

# P I C C M A T

Addressing the climate change challenge - What can agriculture do?

Ideas from Europe and beyond

Final Symposium

Brussels, 28 October 2008

## **Water and Agricultural Policies in Spain: Addressing Climate Change adaptation**

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### *Linking water policies and agricultural policies...*

- 1. NEWATER** (New approaches to adaptive water management under uncertainty) (2005-2009) [www.newwater.info](http://www.newwater.info)
  - IP, 42 r. teams, 15 countries, 7 river basins (Rhine, Elba, Tisza, Guadiana, Nile, Orange, Amuradya)
  
- 2. SCENES** (Water Scenarios for Europe and for Neighbouring States) (2007-2011) <http://www.environment.fi/syke/scenes>
  - IP, 23 r. teams, 17 countries, 4 regions (*Mediterranean , Lower Danube, Baltic , Black sea* )
  
- 3. CROSS COMPLIANCE** (Facilitating the CAP reform: Compliance and competitiveness of European agriculture)(2005-2008)  
<http://www.cross-compliance-fp6.eu/>
  - STREP, 11 research teams (3 non EU)

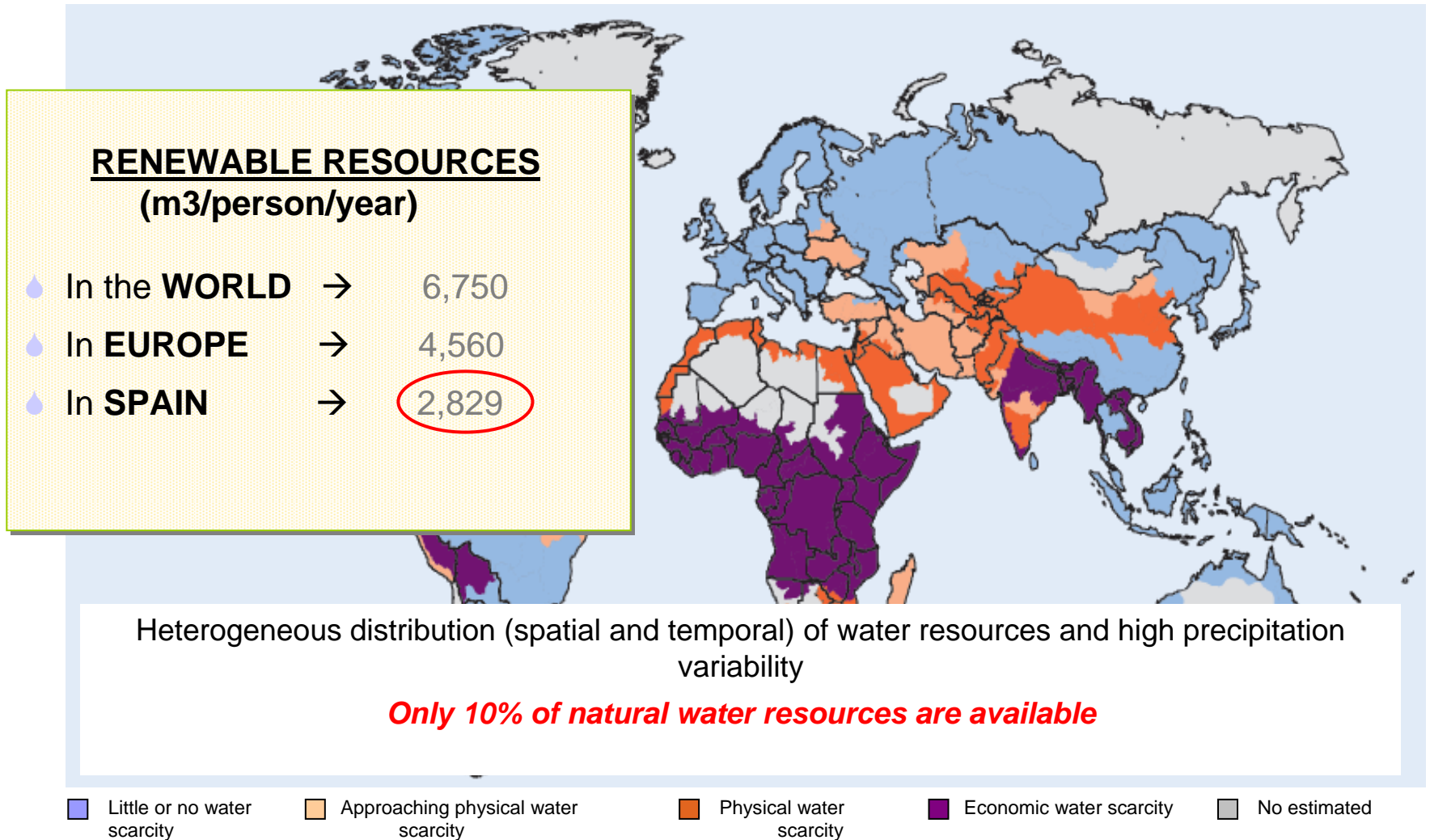
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1. Overview
2. The policy context: Water and agricultural Policies
3. Complying with the EU policies (WFD & CAP) in water-dependent regions?
4. The 'water dimension' of the CAP
5. Down-scaling: from global principles to local actions
6. Concluding remarks

