

Charging for water services to irrigation agriculture in Spain



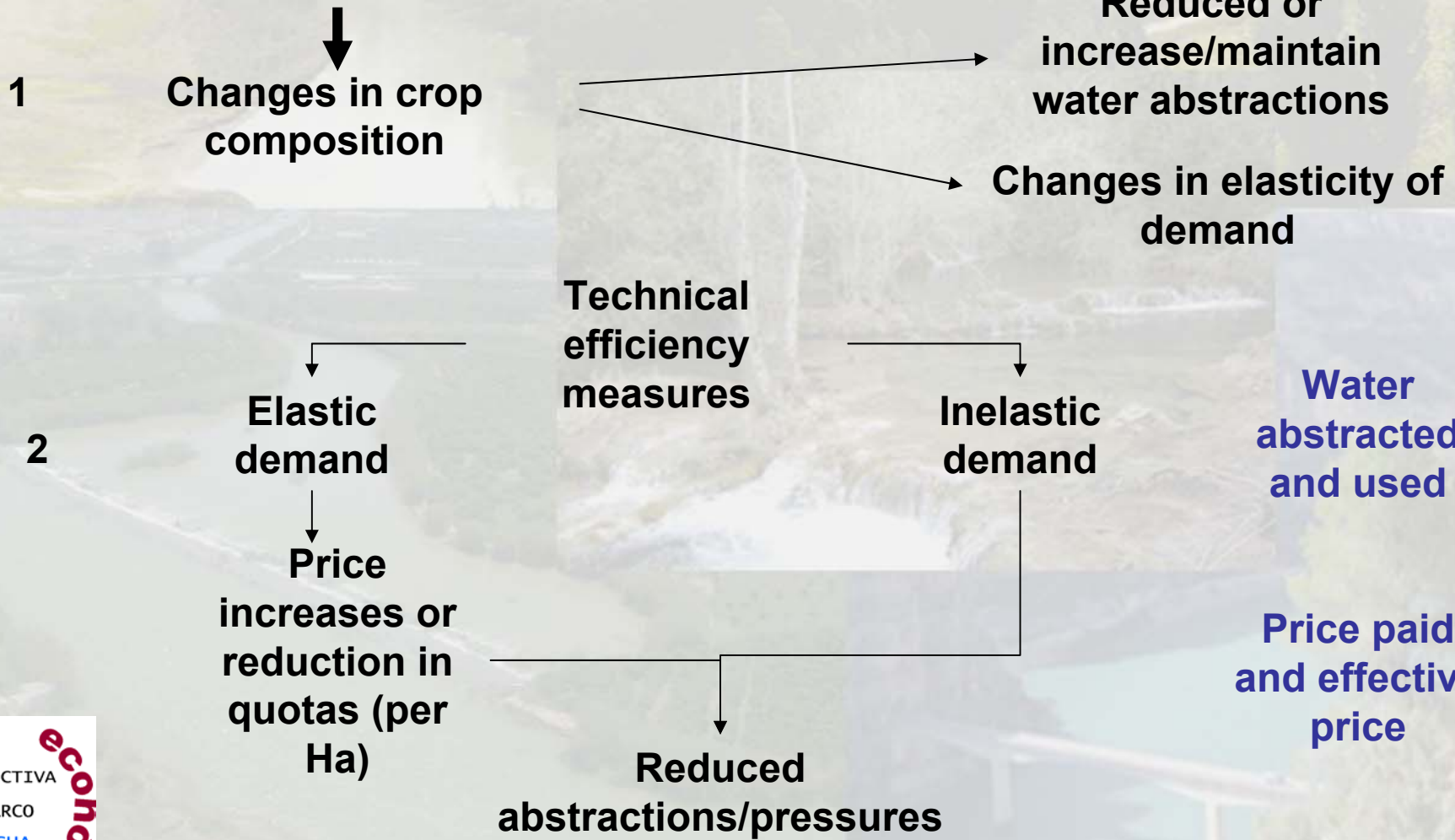
Imágenes tomadas de internet



Key Messages (test cases)

CAP reform

Effects



1

Changes in crop composition

Reduced or increase/maintain water abstractions

Changes in elasticity of demand

Technical efficiency measures

Elastic demand

Inelastic demand

Water abstracted and used

Price increases or reduction in quotas (per Ha)

Price paid and effective price

Reduced abstractions/pressures

Charging for water services to agriculture in Spain

Charges of the River Basin Authorities (storage and main transportation **to irrigation associations**):

- Per hectare
- Per m³

Charges of the Irrigation (or users) associations (**water delivery to farms** and collective GW extraction)

