

Rosenberg International Forum on Water Policy

Water for food: Quantity and Quality in a Changing World

Zaragoza, Spain

June 2008

Water Policies in Spain: Balancing water for food and water for nature

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Universidad Politécnica de Madrid (UPM), Spain



Some highlights of the RF → Key points

1. Get Management right	Maggie, Elias,
2. Policy is one thing, enforcing policy is the key issue	John B...
3. Water productivity can increase, complexity science , multidisciplinary	Elias ...
4. Technology is right, institutions must evolve	John, Maggie, Hellen...
5. Scale matters, local-specific, context is critical	Hellen, Uriel, John ...
6. Public participation, stakeholders, credibility legitimacy	Hellen, Margaret, John
7. Changes are Crisis-driven	Malin, Wendy...

Contents

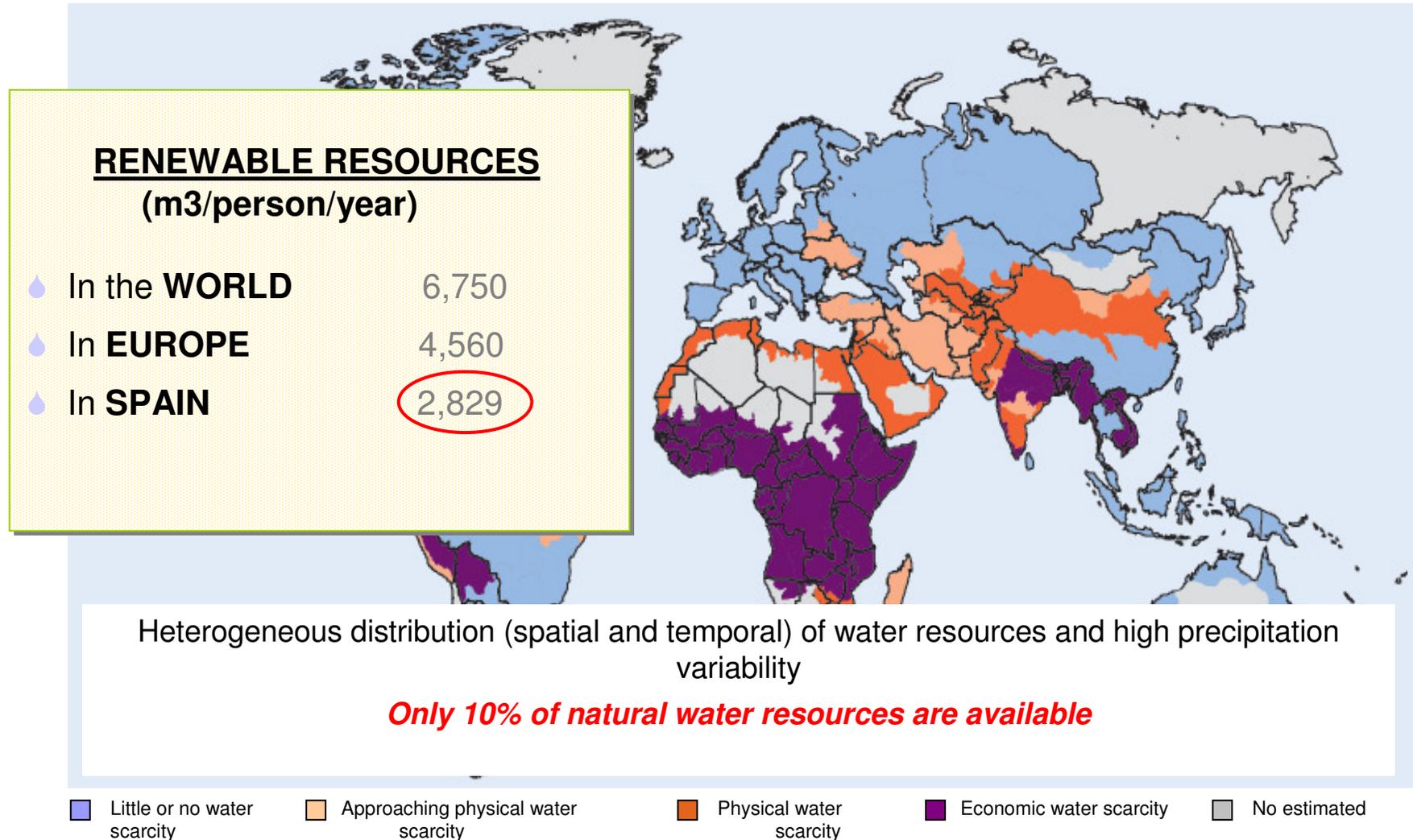
1. Overview: Irrigation agriculture and water use in Spain
2. The policy context: Water and agricultural Policies
3. Complying with the EU policies
4. Down-scaling to the Regional perspective: a case study of groundwater irrigation
5. Concluding remarks

Main Issues:

- Spain Mediterranean (aridity, water stress, ..
EU (policies)
Difficult adaptation, dual objective in water
- Policy-driven determinants for irrigation expansion and water use
water policies, agricultural policies
- Clash between irrigation-based development and ecosystem protection
- Down-scale global EU policies to local actions
- Integration of water and agricultural policies

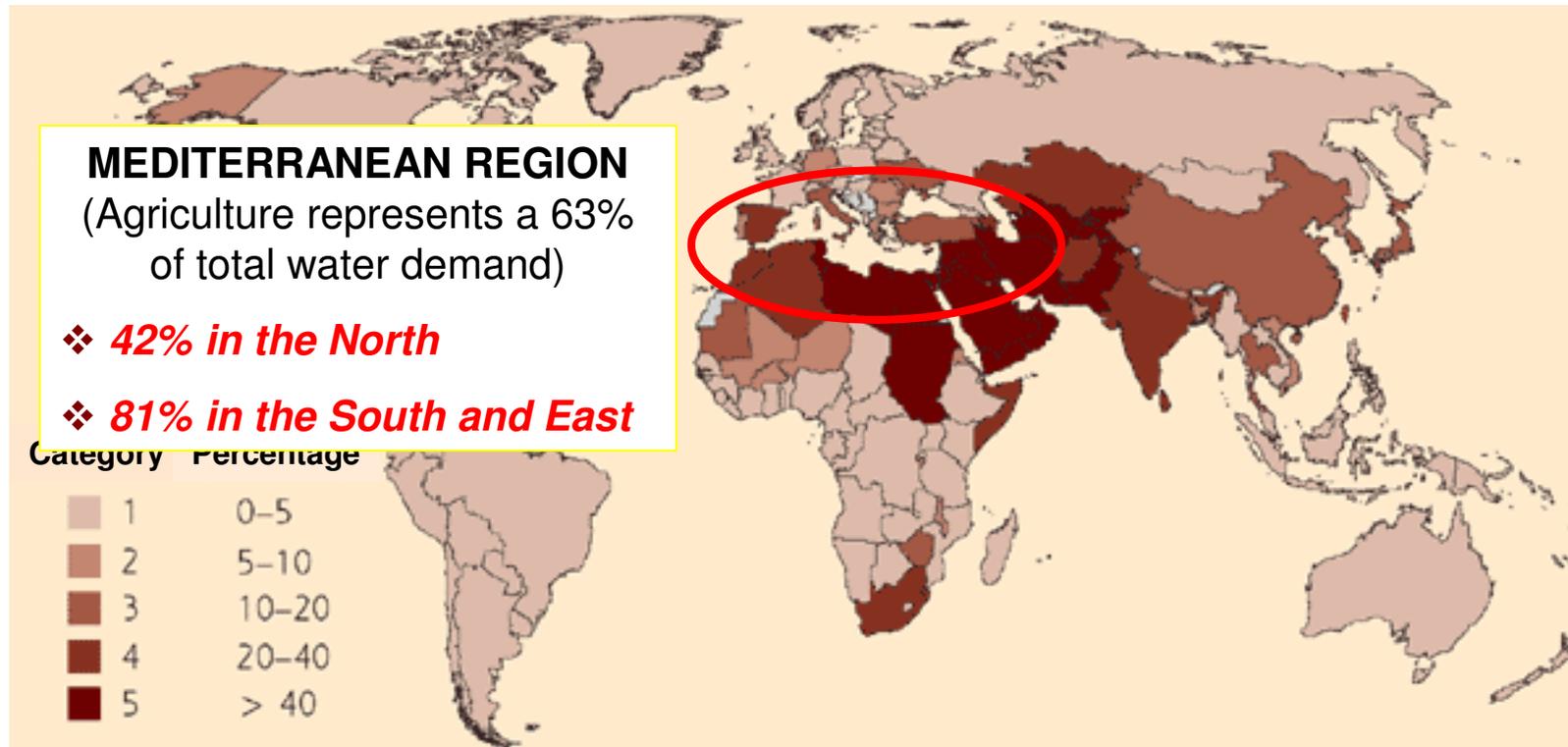
Water resources

Areas of physical and economic water scarcity



Water and Agriculture

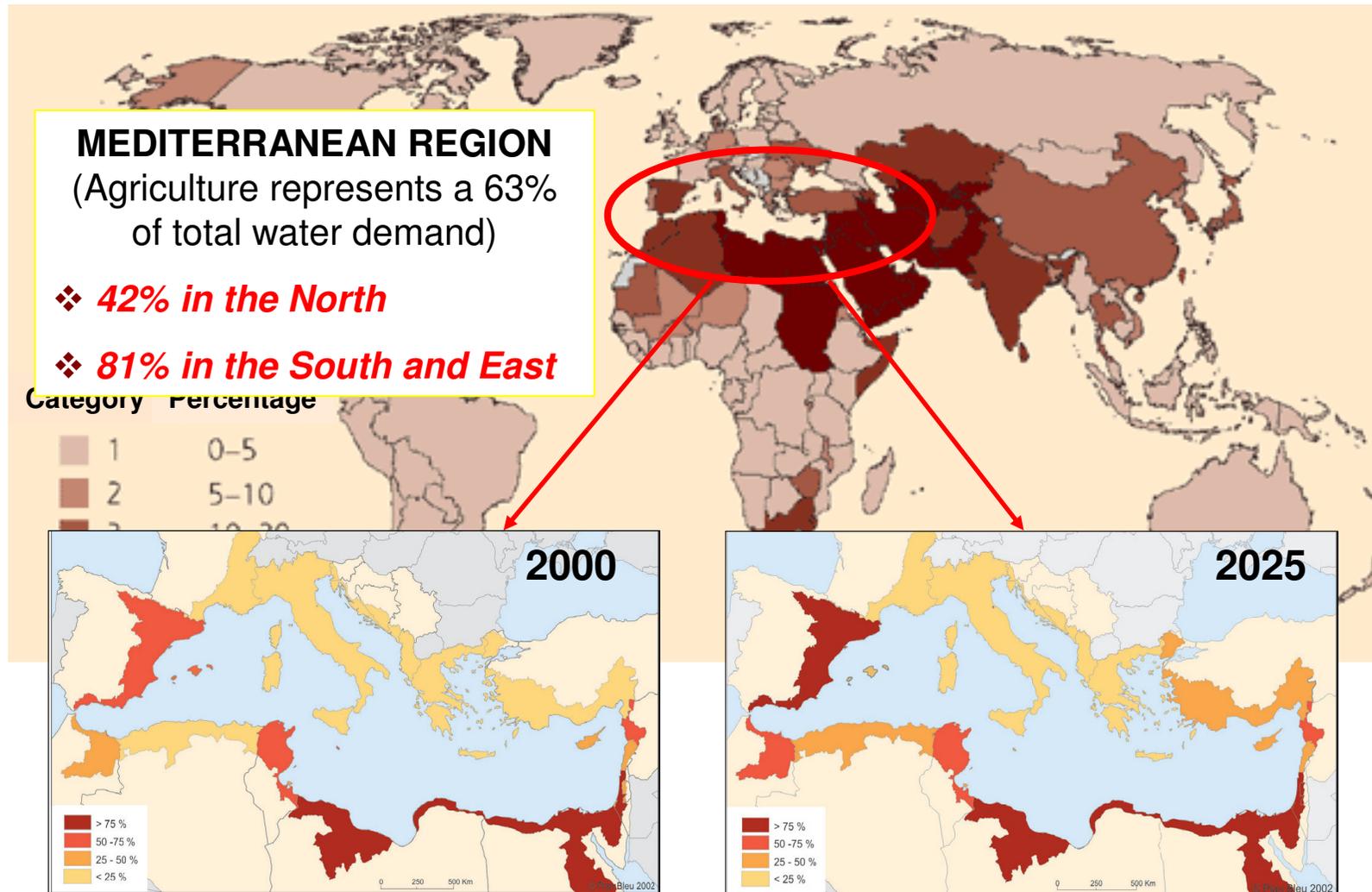
% Agriculture water withdrawals as percentage of renewable water resources



Source: FAO, 2002

Water and Agriculture

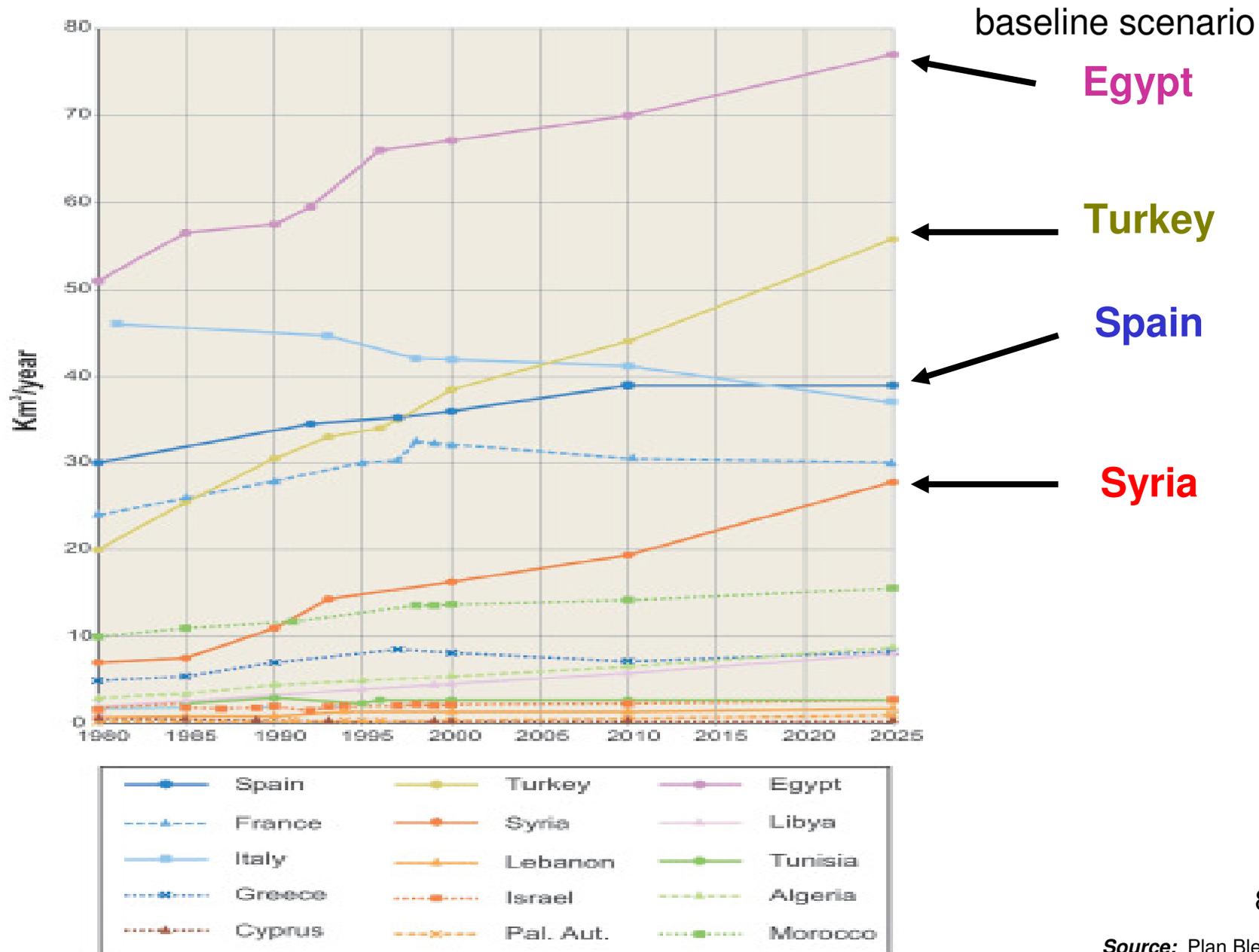
% Agriculture water withdrawals as percentage of renewable water resources



WATER EXPLOITATION INDEX

Source: Plan Bleu, 2005

Total water demand by country in the Mediterranean (1980 – 2025)



Mediterranean countries with unsustainable water production indices

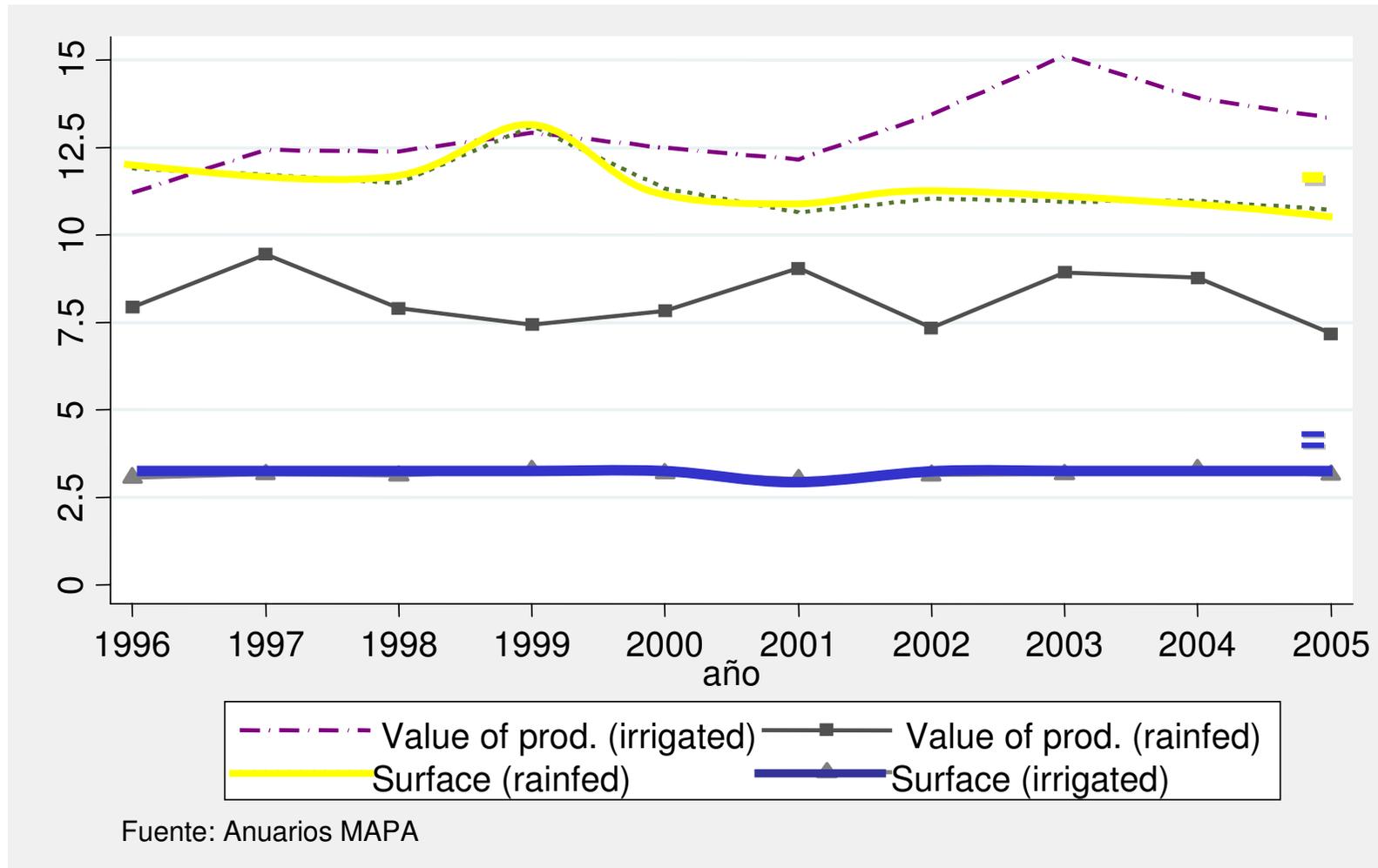
Country	Overexploitation of renewable water resources (1) (in billion m3/year)	Water demand (2) (in billion m3/year)	Index of unsustainable water production % (1)/(2)
Spain	0.70	18.20	4
Malta	0.02	0.05	31
Cyprus	0.04	0.33	12
Israel	0.19	1.80	10
Palestinian territories	0.03	0.13	23
Egypt	0.00	66.0	0
Libya	0.77	2.24	34
Tunisia	0.18	2.27	8
Algeria	0.00	2.90	0