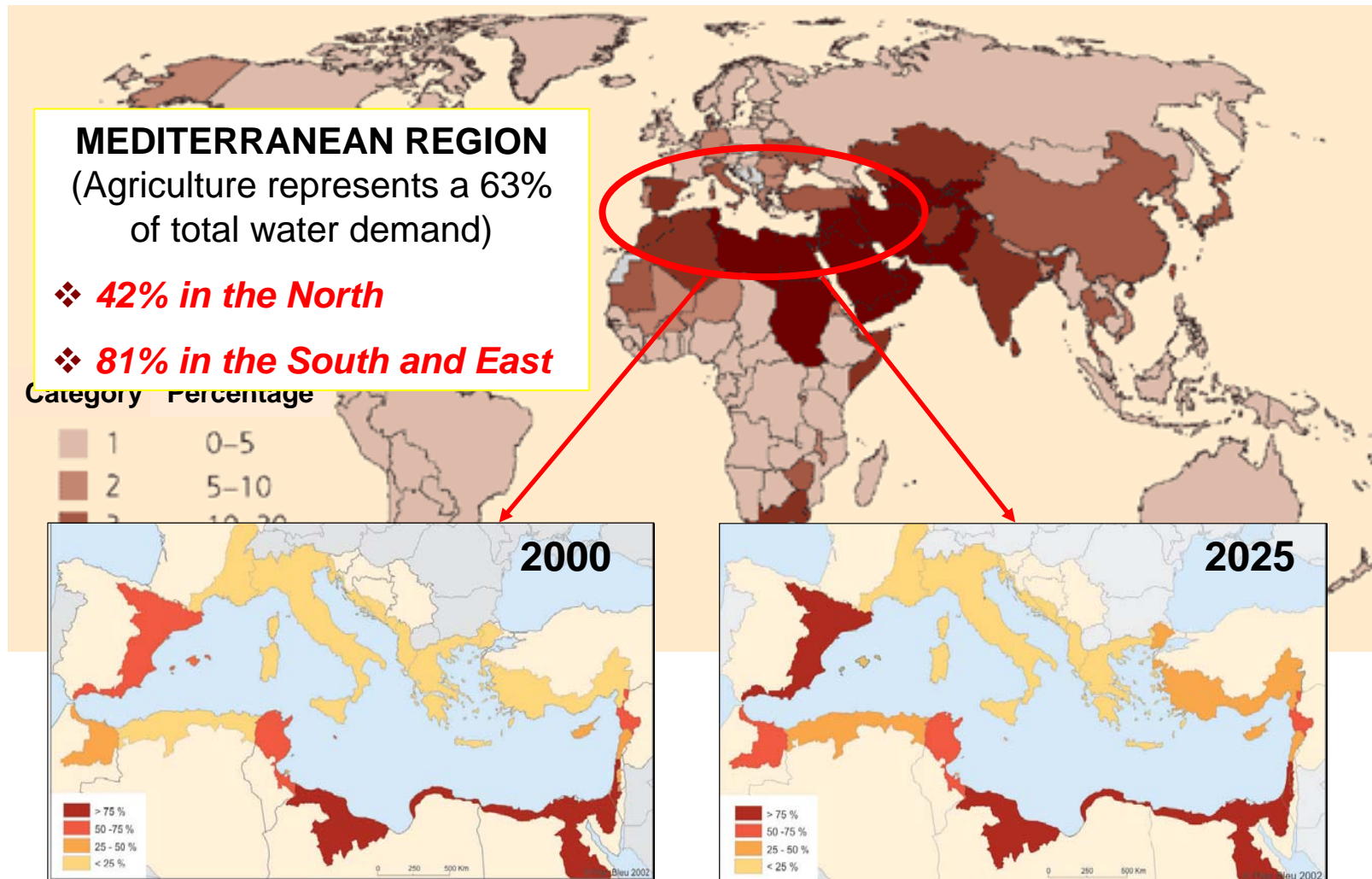
# Water resources

## Areas of physical and economic water scarcity



# Water and Agriculture

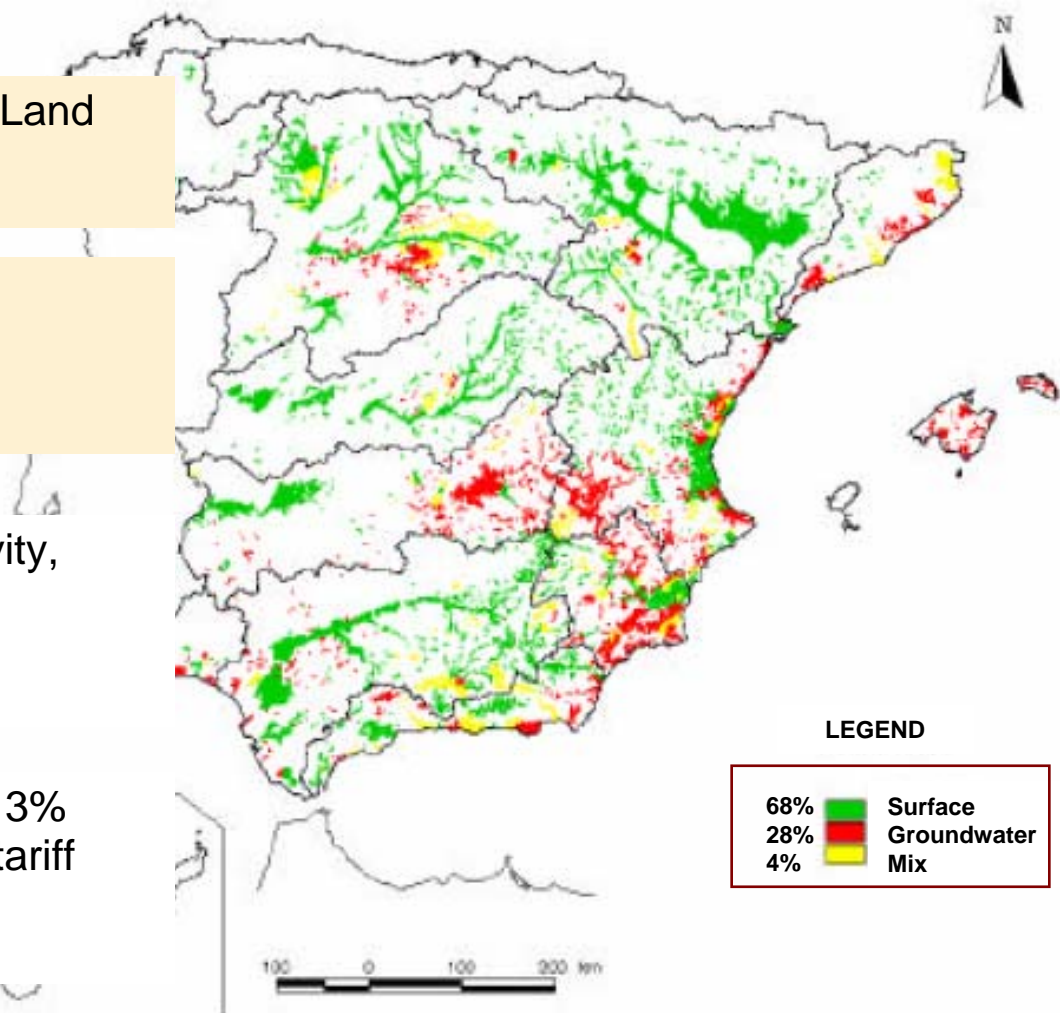
% Agriculture water withdrawals as percentage of renewable water resources



