MINISTERIO
DE MEDIO AMBIENTE

CONFEDERACIÓN
HIDROGRÁFICA
DEL JÚCAR

EURO – RIOC

International Meeting on Water Framework Directive Implementation

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Economical analysis in Júcar River Basin

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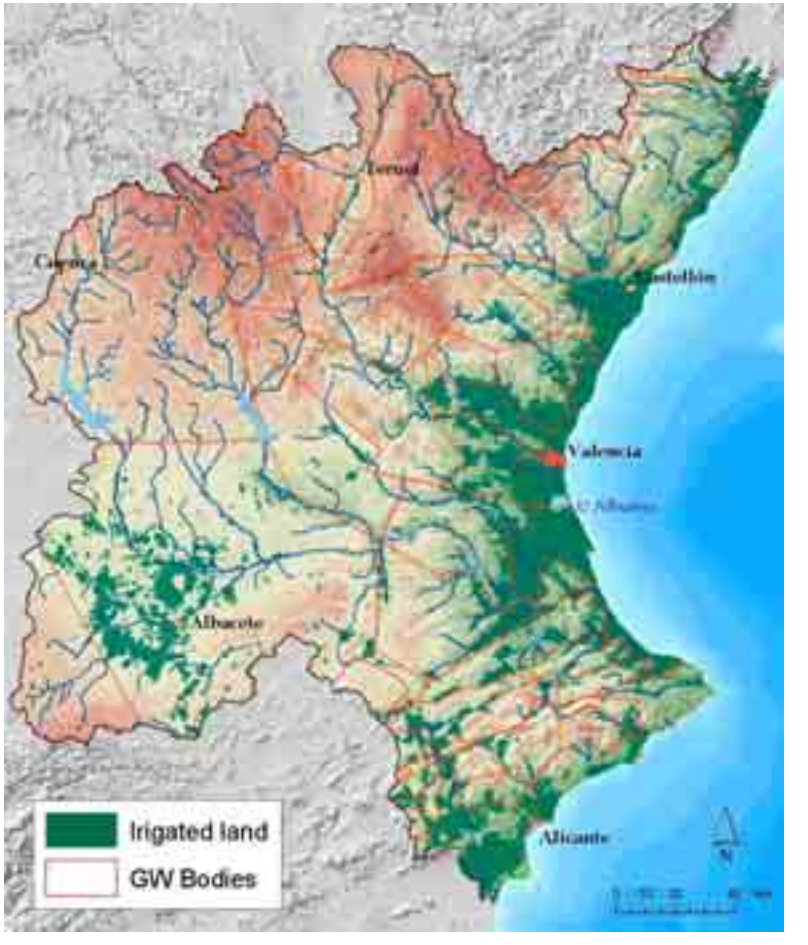
Júcar River Basin



Area (km^2)	43 000
Population (inhabitants)	4 360 000
Equivalent population due to tourism (inhabitants)	1 400 000
Irrigated land (ha)	370 000
Water resources (hm^3/year)	3 300
Water demand (hm^3/year)	3 600

Economic Analysis of water use

- Economic characterisation of water uses and scenarios 2015.
- Cost recovery analysis
- Methodological approach for “resource cost” and “environmental cost”

Scenarios of pressures

Crops	Total ha	Non irrigated ha	Irrigated ha	Water consumption 10^6 m^3	Dose N 10^3 Kg
Cereals	463 805	381 288	82 517	270	39 805
Olive	108 638	97 861	10 776	41	4 912
Vineyard	215 901	183 173	32 728	109	8 514
Vegetables	33 974	880	33 094	170	5 336
Citrus	212 172	0	212 172	1 092	59 387
Fruit trees non-citrus	144 023	108 587	35 436	130	6 565
Other crops	385 508	333 329	52 178	310	5 326

Scenarios of Total Gross pressures of Agriculture in 2015 in the Júcar RBD.
Source: GDW, RBD Agriculture Forecast Model

Cost recovery analysis

- Institutional map of water services, responsibilities and applied tariffs
- Aggregated cost recovery analysis for the whole Júcar RBD
    - services of abstractions and conveyance of surface waters (high supply level)
    - water distribution, wastewater collection and water treatment services to urban users (low supply level)
    - water distribution to agricultural users (low supply level)
- Detailed studies for main Júcar RBD unit demands: Case Benageber-Loriguilla hydraulic system

