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Lessons for Spain: a critical assessment of the role of science and society

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Lesson 1 The agricultural sector is the cornerstone of water policy

As a practical approach, irrigation is crucial:

- Quantitatively
- For drought management
- For the implementation of the EU WFD
(least cost means to achieve good
ecological status by 2015?)

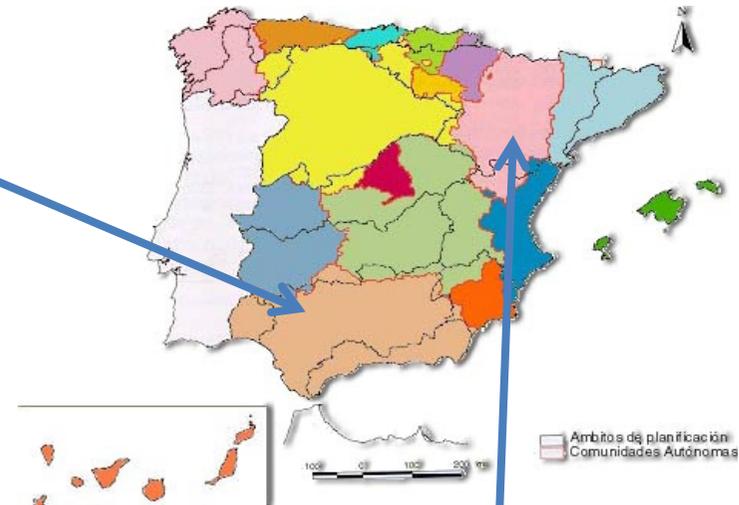
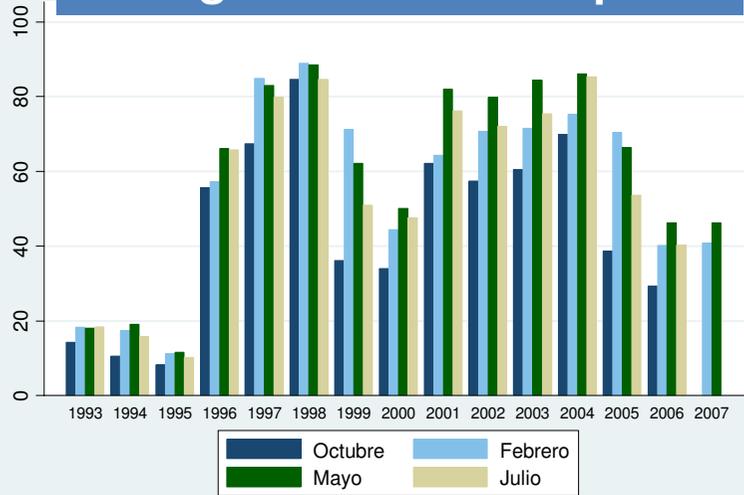
LESSON 1 – Irrigation is the cornerstone of water policy in Spain

ACs	Agriculture	Total Uses Mm ³
Andalusia	89.8%	6,077
Aragon	96.4%	2,992
Castile Leon	91.4%	2,471
Castile La Mancha	93.3%	2,471
Catalonia	73.8%	2,118
Valencia	87.4%	2,718
Extremadura	95.4%	2,822
Galicia	13.3%	1,648
Madrid	22.6%	264
Murcia	80.6%	663
Rest of ACs	33.3%	2,766
Spain	84.4%	23,853