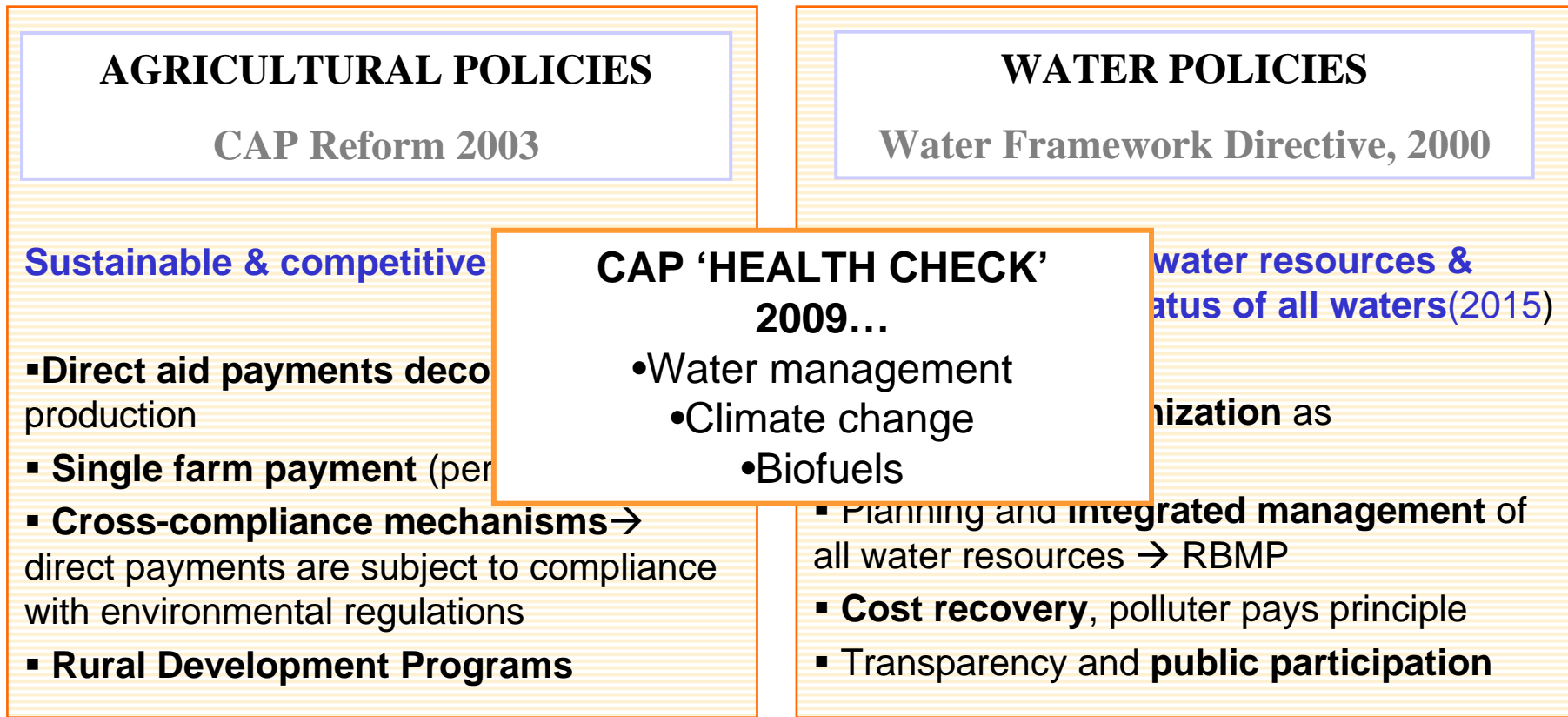
# Water and Agriculture

Agriculture → **80%**

- Extends over 15% of all Arable Land (3.6 M ha)
- 60 % of total A. Production
- 80 % of Total Farm exports
- Irrigation technology: 35 % gravity, 23% sprinkler, 42% localized
- Water tariff: 82% area pricing, 13% volumetric pricing, 5% binomic tariff



# The EU policy context: water and agricultural policies



**Multifunctional**  
**Competitive**  
**Environmentally sustainable**  
**Adaptable to new challenges (i.e. climate change)**

# The EU Water Framework Directive

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- Quality-driven

- ..”This Directive aims at maintaining and improving the aquatic environment in the Community. This purpose is primarily concerned with the quality of the waters. Control of quantity is an ancillary element in securing good water quality and therefore measures on quantity, serving the objective of ensuring good quality, should also be established ...” (pre. 19)

- Difficulty for the RBA to comply with two objectives:
  - SPANISH → Guarantee water availability to all users
  - EU WFD → Good ecological status of all waters
- Effects on irrigated farms ?

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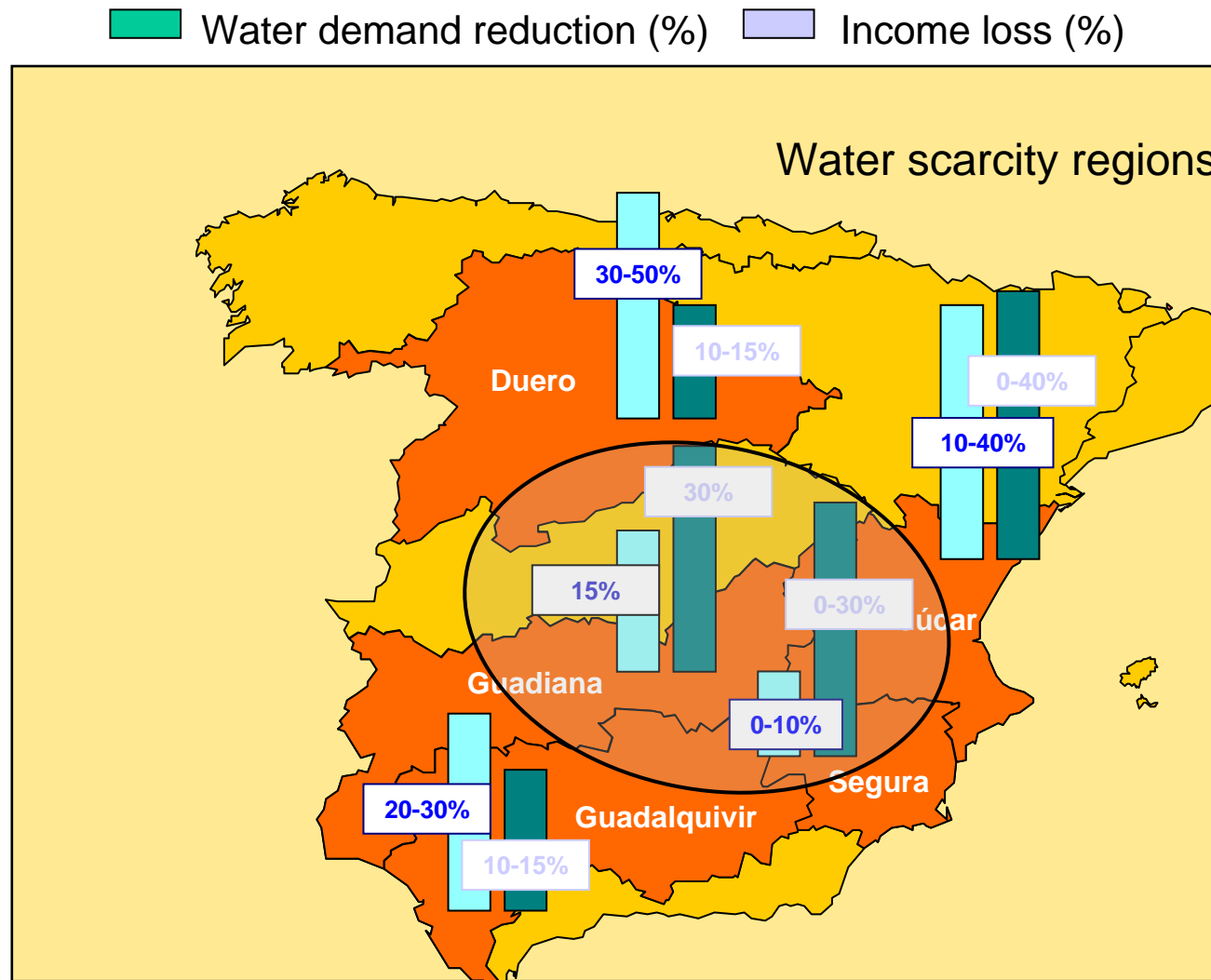
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## Complying with the WFD:

- Can water savings be met?
- is it socially and financially sustainable?
- Resilience and buffering capacity