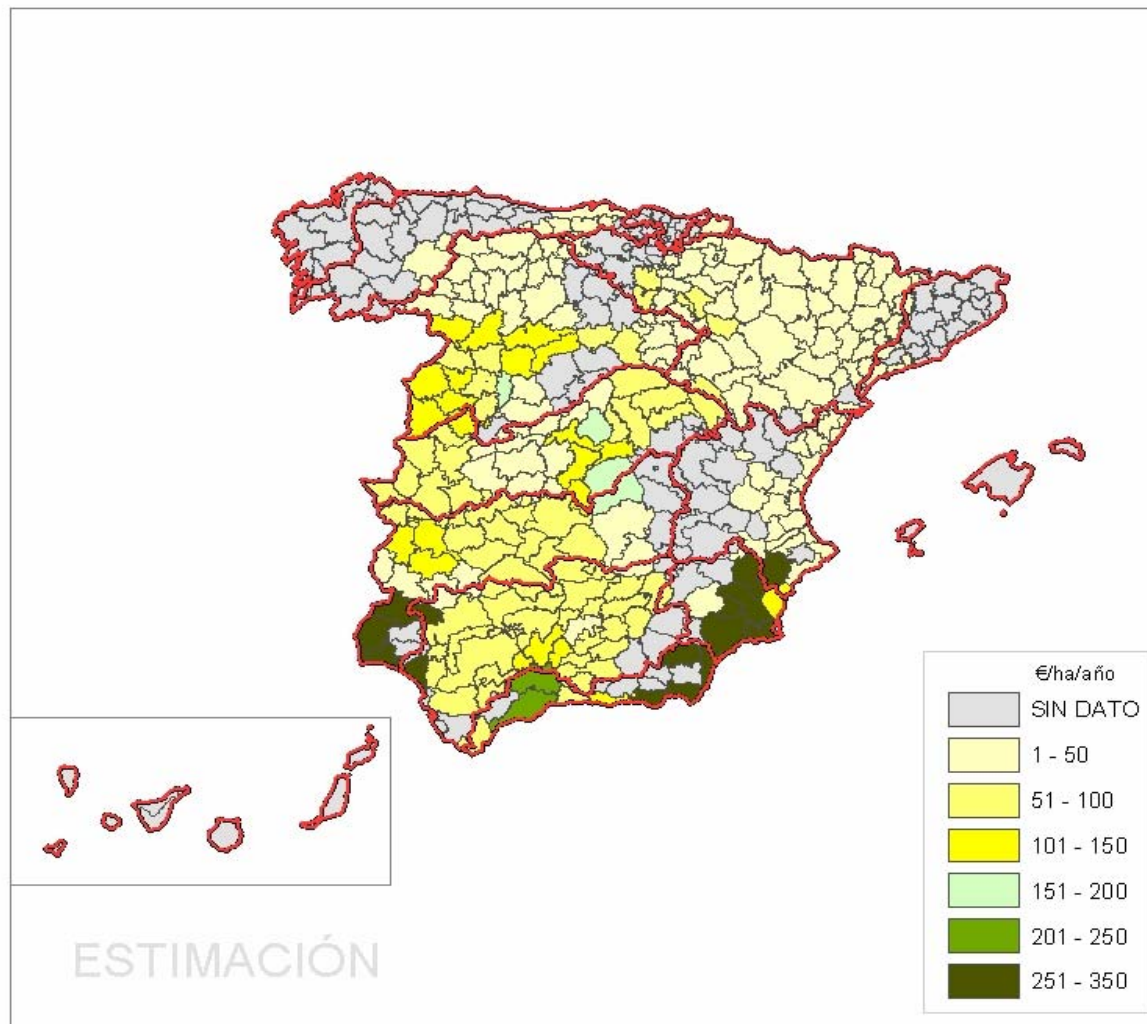
- Per Ha
- Mix systems

Structure. Charges to irrigation associations for dams infrastructure and O&M in the Jucar River Basin

EXPLOTACIÓN/USUARIOS	1996	1997	1998	1999	2000	2001	Unidades
Ulldecona Regadíos Antiguos	17,72	20	21,27	22,15	26,44	36,34	Hectárea
Ulldecona Regadíos Nuevos	35,86	38,13	39,4	40,28	44,58	54,47	Hectárea
Alcora Regadíos	37,17	42,02	38,39	51,64	47,79	31,16	Hectárea
Arenós-Sichar Regadíos Tradicionales	13,23	14,19	14,16	13,85	14,89	18,08	Hectárea
Arenós-Sichar Fortuna de Nules (Consumo)	0,012	0,003	0,003	0,003	0,012	0,012	metro cúbico
Arenós-Sichar Fortuna de Nules (Tarifa)	3,2	5,44	4,99	11,77	12,16	6,39	Hectárea
Arenós-Sichar R M Cristina (Consumo)	0,012	0,003	0,003	0,003	0,012	0,012	metro cúbico
Arenós-Sichar R M Cristina (Tarifa)	5,19	7,43	5,45	13,08	12,6	6,82	Hectárea
Arenós-Sichar Canal C100 (Consumo)	0,012	0,003	0,003	0,003	0,012	0,012	metro cúbico
Arenós-Sichar Canal C100 (Tarifa)	24,89	27,13	24,48	32,11	31,63	25,85	Hectárea
Arenós-Sichar Canal C220 (Consumo)	0,012	0,003	0,003	0,003	0,012	0,012	metro cúbico
Arenós-Sichar Canal C220 (Tarifa)	21,95	24,2	23,75	30,53	30,92	25,15	Hectárea
María Cristina Regadíos	14,27	11,62	11,14	11,23	12,34	14,57	Hectárea
Arquillo de San Blas Regadíos	0,003	0,0015	0,0002	0,0019	0,0009	0,0014	metro cúbico
Benagéber-Loriguilla R Tradicionales	5,02	7,39	7,73	7,97	10,42	11,33	Hectárea
Benagéber-Loriguilla R Canal Júcar-T	6,11	10,07	12,5	12,1	12,68	15,88	Hectárea
Canal Campo del Turia Regadíos	4,95	5,1	6,47	7,03	7,54	9,21	Hectárea
Canal Campo del Turia Tarifa	0,0114	0,009	0,0079	0,0086	0,01	0,0087	metro cúbico
Alarcón Regadíos	0,0033	0,0044	0,0035	0,004	0,0057	0,0065	metro cúbico
Canal Margen Izq Río Magro Regadíos	53,99	61,97	64,37	65,32	66,7	65,88	Hectárea
Contreras-Canal Júcar-Turia Regadíos	4,89	5,08	5,19	5,34	6,87	6,73	Hectárea
Contreras-Canal Júcar-Turia Tarifa	0,0036	0,0031	0,0027	0,0037	0,0069	0,0036	metro cúbico
Forata Regadíos	25,81	24,67	23,8	20,52	23,69	25,27	Hectárea
Beniarrés Regadíos	0,0142	0,0168	0,0063	0,0195	0,0353	0,0321	metro cúbico
Guadalest Regadíos	0,95	1,71	2,09	2,96	4,7	4,43	Hectárea
Amadorio Regadíos ¹	7,91	11,74	6,37	1,96	-3,311	-3,511	Hectárea

Fuente: Elaboración propia a partir de datos del Servicio de Explotación de la Confederación Hidrográfica del Júcar. Notas: Cifras en Euros por hectárea. ¹ Los datos correspondientes a los regadíos del sistema del embalse de Amadorio para los años 2000 y 2001 corresponden a un ajuste por cánones presupuestados en años anteriores superiores al resultado real.

Charges of River Basin Authorities storage and transportation services to irrigation associations – weighted average



DI

infraestructure and O&M in the Jucar River Basin

	DENOMINACION SOCIEDAD	Tarifas función de la superficie (€/ha)	Tarifa variable			Regador		Tipo Tarifa Aplicada
			€/ha	€/hora	€/m ³	€/ha	€/hora	
a.1	Comunidad de regantes Burriana	171,36				17,6		mixta por nº riegos
	Comunidad de regantes Castellón	216,36				14,42		mixta por nº riegos
	C. RR Vilarreal	245,21				18,03		mixta por nº riegos
	Comunidad de regantes Almazora	122,61				19,11		mixta por nº riegos
	Acequia real del Júcar	59,72-222,15				9,01-10,82		mixta por nº riegos
	Sindicato de riegos de Sueca	90,15-212,76						mixta por nº riegos
	C. G. RR y usuarios. Cuenca del Algar	288,49-721,21					3,61	mixta horaria (regador)
	J. Privativo de Aguas de Orihuela	144,24						por superficie
a.2	Riegos de Levante M.D.	25,54		30,06				mixta horaria
	Riegos de Levante M.I.	45,08		6,76-25,84			2,40-3	mixta horaria
a.3	Comunidad de regantes M ^o Cristina	28,85			6,6-9	50,48		mixta volumétrica y riego (regador)
	Comunidad de regantes Sagunto (Acequia Mayor)	180,3	108,18-576,97					mixta por nº riegos
	Comunidad de regantes Albalat (Acequia Mayor)	649,09	21,63	36,06				mixta horaria y nº riegos
	Comunidad de regantes Algimia (Acequia Mayor)	216,36	50,48-79,33					mixta por nº riegos
a.4	Comunidad de regantes Cota 100	72,12-108,18	27,04	13,22-16,82				mixta horaria y nº riegos
	Comunidad de regantes Cota 220	3,01		6,01-10,82		50,48		mixta horaria
	Comunidad de regantes de Bétera	11,54		15,51-19,47				mixta horaria
	Sector I. Los Tollos			7,21-36,06				horaria
	Sector L'Alcudia	72,12-108,18		8,41-12,02			4,21	mixta horaria
	Sector Benimodo	18,03-21,63	37,14					mixta nº de riegos
	Sector Comuna		57,96	18,03				nº riegos y horaria
	Sector Aledua	72,12	72,12-79,33					mixta nº riegos
	Sector Masalet	50,48	36,06					mixta nº riegos
	Sector Nova Comunidad			15,02				horaria
	Sectores X y XI Margen Derecha	9,01		9,62-12,62				mixta horaria
	Sector XIII	9,01		19,23-27,04				mixta horaria
	San José de Alginet			9,01			3	horaria
b	S.A.T Caduf	204,34			5,4			mixta volumétrica
	S.A.T Fosa Pastor	84,14			5,4			mixta volumétrica
	S.A.T Pozo Jara	165,28			5,4			mixta volumétrica
	S.A.T. Sant Llorenç	140,94			5,4			mixta volumétrica
	S.A.T. Cobatelles	60,1			4,2			mixta volumétrica
	S.A.T. Dalme	60,1			6,3			mixta volumétrica
	Sociedades civiles de Pozo de Vilarreal	72,12-108,18		13,22-21,03		14,42		mixta horaria y nº de riegos (regador)
	Sociedades civiles de Pozo de Onda	72,12		21,03-27,04		14,42		mixta horaria y nº de riegos (regador)
	Sociedades de pozos de La Vall d'Uixó	210,35		11,53-55,29				mixta horaria
	Sociedad de pozos El Calvari	72,12-108,18		18,03				mixta horaria
	Sociedades Civiles de pozo de Carlet	108,18-144,24		18,03		36,06		mixta horaria
	Sociedades Civiles de pozo de Picassent	12,02		30,05-33,05				
	S.A.T. Virron de las Nieves de Ane	112,38		45,08-47,48				