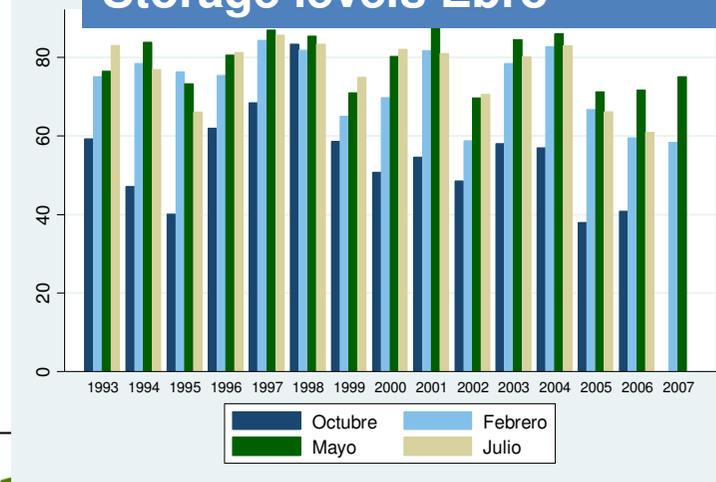


LESSON 1 – Irrigation is the cornerstone of water policy in Spain

Storage levels Guadalquivir

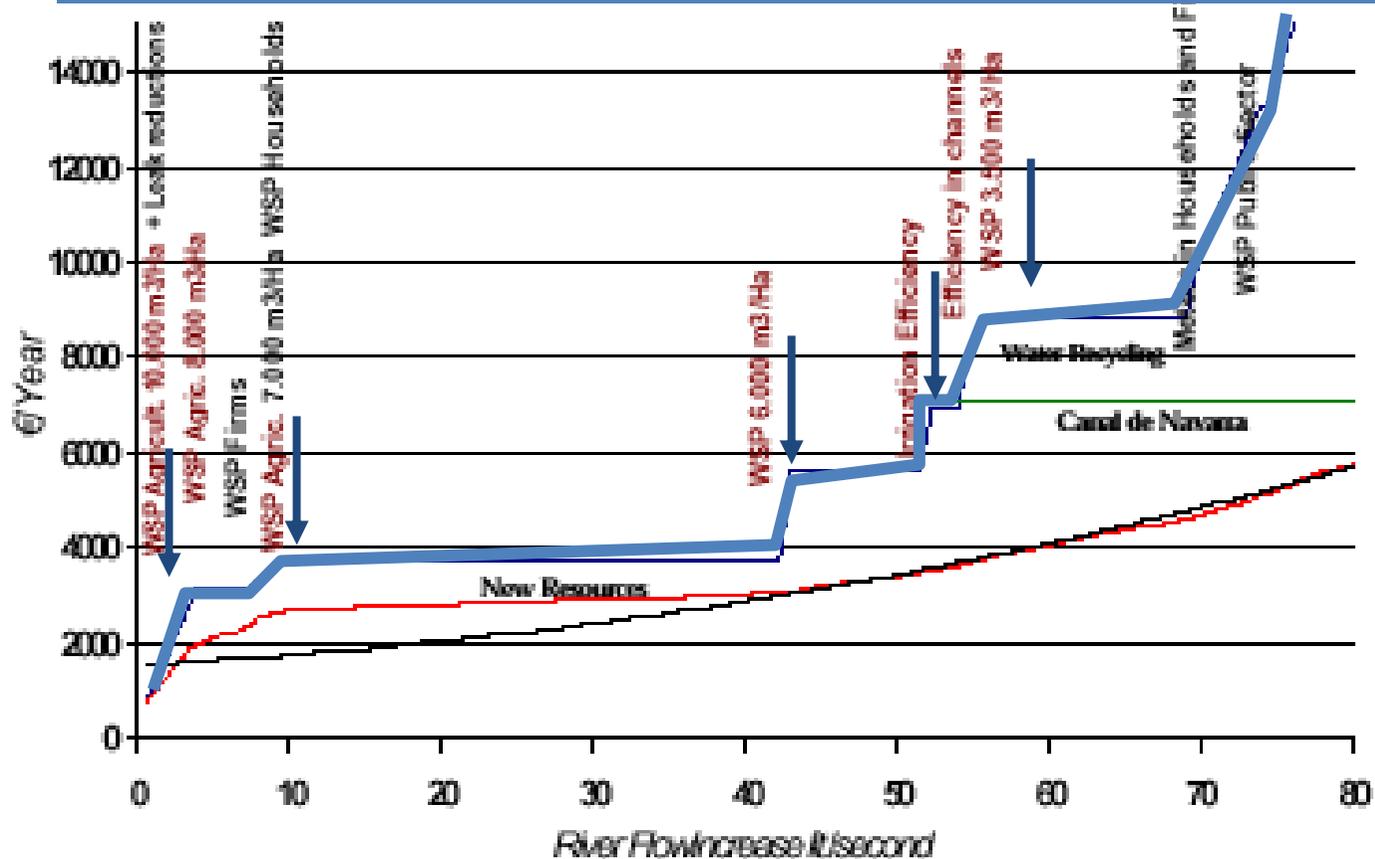


Storage levels Ebro



LESSON 1 – Irrigation is the cornerstone of water policy in Spain

Marginal and average cost of increasing river flows

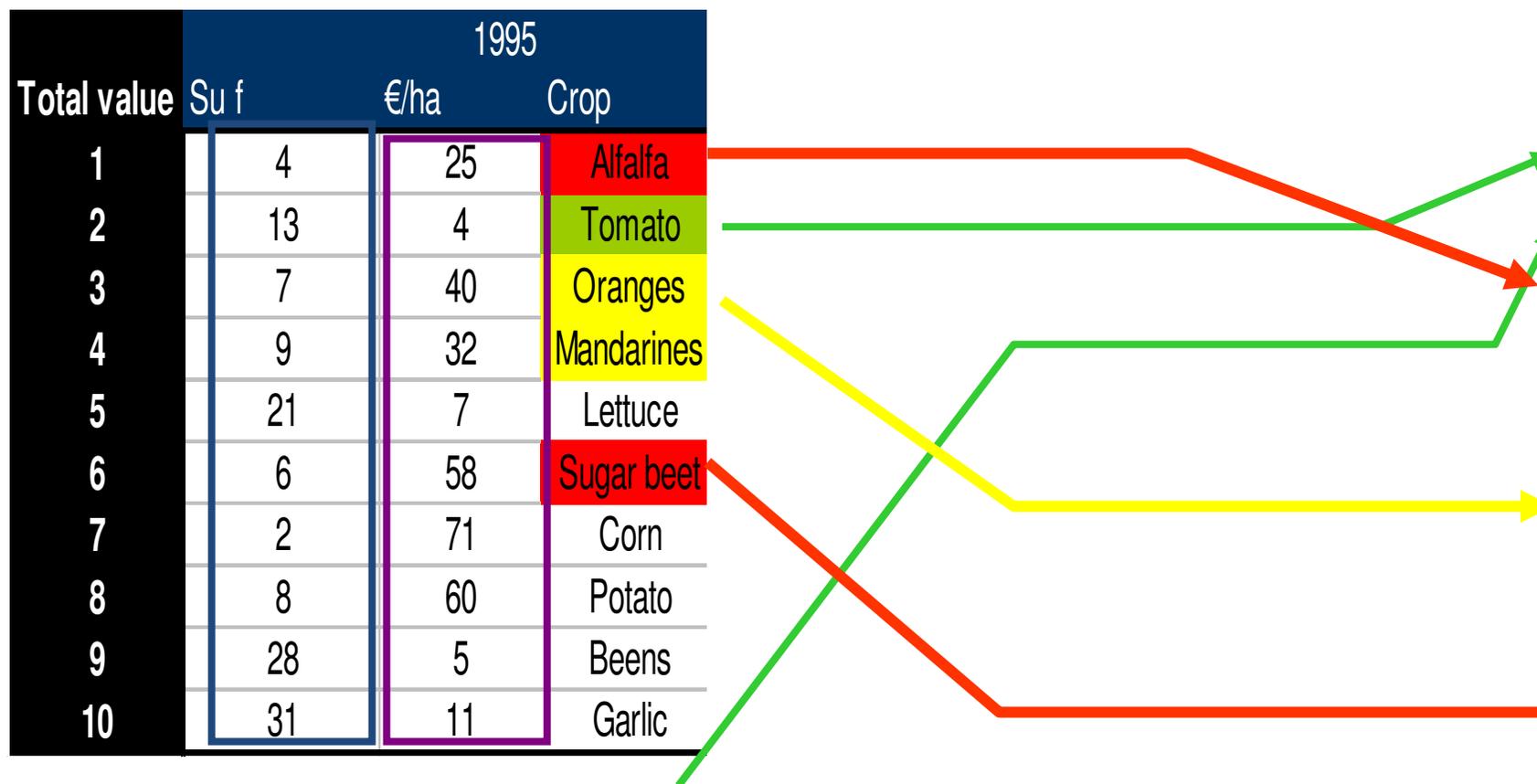


Lesson 2 Let growers' be driven by Commodity markets

- Changes in cropping patterns
- CAP Decoupling measures of support

Lesson 2 Let growers produce to the markets

Rank of crops in total value, surface and pland productivity
Spain (95 crops)



Lesson 3 Don't expect too much from irrigation in terms of income generation

- Stabilised Farm prices (except cereals,...)
- Growing input prices (fertilizers, fuel, labor,...)
- Intense land-consolidation process
- Intense capitalisation (2006 farm outstading debt €21 billion, from €15 b. in 2004)

Lesson 3 Don't expect too much from irrigation in terms of income generation

Crop production in rainfed, irrigated land and greenhouses
(Measured in constant 2001 billion euros --- 1995-2005)

