Water reuse in the management and hydrological planning in the Jucar River Basin District

Round Table 1 *Prevention of drought:*
Planning of adaptation at basin level, reuse and desalination

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18th October 2018

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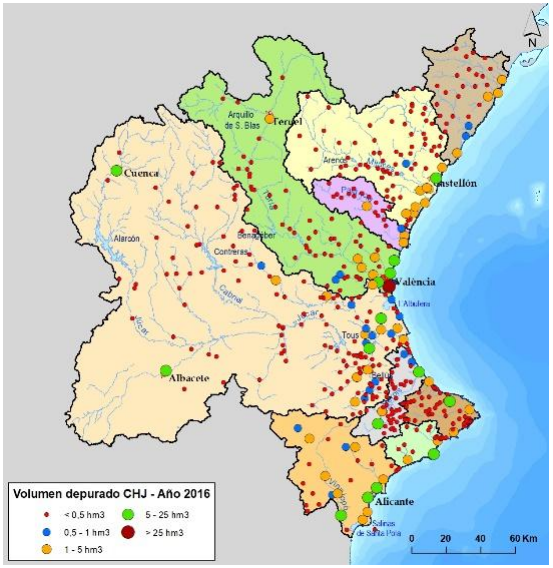
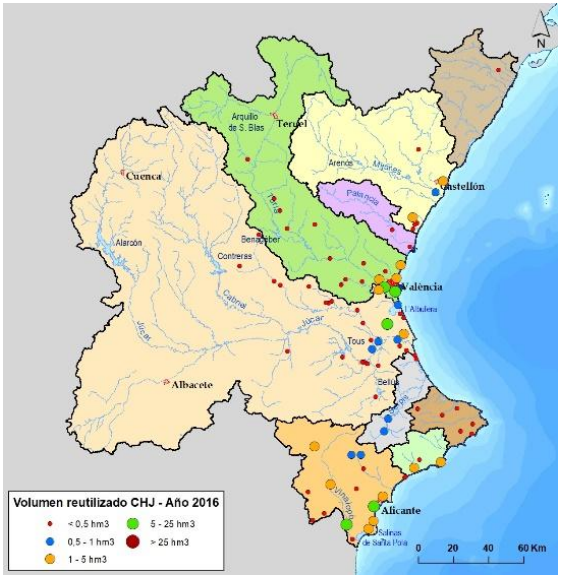
1. The importance of water reuse in the JRBD

- 432 hm^3/year are treated waste water volume: urban agglomerations on the coast and in provincial capitals. 63% is concentrated in 17 Waste Water Treatment Plants (WWTP)
- 107 hm^3/year are directly reused mainly in lower basins, with a predominant use devoted to irrigation.

WWTP	Waste water volume (hm^3/year)	Reclaimed water volume (hm^3/year)
PINEDO	111,18	19,86
ALBACETE	18,55	0,00
RINCON DE LEON	18,42	6,19
CASTELLON DE LA PLANA	13,69	1,03
BENIDORM	13,91	4,59
CUENCA DEL CARRAIXET	12,94	4,11
GANDIA - LA SAFOR	11,70	0,00
ALZIRA – CARCAIXENT	11,82	0,00
QUART – BENAGER	11,10	11,10
POBLA DE FARNALS	8,69	4,33
MONTE ORGEGIA	7,57	3,37
ELX (ALGOROS)	7,98	7,98
CUENCA	5,88	0,00
ALBUFERA SUR	6,78	6,78
DENIA - ONDARA – PEDREGUER	5,55	0,43
ALCOI	5,20	0,62
Other WWTP <5 hm3/year	160,60	36,82
Total	**431,56**	**107,21**