Source. Margat, Plan Bleu (2004)

Water and Agriculture

A recent vision of the Spanish agriculture

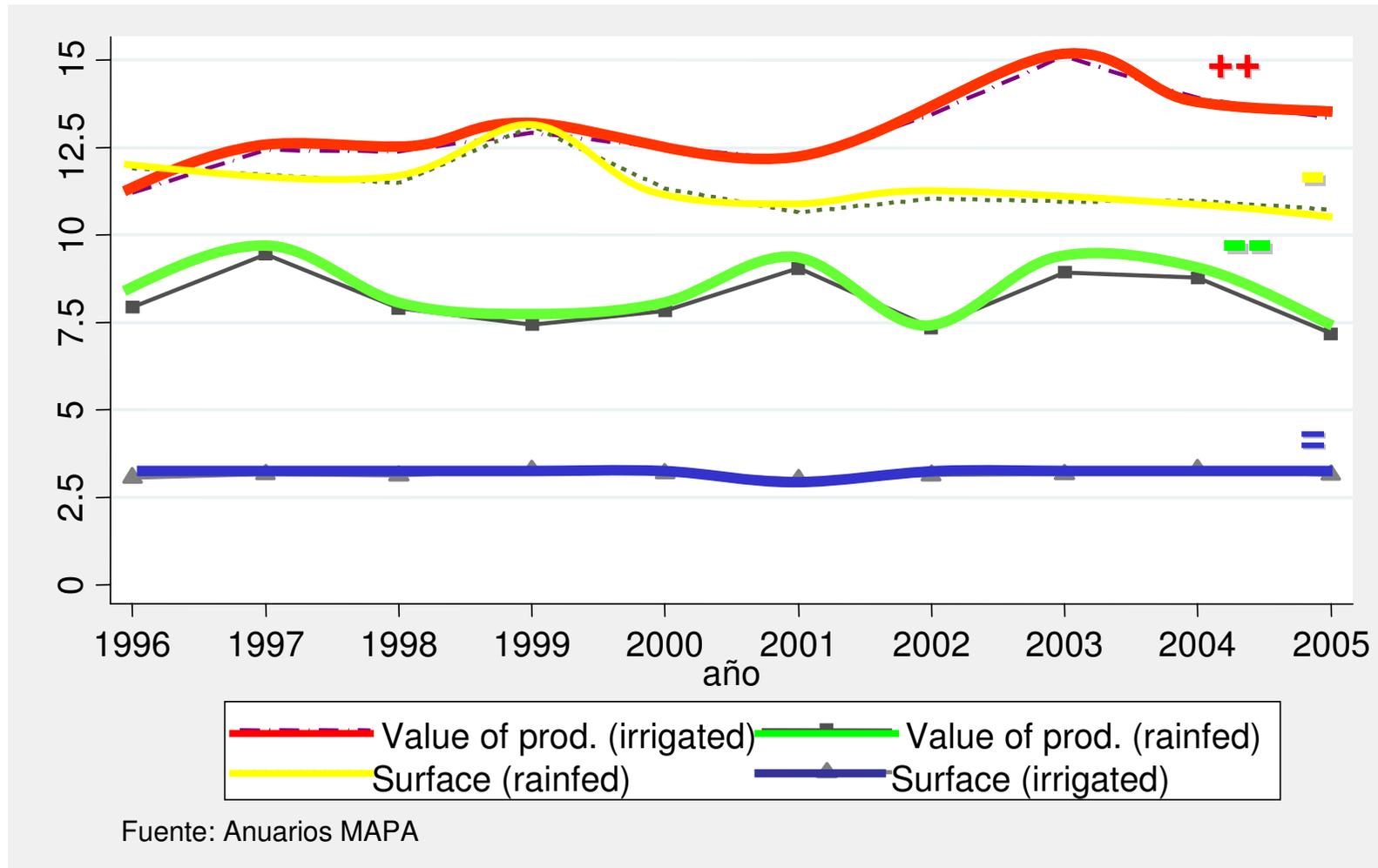
Surface (M ha) and Value of production (1000 M €, year 2000)



Water and Agriculture

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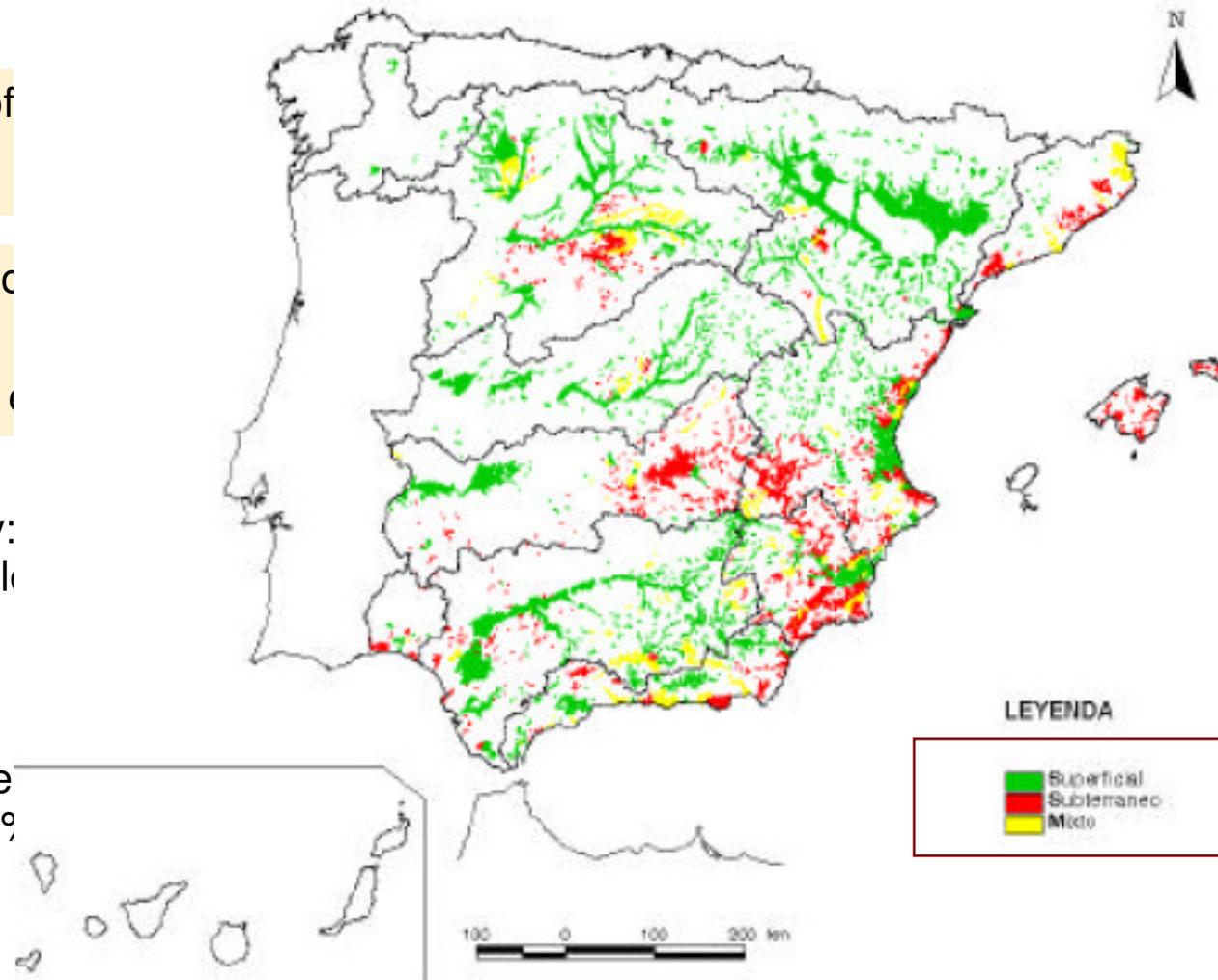
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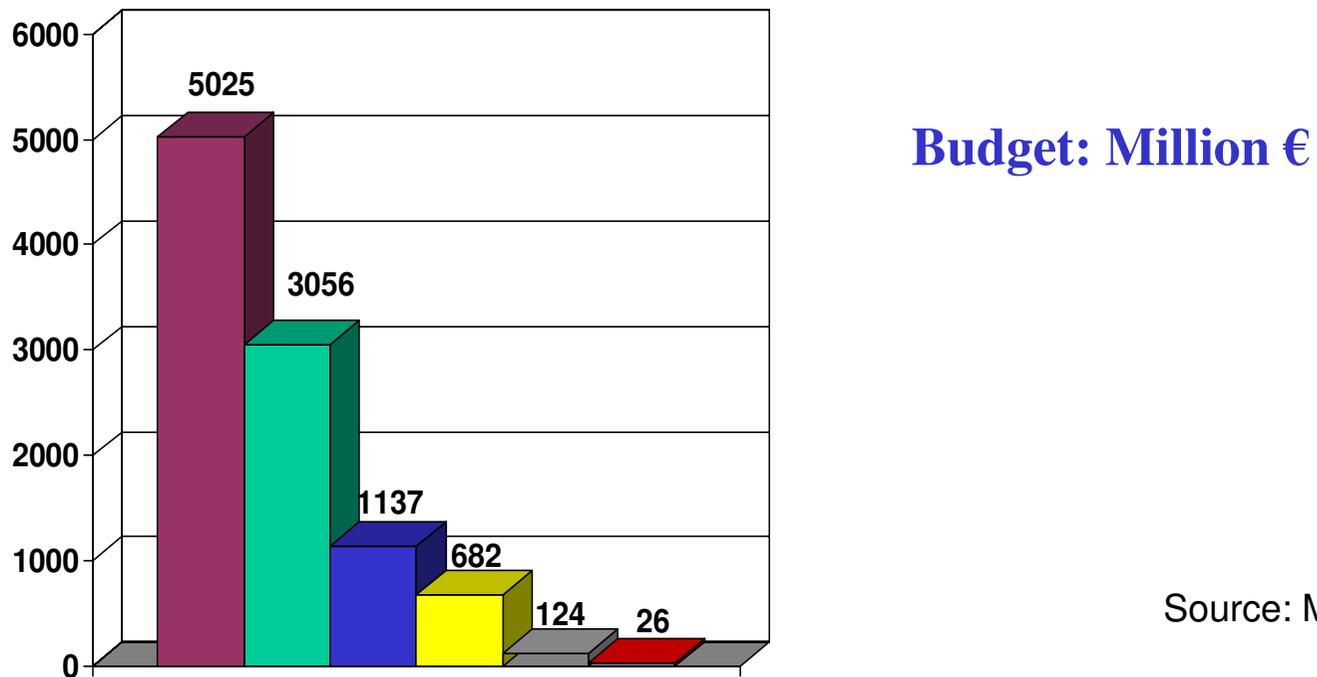
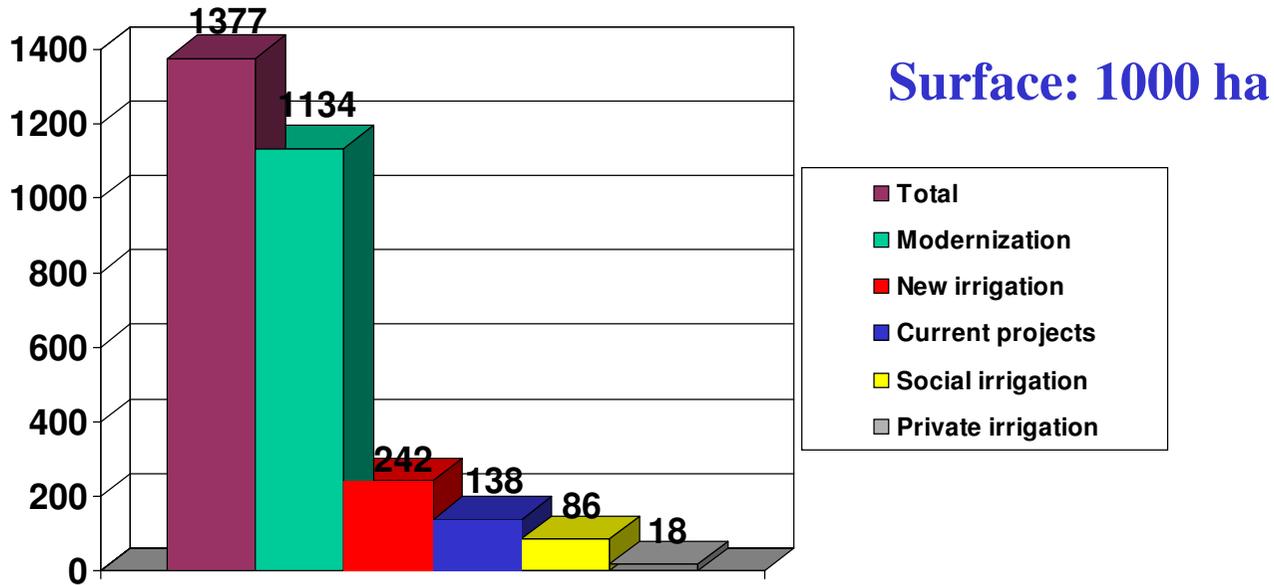
Agriculture **80%**

- Extends over 15% of (3.6 M ha)
- 60 % of total A. Prod
- 80 % of Total Farm c
- Irrigation technology: 23% sprinkler, 42% l
- Water tariff: 82% are volumetric pricing, 5%

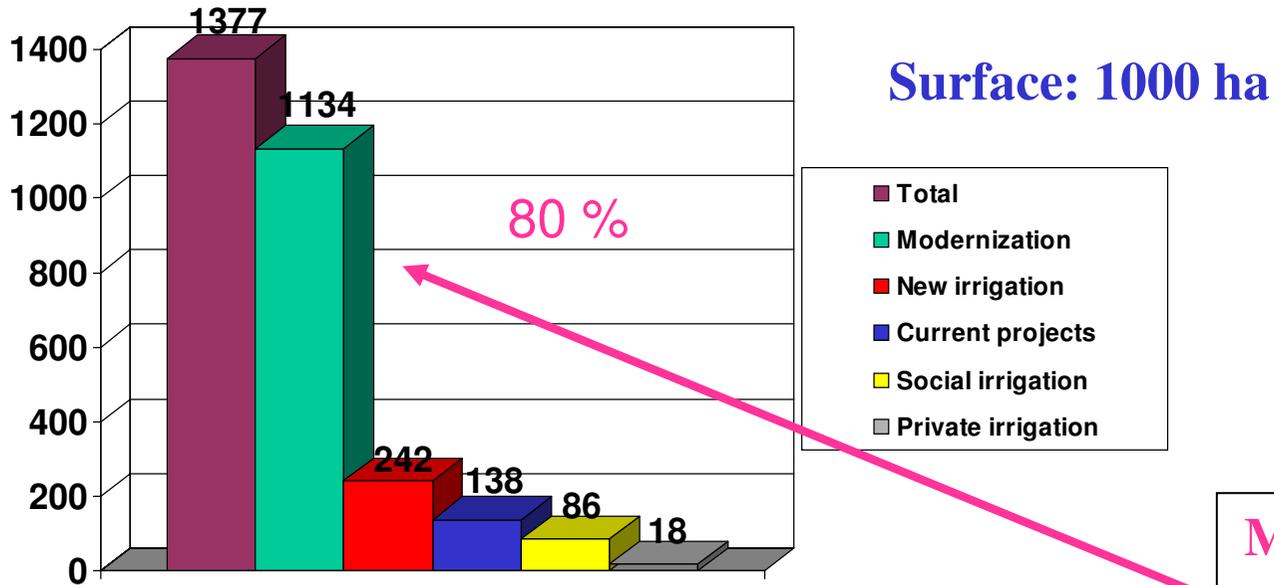


Source: MMA (PHN, 2002), MAPA (2006)

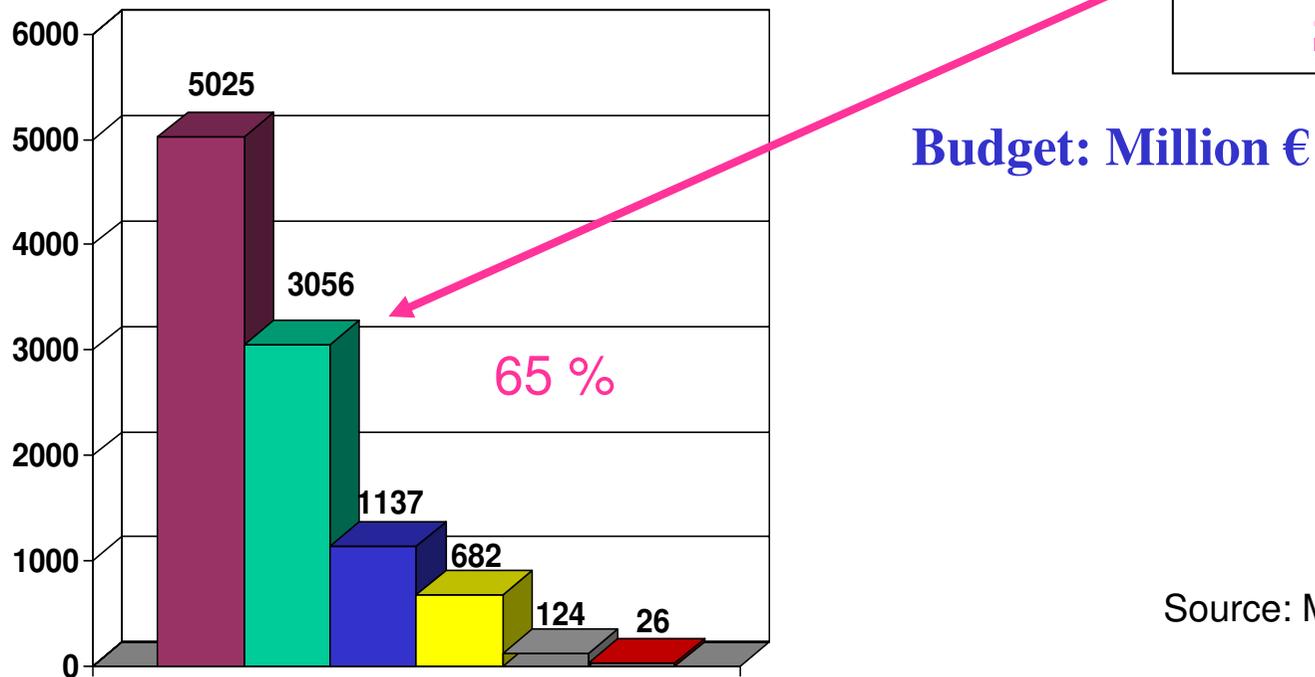
National Irrigation Plan (2002-2008)