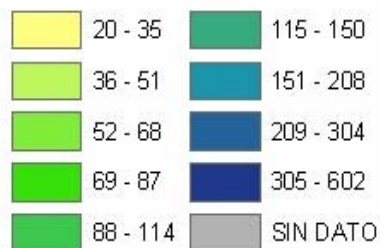
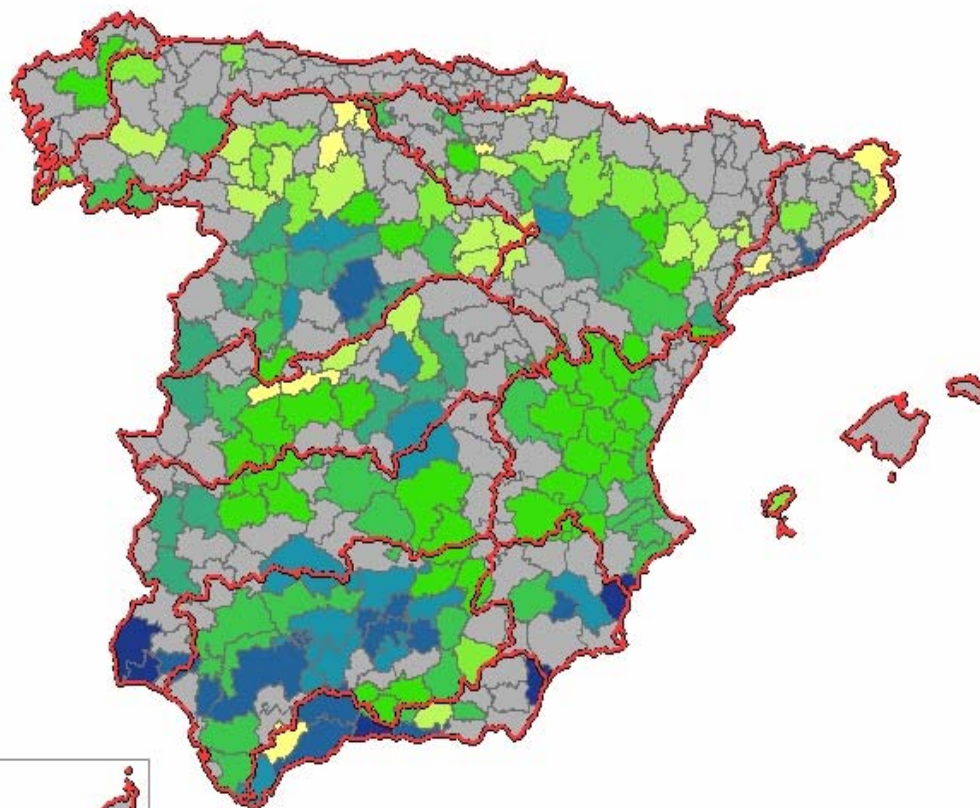
Cost structure of irrigation associations providing water distribution services in the Jucar River Basin (€/Ha)

Tipo	Traditional	Traditional with groundwater	New irrigation areas	Groundwater
Personnel	114	344	232	742
Depreciation	26	62	72	44
Maintenance	54	25	59	69
Administration	29	29	114	46
Supplies	22	64	38	212
Payments for services	37	165	49	95
Others	8	48	40	122
Total €/Ha	290	737	604	1.329

COSTES DE LOS SERVICIOS DE AGUA SUPERFICIAL (€/ha/año) Base 2001



- | | |
|-------------------------|--------------------|
| 1 GALICIA COSTA | 8 SEGURA |
| 2 NORTE | 9 JUCAR |
| 3 DUERO | 10 EBRO |
| 4 TAJO | 11 C.I. CATALUÑA |
| 5 GUADIANA | 12 BALEARES |
| 6 GUADALQUIVIR | 13 CANARIAS |
| 7 MEDITERRANEA ANDALUZA | 14 C.I. PAIS VASCO |