Source: EPSAR 2016, IAA 2016 and JCJLM 2016





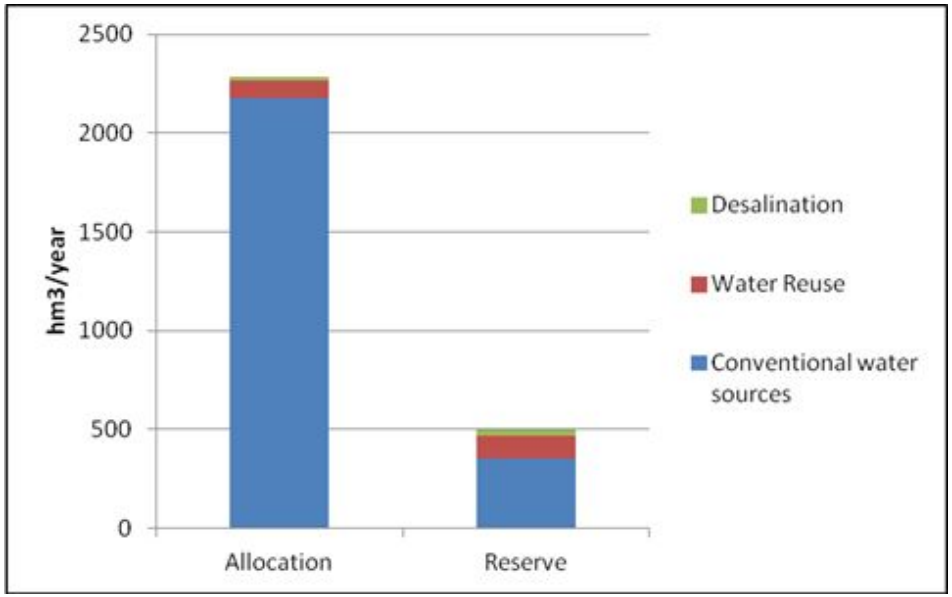
1. The importance of water reuse in the JRBD

Reclaimed water allows:

- To fight drought situations with a higher guarantee for users
- Alternative resource to achieve a good status of groundwater bodies
- Improve the status of surface water bodies by reducing the volume discharged into the environment

Hydrological Planning (RBMP)

- Allocations: 89 hm^3/year
- Reserves: 115 hm^3/year



2. The Legislative Framework of water reuse

Spain

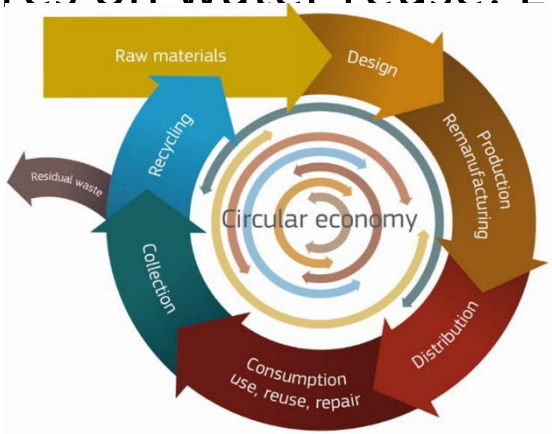
- ✓ Water Law
- ✓ Royal Decree 1620/2007 on a legal framework on the reuse of treated waste water
  - Necessary requirements
  - Procedure to get the required water right for using
  - Minimum quality criteria according to the uses
  - Real Experience: lack of health problems

Europe

- ✓ *Water Framework Directive (WFD)*
- ✓ *New proposal (May 2018) "Regulation* on minimum requirements for water reuse"
  - *Lays down minimim quality requirements for agricultural uses*
  - Based on the technical document of the JRC of January 2018

2. The Legislative Framework of water reuse

Ongoing measures on water reuse: European scope



SUSTAINABLE WASTEWATER TREATMENT COMBINING ANAEROBIC MEMBRANE TECHNOLOGY AND WATER REUSE


EUROPEAN
COMMISSION

Proposal for a

REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

on minimum requirements for water reuse

PROPOSAL "REGULATION ON MINIMUM REQUIREMENTS FOR WATER REUSE"