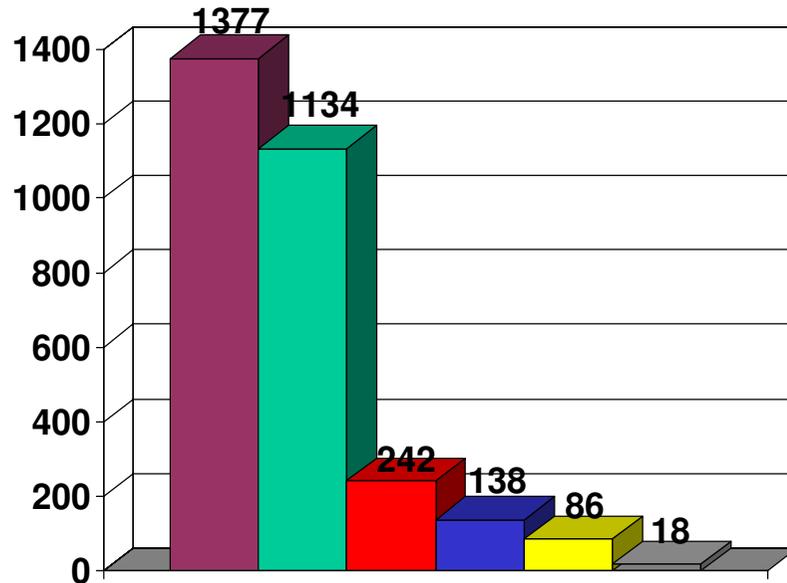
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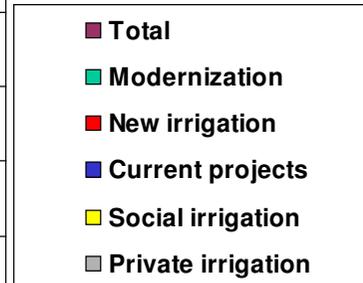
**MODERNIZATION
OF IRRIGATION
SYSTEMS**



National Irrigation Plan (2002-2008)

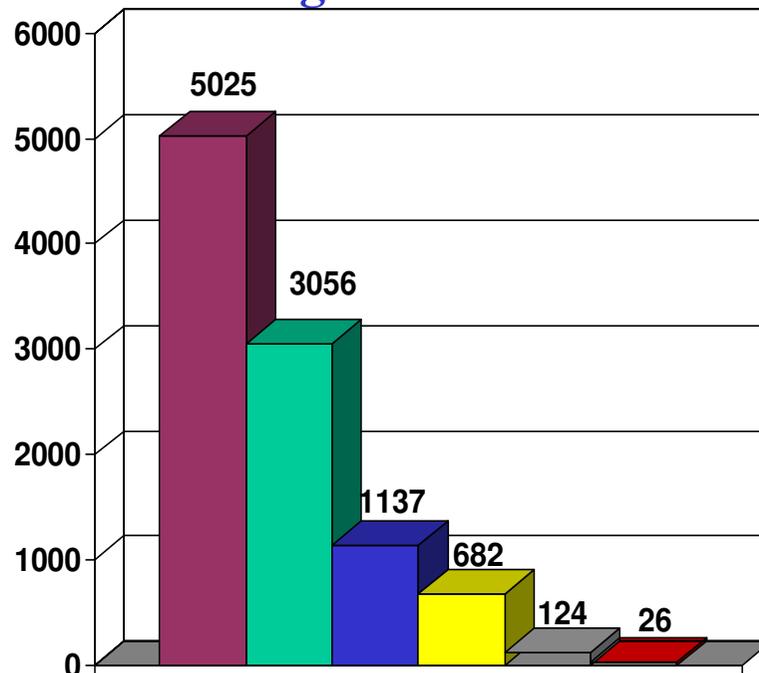


Surface: 1000 ha



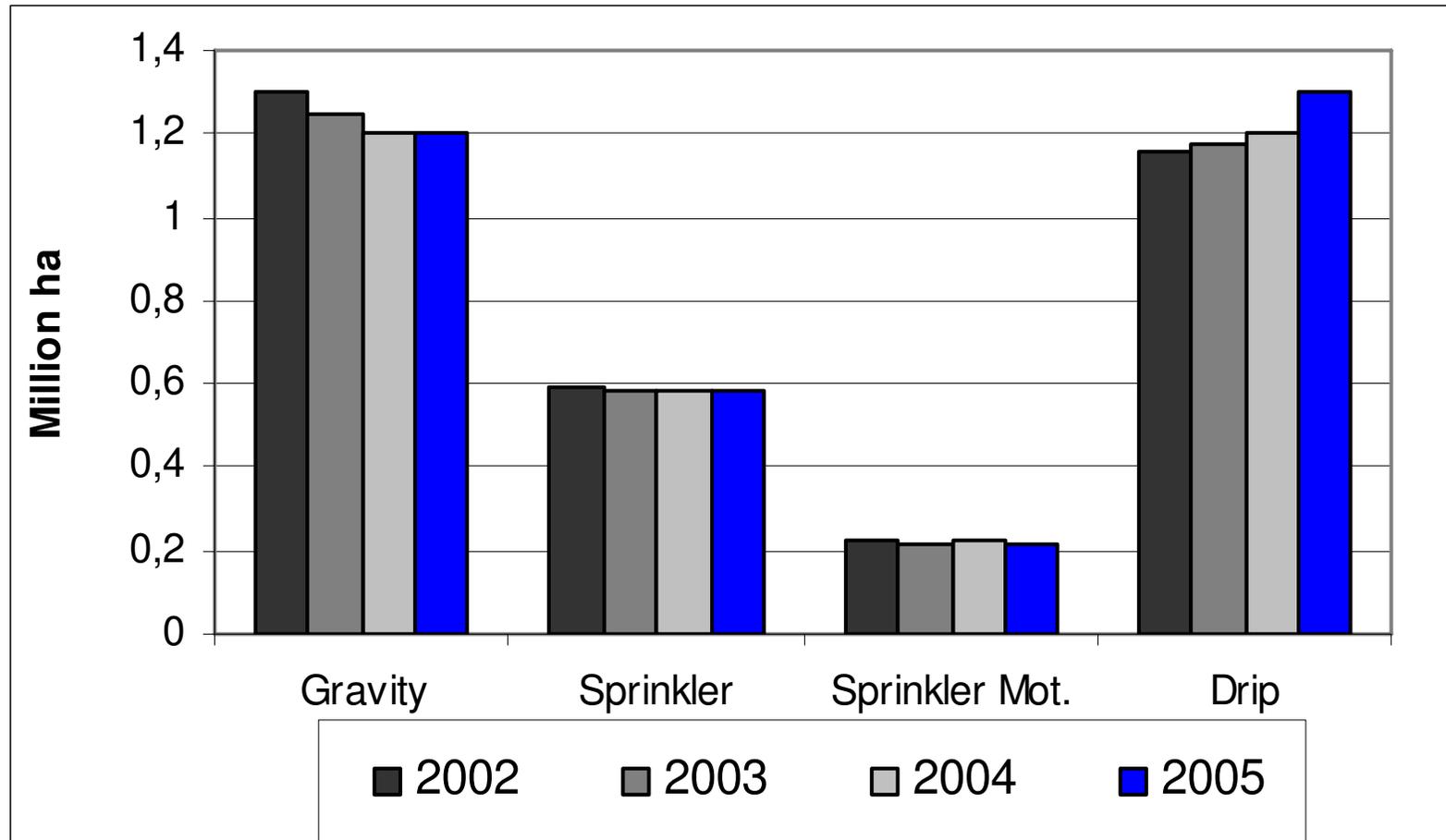
Objectives

Budget: Million €



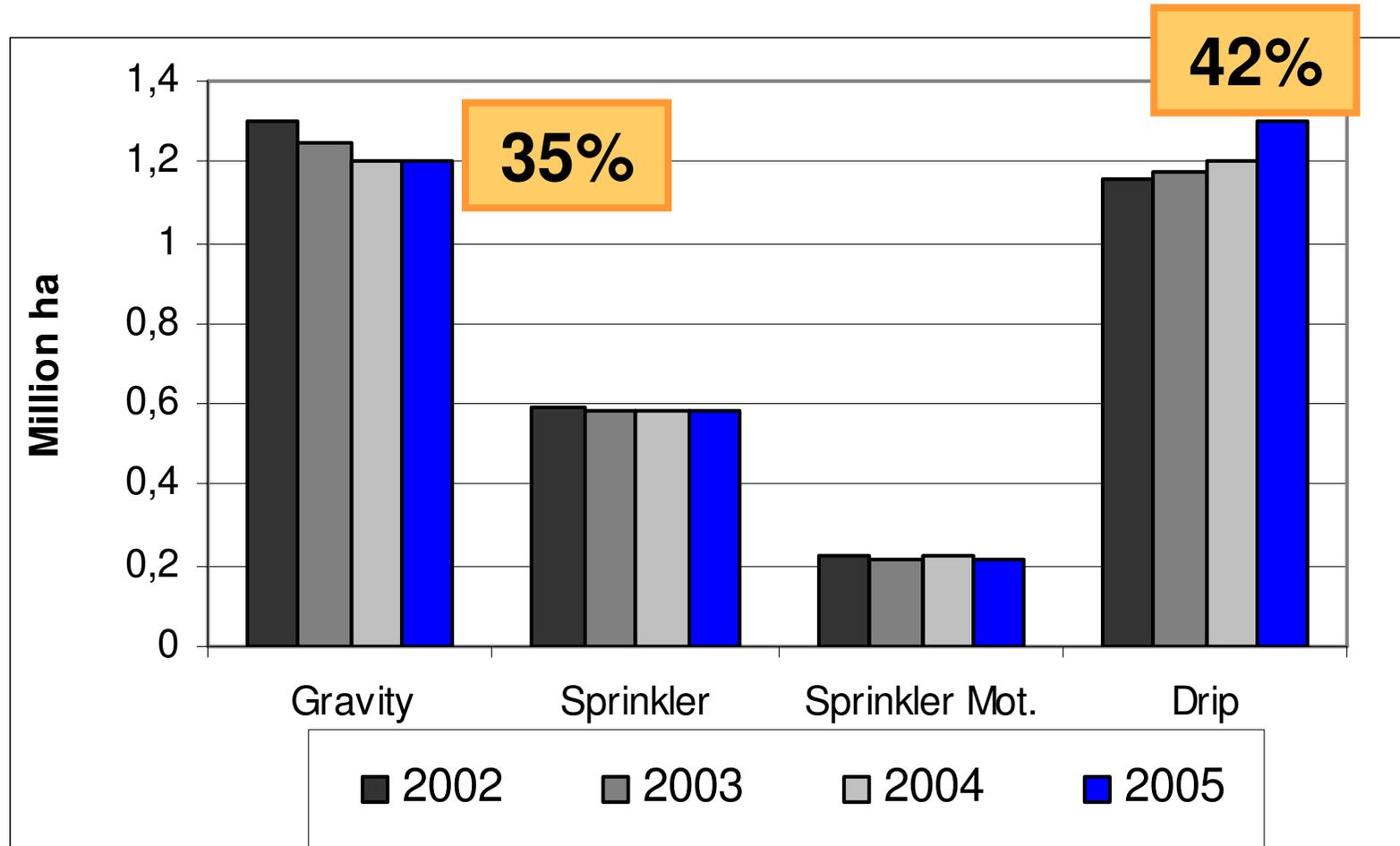
- Ecologic: water saving 1350 Mm3
- Water av. security reduce risk
- Increase crop divers. & productiv.
- Employment, population stability
- Multifunctional agriculture