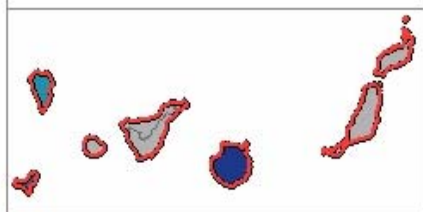
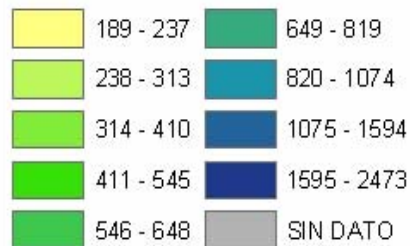
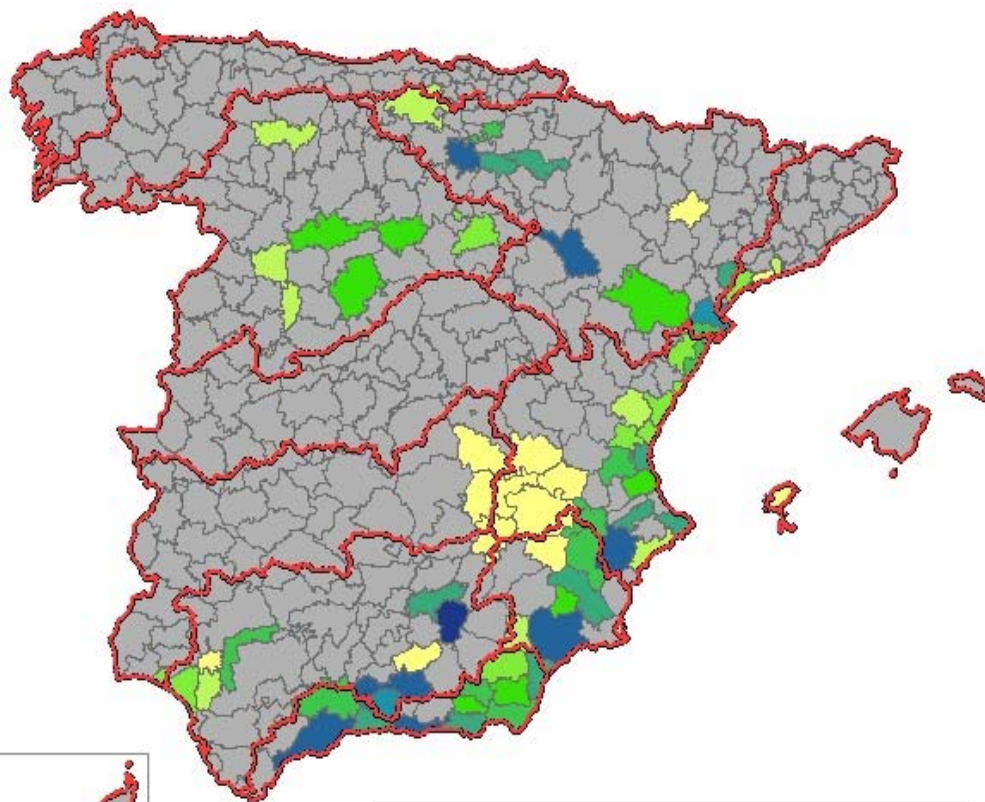




COSTES DE LOS SERVICIOS DE AGUA SUBTERRÁNEA (€/ha/año) Base 2001

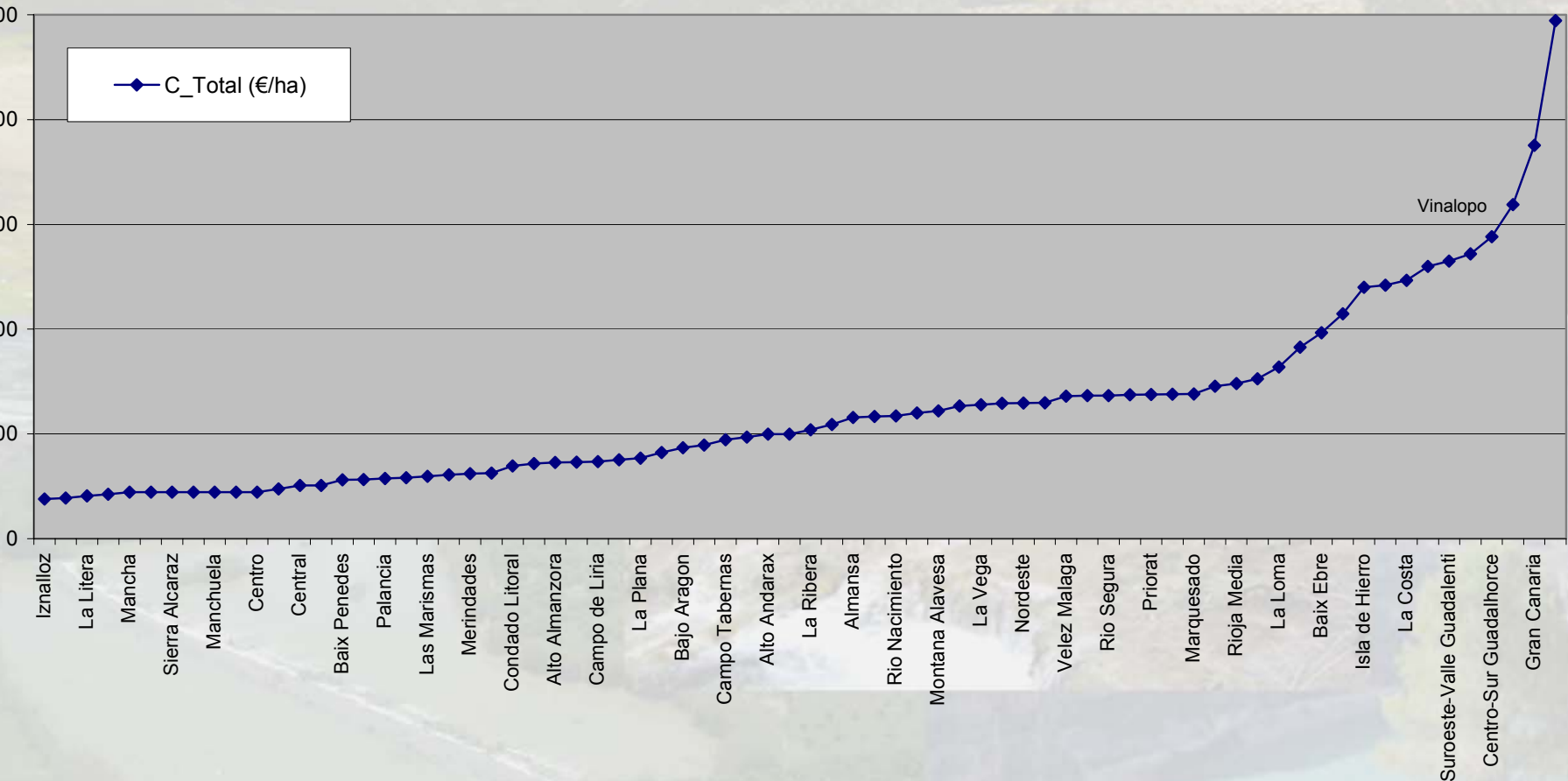


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|-------------------------|--------------------|
| 1 GALICIA COSTA | 8 SEGURA |
| 2 NORTE | 9 JUCAR |
| 3 DUERO | 10 EBRO |
| 4 TAJO | 11 C.I. CATALUÑA |
| 5 GUADIANA | 12 BALEARES |
| 6 GUADALQUIVIR | 13 CANARIAS |
| 7 MEDITERRANEA ANDALUZA | 14 C.I. PAIS VASCO |

