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NEW PARADIGMS IN GLOBAL WATER POLICY: APPLICATION TO THE HYDROLOGICAL PLAN OF THE GUADALQUIVIR BASIN (SPAIN)

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1. INTRODUCTION

- Some authors consider that our era should be defined as the ANTHROPOCENE ERA due to the great changes that human activities are causing in the environment.
- In other words, we are not in an era of changes but in a changing era.
- This general process has a clear meaning in the global water policy, as it will be shown in this analysis taking the Guadalquivir River Basin Hydrological Plan as a good example of these modifications.

2. THE PURSUE OF THE INTEGRATED WATER RESOURCES MANAGEMENT (IWRM)) (I)

- Most water experts consider that good governance of water resources demands an INTEGRATED WATER RESOURCES MANAGEMENT (IWRM).

- The definition of IWRM may vary from author to author but most of them consider that it requires equilibrium between the data or values coming from natural sciences and those coming from social sciences.

2. THE PURSUE OF THE INTEGRATED WATER RESOURCES MANAGEMENT (IWRM)) (II)

- Other authors consider that this equilibrium is also necessary between the utilitarian and the “intangible” values of water resources.
- The former ones mainly refer to human water uses (e.g. urban water supply, irrigation and industrial uses).
- The second are usually related to the cultural, social or religious background of the inhabitants of the region and might change from country to country.

3. THE NECESSARY EQUILIBRIUM BETWEEN UTILITARIAN AND INTANGIBLE VALUES (I)

- The utilitarian values are usually “metrificable”, they may be quantified in volumes of water, money or jobs, for instance. The intangible values are not usually easily quantified, although more and more scientists are trying to do it.
- This means that both values metrificable and non-metrificable have to be considered if good water governance is the goal.
- The intangible values are usually non-quantitative but it does not mean that are less important.

3. THE NECESSARY EQUILIBRIUM BETWEEN UTILITARIAN AND INTANGIBLE VALUES (II)

THE SPANISH EXAMPLE

WATER UTILITARIAN VALUES "METRIFICATION"

Blue water consumptive uses and socio-economic values associated

Activity	Consumptive use (10^9 m^3)	GDP (10^9 Euro)	Workforce (%)
Agriculture & livestock	15 (75%)	25 (3%) (*)	4
Industry	1 (5%)	160 (16%)	17
Urban Uses	3 (12%)	5 (0.5%)	1
Services (excl. Tourism)	0.5 (4%)	600 (60%)	67
Tourism and Golf courses	0.5 (4%)	110 (11%)	11
Bottled waters	0.1 (-%)	3 (0.2%)	0.1
TOTAL	20 (100%)	900 (100%)	100

(*) From this value about 60% is agricultural, 35% livestock and 5% forestry and fisheries

4. THE DRIVERS OF CHANGE (I):

- Globalization
- Membrane technology
- The groundwater intensive use silent revolution
- The Information Technology
- The urbanization
- Others

Due to time constriction only globalization will be considered.

4. THE DRIVERS OF CHANGE (II): a) Globalization. Virtual Water Trade

- The globalization that has allowed a significant increase in the international food (virtual water) trade.
- This international trade allows that the water scarce regions can import “virtual water” (usually in the form of food or fiber) from the water rich countries.
- The virtual water trade due to the trade towards the water scarce countries is only a small fraction (probably less than 20%) of all the virtual water trade.

4. THE DRIVERS OF CHANGE (III): a) Globalization. Virtual Water Trade

Water footprint (WF) means the amount of water (blue and green) that a human being or a collective group requires for all her/his needs (about 90% for food and fiber).

The WF is an indicator of water consumptive use of virtual water domestic or imported

vegetarian diet ~ 800 m^3/year

read meat diet ~ 1.500 m^3/year

4. THE DRIVERS OF CHANGE (IV): Globalization. Virtual Water Trade

Total Water resources	110.000 km^3/year
Green Water	70.000 km^3/year
Blue Water	40.000 km^3/year

Human needs

diet	population	km^3/year (blue + green)
Vegetarian	$7.000.10^6$	~6.000
Readmeat	$7.000.10^6$	~12.000
Vegetarian	$10.000.10^6$	~8.000
Readmeat	$10.000.10^6$	~15.000

BETWEN 5-13% OF TOTAL WATER RESOURCES

4. THE DRIVERS OF CHANGE (V): Globalization. Virtual Water Trade

Food security is today more related to economic capacity than to water scarcity.

There exist some problems mainly related to:

1) WTO regulations: a) Hidden monopolies and b) Threat of political embargo.

2) Domestic social changes required in the importer country.

5. PECULIARITIES OF SPAIN (I):
a) The fast socio-political change

- Spain has experienced in the last half century very relevant changes in its social, economic and political situation.

  a) Population has approximately double. From 25 million to almost 50 million.

  b)The Gross Domestic Product per capita has increased from US$ 300 to US$ 25,000 (almost one hundred fold). Similar to Singapore.

  c)The rural population has decreased from 45% to less than 4%.

5. PECULIARITIES OF SPAIN (II):
a) The fast socio-political change

- 4. The political regime has changed from a mild dictatorship to an almost mature democracy.
- 5. The relative value of agriculture in the GDP has decreased from 20% to less than 4%.
- 6. For instance, now the Tourism workforce is almost fourfold the one in agriculture and its economic value is also fourfold the one of the agricultural sector.

5. PECULIARITIES OF SPAIN (III):
b) The water conflicts

- The water issues are frecuently used by politicians as a political weapon to win votes in the next elections.