Technological change: irrigation modernization



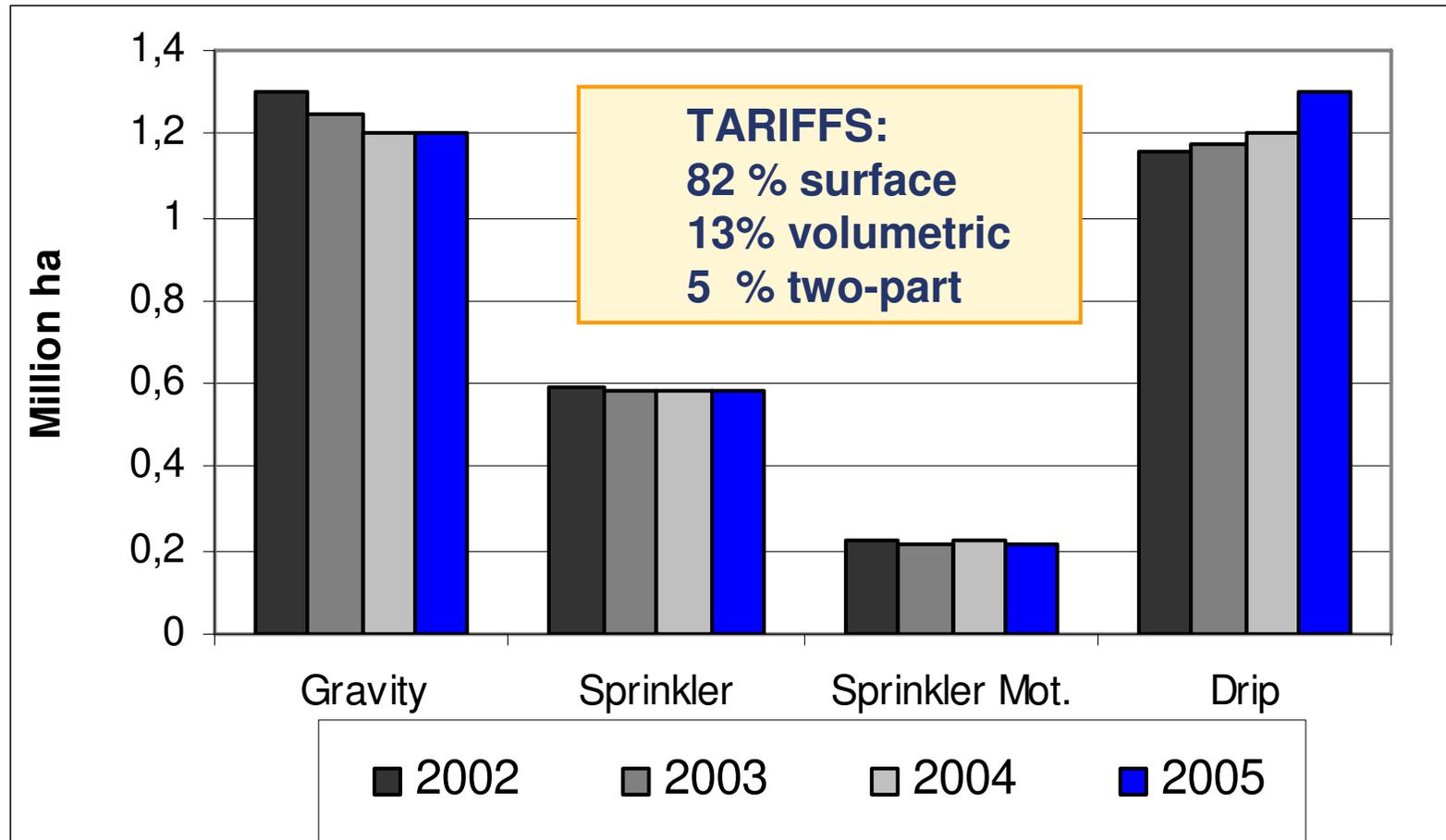
Source: MAPA 2007

Technological change: irrigation modernization

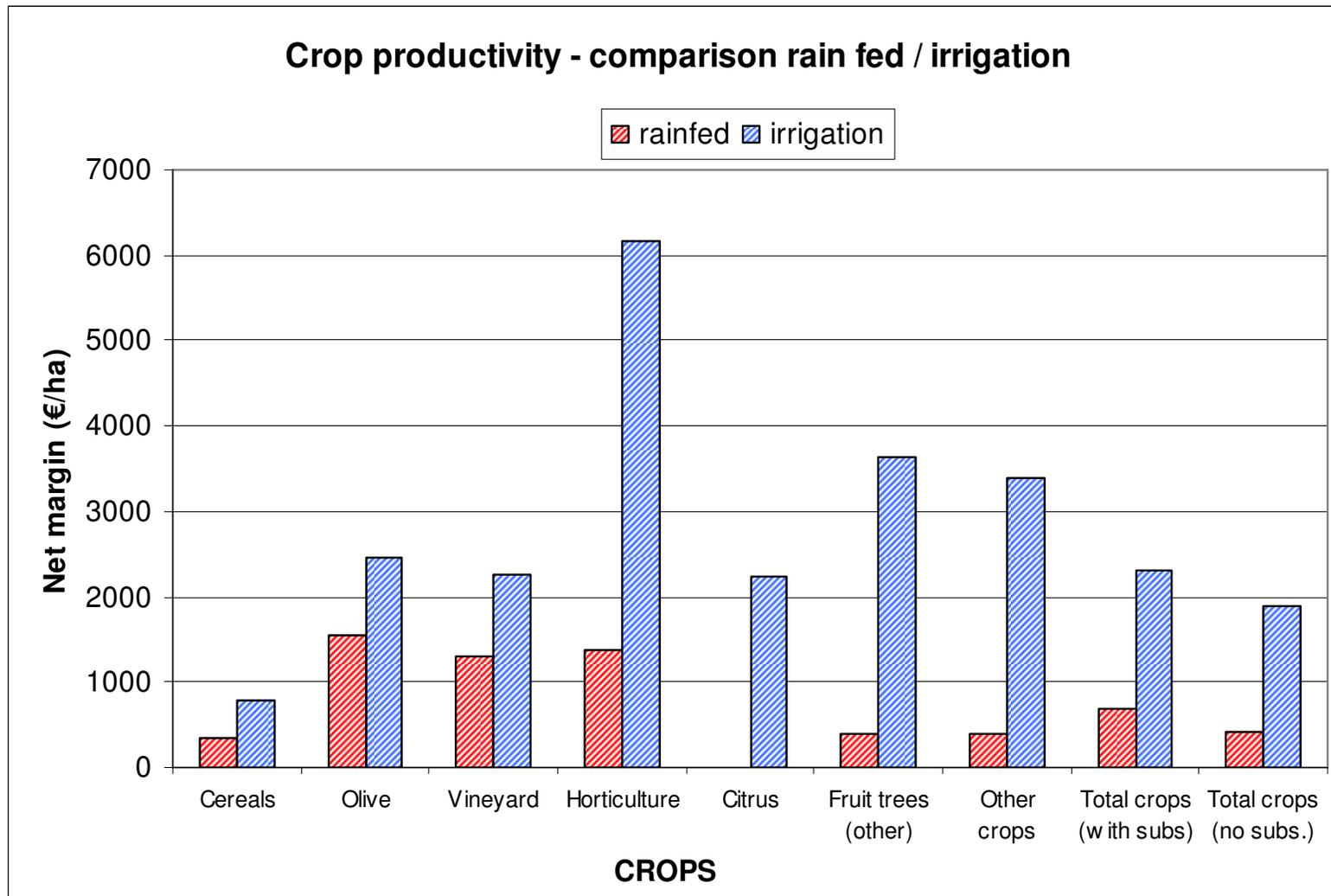


Source: MAPA 2007

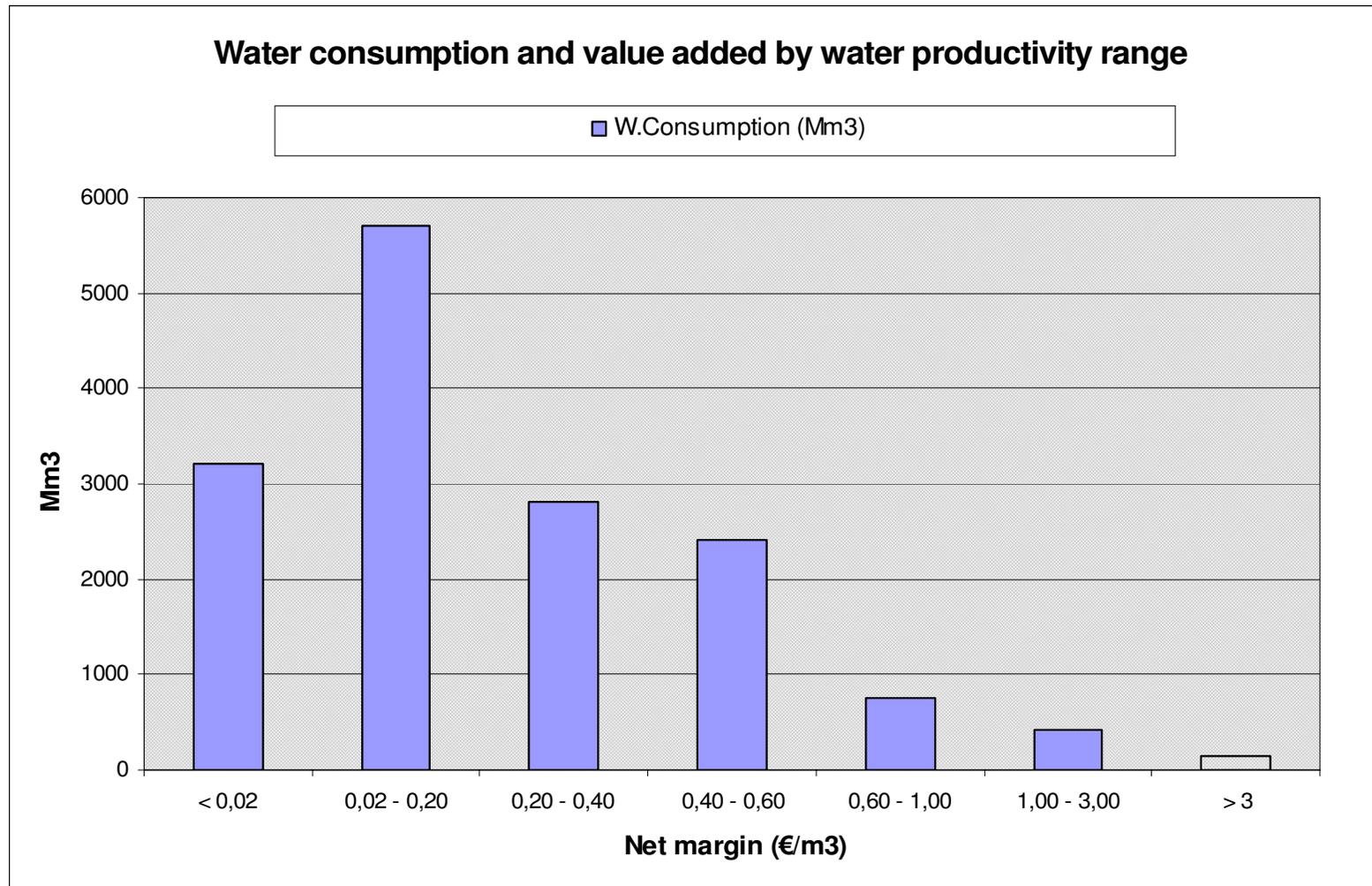
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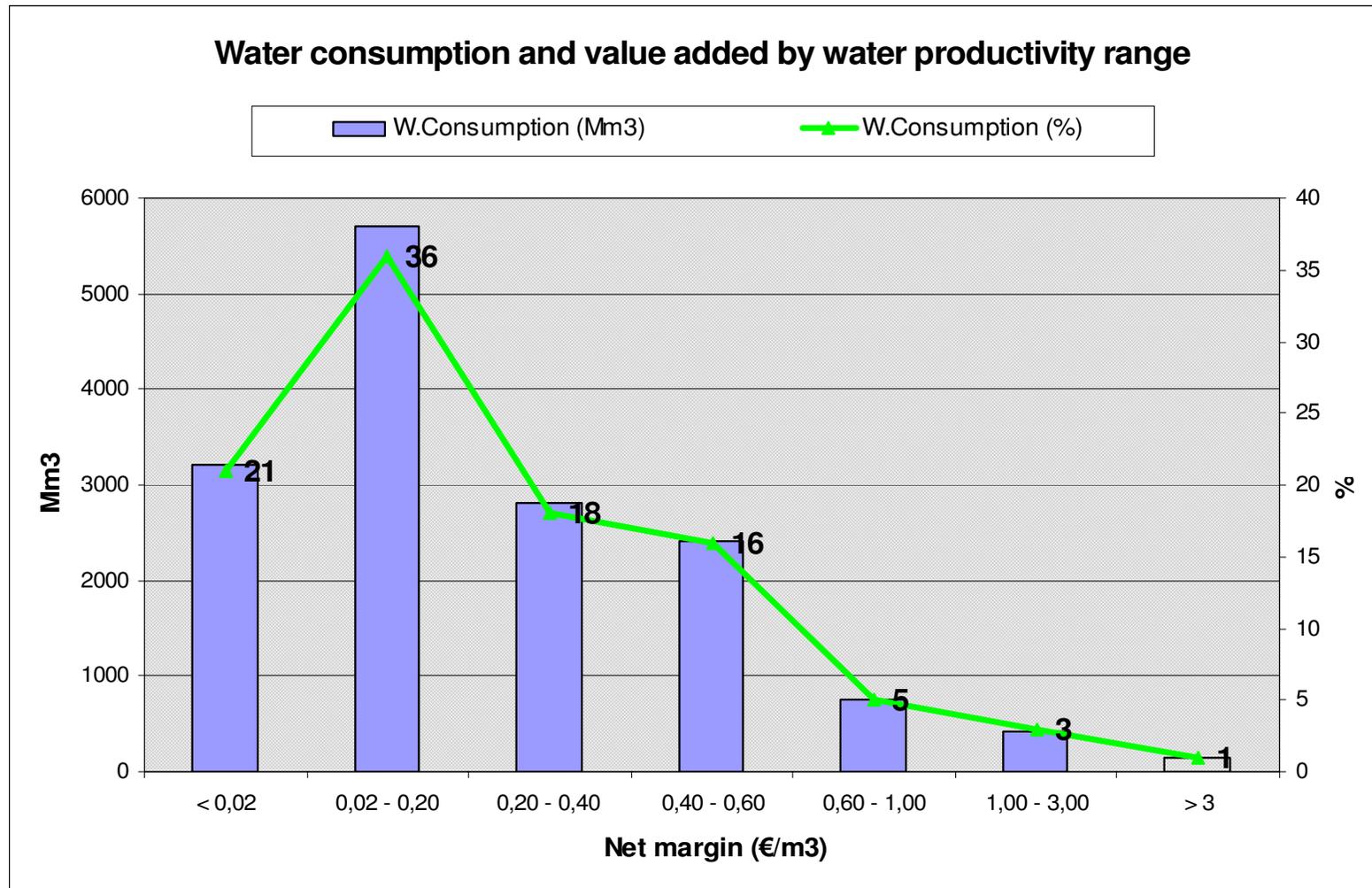
Water productivity comparisons between rainfed and irrigated agriculture



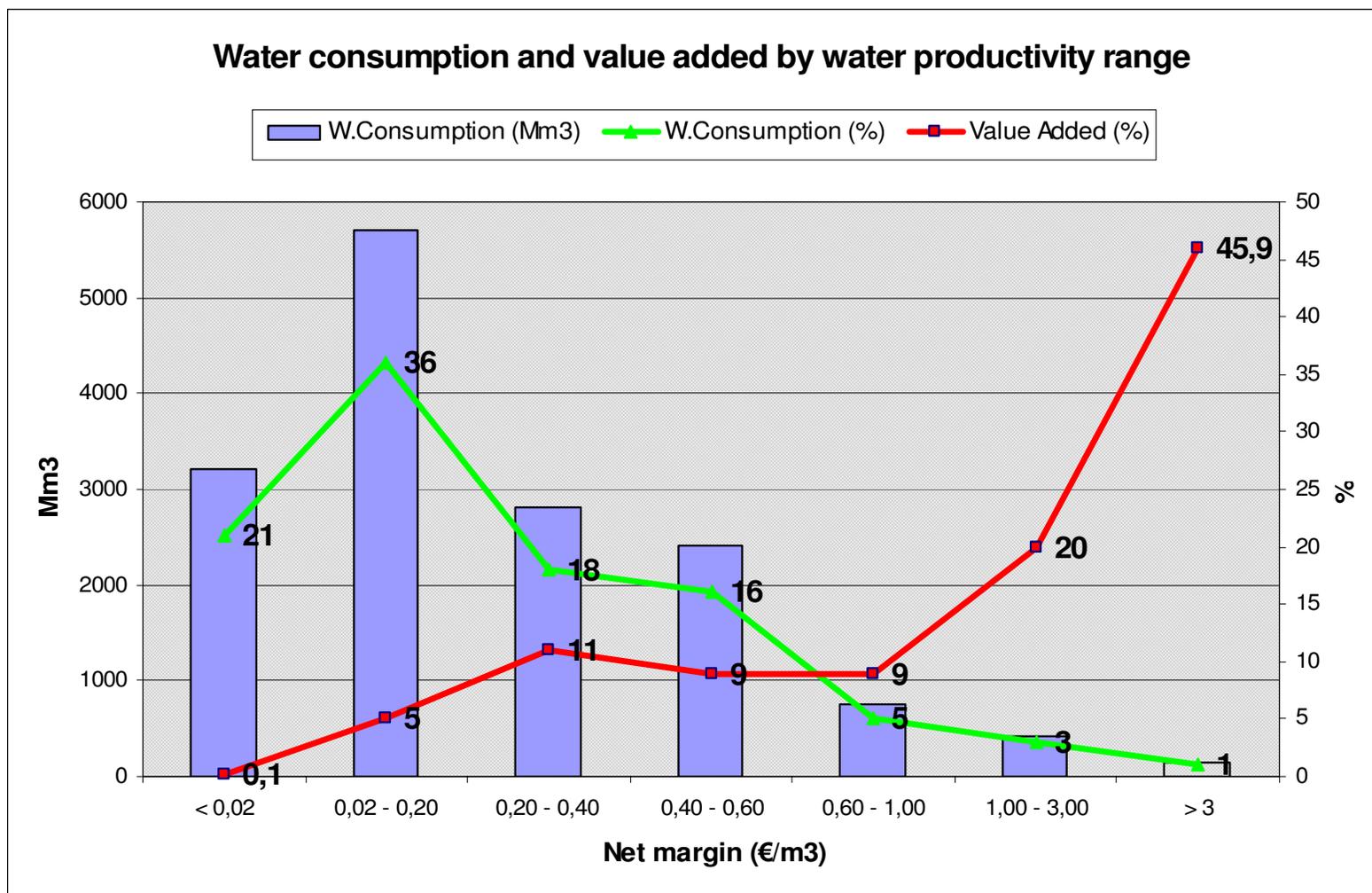
Water consumption and value-added by water productivity range



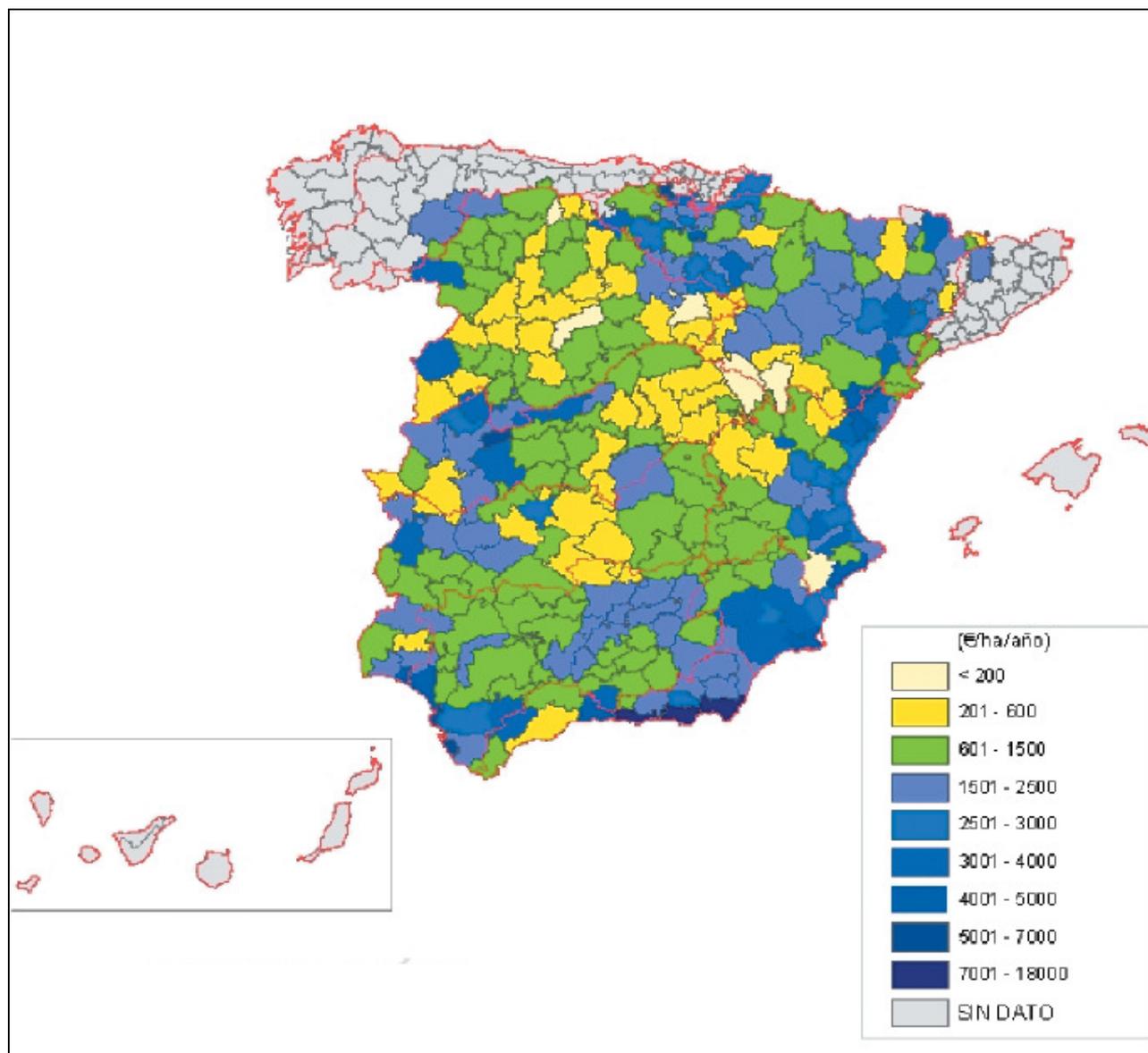
Water consumption and value-added by water productivity range



Water consumption and value-added by water productivity range



Productivity of irrigated crops (€ /ha) (average values of prices and i d f th i d 1997 2002)



Source: MMA (2007)

The EU policy context: water and agricultural policies

AGRICULTURAL POLICIES

CAP Reform 2003

WATER POLICIES

Water Framework Directive, 2000

The EU policy context: water and agricultural policies

AGRICULTURAL POLICIES

CAP Reform 2003

Sustainable & competitive Agriculture

- **Direct aid payments decoupled** from production
- **Single farm payment** (per farm)
- **Cross-compliance mechanisms**
direct payments are subject to compliance with environmental regulations
- **Rural Development Programs**

WATER POLICIES

Water Framework Directive, 2000

Sustainable use of water resources & Good ecological status of all waters(2015)

- **River Basin Organization** as management unit
- Planning and **integrated management** of all water resources RBMP
- **Cost recovery**, polluter pays principle
- Transparency and **public participation**