EVALUATION AND FITNESS CHECK OF THE URBAN WASTE WATER TREATMENT (UWWTD) DIRECTIVE 91/271/EEC

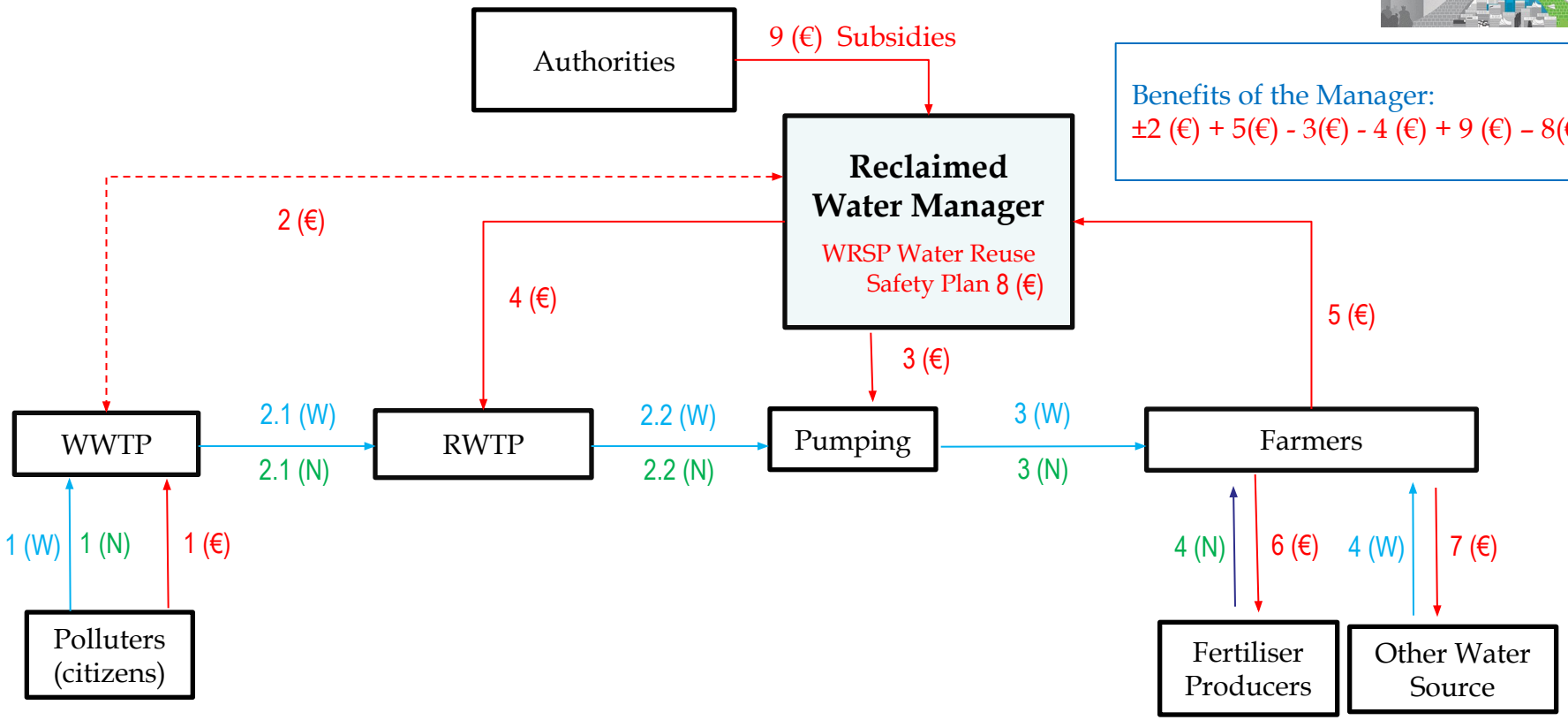
3. Innovation Deal on SUSTAINABLE WASTEWATER TREATMENT COMBINING ANAEROBIC MEMBRANE TECHNOLOGY AND WATER REUSE”

Points addressed:

- Technological improvement: Anaerobic Membrane Technology
- Possible savings on fertilisers and energy
- Less polluting discharges into the environment
- Health and environmental security: Safety Plan
- Economic feasibility and a newly created Entity: The Reclaimed Water Manager
- Positive economic balance of the Manager if:
  - Equal cost of agricultural users
  - Equal cost for urban users
- Appropriateness of making the legislative framework (UWWTD) more flexible : remove nutrients to put them back?