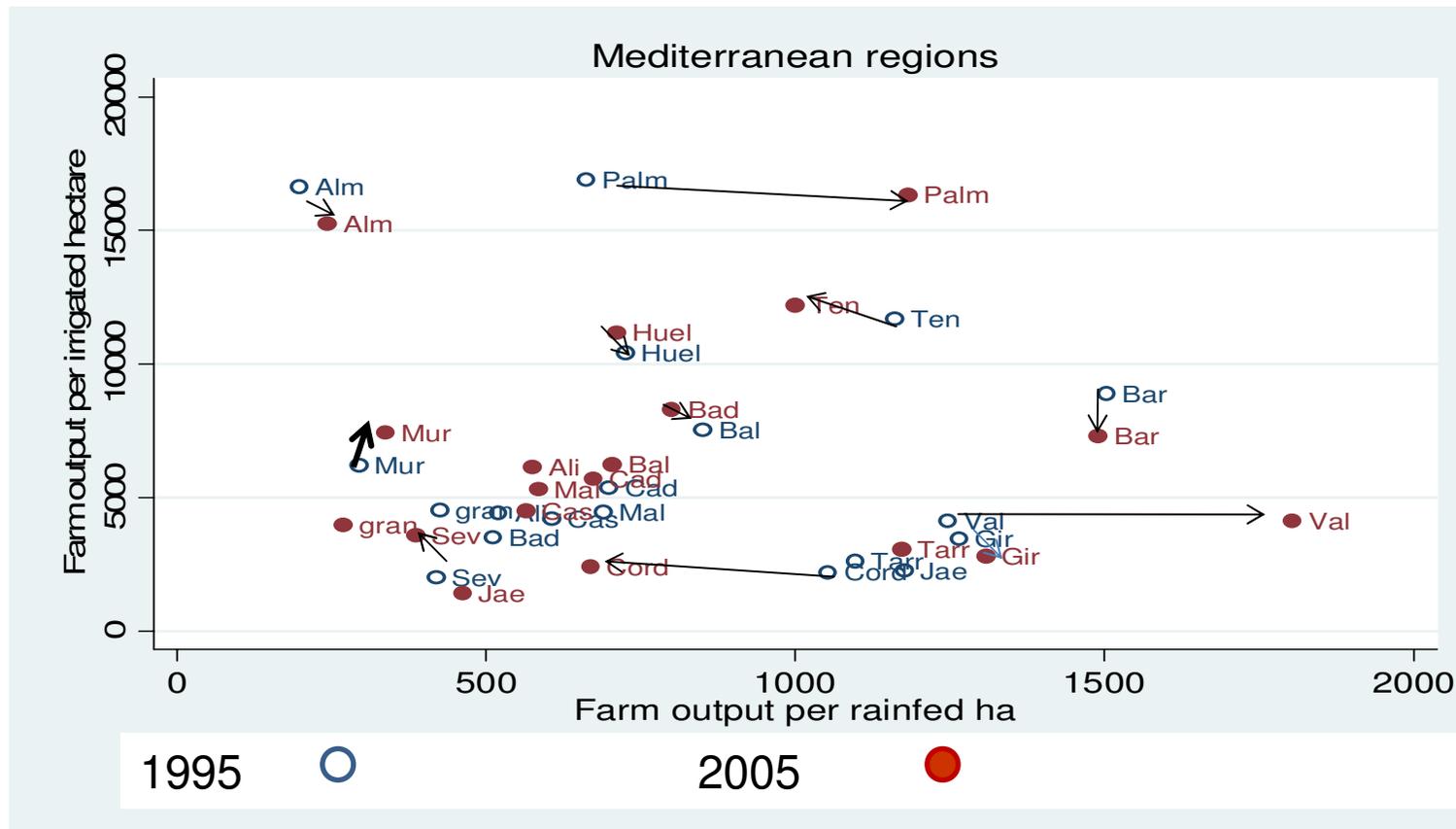


Rainfed
Irrigated land
Greenhouses



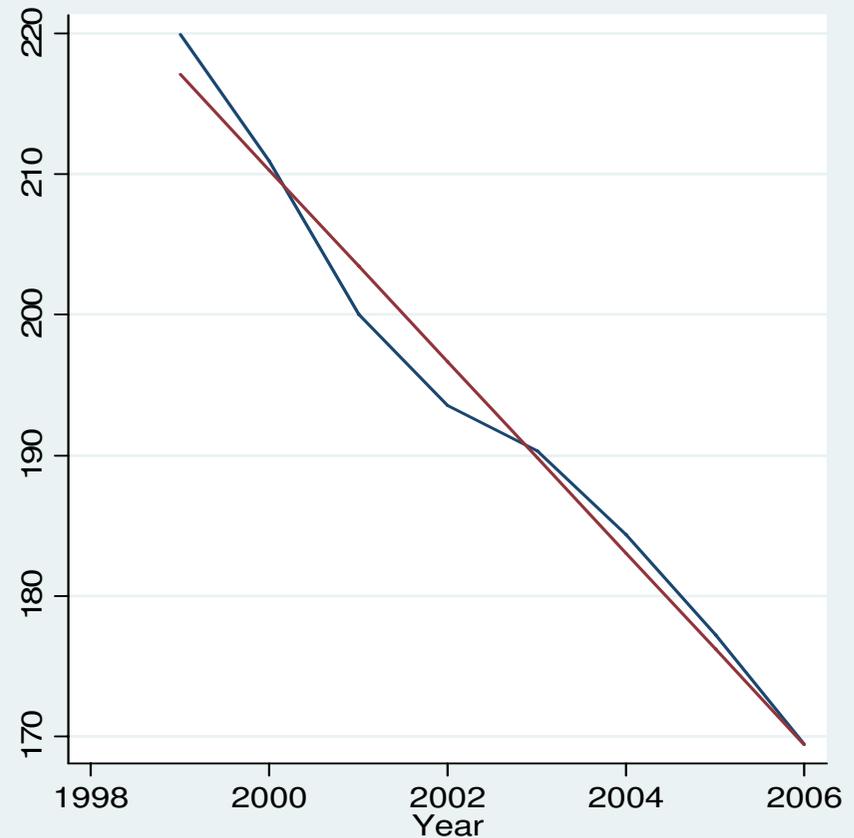
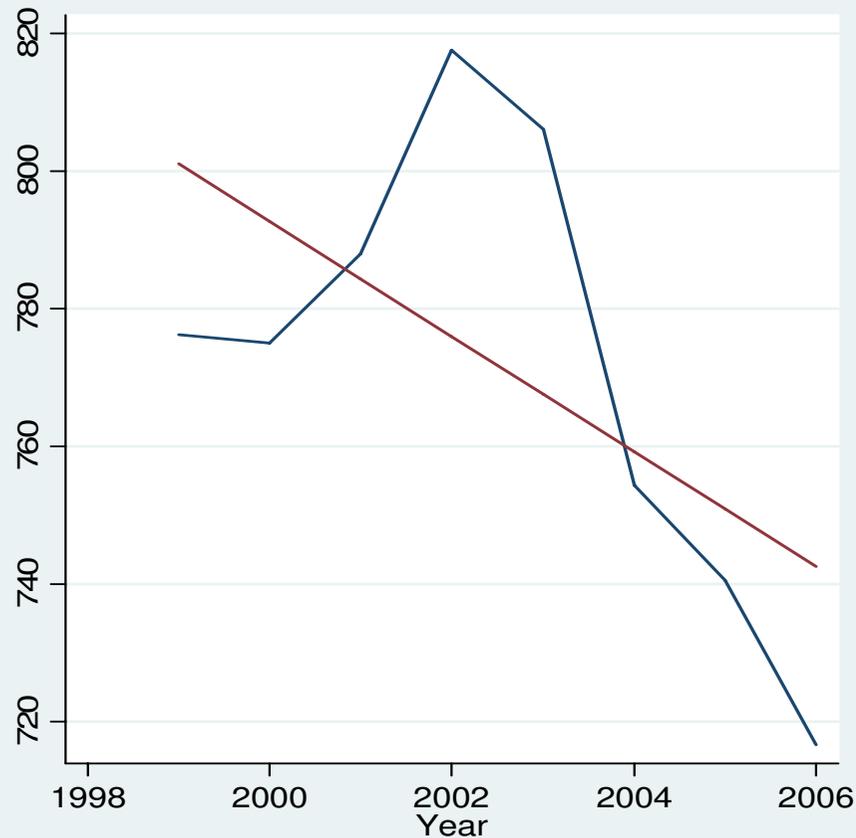
Lesson 3 Don't expect too much from irrigation in terms of income generation in terms of income generation