The EU policy context: water and agricultural policies

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IRRIGATED AGRICULTURE

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

The EU policy context: water and agricultural policies

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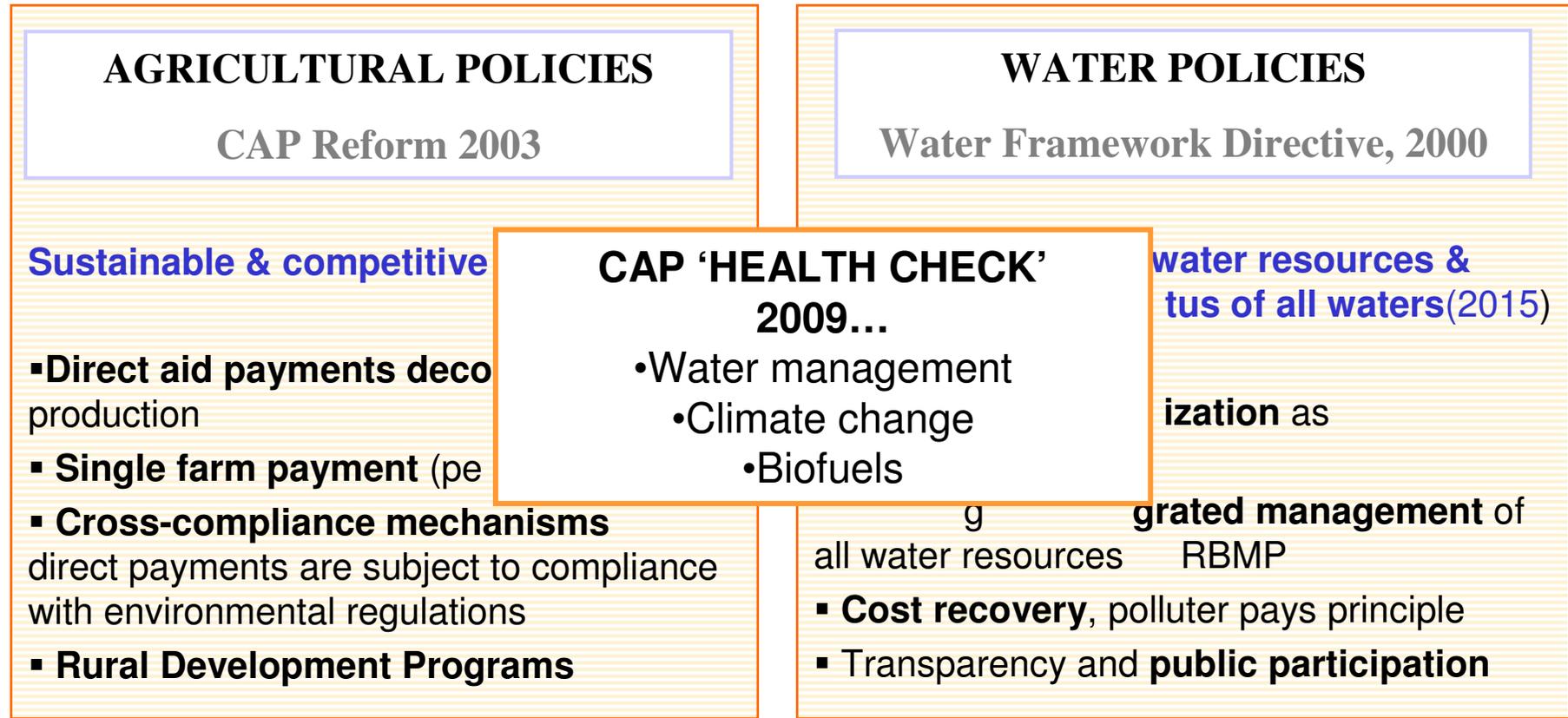
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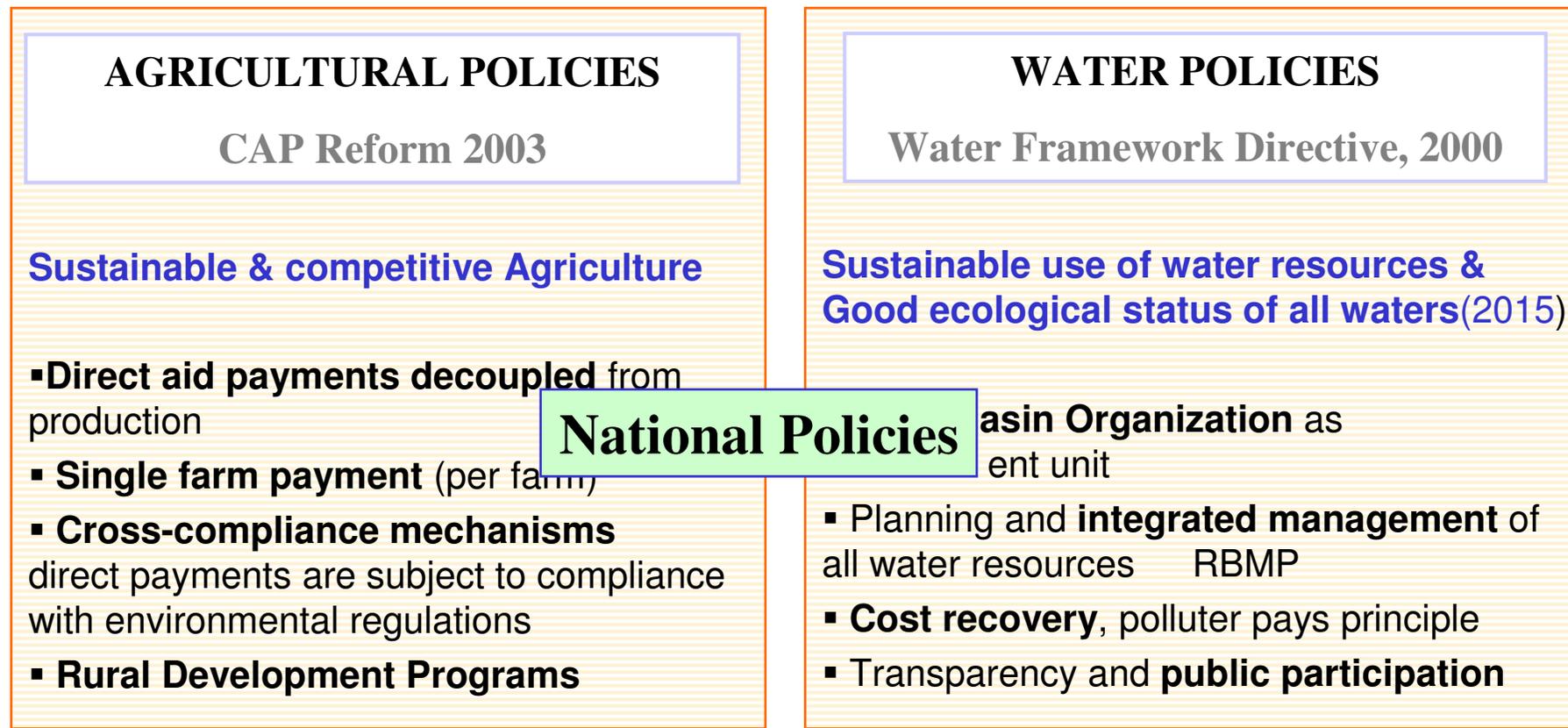
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The EU policy context: water and agricultural policies



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The EU policy context: water and agricultural policies



***Multifunctional
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The EU Water Framework Directive

- 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 ?

Water policy: water tariffs

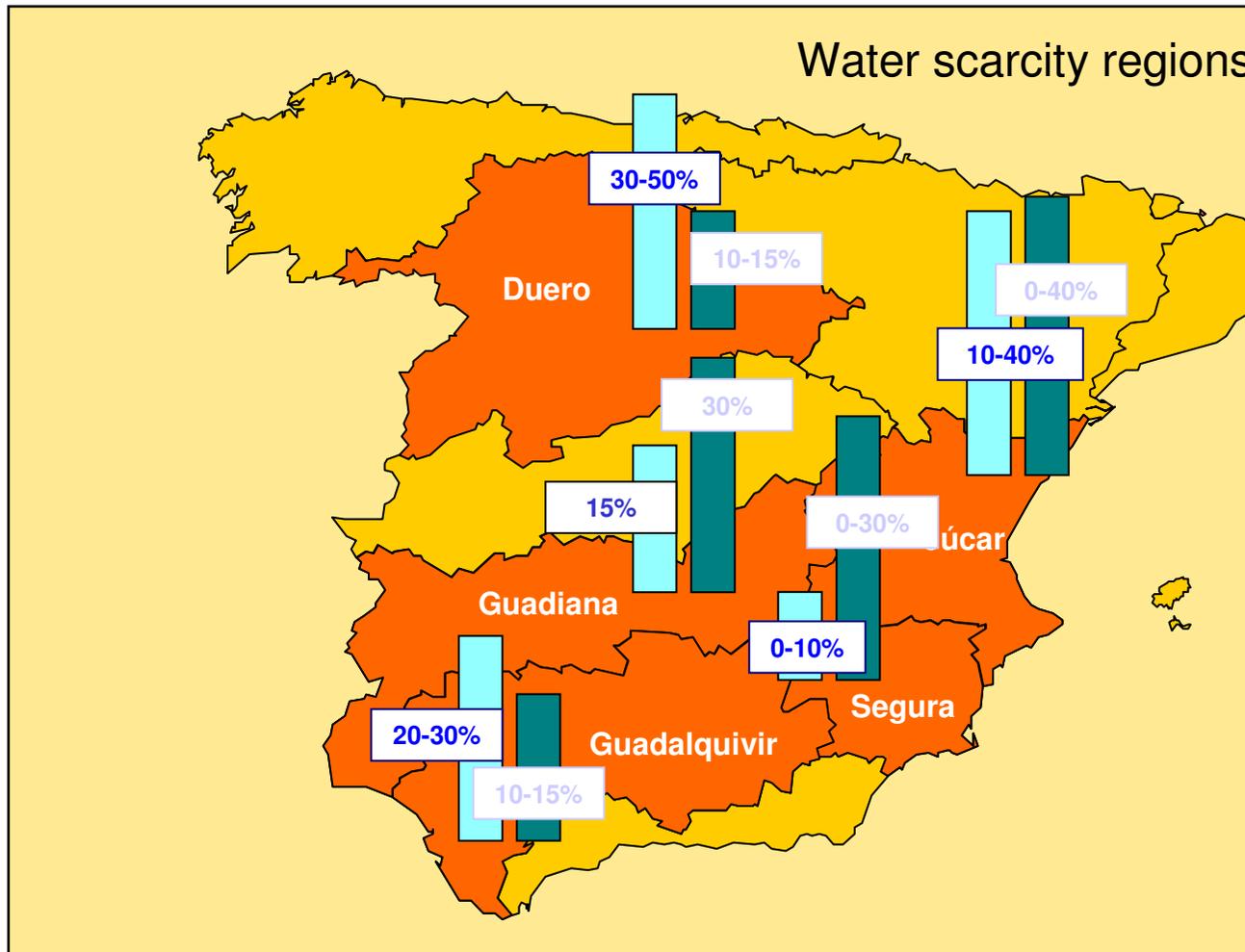
Effect of cost recovery of the WFD in other Spanish Irrigation areas



Water policy: water tariffs

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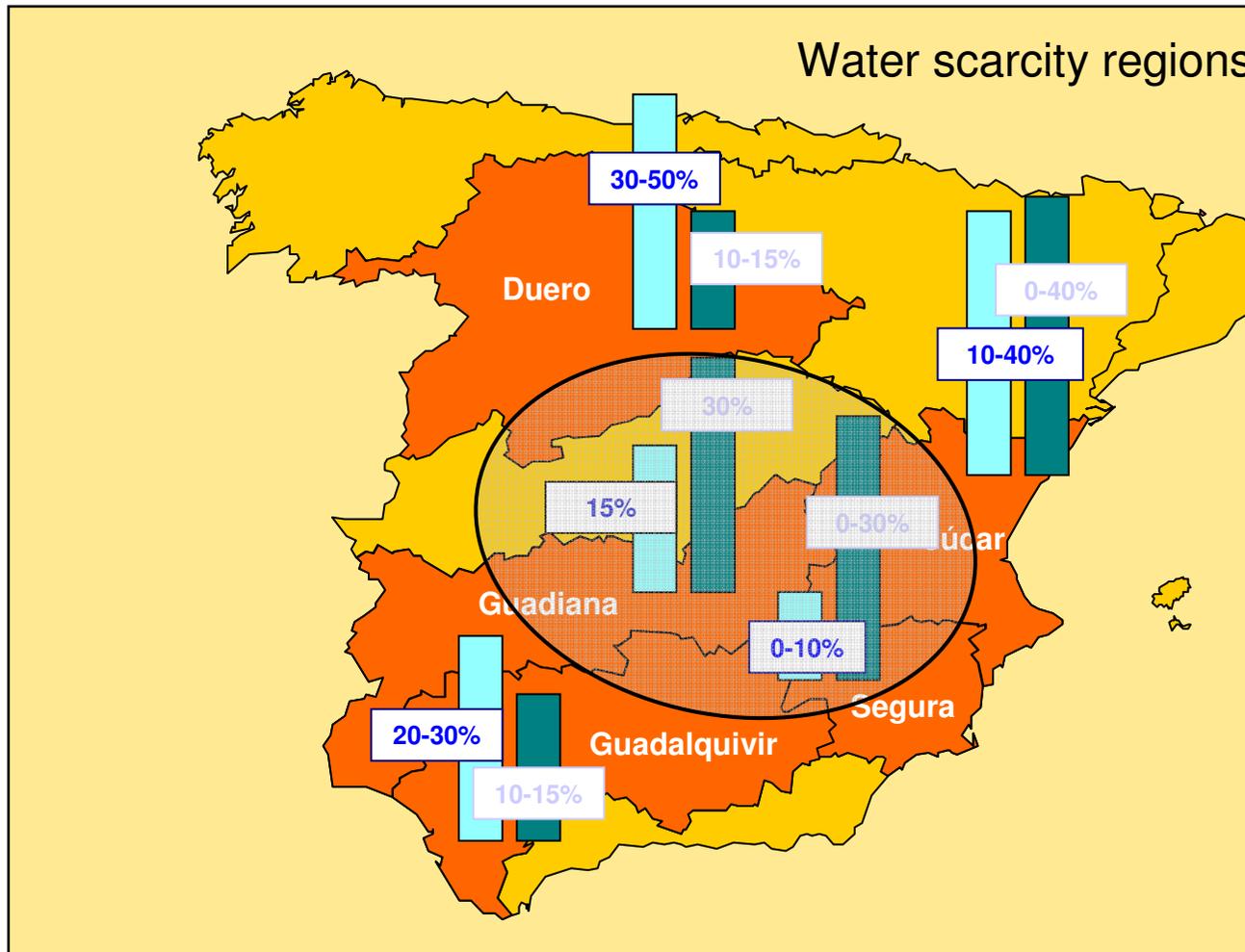
■ Water demand reduction (%) ■ Income loss (%)



Water policy: water tariffs

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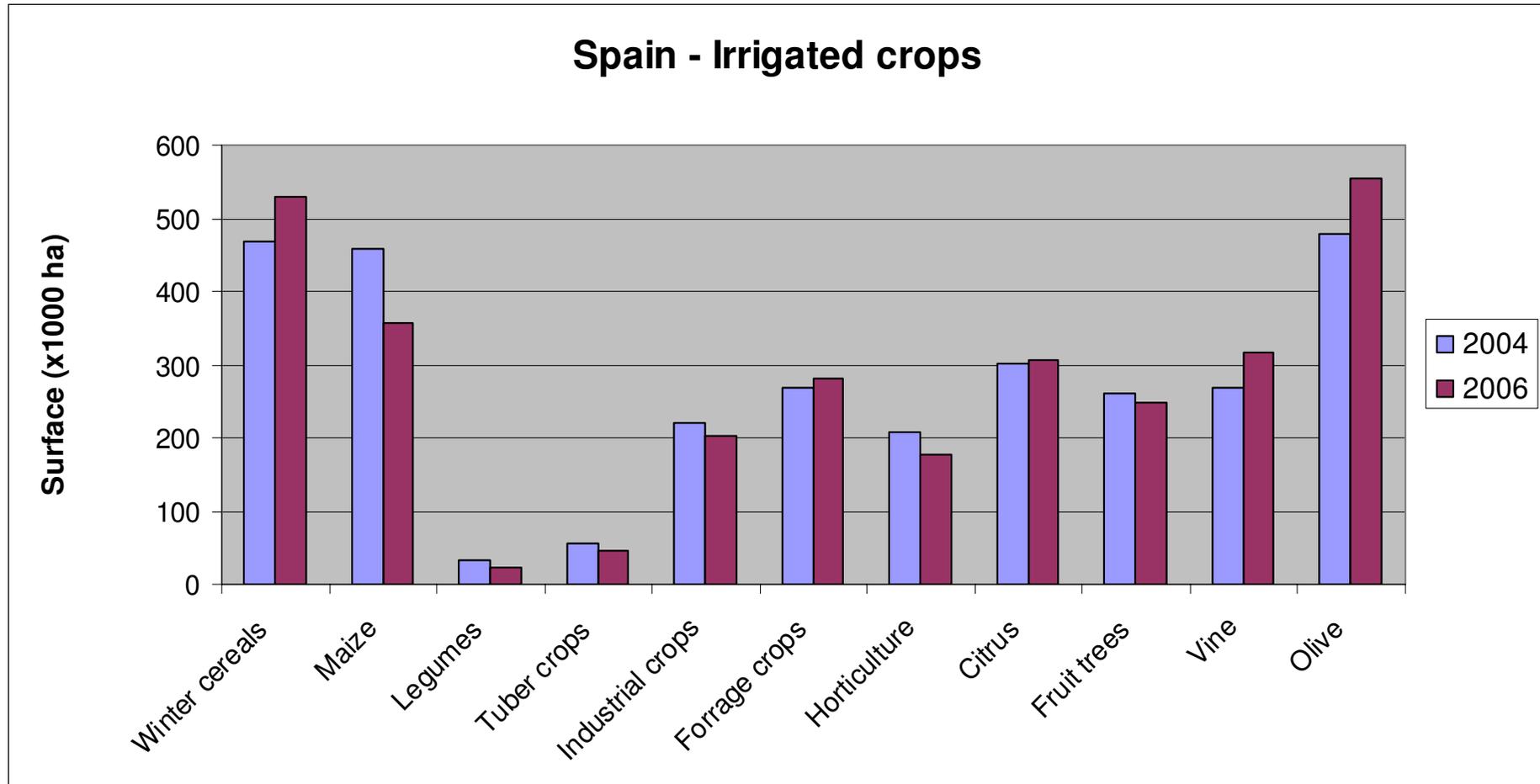
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THE EU COMMON AGRICULTURAL POLICY (CAP)

- Effects on land use and cropping patterns
- Can the CAP reform induce water savings?
- The 'water dimension' of the CAP

Effects of the CAP reform: Changes in crop surface



Source: Data from MAPA (2007)

REGIONAL DISTRIBUTION OF CAP DIRECTPAYMENTS 2006 (M €)



Source: MAPA 2007

The Common Agricultural Policy: effects on water use

POLICY		POLICY OBJECTIVE	POLICY INSTRUMENT	ENVIRONMENTAL EFFECTS	SOCIETAL EFFECTS
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CROSS COMPLIANCE IN THE CAP 2003

ANEX IV Good Agricultural and Environmental Conditions	ANEX III STATUTORY MANAGEMENT REQUIREMENTS EU Directives	
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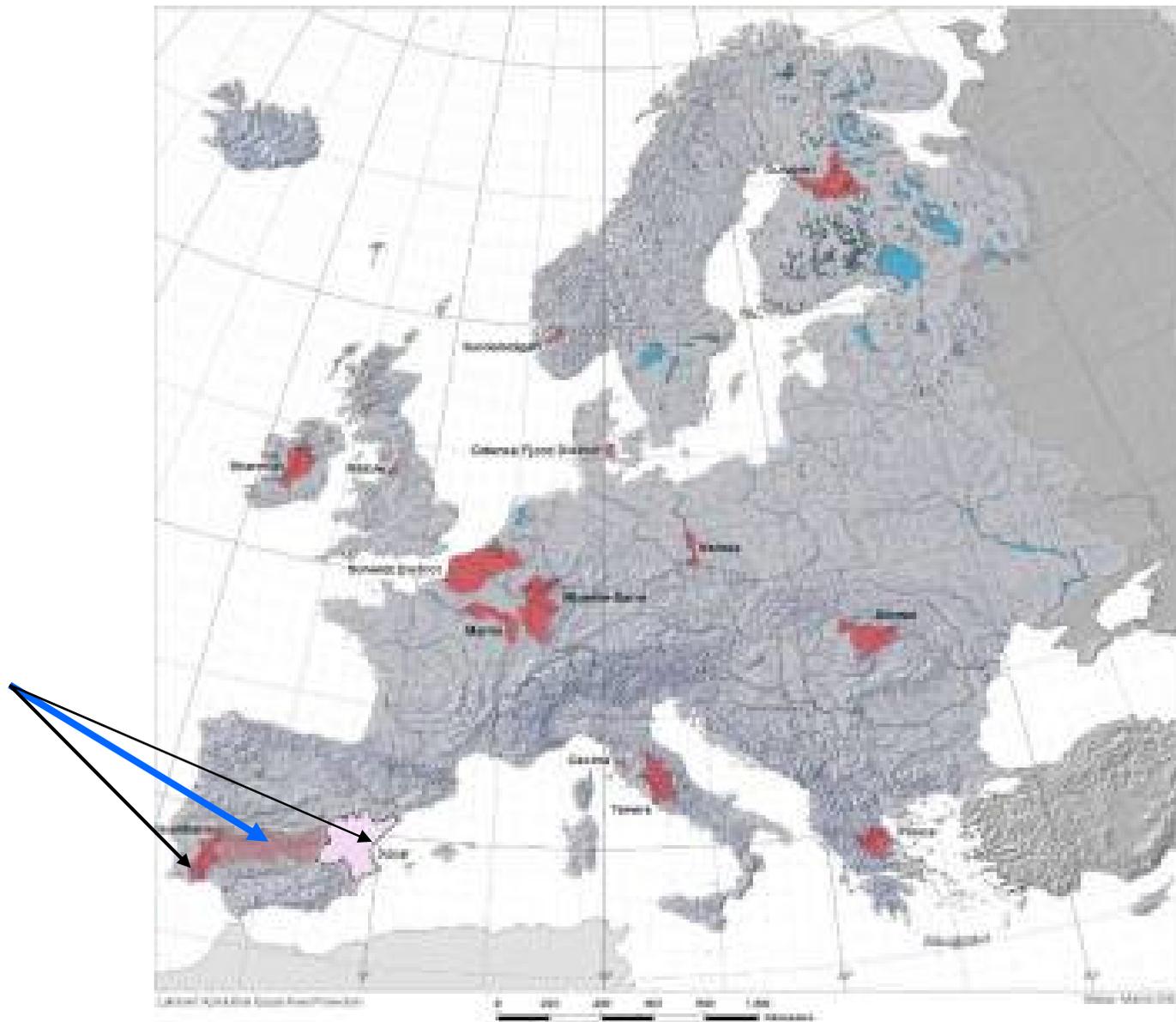
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Down-scaling global policies to regional actions