# Water policy: water tariffs

## Effect of cost recovery of the WFD in other Spanish Irrigation areas



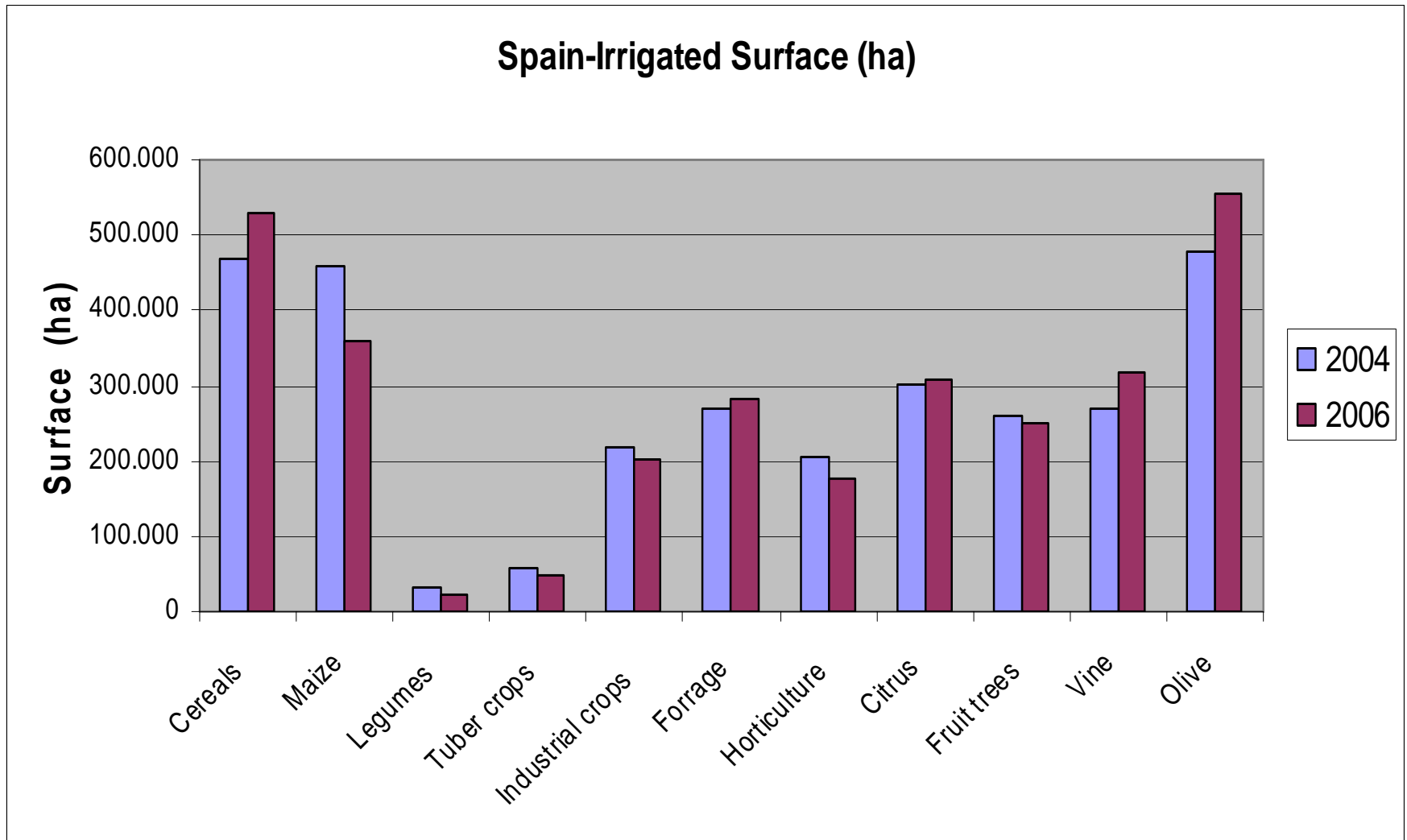
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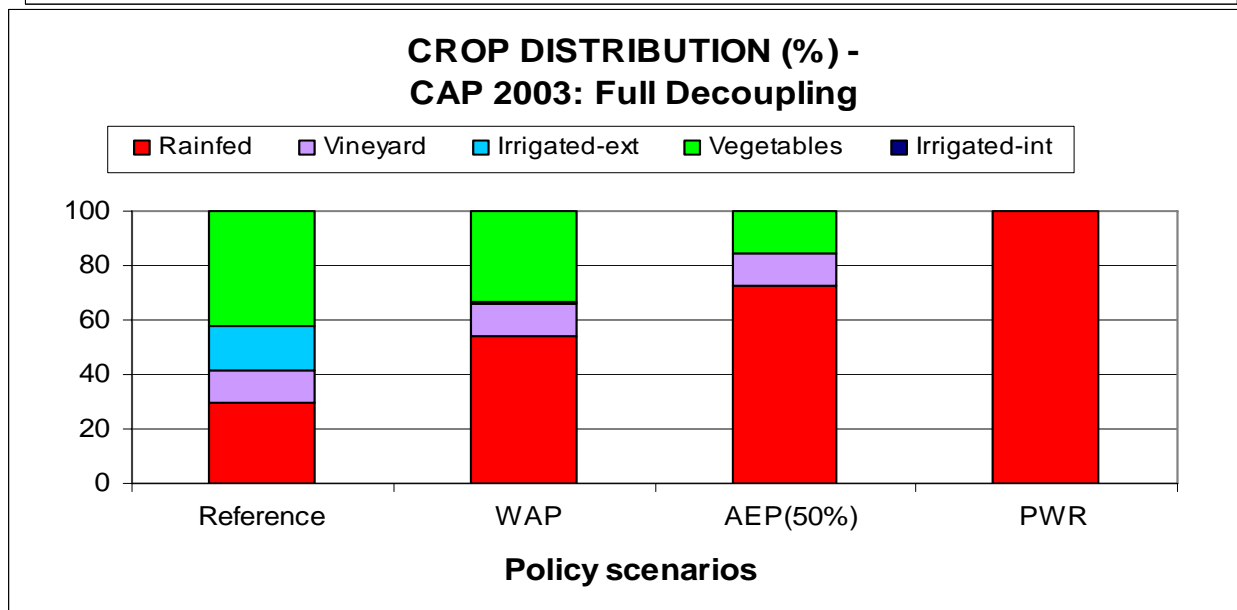
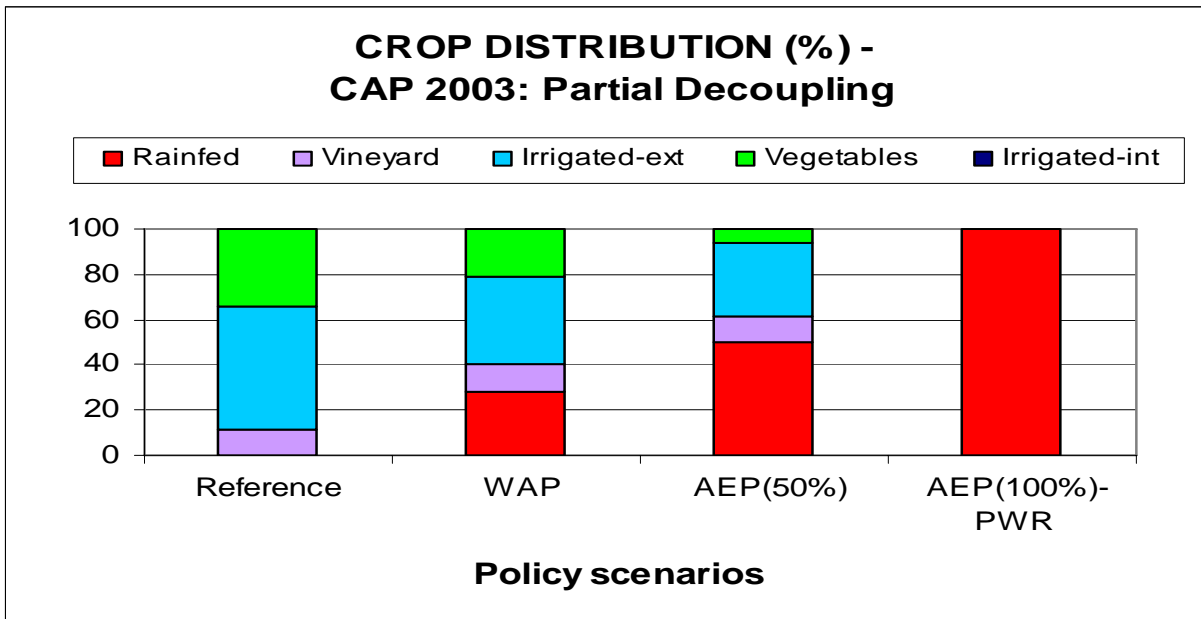
## Complying with the CAP

- The effects of the CAP reform on cropping patterns
- Is there a water-saving potential in the CAP?
- The 'water dimension' of the CAP in Spain?