Provincial changes of land productivity irrigated land vs rainfed region (constant €/ha)



Lesson 3 Don't expect too much from irrigation in terms of income generation

Labor utilisation and farm operators (1000 persons, measured in December each year 1996-2006)



— Contracted farm workers — Tendencia

— Farm owners — Trend

Only 17 provinces

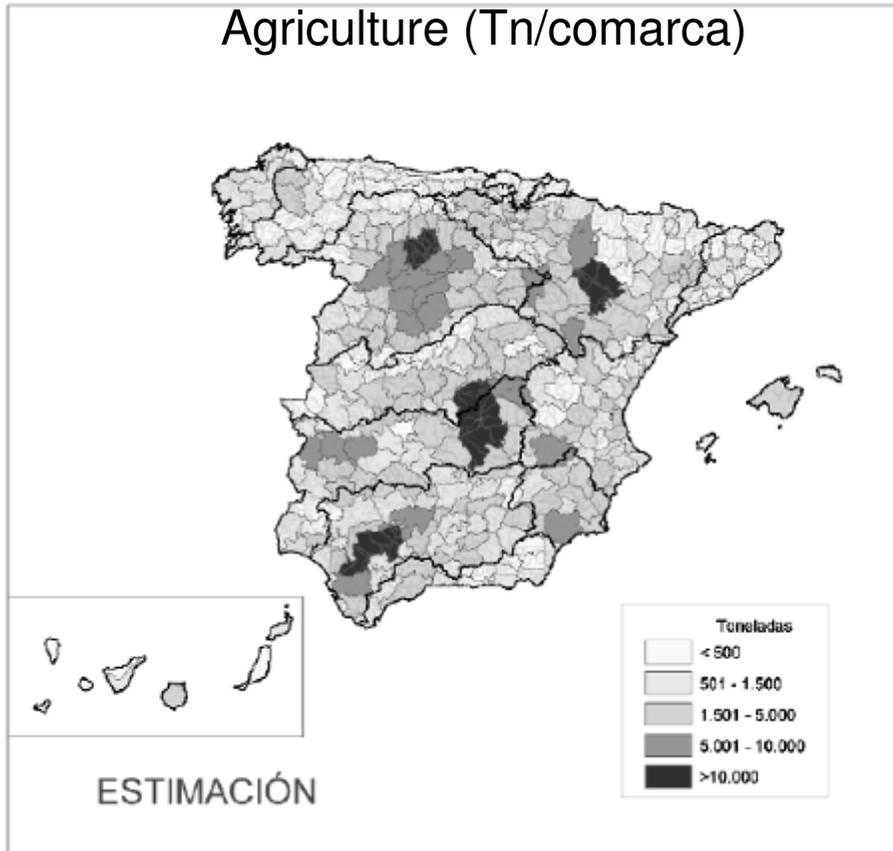
Lesson 4 Focus on non-point pollution

- Use of Nitrogen and other fertilizers
- Livestock density (Spain tops EU pork production)

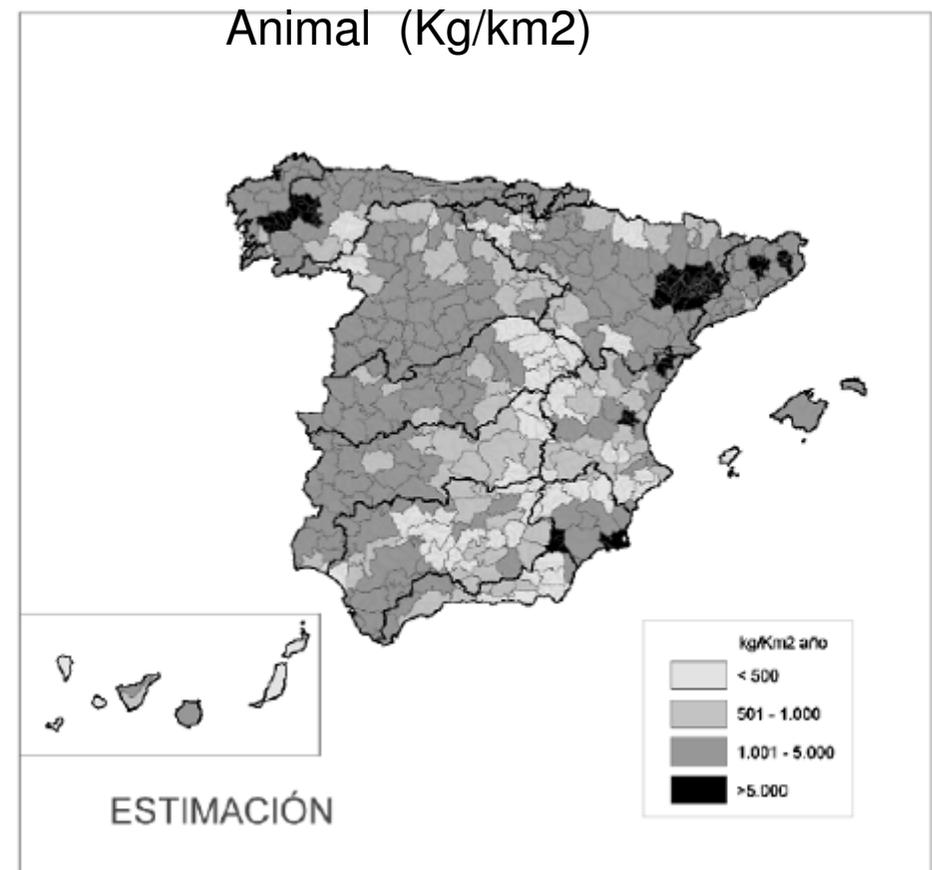
Lesson 4 Focus on non-point pollution

Nitrogen use

Agriculture (Tn/comarca)