- **CASE STUDY:**
The Upper Gaudiana Basin, region of Castilla-La Mancha
- **NEWATER** (New approaches to adaptive water management under uncertainty) (2005-2009) www.newwater.info
 - IP, 43 research teams, 18 countries, 7 basins (Europe: Rhine, Elba, Tisza, Guadiana. Africa: Nile, Orange. Asia: Amuradya)

integrated and adaptive water resources management, multidisciplinary perspective (ecological, economic, social institutional), stakeholder participatory process

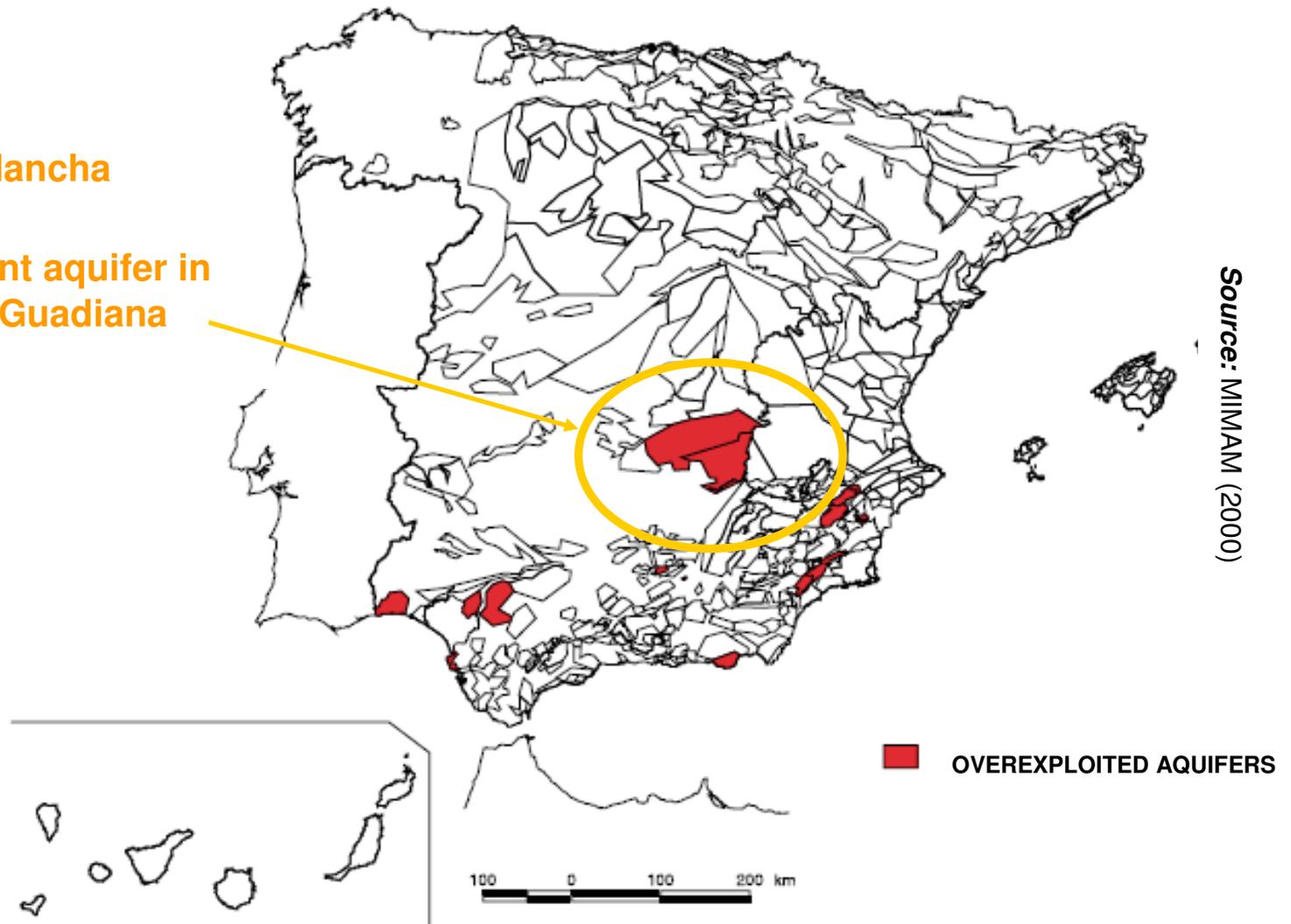
The WFD Pilot Basins



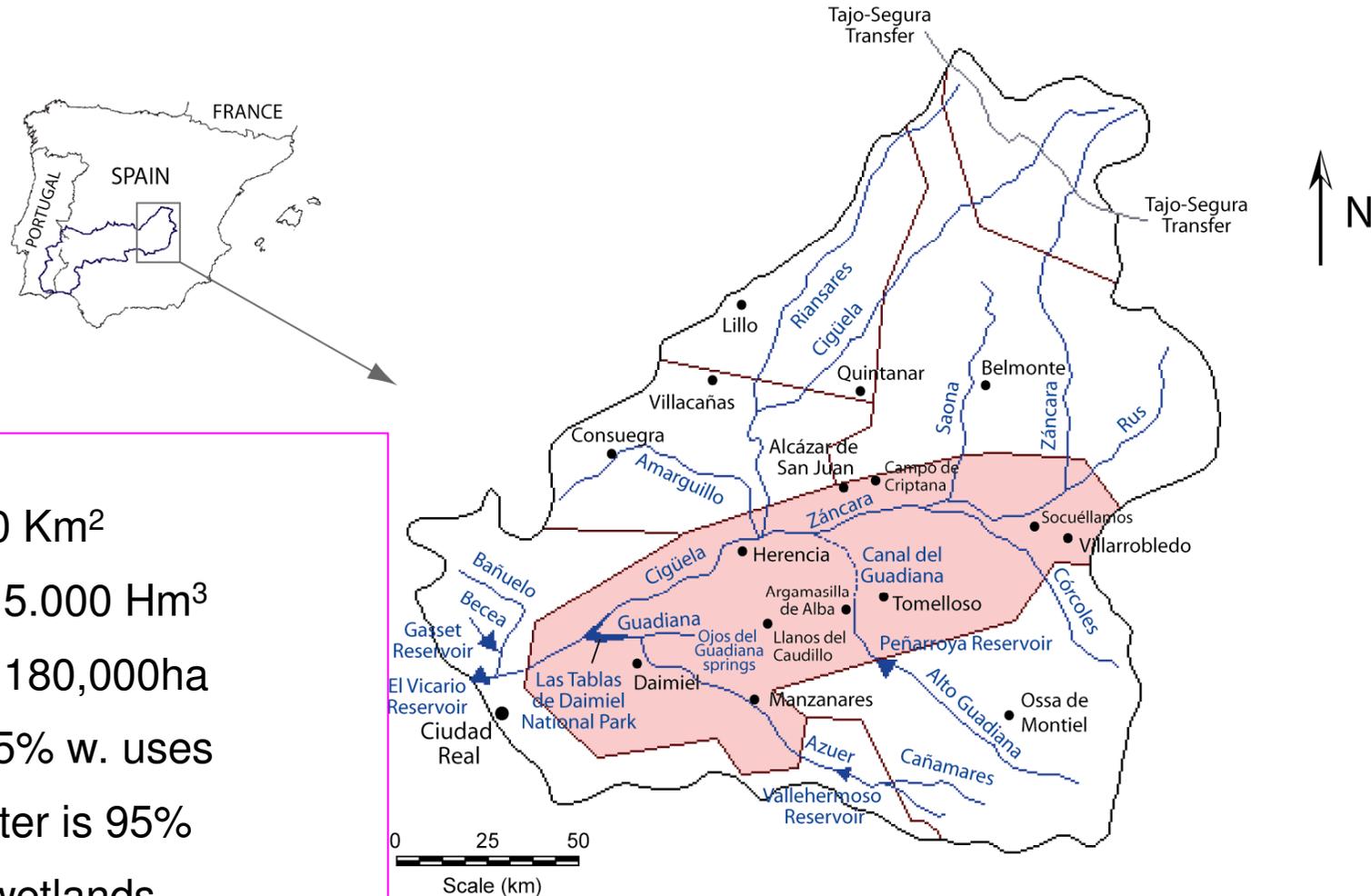
Groundwater overexploitation in the Upper Guadiana basin

- ecosystem / socio-economic sustainability ??

Western La Mancha
Aquifer:
most important aquifer in
the Upper Guadiana
Basin



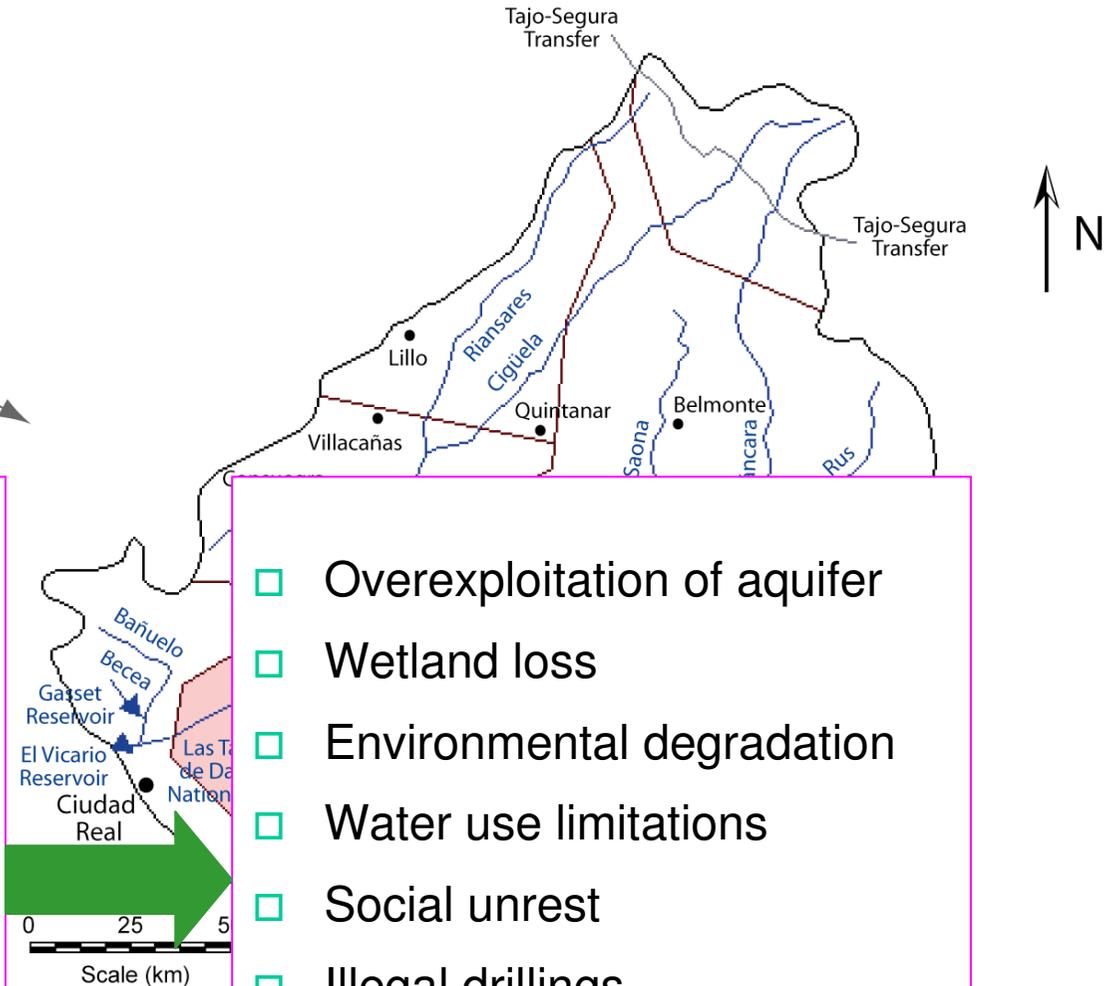
AREA OF STUDY: The Western La Mancha Aquifer (Upper Guadiana River Basin)



- Area: 5.500 Km²
- Capacity: 15.000 Hm³
- Irrigation ± 180,000ha
- Irrigation 95% w. uses
- Ground water is 95%
- RAMSAR wetlands
- UNESCO biosphere reserve
- Irrigation-based development

Fuente: Martínez Santos P., Llamas R. (2005)

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



“TABLAS DE DAIMIEL” NATIONAL PARK (Ramsar Wetlands)



The policy context in the Upper Guadiana basin:

- **Policy context Actions taken one objective and 2 instruments**
 - **National Policy:** Water Management Regime (Water use restrictions) (1991.....)
 - Water Quotas **compulsory**
 - **EU policy:** CAP Agri-Environmental Program Income compensation for reducing water use (1993 ...2007)
 - Water Quotas + Income compensation **Voluntary**
- **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)

The policy context: centralized management

Water policies have not been capable to attain water conservation targets

– Water abstraction Plan (National Policy, 1991)

- Water quotas: reduction from 5000 to 2000 m³/ha
- Compulsory
- No compensation of income loss

- Unsuccessful
- Social unrest
- Farmers' litigations

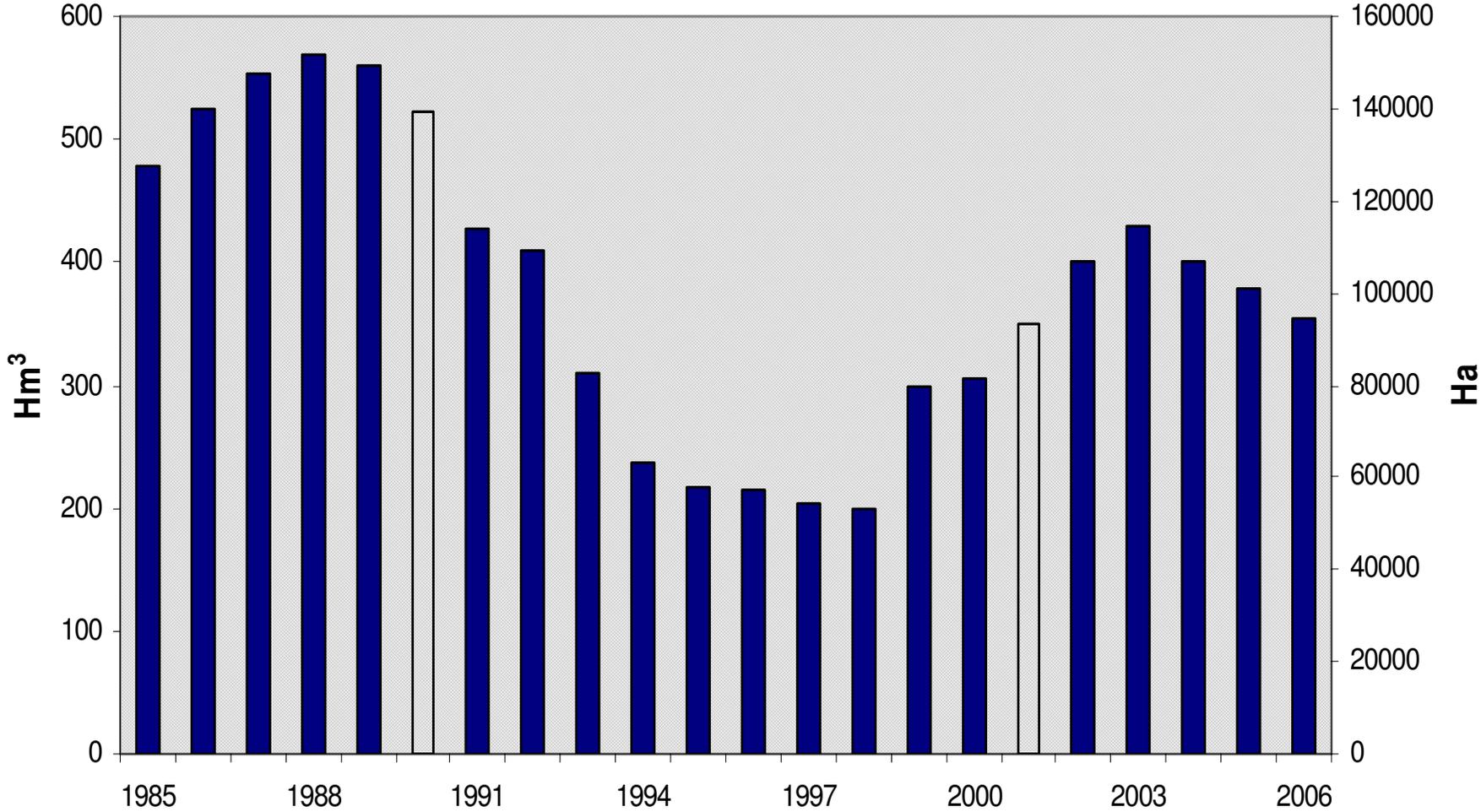
– Agri-Environmental Program (CAP, 1993.....)