## CAP reform effects on cropping patterns in Spain



# CAP: Effects on Cropping patterns (Region of Castilla-La Mancha)



# CROSS COMPLIANCE IN THE CAP 2003

<b>ANEX IV</b> <b>Good Agricultural and Environmental Conditions</b>	<b>ANEX III</b> <b>STATUTORY MANAGEMENT REQUIREMENTS</b> <b>EU Directives</b>	
<ul style="list-style-type: none"> <li>•Protection and conservation of soils from erosion</li> <li>•Maintaining soil matter</li> <li>•Maintaining soil</li> </ul>	<b>ENVIRONMENT</b> 1. Wild Birds Directive 2. Ground Water	<b>PUBLIC AND PLANT HEALTH</b> <ul style="list-style-type: none"> <li>•Plant protection products and β-</li> </ul>
<ul style="list-style-type: none"> <li>•Avoid deterioration of habitats</li> </ul>	conservation Dir.	<b>WELFARE</b> line in animal farms  <b>REGISTRATION OF ANIMALS</b> <ul style="list-style-type: none"> <li>•Identification and registration of bovine, ovine and porcine animals</li> </ul>

In irrigated areas of **overexploited aquifers** farmers should hold an officially documented **water use right**. All irrigators in these areas are obliged to install and maintain **water measuring devices**

**Overexploited aquifers**

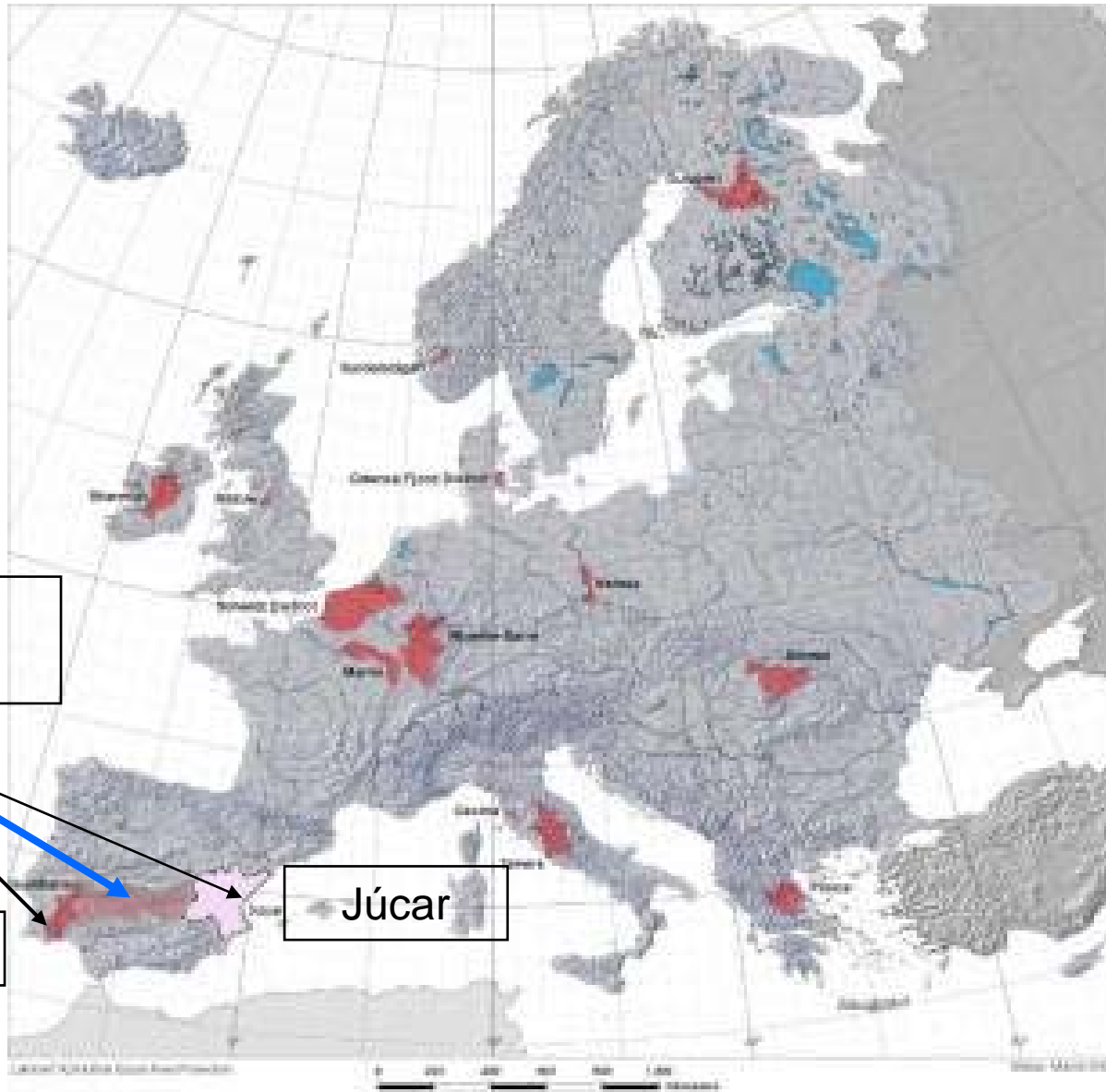
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## Down-scaling to the regions

- From global policies to local actions
- Policy-driven strategies for nature conservation. Are there contradictory outcomes?