3. Innovation Deal on SUSTAINABLE WASTEWATER TREATMENT COMBINING ANAEROBIC MEMBRANE TECHNOLOGY AND WATER REUSE"

Innovation Deal: implementation of a new Entity: Manager



4. Proposal for a REGULATION ON MINIMUM REQUIREMENTS FOR WATER REUSE

Goal: to foster water reuse, whilst ensuring the protection of the environment and human health, and the free trade of food products

Advantages:

- Homogeneous quality requirements in Europe for agricultural reuse
- Health and environmental security: Safety Plan

Problems:

- Difficult implementation in all ME: competencies
  - Safety Plan
  - Operator/Manager
- Feasibility of achieving the requirements with the existing technologies: affordability of adaptation costs?
- Validation horticultural: small horticultural areas condition the entire irrigation surface

4. Proposal for a REGULATION ON MINIMUM REQUIREMENTS FOR WATER REUSE

Enhanced quality requirements: difficulty to achieve class A & Validation

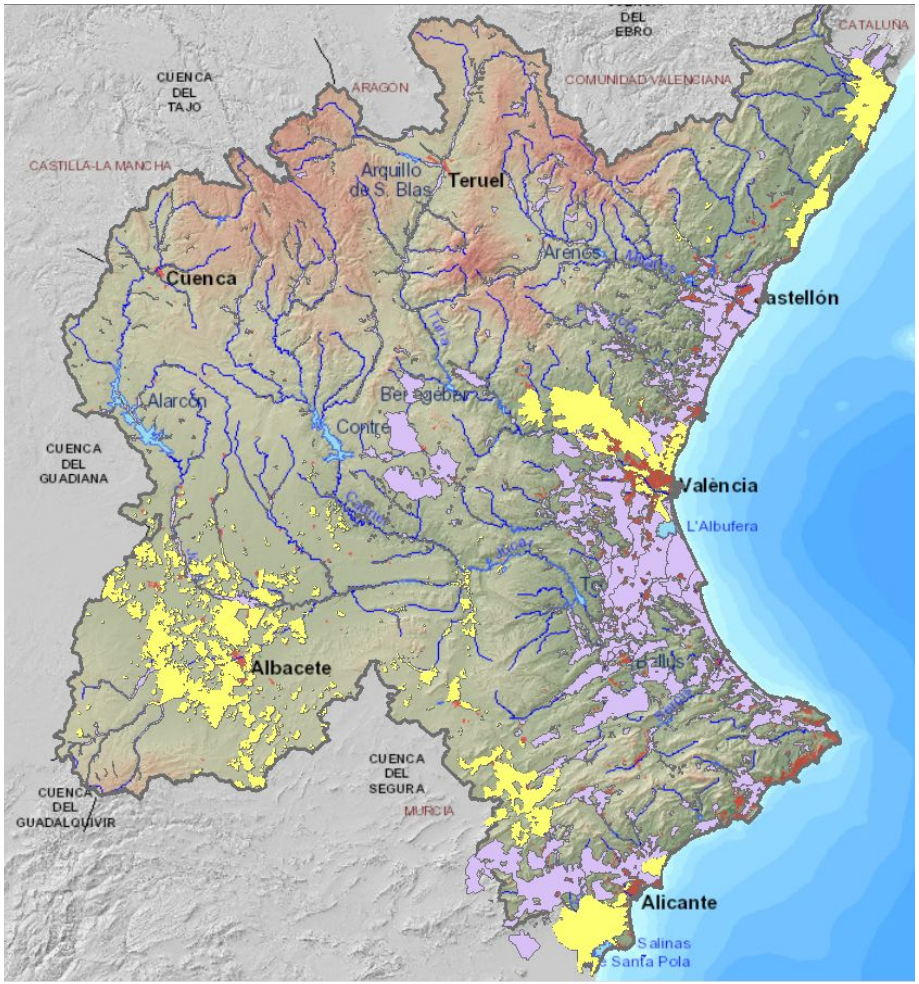
RECLAIMED WATER QUALITY CLASS. Comparative EU/Spain							
CROP CATHEGORY	Irrigation method	EU			Spain		
		Class	E.Coli (cfu/100 ml)	Validation	Class	E.Coli (cfu/100 ml)	Validation
RAW CROPS with edible part in contact with reclaimed water	Drip	A	10	Yes	1	100	-
	Other	A	10	yes	1	100	-
RAW CROPS with edible part above ground or with inedible skin	Drip	C	1,000	-	1 3 for tree crops	100 10,000 for tree crops	-
	Other	B	100	-	1	100	-
PROCESSED CROPS NON FOOD CROPS except industrial, energy and seeded crops (including feed milk- or meat-producing animals)	Drip	C	1,000	-	2 3 (*)	1,000 10,000 (*)	-
	Other	B	100	-	2	1,000	-
NON-FOOD CROPS: industry, energy and seeded crops	Drip	D	10,000	-	3	10,000	-
	Other	D	10,000		3	10,000	-