- Water quotas: % reduction (50-70 to 100%)
- Voluntary
- Compensation of income loss

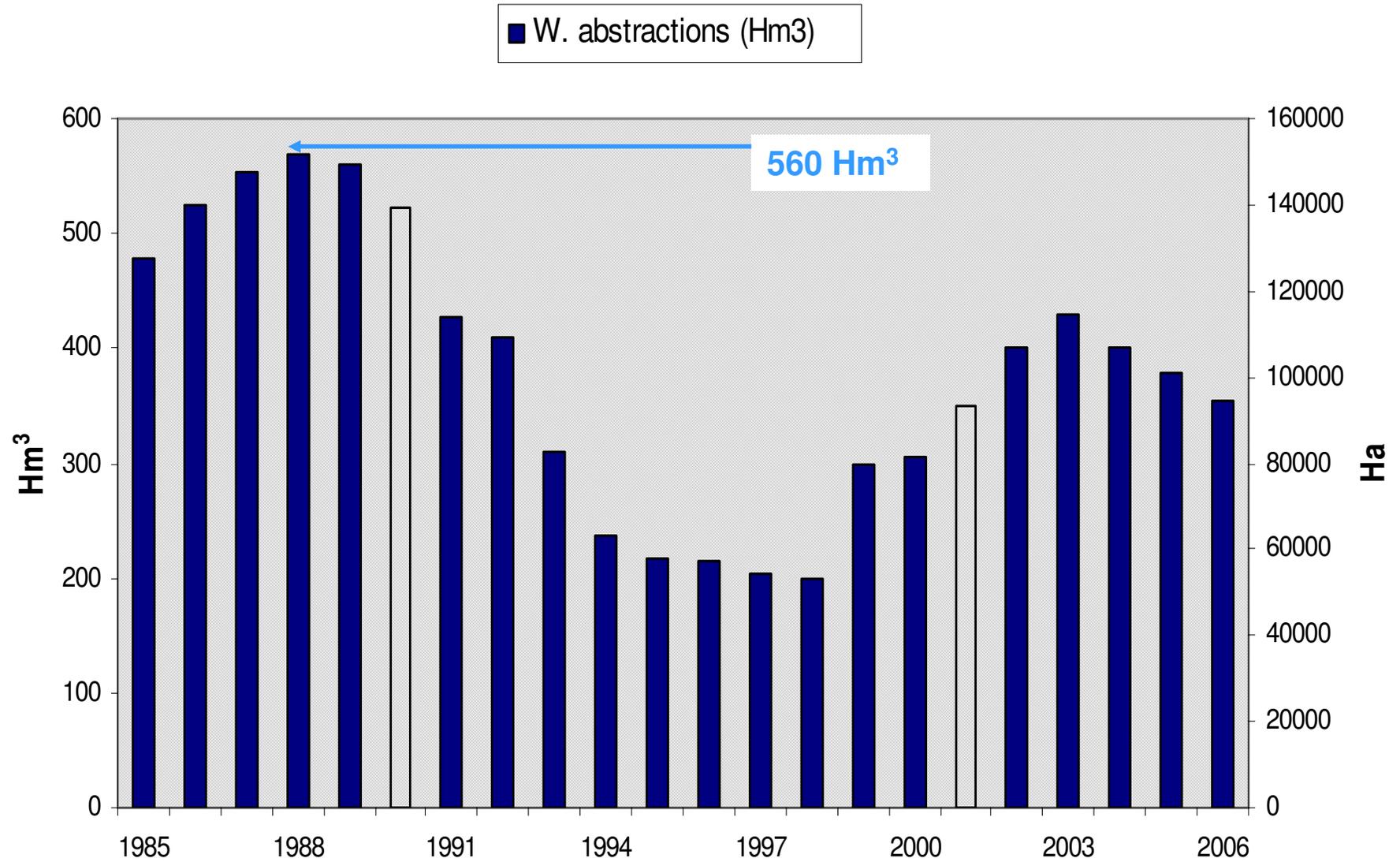
- Highly successful
- Reduction of social conflicts
- Low cost-effectiveness

Water abstractions and irrigated surface in the UGB

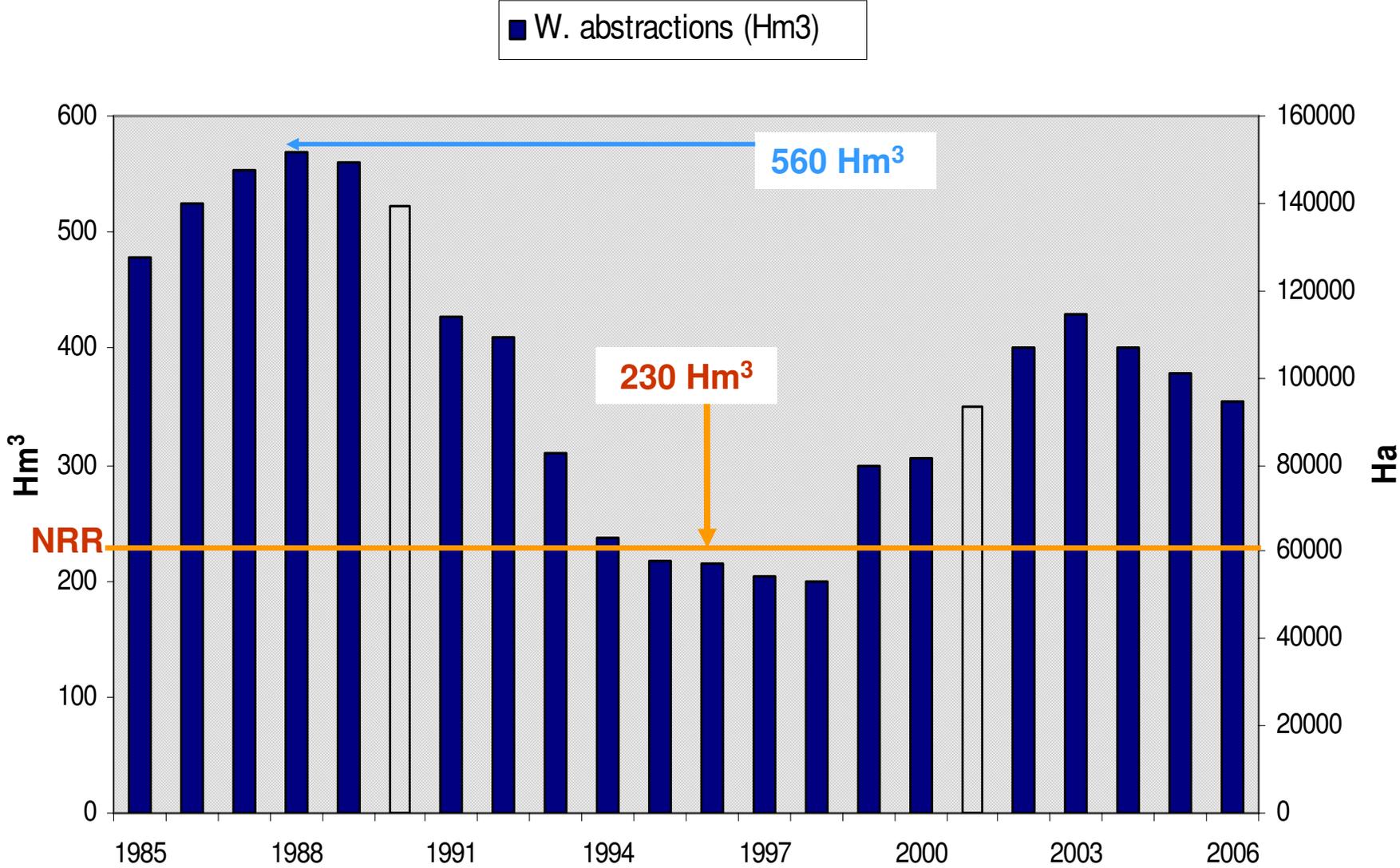
■ W. abstractions (Hm3)



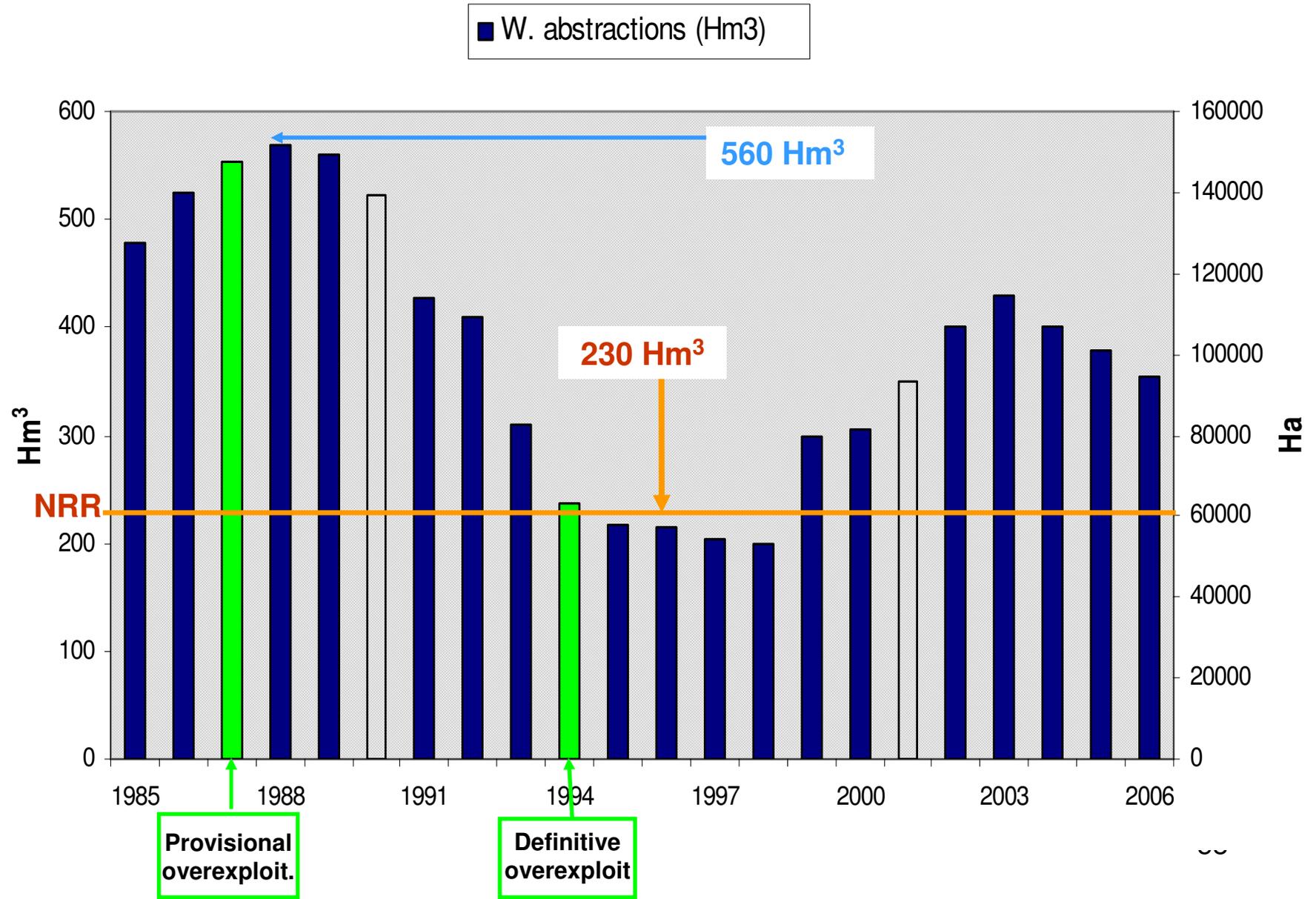
Water abstractions and irrigated surface in the UGB



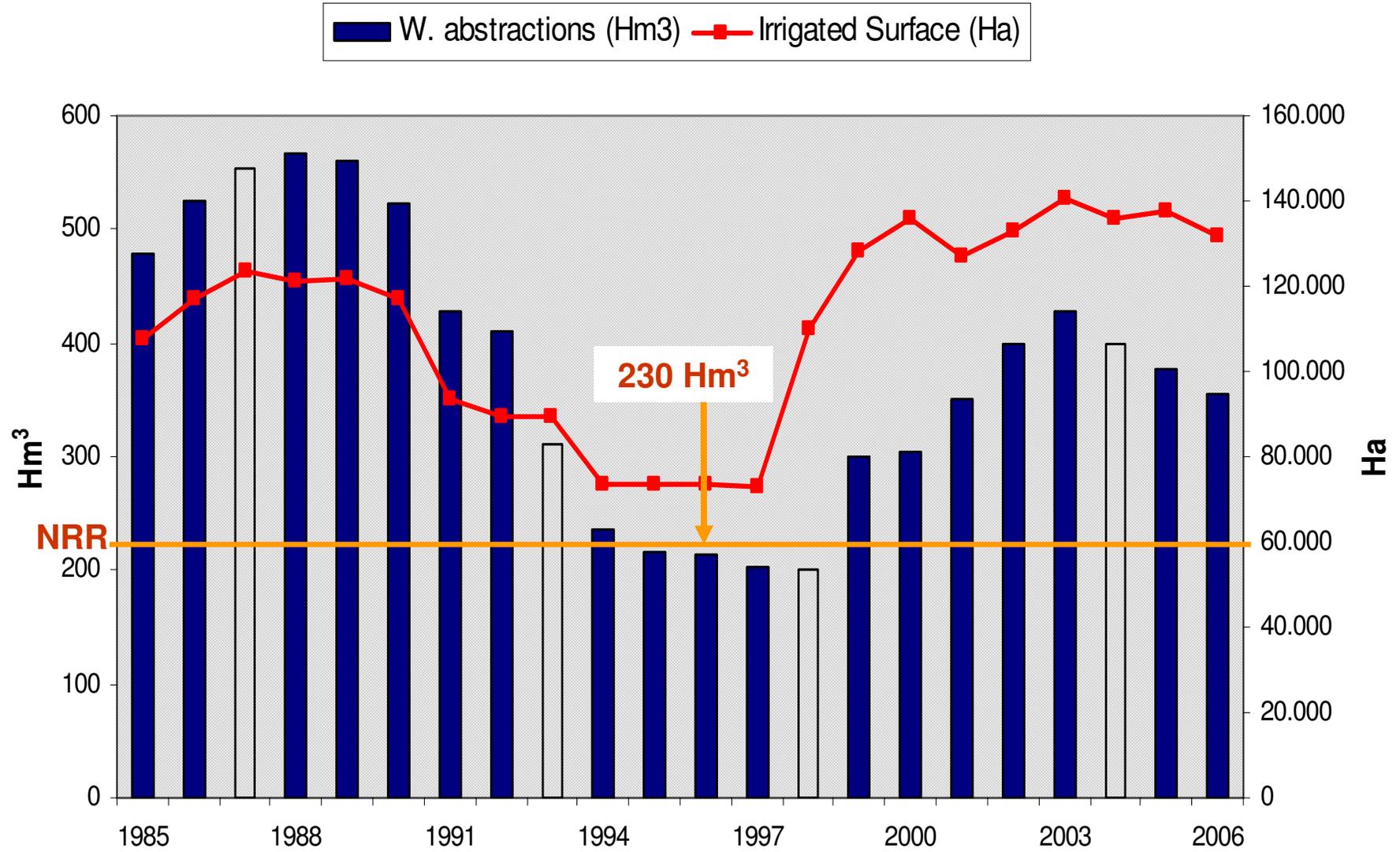
Water abstractions and irrigated surface in the UGB



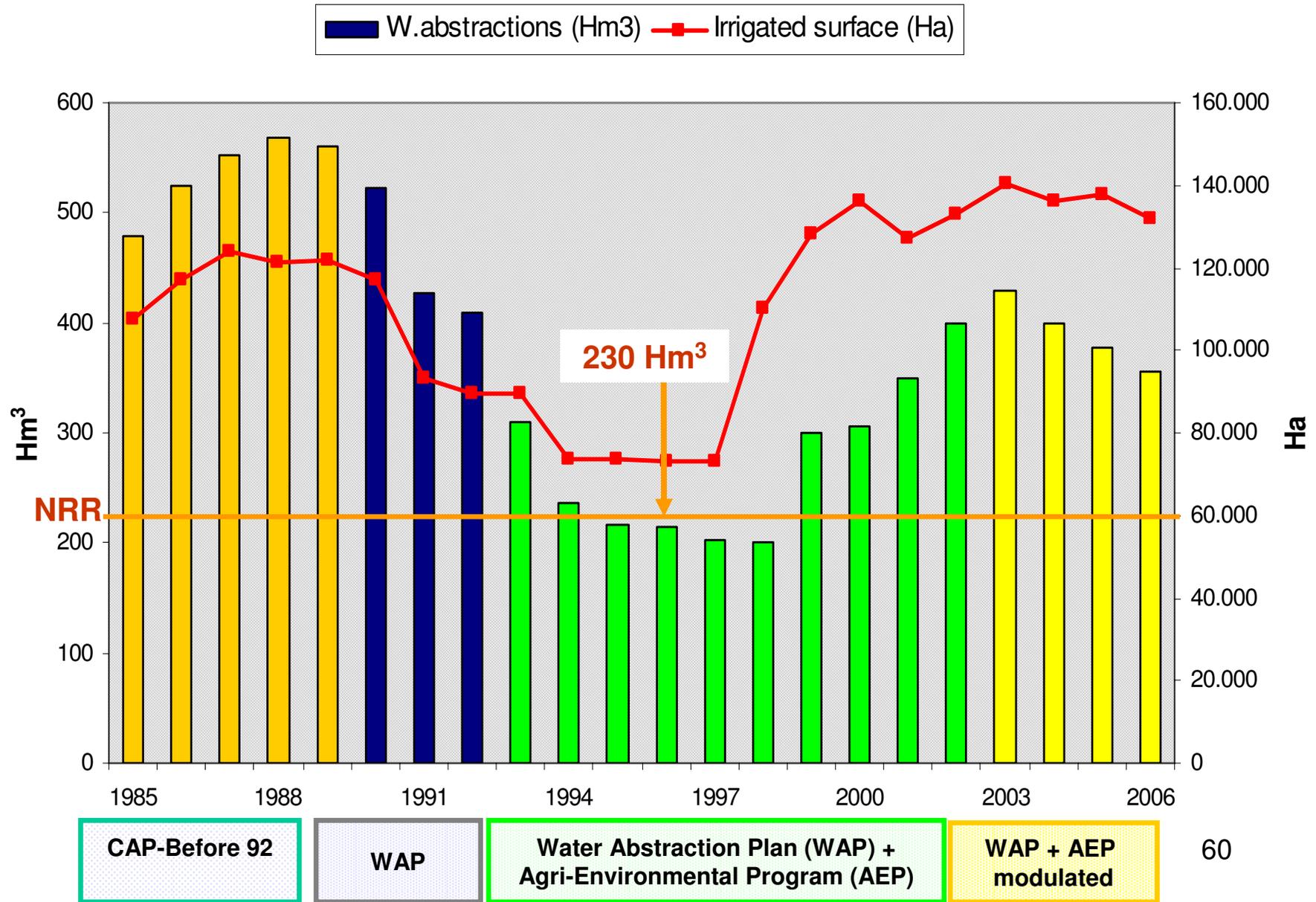
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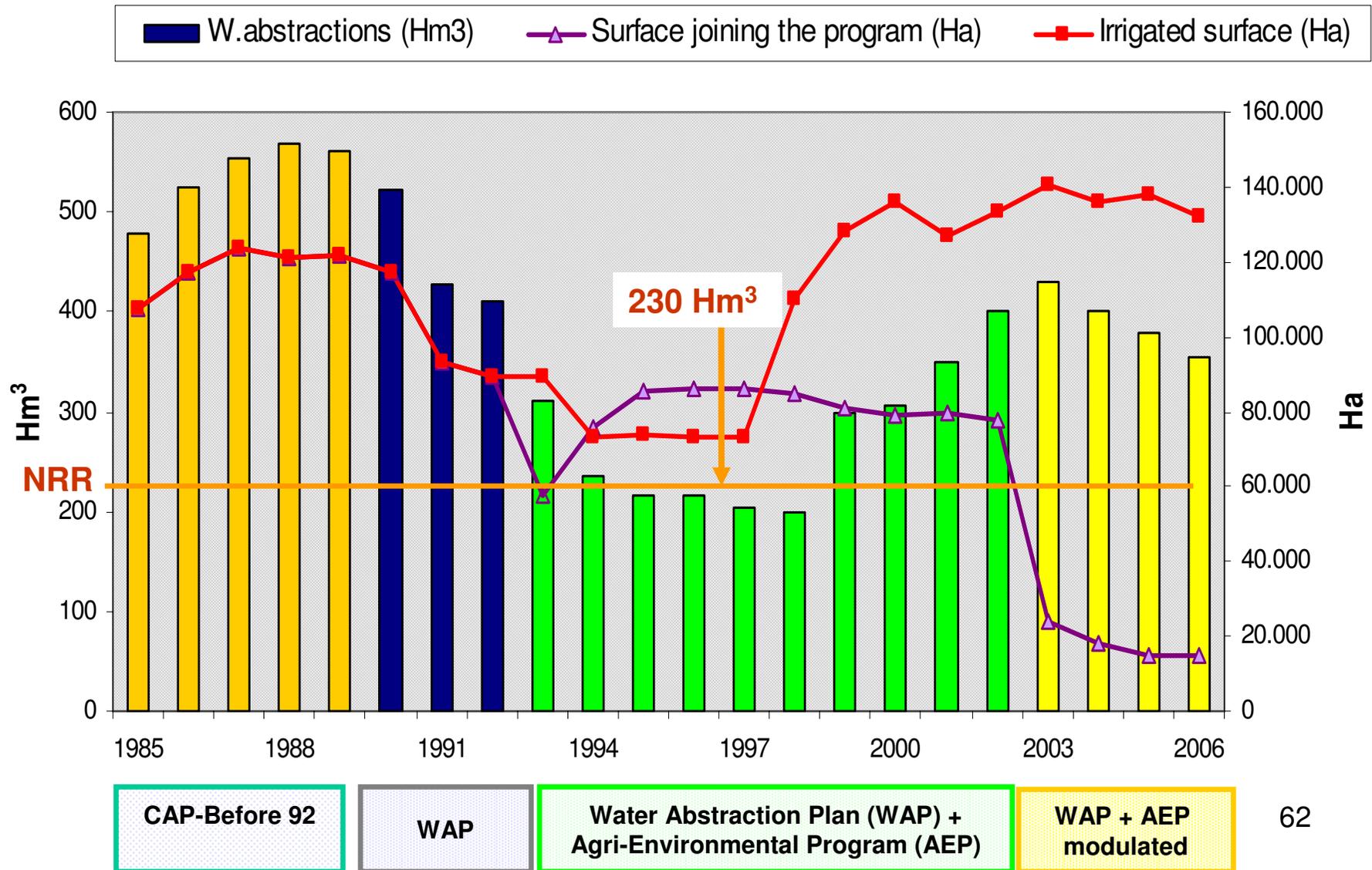
Water abstractions and irrigated surface in the UGB