# The WFD Pilot Basins

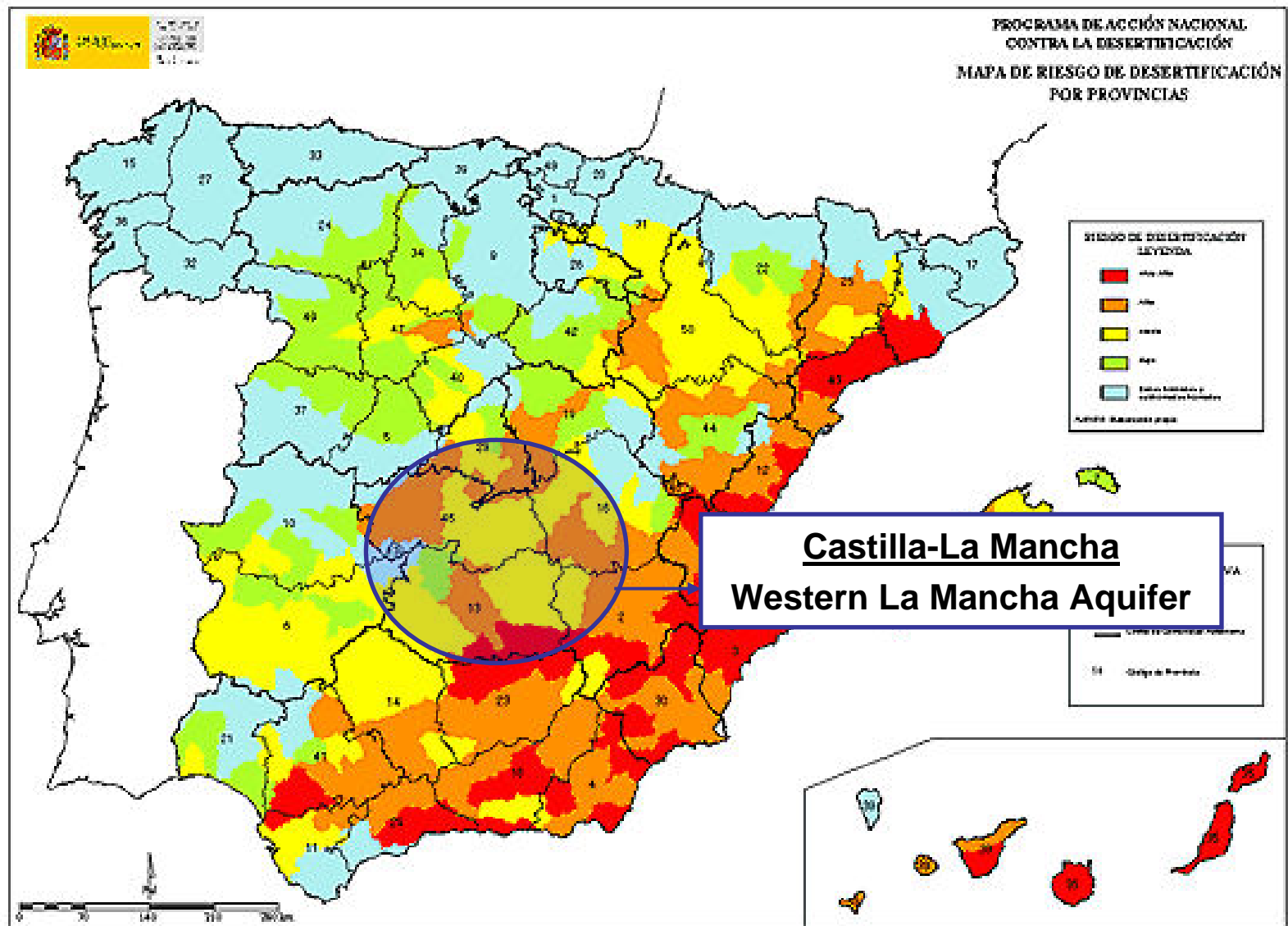


Upper Guadiana

P. Guadiana

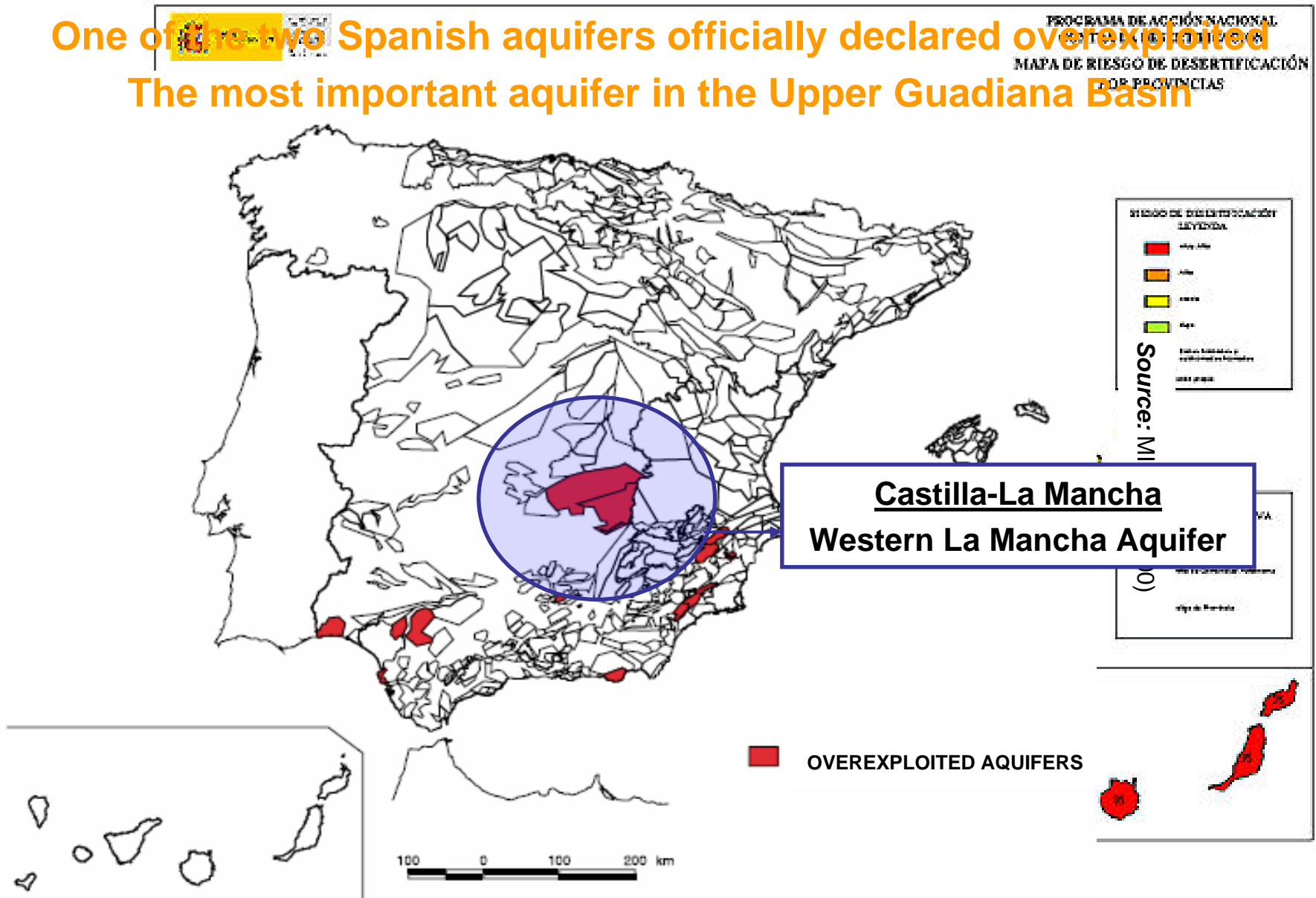
Júcar

# Environmental issues in Spain



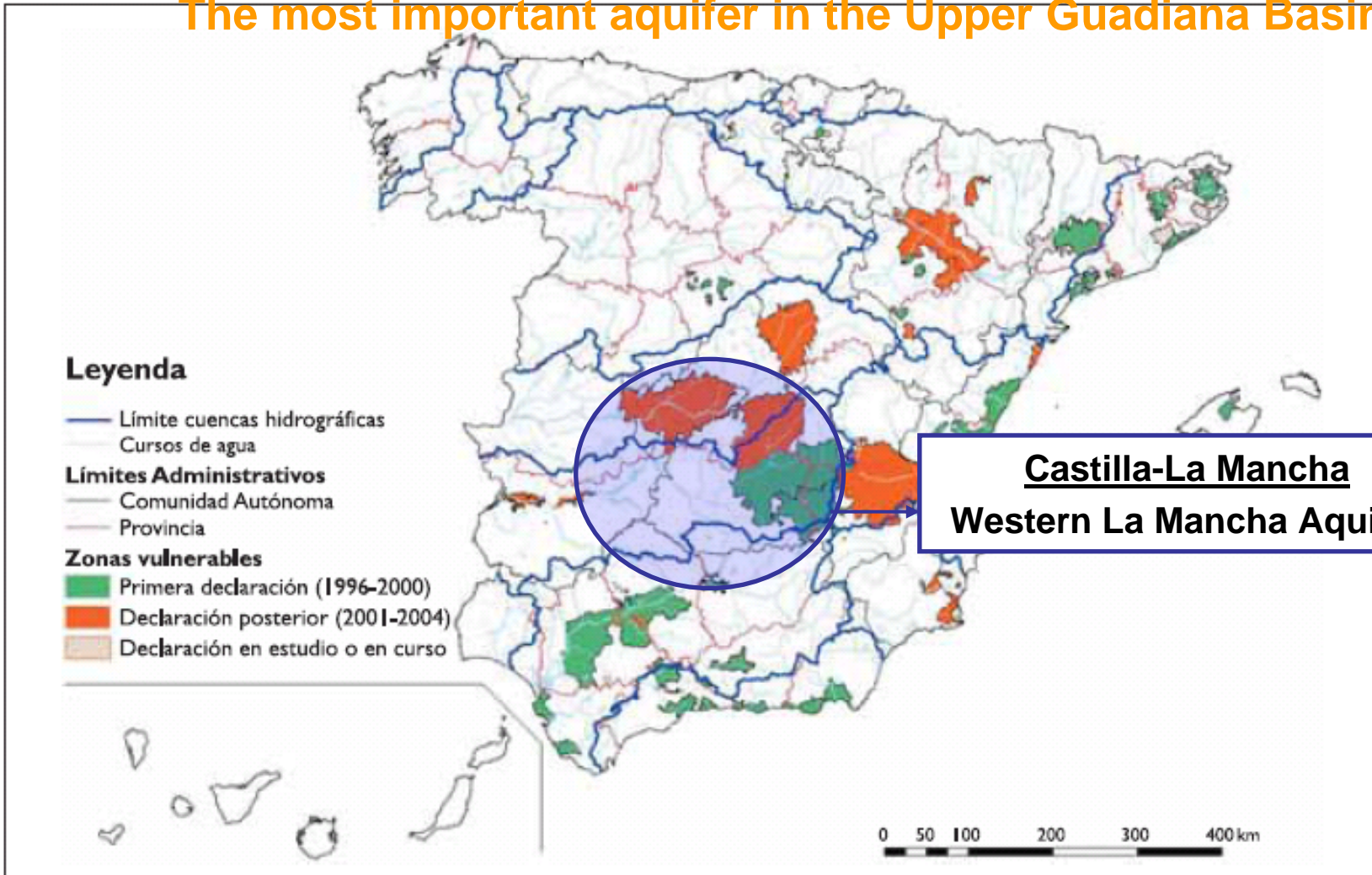
# Environmental issues in Spain

One of the two Spanish aquifers officially declared overexploited  
The most important aquifer in the Upper Guadiana Basin

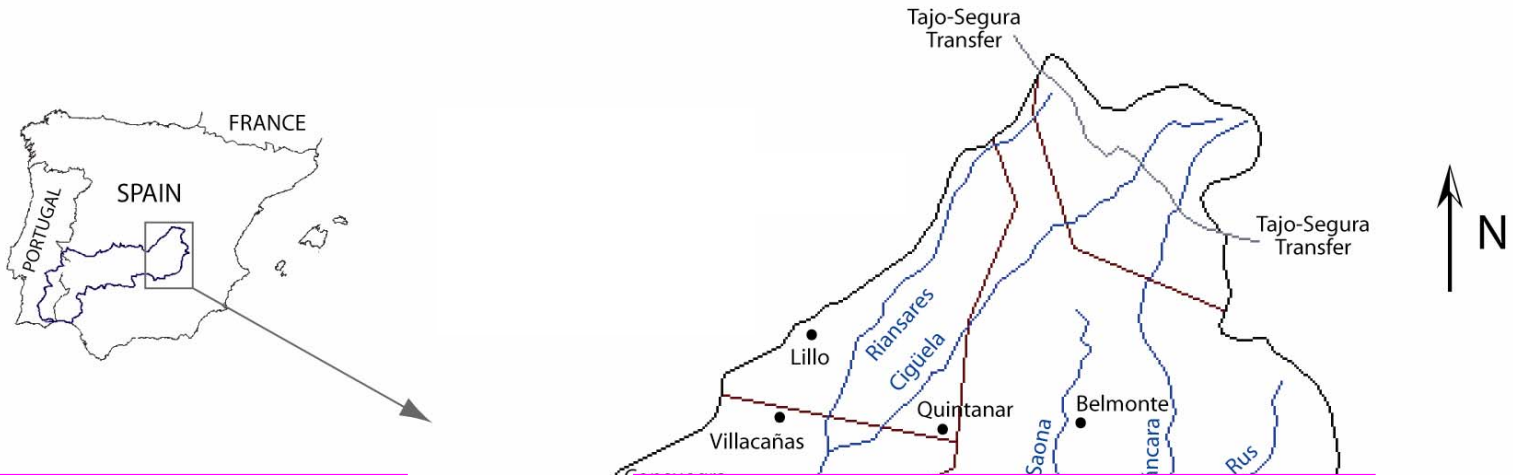


# Environmental issues in Spain

One of the twin Spanish aquifers officially declared in Spain exploited  
The most important aquifer in the Upper Guadiana Basin