(*) ornamental crops (greenhouses, garden centres and flower crops)

Table 4 Validation monitoring of reclaimed water for agricultural irrigation

Reclaimed water quality class	Indicator microorganisms (*)	Performance targets for the treatment chain (log_{10} reduction)
A	*E. coli*	≥ 5.0
	Total coliphages/ F-specific coliphages/somatic coliphages/coliphages(**)	≥ 6.0
	Clostridium perfringens spores/spore-forming sulfate-reducing bacteria(***)	≥ 5.0

4. Proposal for a REGULATION ON MINIMUM REQUIREMENTS FOR WATER REUSE



Class A
Agricultural areas with horticulture >5%.

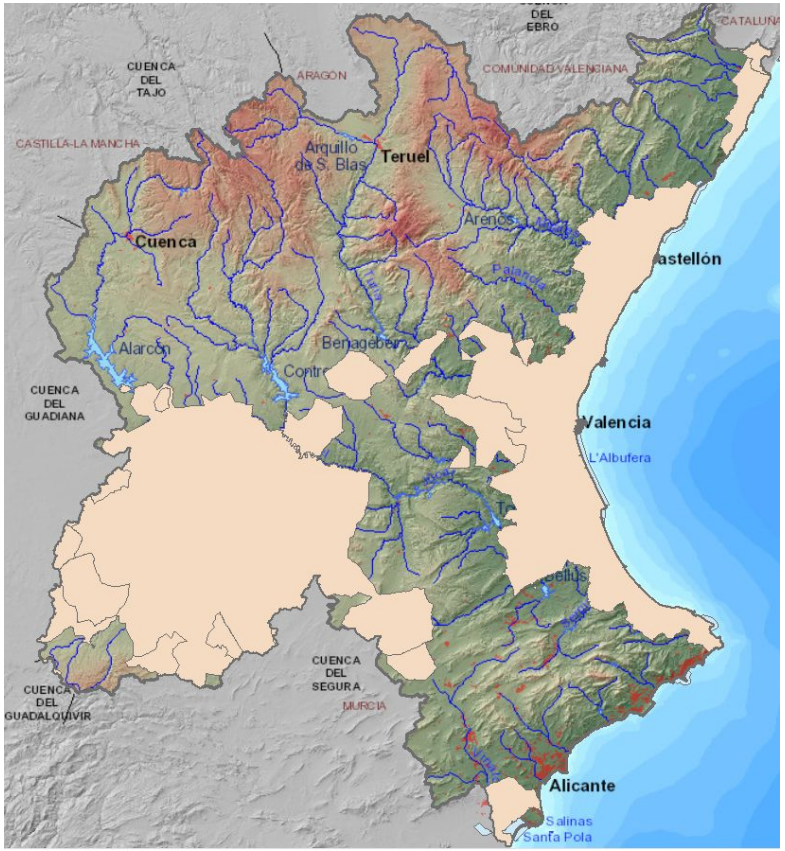
5. Evaluation and fitness check OF THE UWWTD 91/271/EEC

Evaluation of the UWWTD is ongoing with a public consultation finishing soon.