Animal (Kg/km²)



Lesson 5. Listen to what scientists have to say

- Yearly growth in papers produced by Spanish scientists 9%.
- Spain is #5 in EU and #9 in world, in number papers
- Spain is #10 (March 2008) in total citations (12 in Sept. 2004)
- Spain in #6 world ranking in agricultural sciences (13 in Geology, 11 in Chemistry, 15 in Engineering)

Lesson 5bis. Stimulate researchers' outreach and popular dissemination

- To reach
 - Gov't agencies
- To work with
 - The private sector

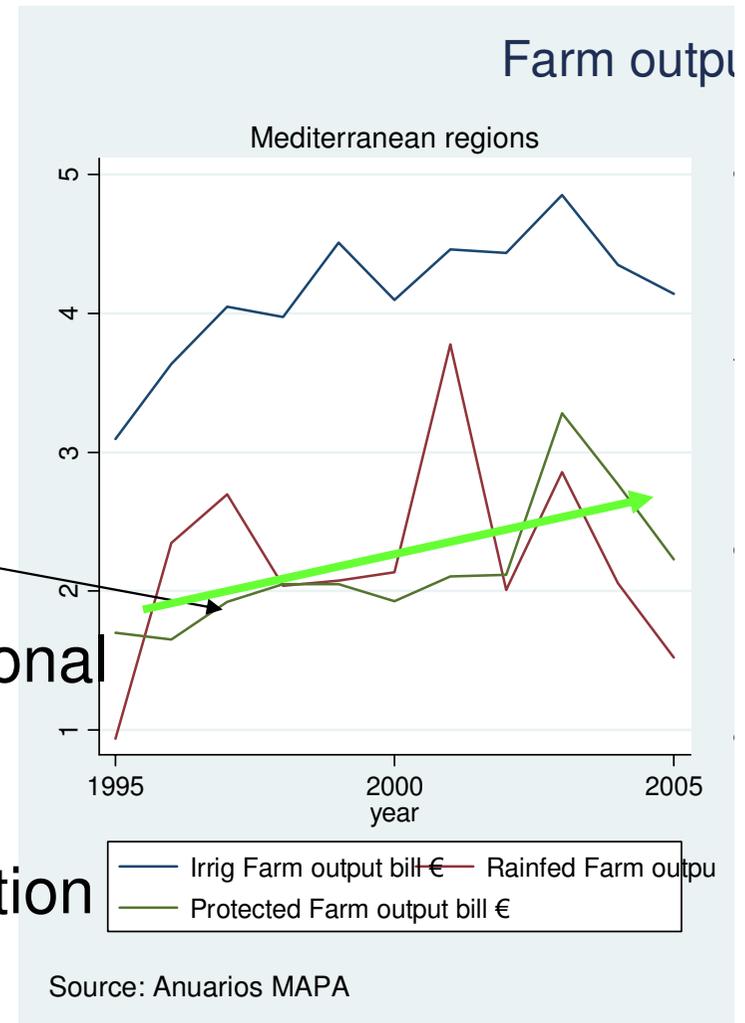
Lesson 6. Prepare for intense pressures for water trading