## AREA OF STUDY: The Western La Mancha Aquifer (Upper Guadiana River Basin)



- ❑ Area: 5.500 Km<sup>2</sup>
- ❑ Capacity: 15.000 Hm<sup>3</sup>
- ❑ Irrigation ± 180,000ha
- ❑ Irrigation 95% w. uses
- ❑ Ground water is 95%
- ❑ RAMSAR wetlands
- ❑ UNESCO biosphere reserve
- ❑ Irrigation-based development

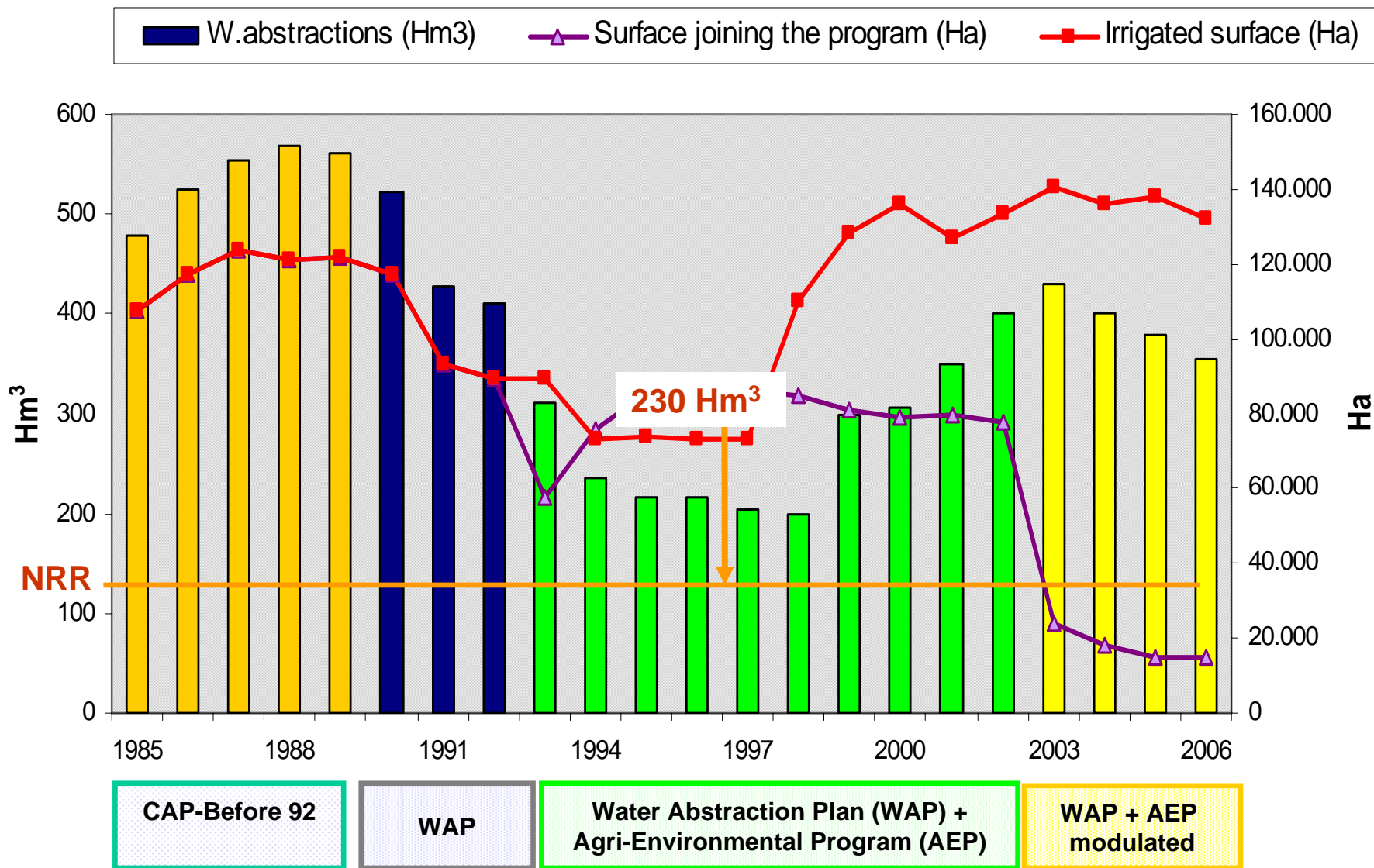
- ❑ Overexploitation of aquifer
- ❑ Wetland loss
- ❑ Environmental degradation
- ❑ Water use limitations
- ❑ Social unrest
- ❑ Illegal drillings
- ❑ Difficult policy enforcement