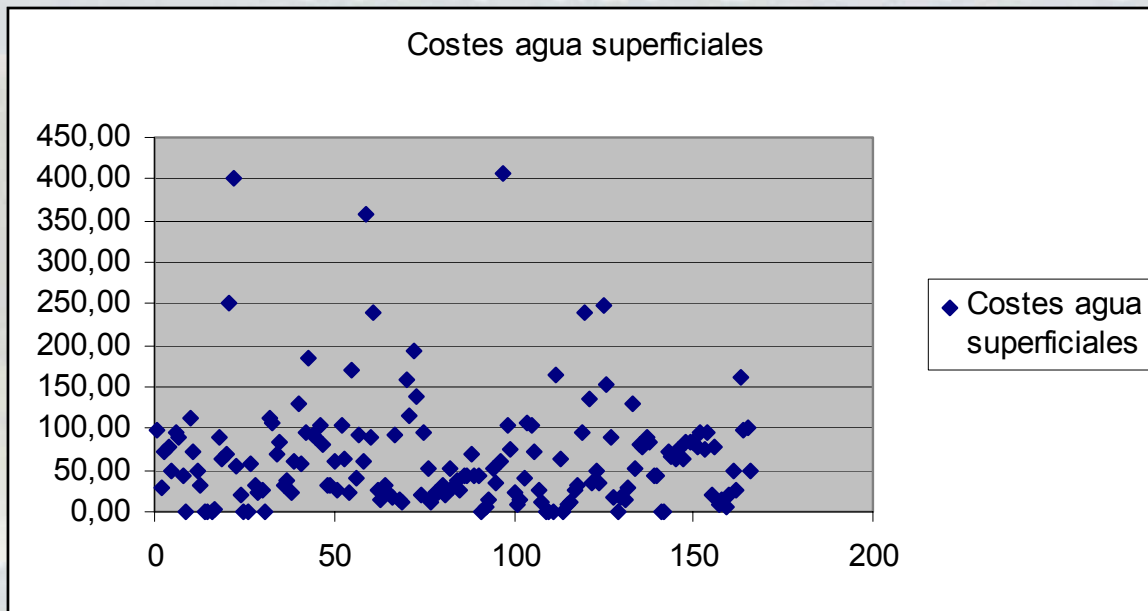


Average Payments for water delivery to farms with GW

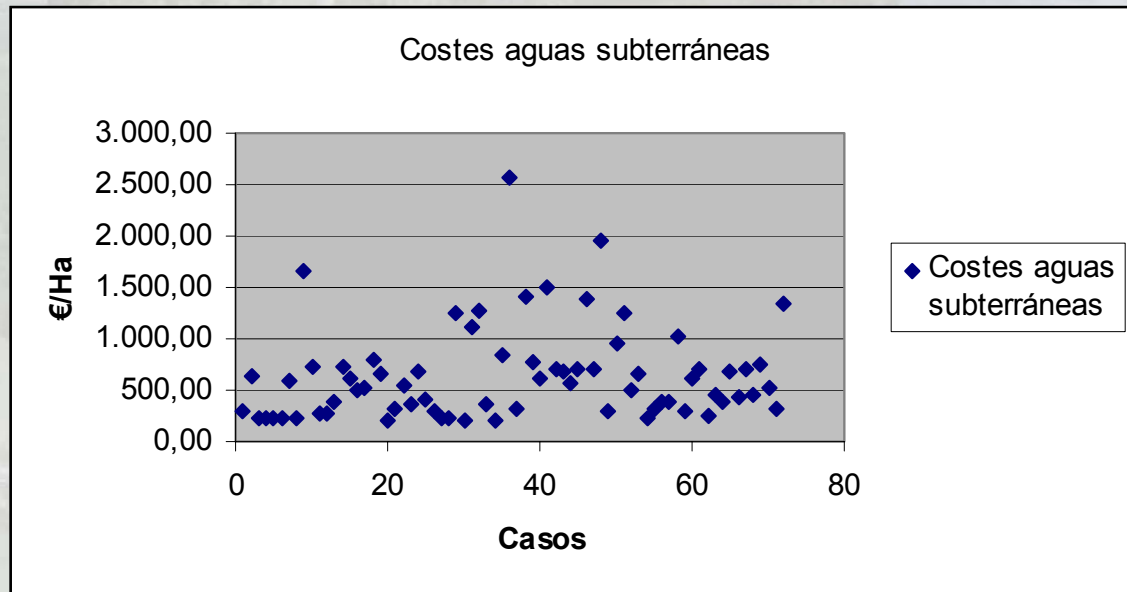
C_Total (€/ha)



**Average payments
for water delivery
to farms with
surface water**

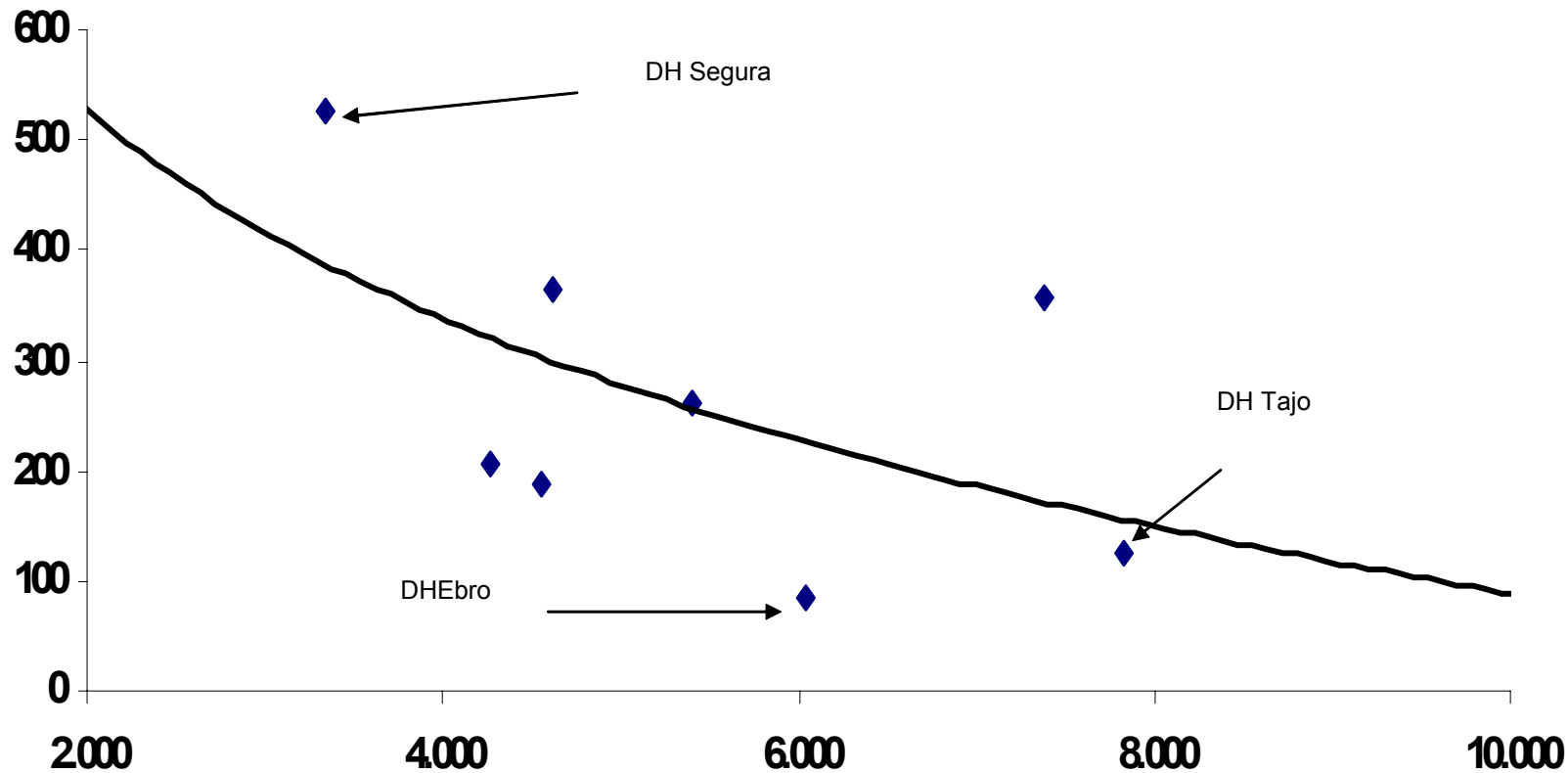



**Average payments
for water delivery
to farms with GW**



Weighted average consumption per Ha and weighted average paid for water delivery services to farms in River Basin Districts