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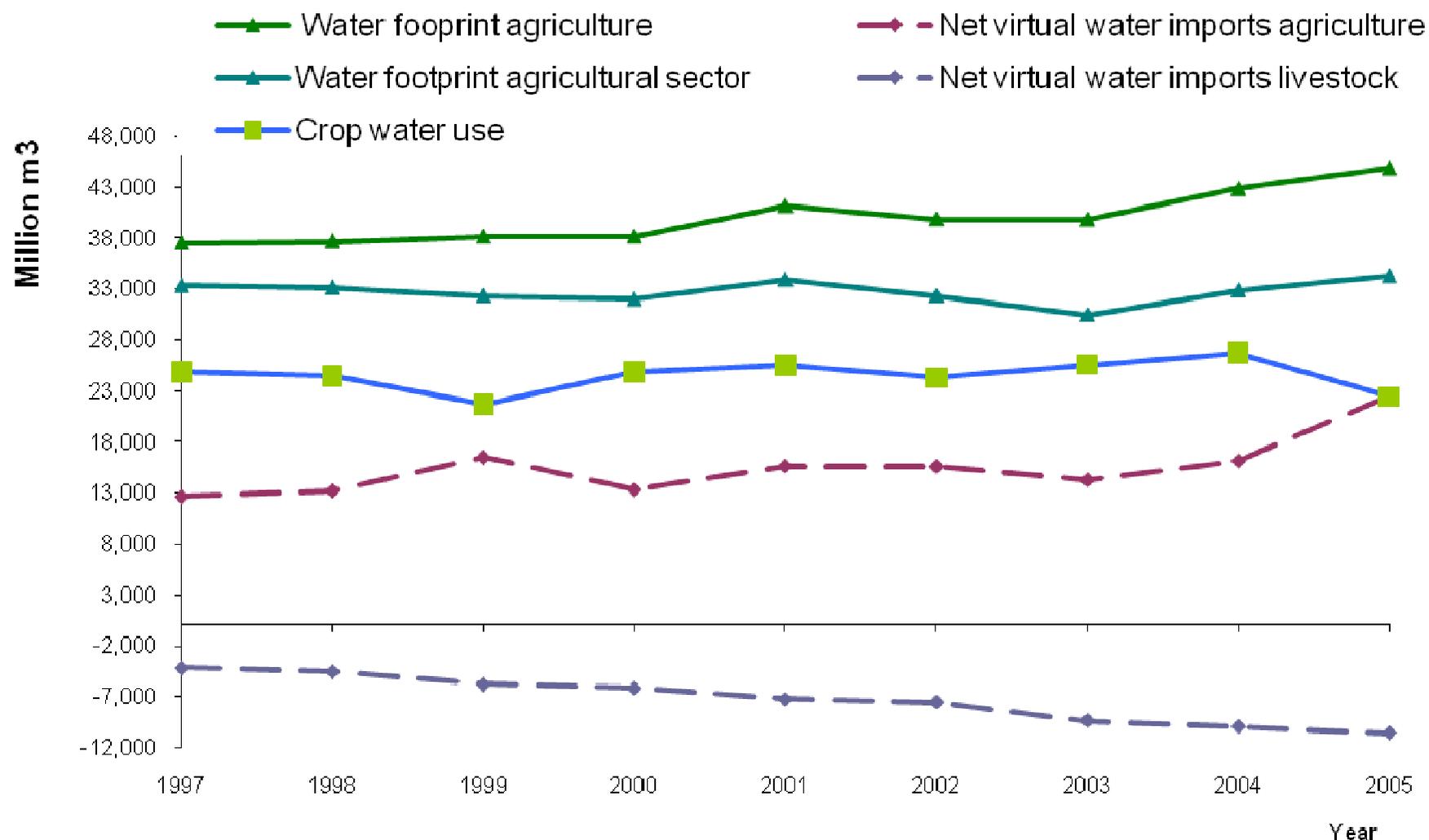


- Trading means not only spot or occasional water exchanges, but also risk-sharing instruments
- Note that trading requires revised definition of water rights