# “TABLAS DE DAIMIEL” NATIONAL PARK (Ramsar Wetlands)



# Water abstractions and irrigated surface in the Upper Guadiana Basin



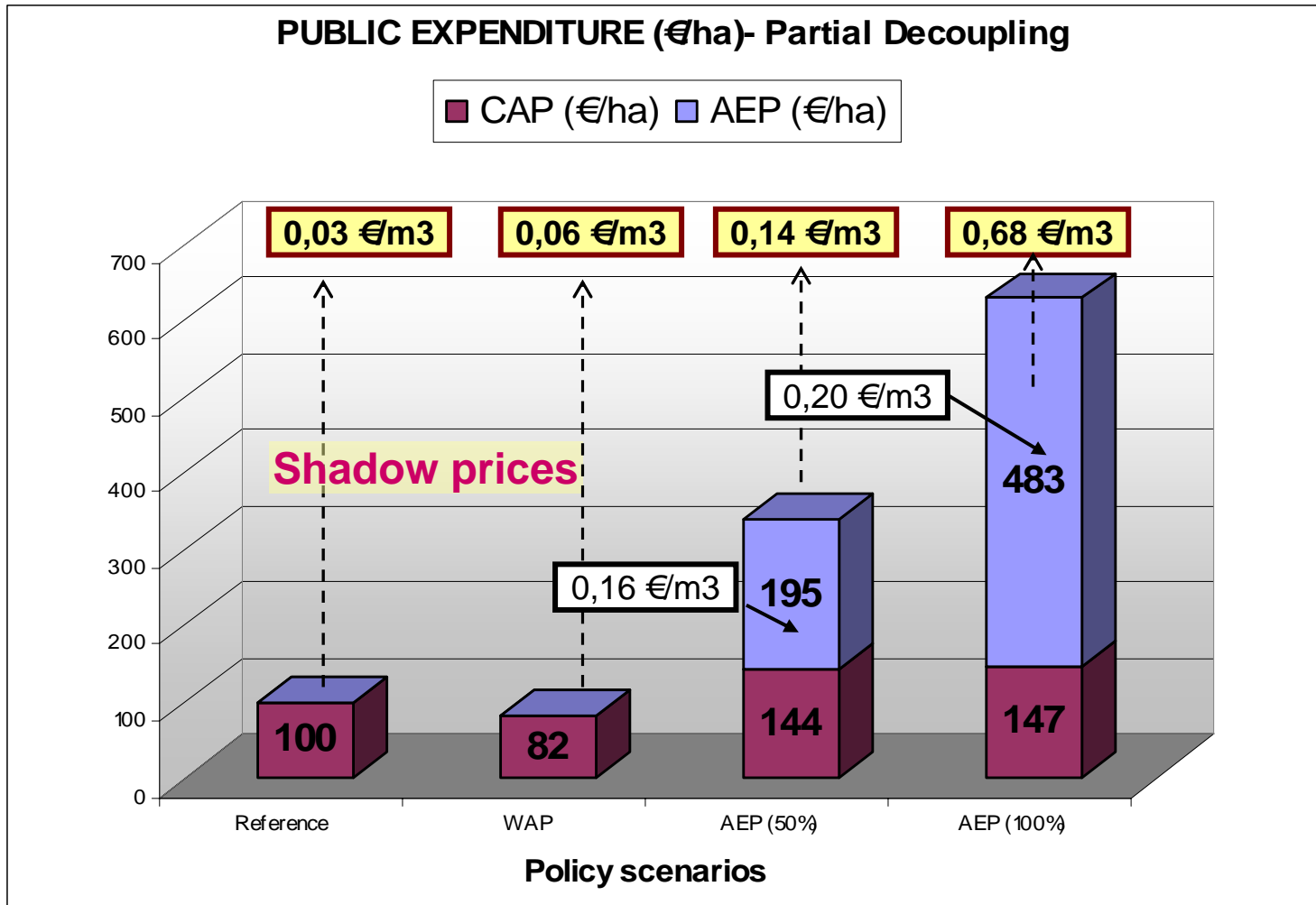
# Cost-Effectiveness Analysis

*Aggregate comparative results to initial situation*

<b>COST-EFFECTIVENESS</b>				
<b>Costs €/ha</b>	<b>Water Abstraction Plan (Quotas)</b>	<b>Volumetric tariffs P= 0.05€/m<sup>3</sup></b>	<b>Agri- Env. Program (50%)</b>	<b>Agri- Env. Program (100%)</b>
private cost	169,66	315,25	258,63	355,67
public cost	-18,52	-135,54	238,73	529,57
<b>net social cost</b>	<b>151,13</b>	<b>179,71</b>	<b>497,36</b>	<b>885,23</b>

**Objective** → Reduction of total water consumption to 230 Hm<sup>3</sup>

# Effects on: Public expenditure



## The policy context in the Upper Guadiana basin:

### Water policies have not been capable to attain water conservation targets

- **Implemented Policies** → 2 policies, → one objective and 2 instruments
  - **National Policy:** Water Management Regime (Water use restrictions) (1991....)
    - Water Quotas → **compulsory** → free-riding, illegal drillings, → high enforcement costs
  - **EU policy:** CAP Agri-Environmental Program → Income compensation for reducing water use (1993 ...2007)
    - Water Quotas + Income compensation → **Voluntary** → low cost-effectiveness
- **New developments: policy-driven solution?**
  - **WFD**
  - **Special Plan of the Upper Guadiana:** Water Bank, Purchase of water rights, land use measures (forestation, rainfed farming, ..) (2007 – 2027)

# CONCLUSIONS

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- Spain and the Mediterranean countries have an added difficulty adapting to quality-driven EU water policies. Down-scaling to local actions is crucial to meet adaptation targets
- In irrigation-dependent agriculture of arid regions, policy-driven actions for nature conservation can have contradictory effects and high social costs

## Conclusions

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- **Adaptive capacity** to CC in irrigation agriculture is dependent on regional and water-dependent factors (buffering capacity, resilience, cropping mix, social..):
  - **Surface irrigation systems** have a **lower adaptive capacity** to the WFD environmental targets
    - **inelastic** response, low water savings, loss of farm profits, question the viability of some farm types
  - **Ground water irrigation** systems have a **higher adaptive capacity**
    - **elastic** response, **higher resilience** to water scarcity (drought), adoption of modern irrigation technologies, cropping flexibility

# CONCLUSIONS

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- CAP and water:
  - → Tendency to reinforce environmental requirements
  - → The future reform: Include water management and CC
- Approximation of CAP and WFD will lead to higher adaptation potential
- Policy integration and cohesion:
  - → seek **policy synergies** (e.g. regional water plans aimed to comply with the WFD objectives have the potential to induce agricultural practices that increase CC adaptation potential of the agro-systems)
- → administrative coordination
- → cost-effectiveness
- → social components: **enforcement, legitimization, credibility  
transparency and participation**

**GRACIAS POR SU ATENCIÓN**

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