Average paid per hectare / Consumption per Ha per year

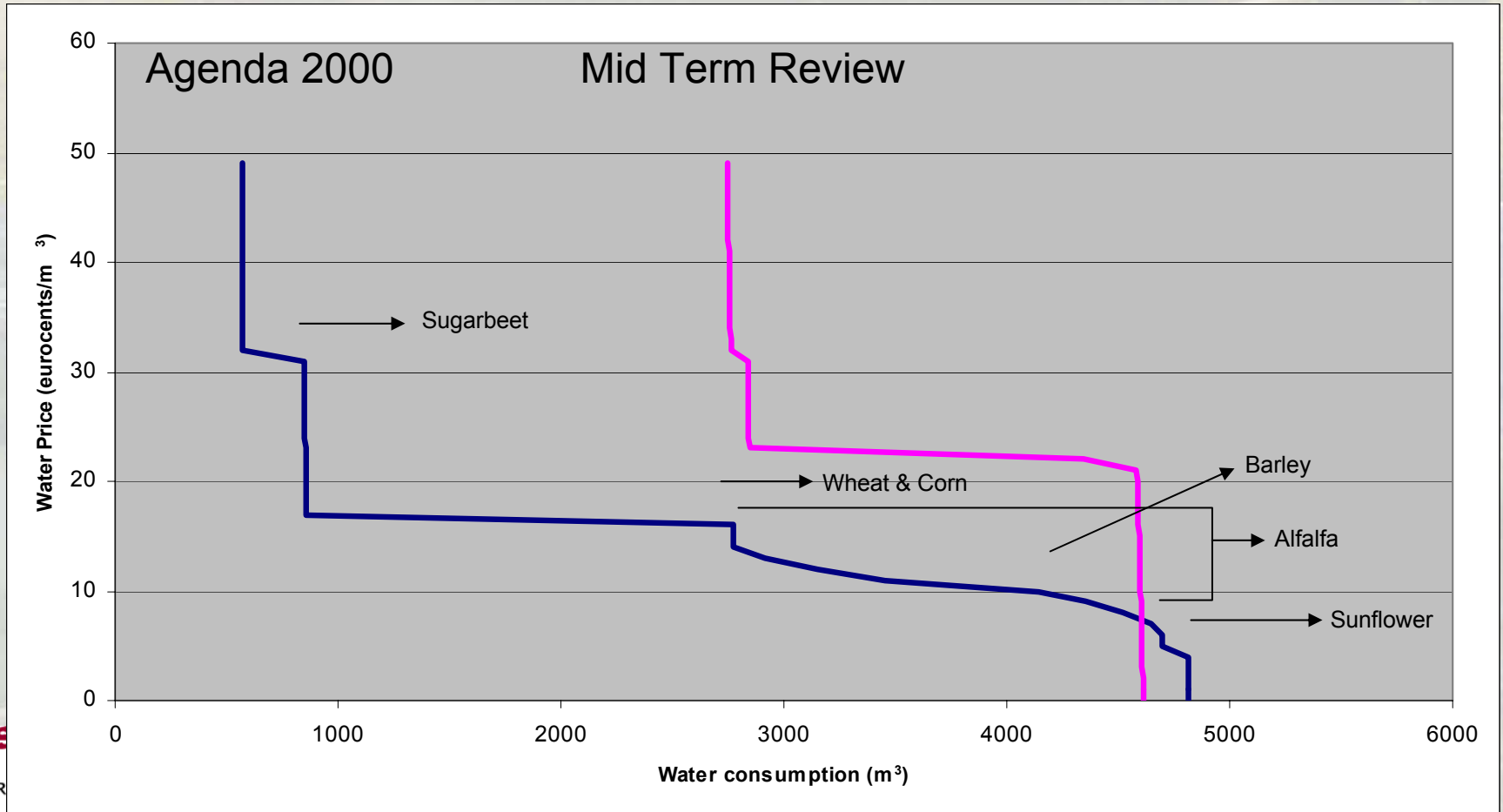


An aerial photograph of a river with a dam, surrounded by agricultural fields and trees. The image is slightly faded to serve as a background for the text.

Water demand and CAP reform

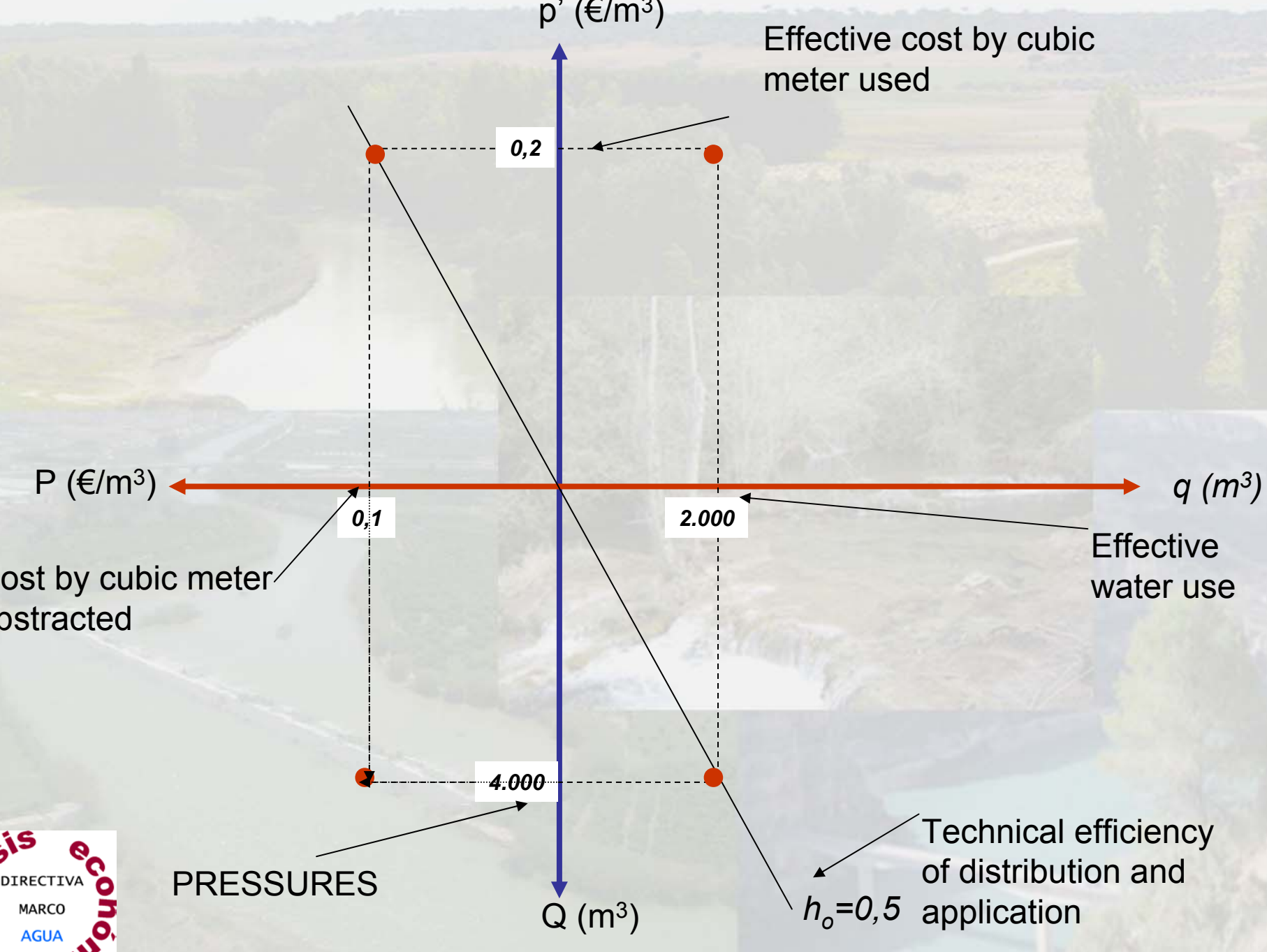
Changes in composition of crops and elasticity of demand