Institutional map of water services, responsibilities and applied tariffs

SERVICE	*RESPONSIBILITY*	*TARIFFS*
Abstraction and conveyance of surface waters (dams and main channels)	River Basin Authority	Canon de regulación (regulation fee) Tarifa de utilización (distribution fee)
Wells (groundwater)	Service provided by Municipalities, Irrigation Associations or individual users	Either by Municipalities or by Irrigation Associations (see below)
Water distribution to urban areas	Municipalities (with Regional Governments in some cases)	Tarifa de abastecimiento (urban water supply fee)
Water distribution to irrigation	Irrigation Associations ("public entities" with delegated management)	Derrama (apportionment of taxes): Apportionment of expenditures (according to cultivated ha, water use or combination)
Wastewater collection and treatment in urban areas	Municipalities and Regional Government	Canon de saneamiento (sewage fee, only for urban and industrial uses)
Control of discharges	River Basin Authority	Canon de control de vertidos (surveillance discharge and spill fee, only for urban and industrial uses)

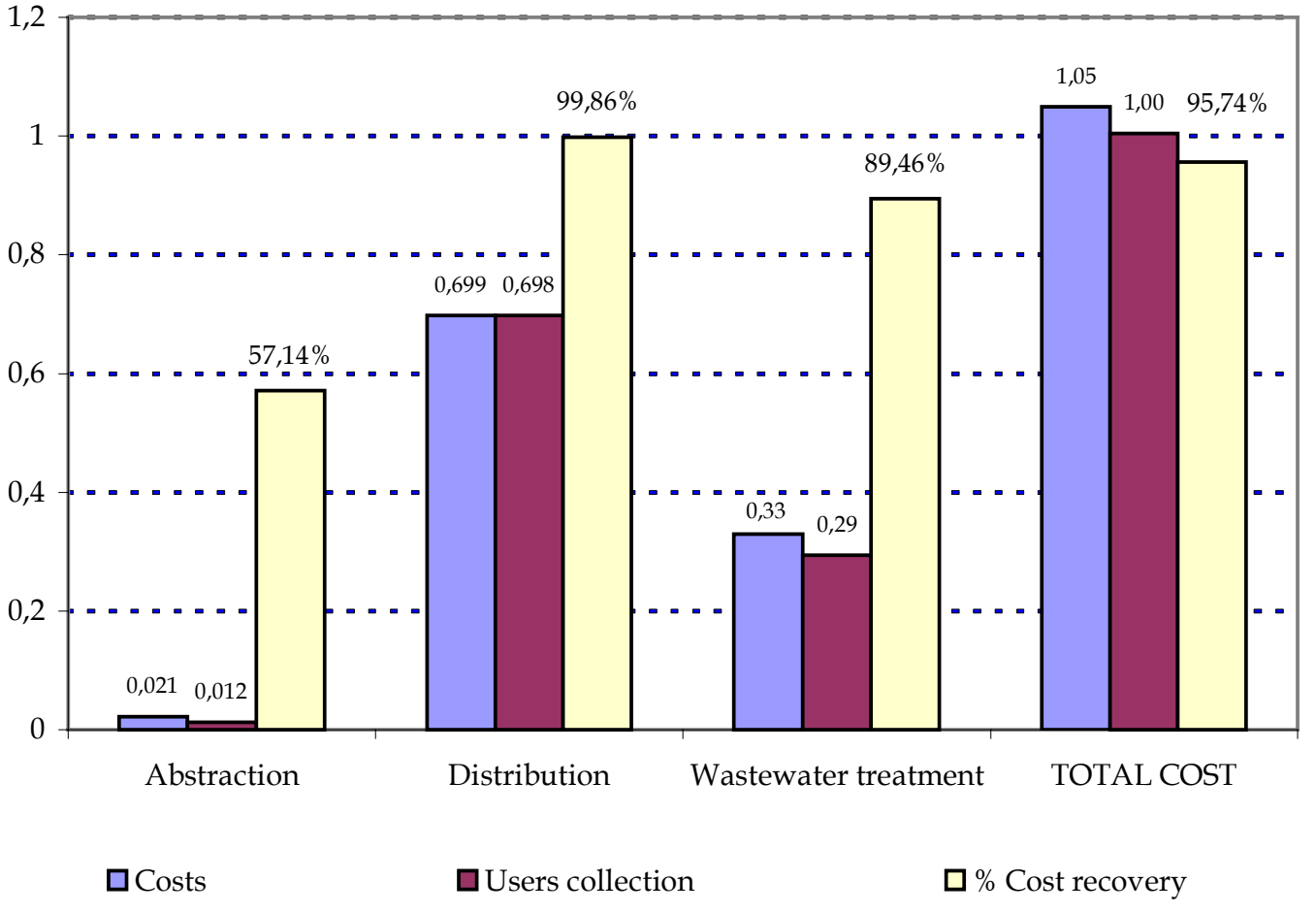
Hydraulic infrastructure facilities for services of abstractions and conveyance of surface waters