Evolution of the EU income compensation program in the Upper Guadiana basin (1993-2006)

Level of Water consumption reduction	Compensation payments €/ha			
	1993	1997	2001	2003 ...2006 modulation
50%	156	164	179	1-40 ha 209 40-80 ha 125 > 80 ha 63
70%	258	271	296	
100%	360	379	414	1-40 ha 518 40-80 ha 311 > 80 ha 155

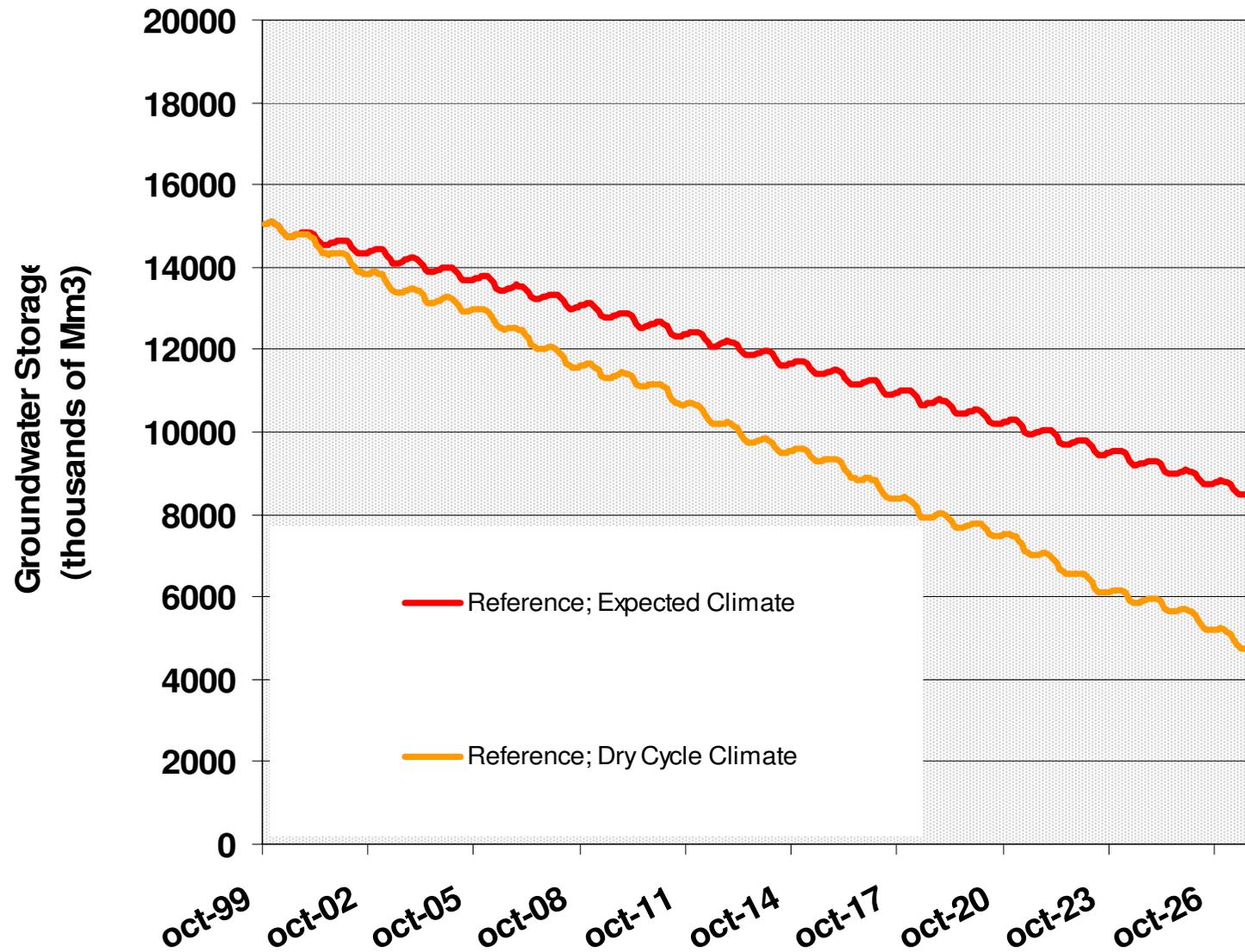
Water abstractions and irrigated surface in the UGB



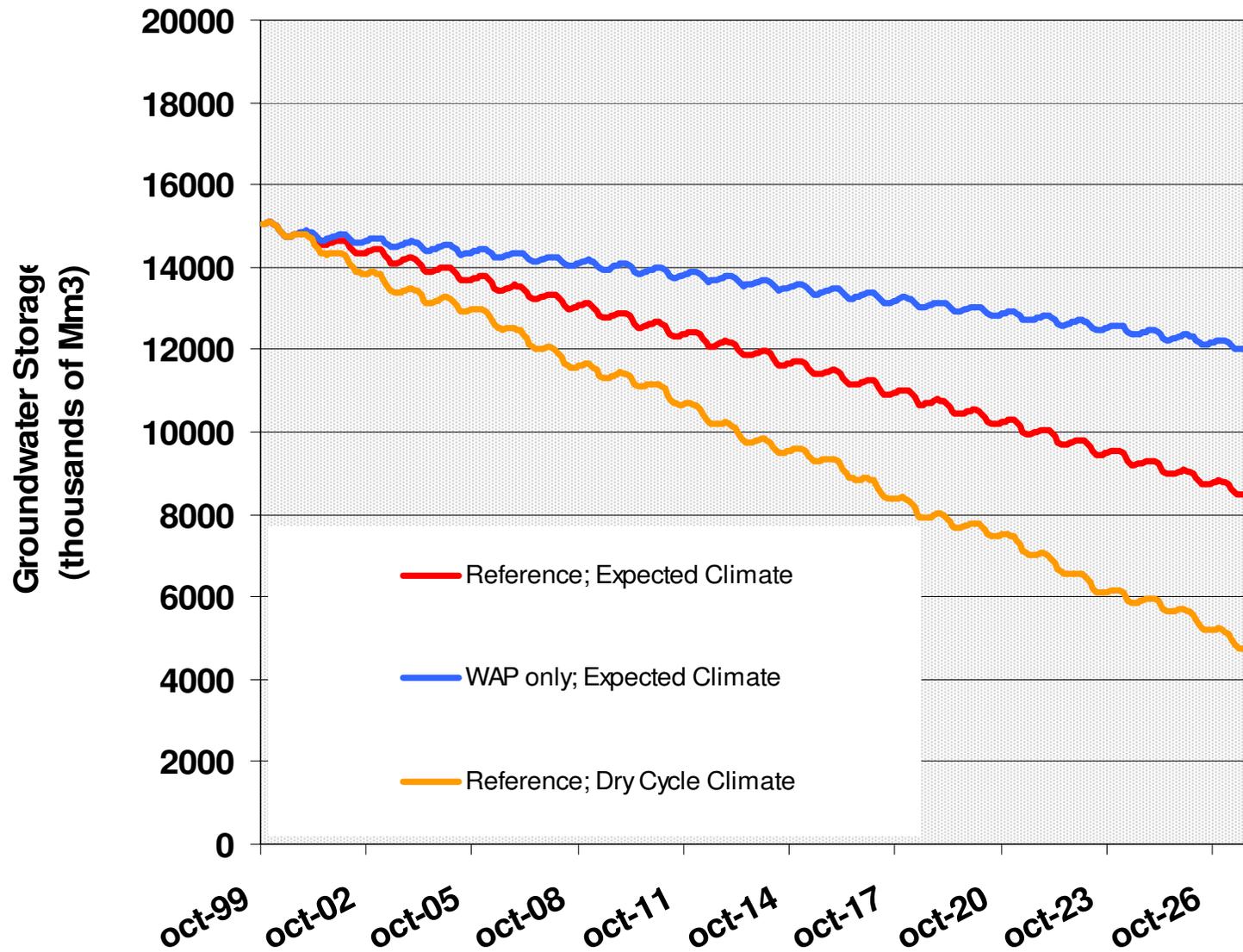
Case study results

- **The NEWATER project**
 - Integration of an economic - hydrology modeling
- **The CAP programs**
 - -AEP compensation: 0.16 – 0.20 €/m³
 - -W dual value: 0.87
- **PEAG - (Special Plan of the Upper Guadiana) (2007....2027)**
(5,000 M €)
 - W savings . 272 Mm³
 - Purchase of water rights (Water rights Exchange Center)
 - closing up illegal wells
 - legalization of illegal wells
 - other measures: forestation , rainfed farming...
- Projections to 2027 the aquifer's recovery path

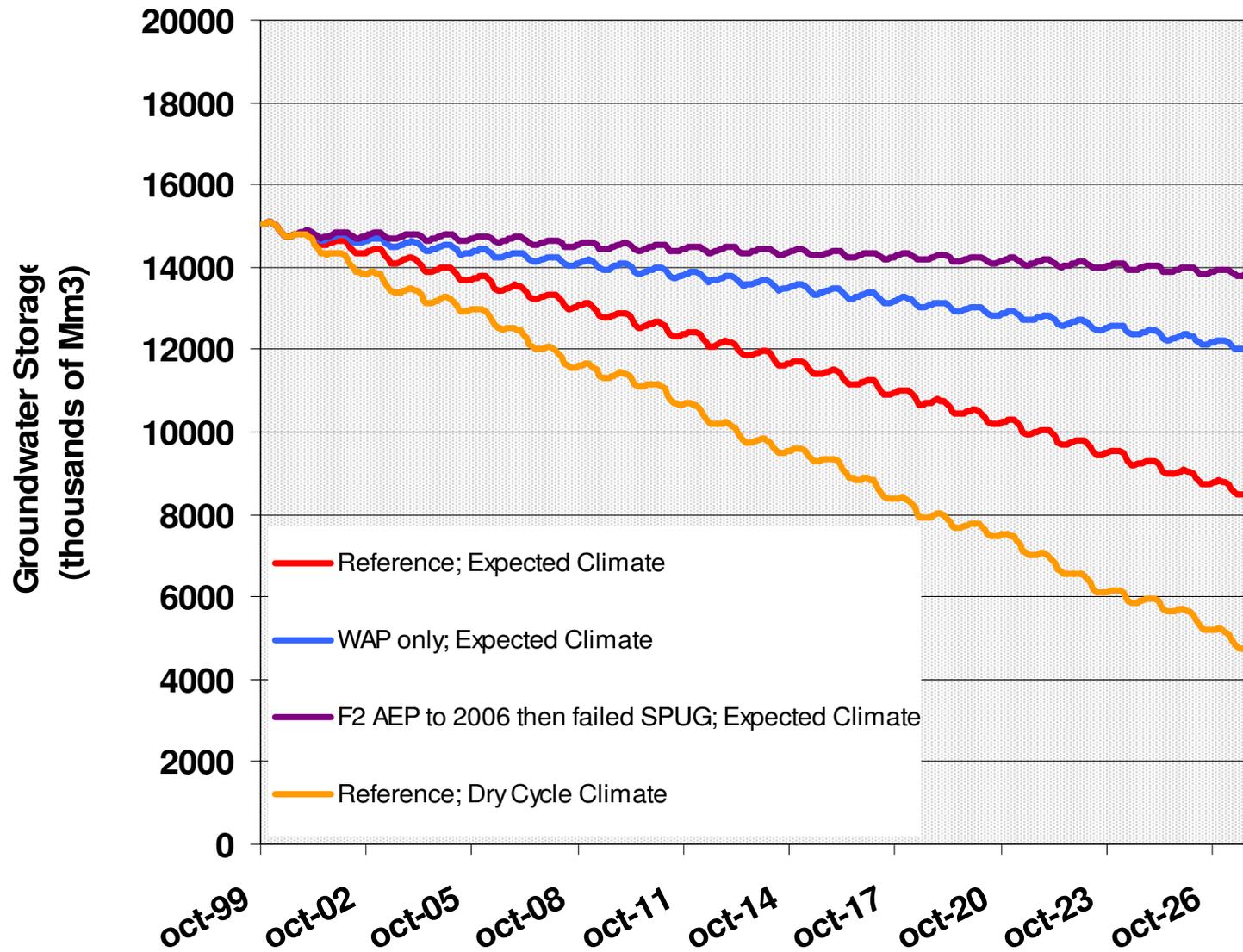
WEAP Model: Groundwater storage



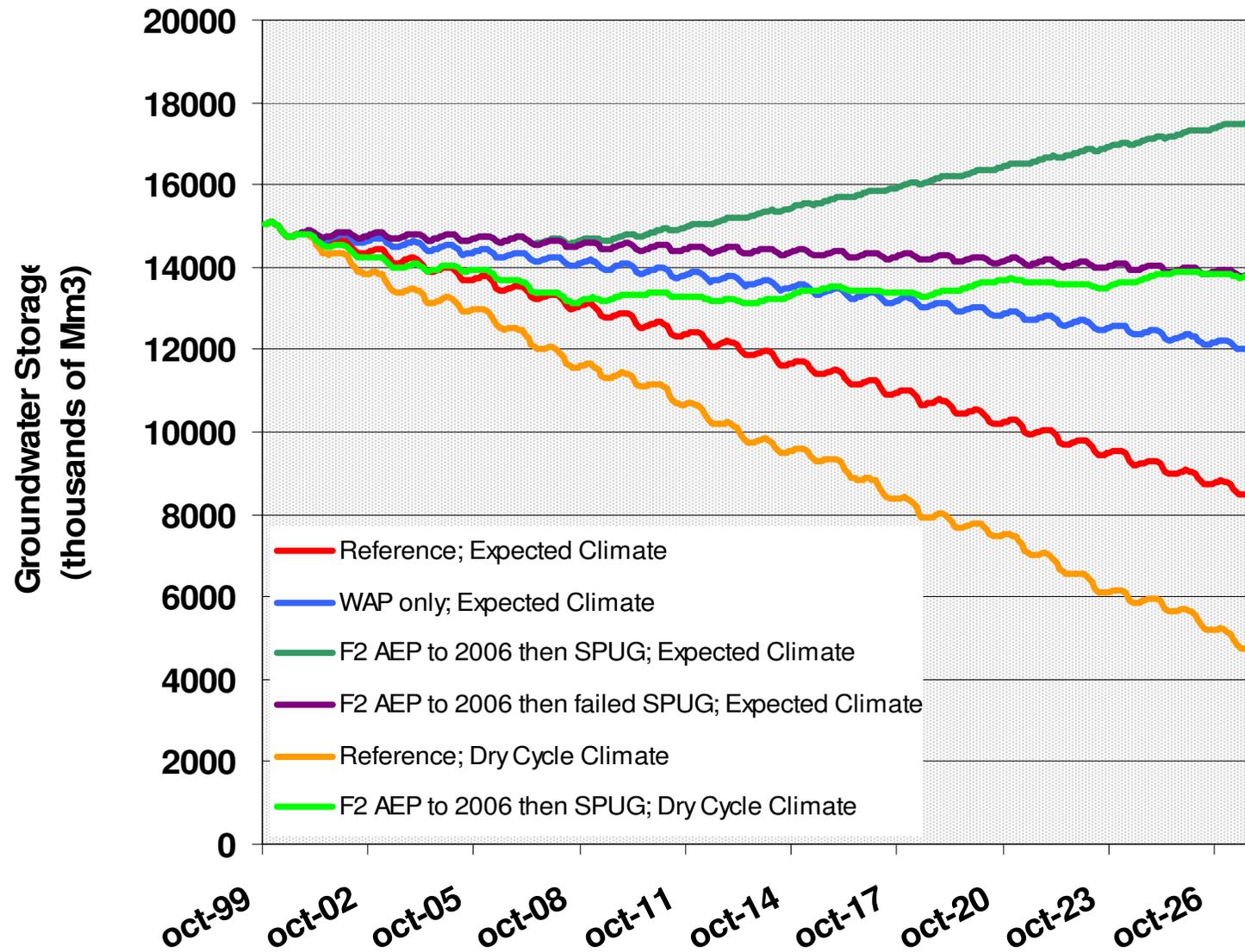
WEAP Model: Groundwater storage



WEAP Model: Groundwater storage



WEAP Model: Groundwater storage



CONCLUSIONS

- Spain has an added difficulty adapting to quality-driven EU water policies
 - public participation and stakeholder involvement may help (RBMP)
 - adaptation of RBA
- Irrigation modernization will not attain water savings unless institutional development comes in (w.rights exchanges...)
- Encourage new more flexible water demand instruments: water rights exchanges, purchase of WR

CONCLUSIONS

- CAP and water:
 - Crop shift, water use may not change
 - Tendency to reinforce environmental requirements
 - The future reform: Include water management and CC
- Approximation of CAP and WFD

- Policy integration and cohesion:
 - administrative coordination
 - enforcement, legitimization, credibility
 - public transparency and participation

THANK YOU FOR YOUR IDEAS AT THE RF!