Effects of CAP reform (case of irrigation district in Castilla La Mancha specialised in COP production)



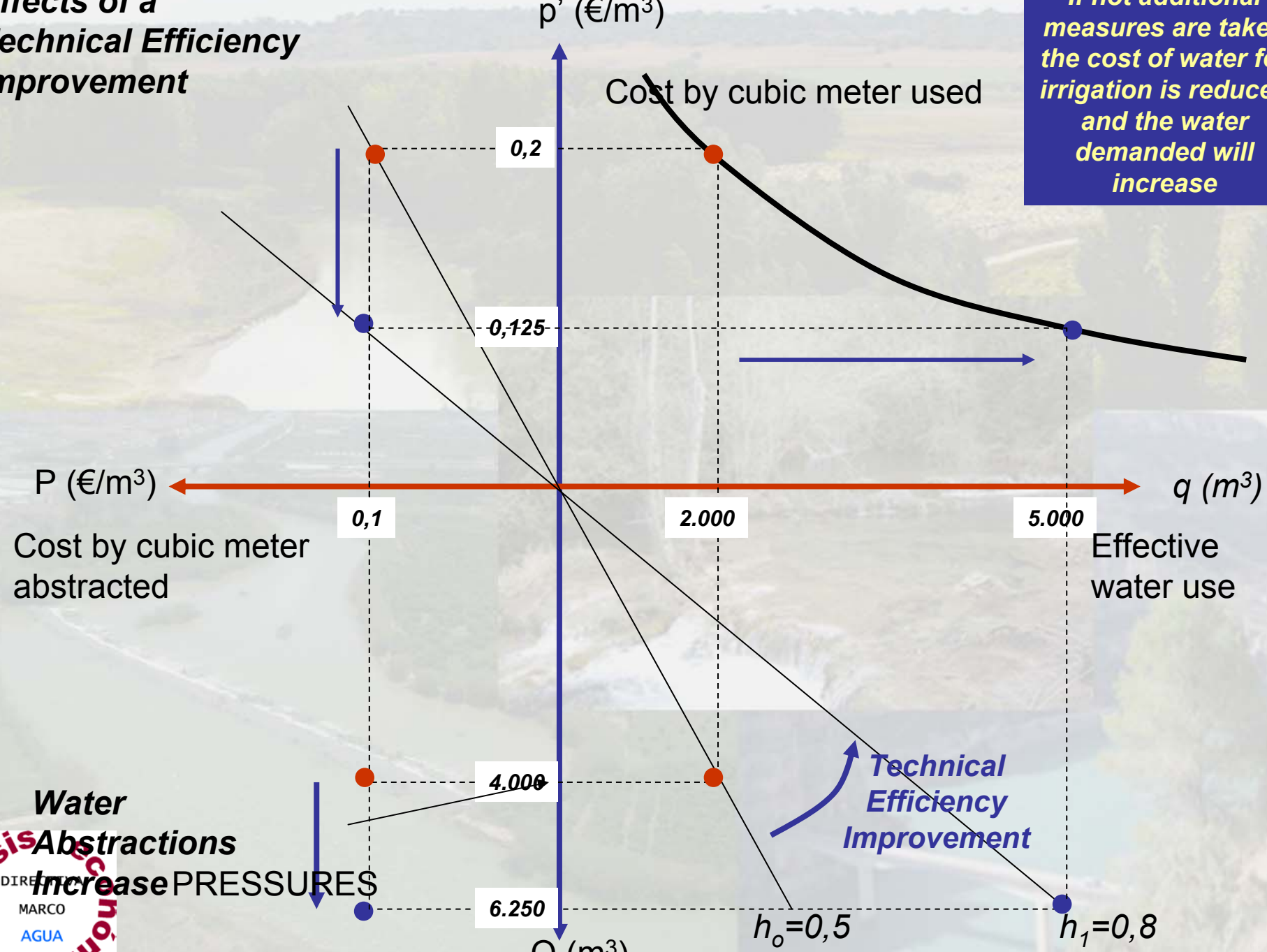
Elasticity of demand

Effects of measures to improve technical efficiency (drip irrigation, channels improvements) on water abstractions



Effects of a Technical Efficiency Improvement

If not additional measures are taken, the cost of water for irrigation is reduced and the water demanded will increase

