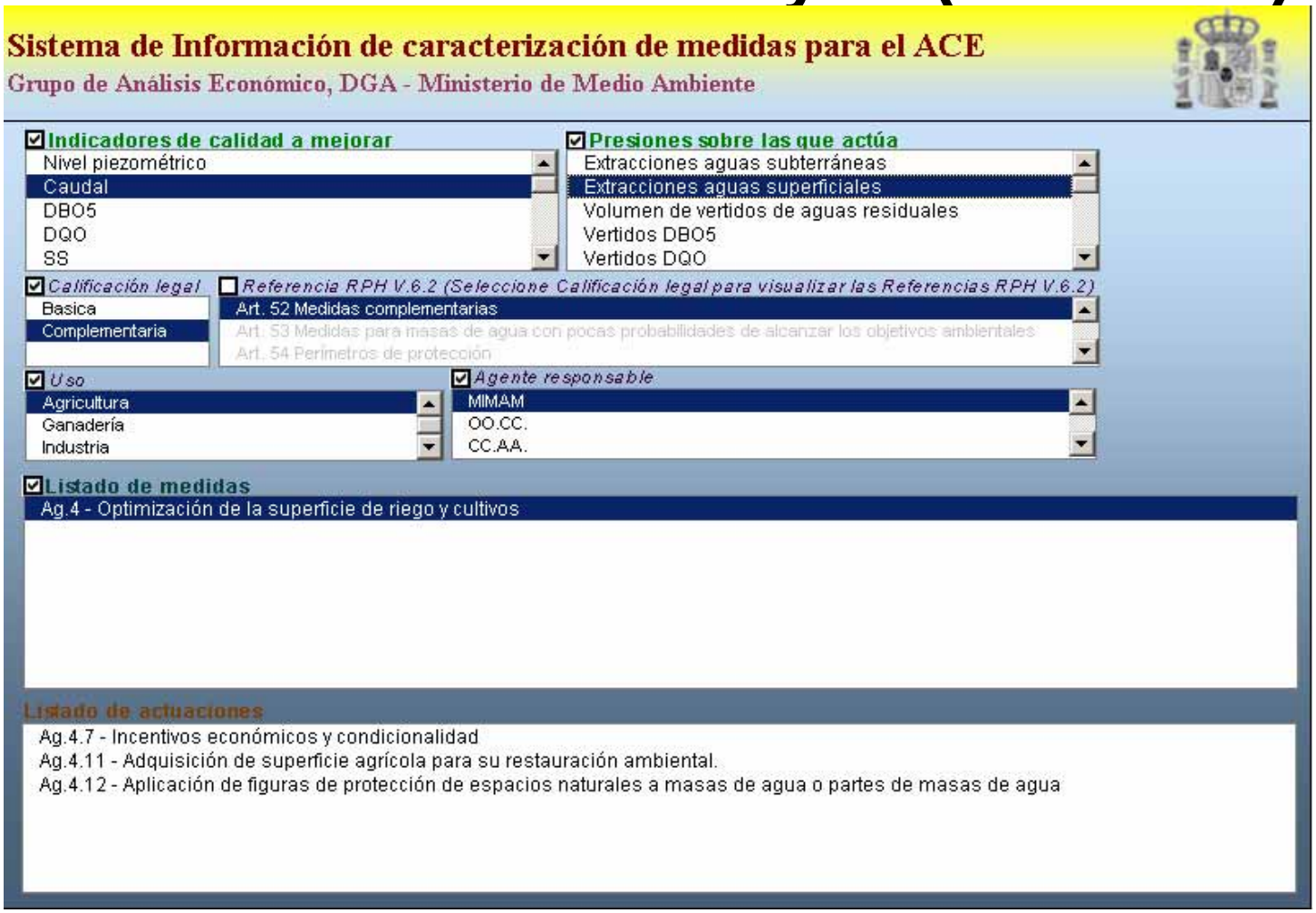
Cost of the WFD measures in Spain

Wide range of estimates so far:

Preliminary estimates of Prointec of around 18 € per person/year for domestic measures

Case studies: up to 75 € per person/year

Characterization System of Measures for the Cost-Effectiveness Analysis (SICMACE)