- Júcar RBA is in charge of management of each water exploitation system
- Collection and organisation in databases and GIS of data for the 19 main hydraulic infrastructures (dams and channels)

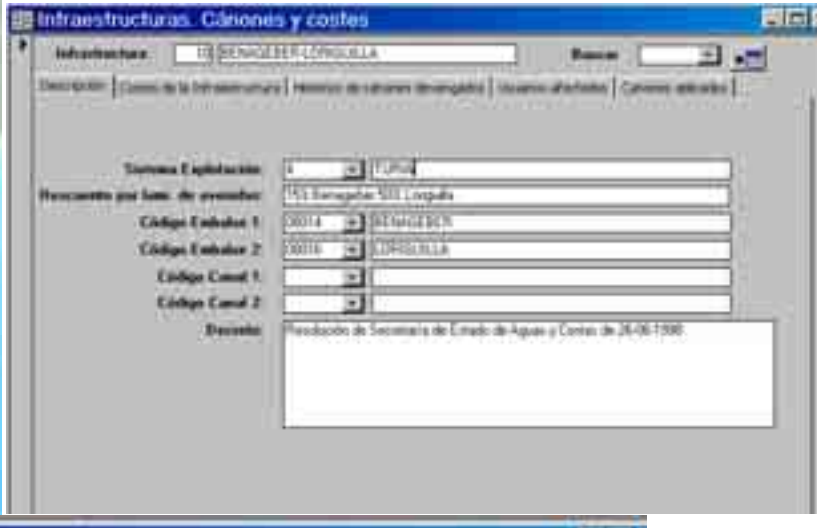
Infraestructuras. Cánones y costes

Número	Nombre	Descuentos Leg.	Nombre Sist. Explotación
1	ULLDECONA	20% Ulldecona	CENIA-MAESTRAZGO
2	ALCORA	30% Alcora	MIJARES-PLANA DE CASTELLON
3	ARENÓS-SICHAR	20% Arenós y 20% Sichar	MIJARES-PLANA DE CASTELLON
4	CANAL COTA 100		MIJARES-PLANA DE CASTELLON
5	CANAL COTA 220		MIJARES-PLANA DE CASTELLON
6	CANAL TRAMO COMÚN		MIJARES-PLANA DE CASTELLON
7	MARÍA CRISTINA	70% María Cristina	MIJARES-PLANA DE CASTELLON
8	REGAJO	25% Regajo	PALANCIA Y LOS VALLES
9	ARQUILLO DE SAN BLAS	90% Arquillo de San Blas	TURIA
10	BENAGÉBER-LONGUILLA	15% Benagéber 50% Longuilla	TURIA
11	CANAL PRINCIPAL CAMPO DEL TURIA		TURIA
12	ALARCÓN y TOUS	15% Alarcón 71,64% Tous	JUCAR
13	CANAL MARGEN IZQUIERDA DEL RIO MAGRO		JUCAR
14	CANAL TRAMO COMÚN Y MARGEN IZQUIERDA		JUCAR
15	CONTRERAS CANAL JUCAR TURIA	15% Contreras	JUCAR
16	FORATA	15% Forata	JUCAR
17	BENIARRÉS	20% Beniarrés	SERPIS
18	ALGAR-GUADALEST	15% Guadalest	MARINA BAJA
19	AMADORIO	15% Amadorio	MARINA BAJA

Cost recovery of water distribution, wastewater collection and water treatment services to urban users in Júcar RBD