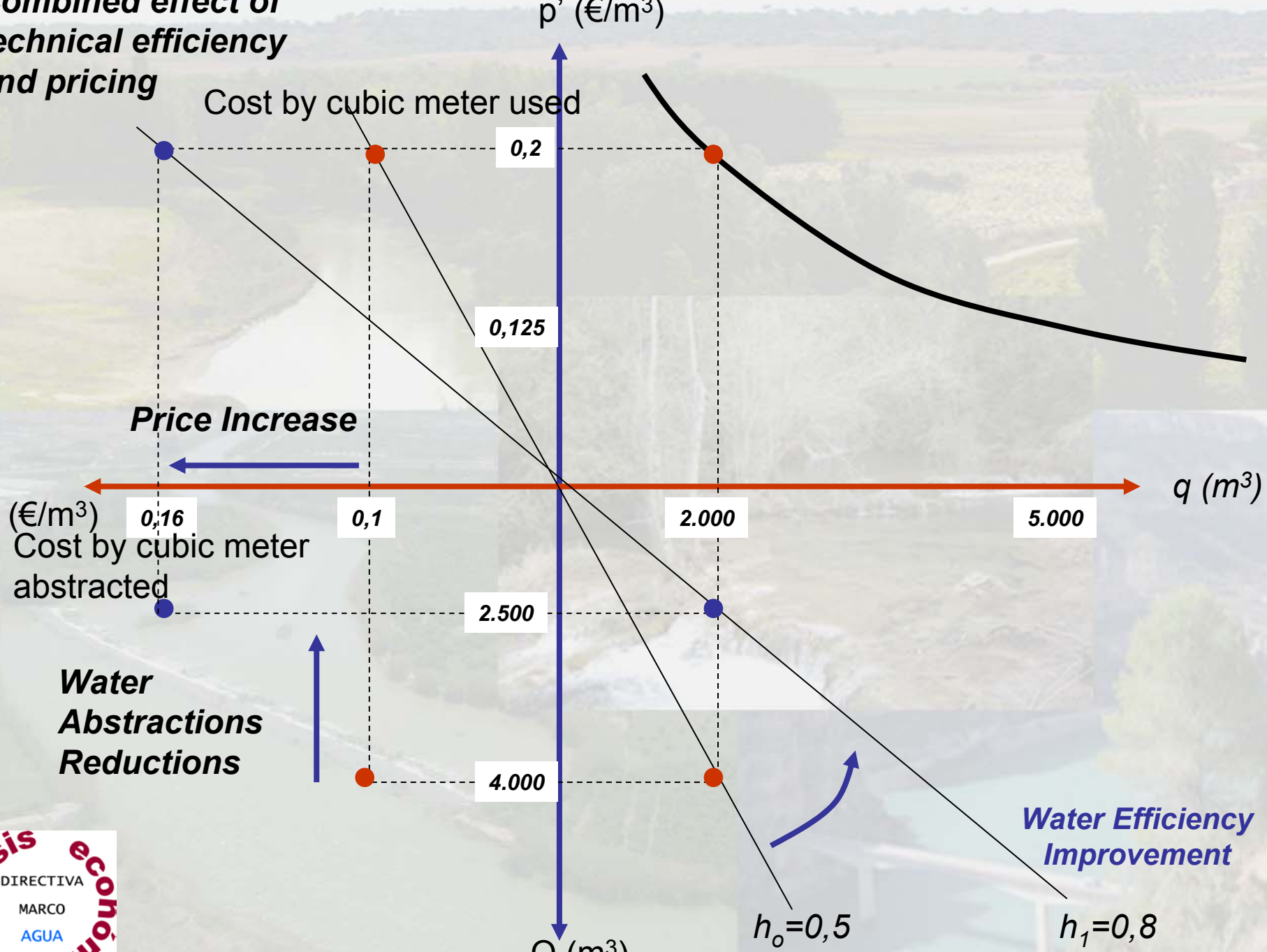


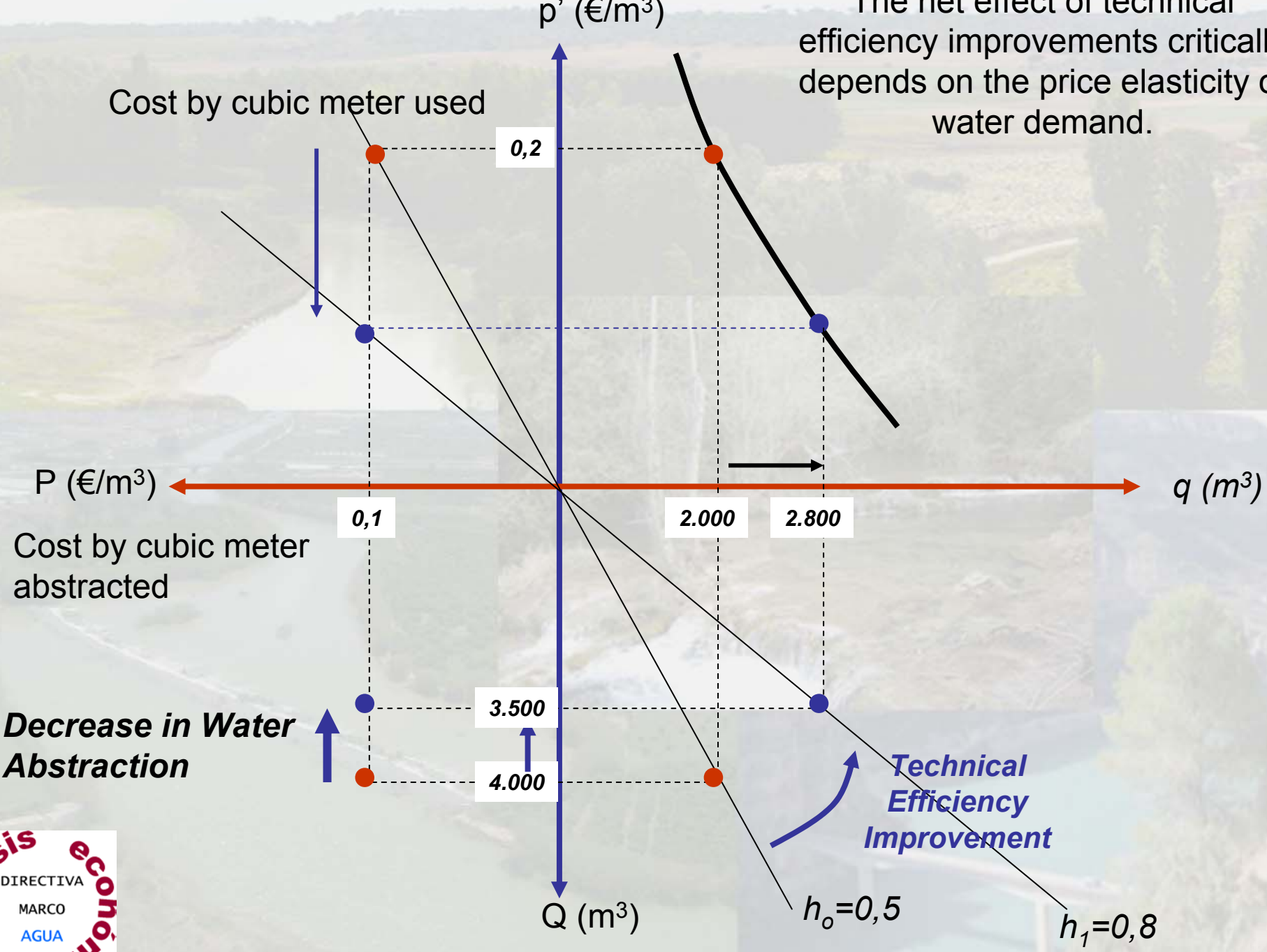
Water Abstractions Increase PRESSURES

Preliminary conclusion 1 (elastic demand)

- Technical efficiency measures on their own might not be effective ways to reduce pressures on water ecosystems:
- Prices and/or reduced quotas per ha.

**Combined effect of
technical efficiency
and pricing**





Final Conclusions

- With CAP reform there are two effects (some cases): slight reduction of water uses and changes in elasticity of demand.
- Technical efficiency measures need to be complemented with water price increases (if demand elastic) or reduced quotas in order to guarantee that at least partially the water gains are transformed into lower pressures on the ecosystems.
- Effects depends on volumetric pricing.
- Disproportionality issues: If properly designed, water prices when demand is elastic may be used to improve nature and simultaneously:
 - Finance the water efficiency program.
 - Create the required incentives to implement the investment required in new capital, labour and skills.
 - Guarantee that **the final production and the income level will no be lower** than in initial situation.