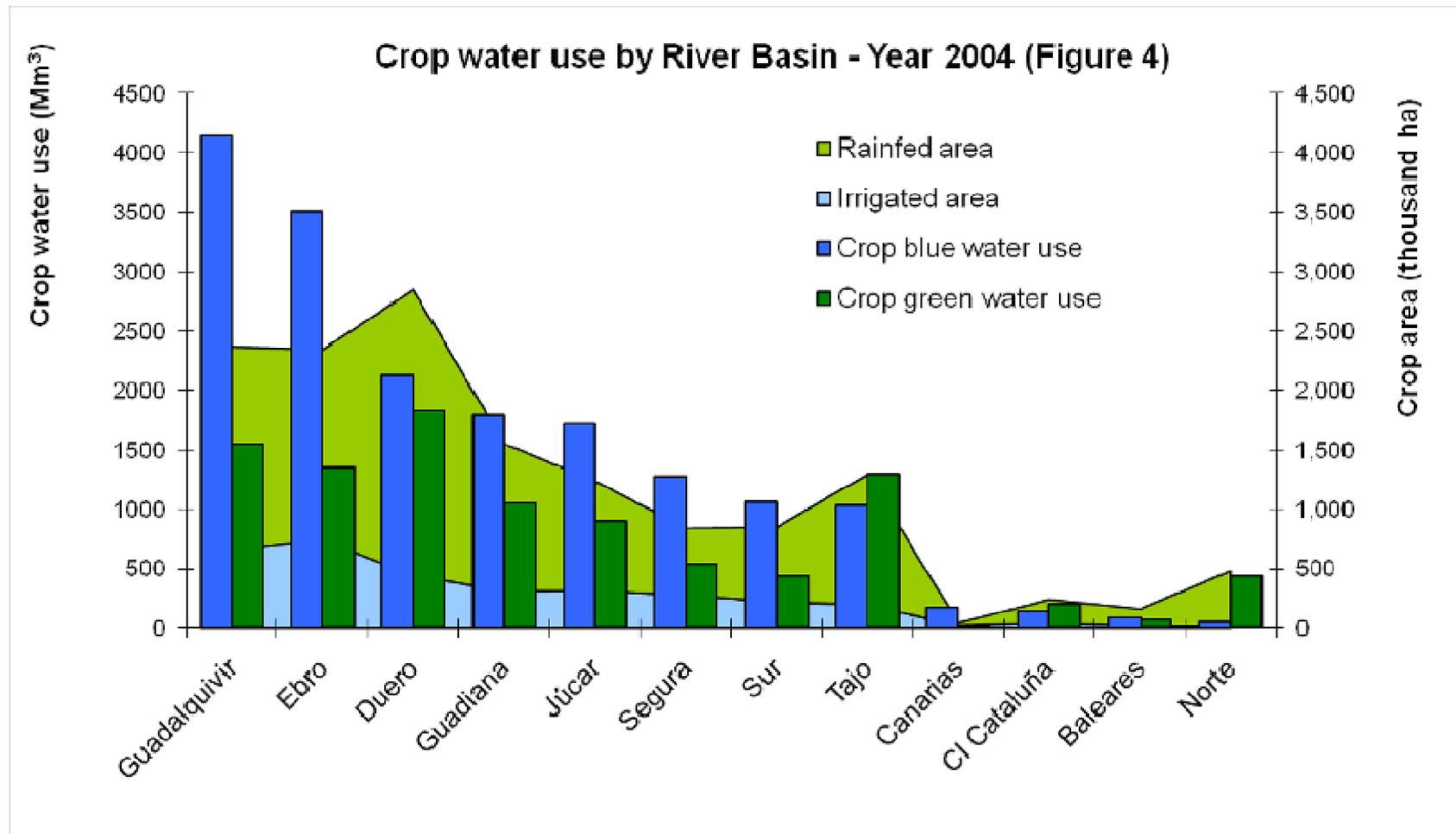


Lesson 7. Frame evaluations of Water footprint and virtual water trade in policy contexts

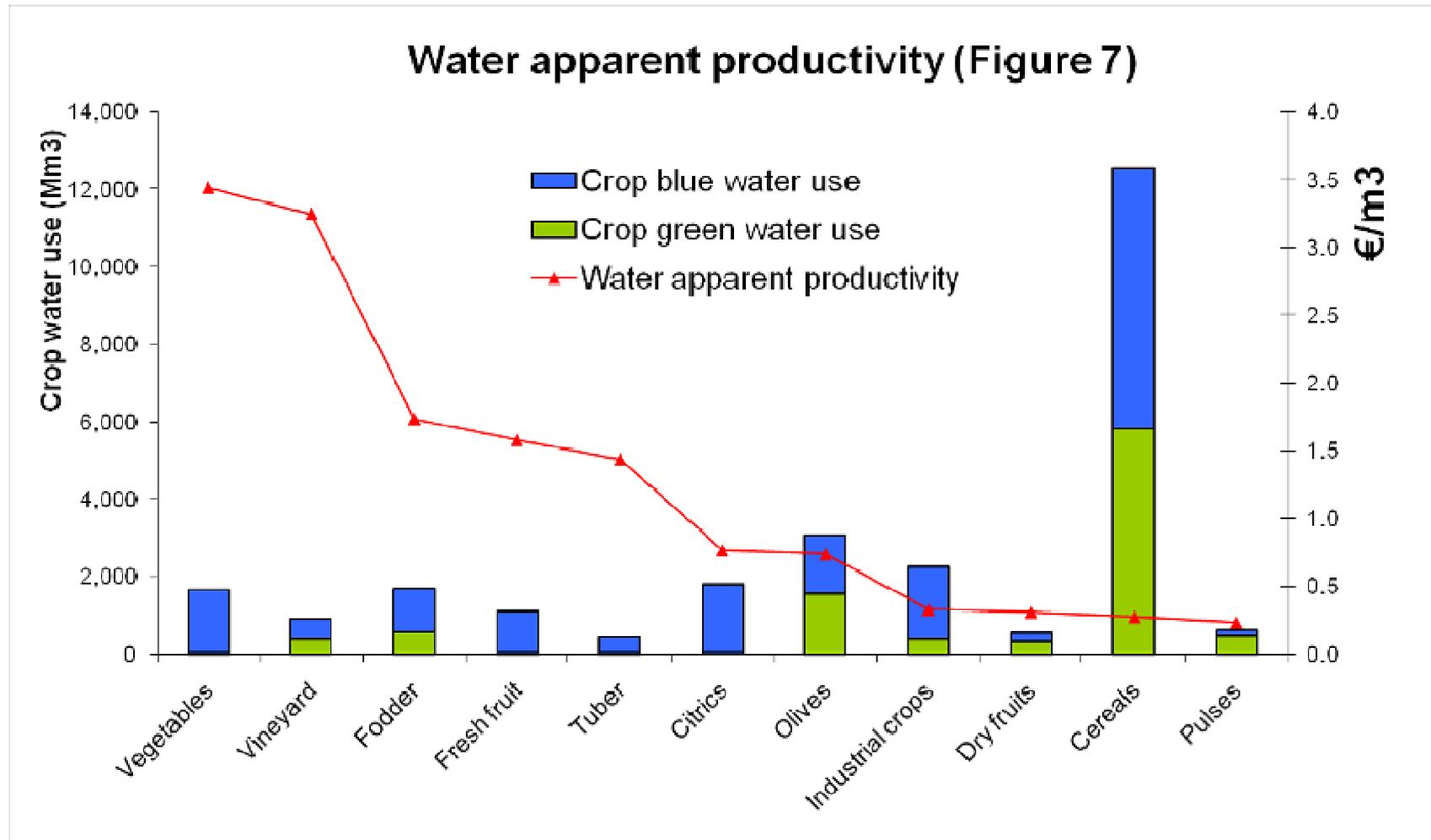
Agricultural Water Footprint (Figure 1)



Lesson 7. Interpret the Water footprint and virtual water trade



Lesson 7. Interpret the Water footprint and virtual water trade



Lesson 8. Communicate better what is agriculture and irrigation

- During 2004-08, agriculture has been blamed for everything that went wrong
- Agricultural key roles are poorly explained:
 - Buffer to other users
 - Food production
 - Landscape stewards

Lesson 9. Take into account that rivers are shared with others



The EU mandates that EU member states coordinate Water plans.