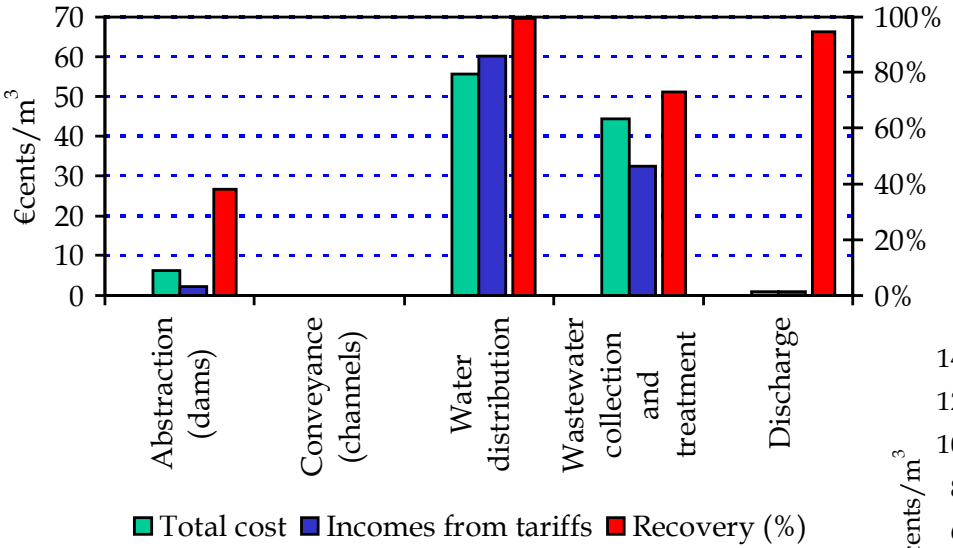


Detailed case study: Benageber-Loriguilla system

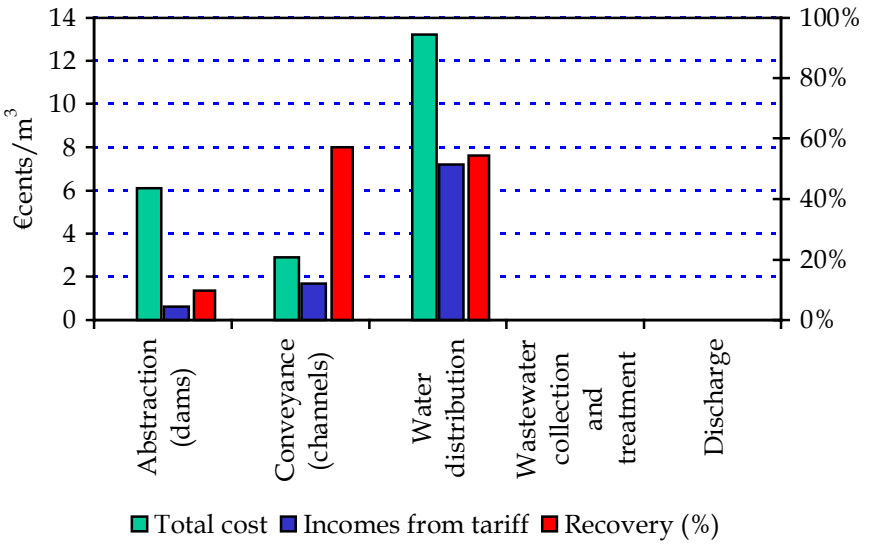


Ano.Cos	Coste Directo €	Coste Indirecto €	Ar	Amortización €	Suma
1996	168,912.19	314,993.04	00	37,897.18	521,802.41
1997	157,318.42	324,468.87	00	86,058.42	567,845.71
1998	168,900.90	367,553.14	00	91,370.75	627,824.79
1999	196,764.17	349,326.62	00	89,392.11	635,482.90
2000	230,763.96	387,912.02	00	89,361.82	707,037.90
2001	262,958.47	401,674.71	00	89,154.45	742,987.63

Costs, tariffs and recovery for urban and agricultural users



Costs and tariffs for urban users of Valencia city



Costs and tariffs for irrigation users of *Campo del Turia* channel

Cost of water services

- Cost of water services according WFD:
  - Financial (traditional approach)
  - Resource (a methodological approach has been proposed)
  - Environmental (different approaches are being discussed)