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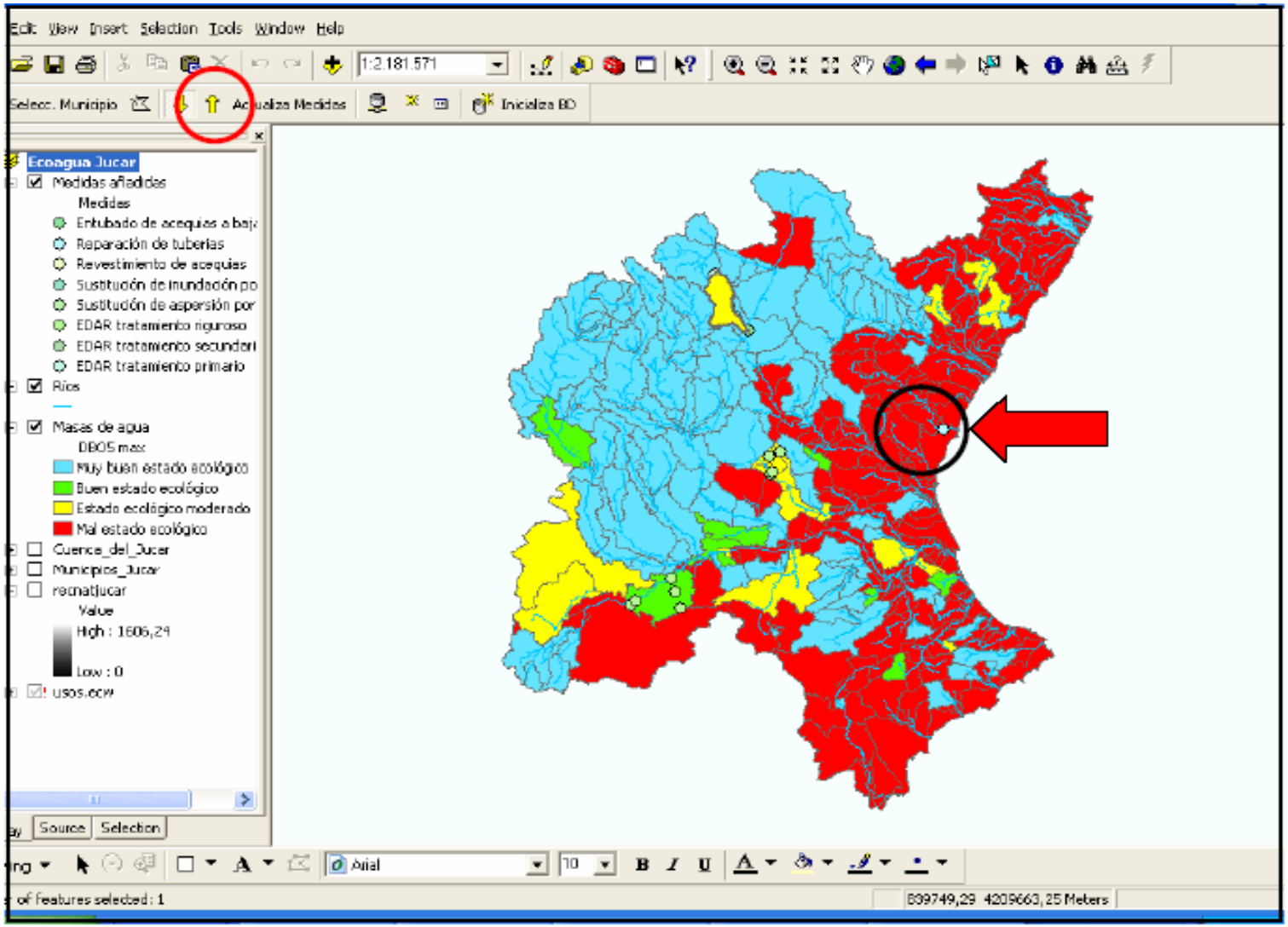

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Costs and financing strategies of specific measures: Sanitation and Modernization of Irrigation

The new 2007-2015 water quality plan

Budget: 19007 Million Euros of investment in the period 2007-2015

More than 2000 actions in a 9 year period (2007-2015)

Aiming to comply with EC regulations (Directive 91/271/CEE; and the WFD 60/2000/CE) and the National "AGUA" programme (Law 11/2005)

Financing strategy

Central Government participation (DGA/PPCC and CCHH): 3046 + 557 M€ : 3603 M€

European Funding: 1369.9 M€

Important role of State Water Companies

Need for private financing

Financing strategy: Conditionality in Central Government participation in financing

General Budget financing of projects in autonomous regions on the basis of bilateral formal framework agreements/contracts (Convenios)

Financing of projects by State Water Companies on the basis of bilateral formal agreements/contracts for specific projects: co-financing and execution (possible Operation)

Financing of Central Government conditional to:

a) existence of WWT tariff (3 regions do not have them)
b) cost - recovery mechanisms in place
c) existence of WWT Law and
d) WWT Plan in the region

IMPACT on prices

Cost recovery of projects financed by the public budget must be recovered, as well as the ones financed by external financing

Average impact on prices of infrastructure costs of 11%, varies according to Autonomous Communities. Ranges between 6.9% and 21%

The issue of distributing the burden of the smaller projects with greater unit costs

The issue of exceptions to the cost recovery principle

Prices in the different Autonomous Communities

Comunidad Autónoma	Precio Saneamiento 2004 (AEAS)	Precio Ciclo Integral 2004 (AEAS)
Andalucía	0,48	1,12
Aragón		
Canarias	0,29	1,76
Cantabria	0,10	0,75
Castilla y León	0,36	0,80
Castilla-La Mancha	0,41	0,89
Cataluña	0,50	1,45
Ciudad Autónoma de Ceuta		
Ciudad Autónoma de Melilla		
Comunidad de Madrid	0,33	0,97
Comunidad Foral de Navarra	0,36	0,77
Comunidad Valenciana	0,42	1,04
Extremadura	0,24	1,01
Galicia	0,34	0,95
Islas Baleares	0,77	2,06
La Rioja	0,40	0,76
País Vasco	0,60	1,21
Principado de Asturias	0,34	1,09
Región de Murcia	0,66	1,72
Total España	0,43	1,17

Modernization of irrigation

National Plan of Rural Development 2007-2013

Impact Plan 2006-2007

- Coordinated actions of Minister of the Environment and Minister of Agriculture
- Saving foreseen 1.200 hm^3
- Modernisation of 866.898 ha
- ICO (Credit Official Institute) average support to farmers of 5.000 € – 18.000 €

Summary

- Important effort in economic analysis to asses future water use, efficiency and productivity of present water use.
- Policy oriented results: potential of pricing and market instruments and modification of legislation
- Pending information on costs of the WFD measures and on going work on financing strategies and analysis of economic impacts of measures
- Some major efforts under way in implementing measures to improve water status.
- Development of computer applications for estimating future use, efectiveness and economic impacts of measures, and for comparing the cost-effectiveness of measures