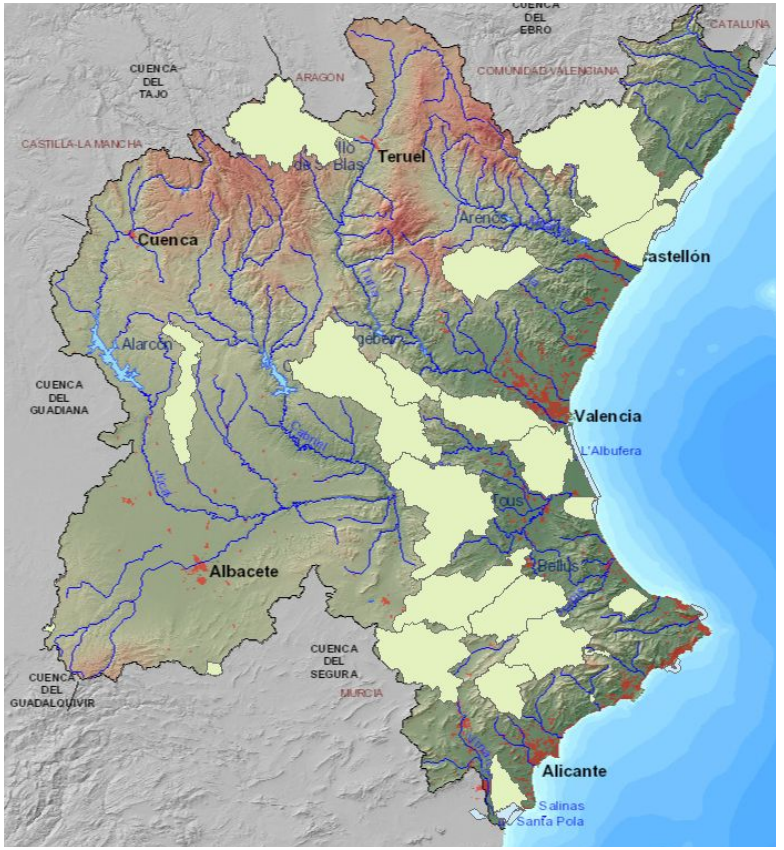
In the case the Directive is reviewed, it would be possible to relax the nutrient removal requirements in sensitive areas as the Risk Management approach would guarantee the reuse of treated wastewater in safe and cost-effective conditions, which would result in an increase of efficiency and environmental protection.

5. Evaluation and fitness check OF THE UWWTD 91/271/EEC

Is the same nutrients removal necessary for discharge into water bodies as for reuse?



Map vulnerable areas (N)



Map sensitive areas (N & P)

http://www.mapama.gob.es/es/cartografia-y-sig/ide/descargas/agua/default.aspx

6. Future challenges

Legislative challenges: forthcoming EC Regulation

- Validation horticultural: independent of the Safety Plan?
- Define responsibilities of the operator/manager
- Point of discharge/point of compliance: recovery nutrients in crops

Economic challenges:

- New and important investments in tertiary and disinfection.
- Make the most of the circular economy framework:
  - Water savings, energy and fertilisers to finance reuse.
  - Reduction of discharges into the environment: possible environmental subsidy
- Modification of the economic framework:
  - Possibility of incorporating the environmental cost of water.
  - Exemption of this eventual environmental cost in case of reuse of water.

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Thank you for your atention!

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