Resource cost

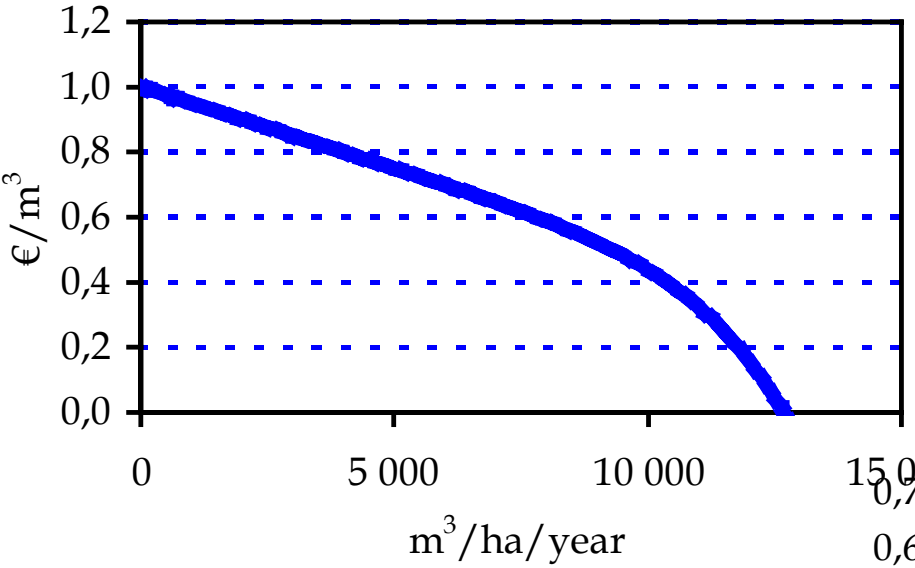
- The marginal opportunity cost of the resource (MOCR) in a certain location and time can be defined as the cost for the system of having available one less unit of resource.

- The assessment of the MOCR with hydro-economic models. They take into account resource availability, storage capacity, losses, return flows, surface and GW interactions, and willingness-to-pay (or marginal economic value) of demand units.

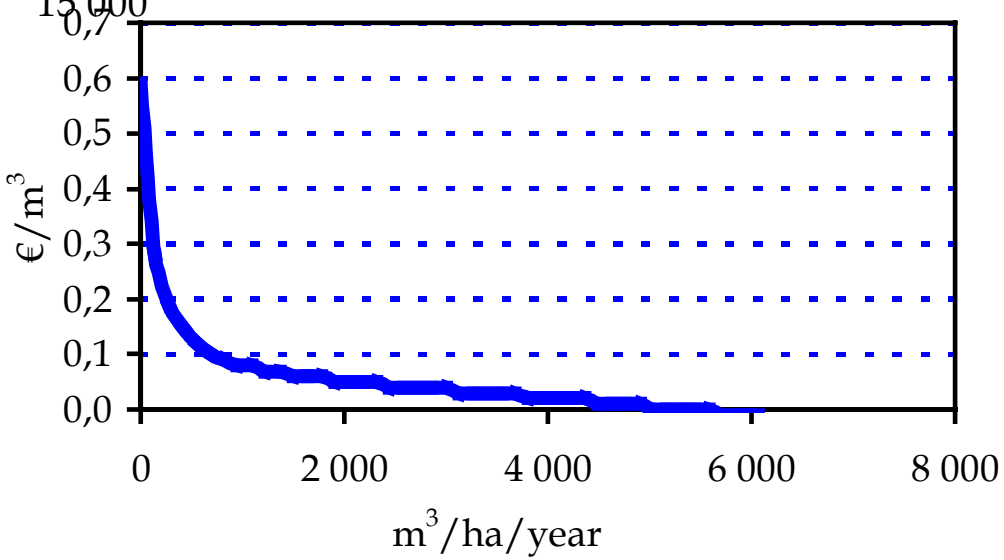
- The MOCR is obtained by comparing the aggregated benefits of the system with the aggregated benefits that would occur if one less unit of water were available at a given location and at a given time.

Annual demand economic functions

Traditional Irrigation systems (Citrics)



Mancha Oriental Aquifer



Time evolution of MOCR in Júcar river system