5. PECULIARITIES OF SPAIN (IV):
b) The water conflicts

SARAGOSSA, Oct 2002

BRUSSELS, Sep 2001

VALENCIA, May 2003

CLAMOROUS SOCIAL CONFLICTS IN SPAIN

5. PECULIARITIES OF SPAIN (V):
b) The water conflicts

- This situation forbids water mid and long term planning.

5. PECULIARITIES OF SPAIN (VI):

c) The old motto "MORE CROPS AND JOBS PER DROP"

- There is not a blue print. The solutions should be taylor-made, according to the hydrological, economic and political situation of each country.
- Most effort of International Organizations has been dealing with the developing countries (from 1 to 2 billion people).
- In these countries the main problem is not water scarcity but extreme poverty.
- The usual goal in these countries is to achieve "more crops and jobs per drop"

5. PECULIARITIES OF SPAIN (VII):
d) The new motto "MORE CASH AND CARE OF NATURE PER DROP"

- Our suggestion is that it is important to pay more attention to the industrialized and emerging countries (from 5 to 6 billion people).

- In this countries the motto should be "more cash and care of nature per drop"

5. PECULIARITIES OF SPAIN (VIII):
d) The new motto "MORE CASH AND CARE OF NATURE PER DROP"

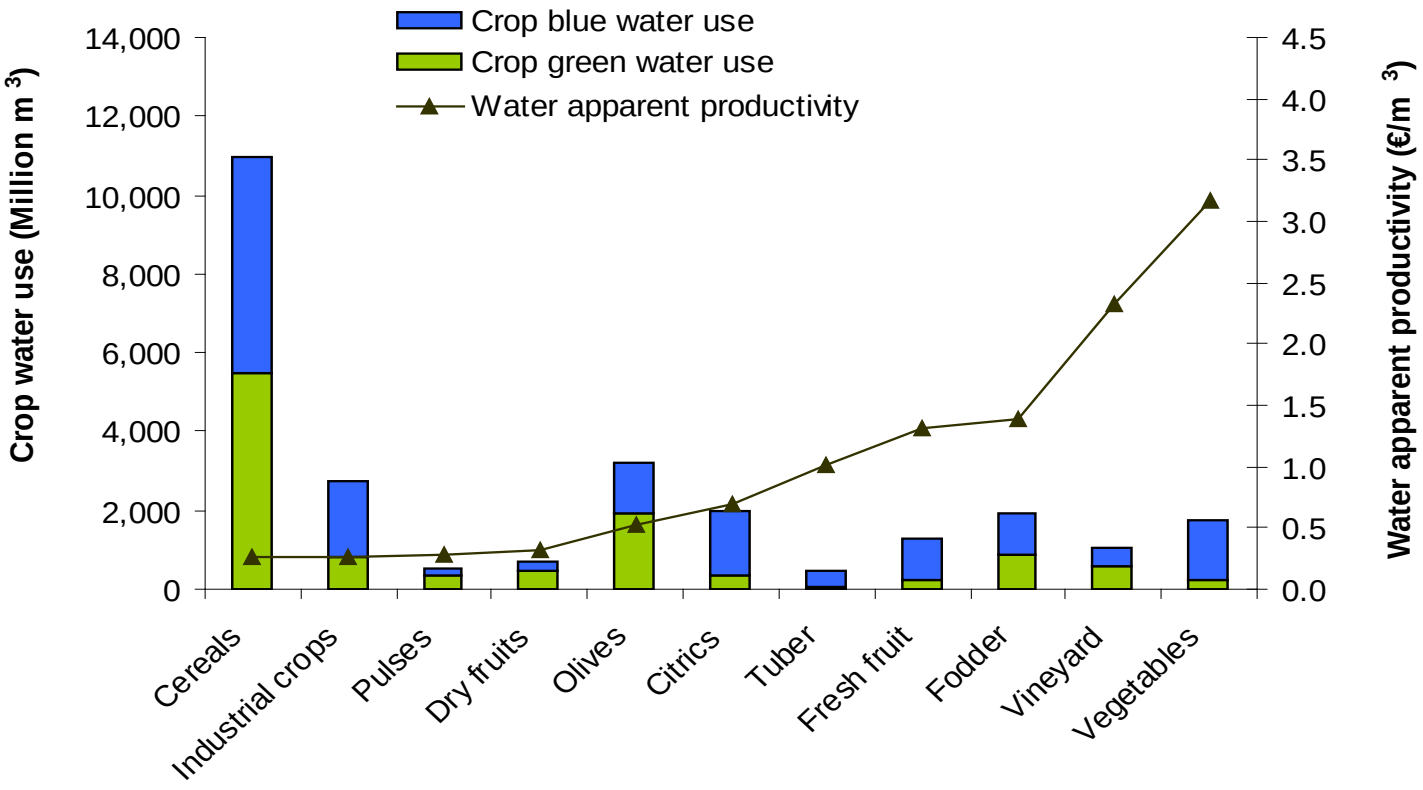
- It is necessary to work with the powerful farmers lobbies to find a "win-win" solution.

- The current (and future) technological advances will facilitate this option.

5. PECULIARITIES OF SPAIN (IX):

d) The new motto "MORE CASH AND CARE OF NATURE PER DROP"

WATER APPARENT PRODUCTIVITY AND BLUE AND GREEN WATER FOOTPRINT OF CROP PRODUCTION IN SPANISH AGRICULTURE (AVERAGE YEAR) (AFTER GARRIDO, ET AL., 2010).

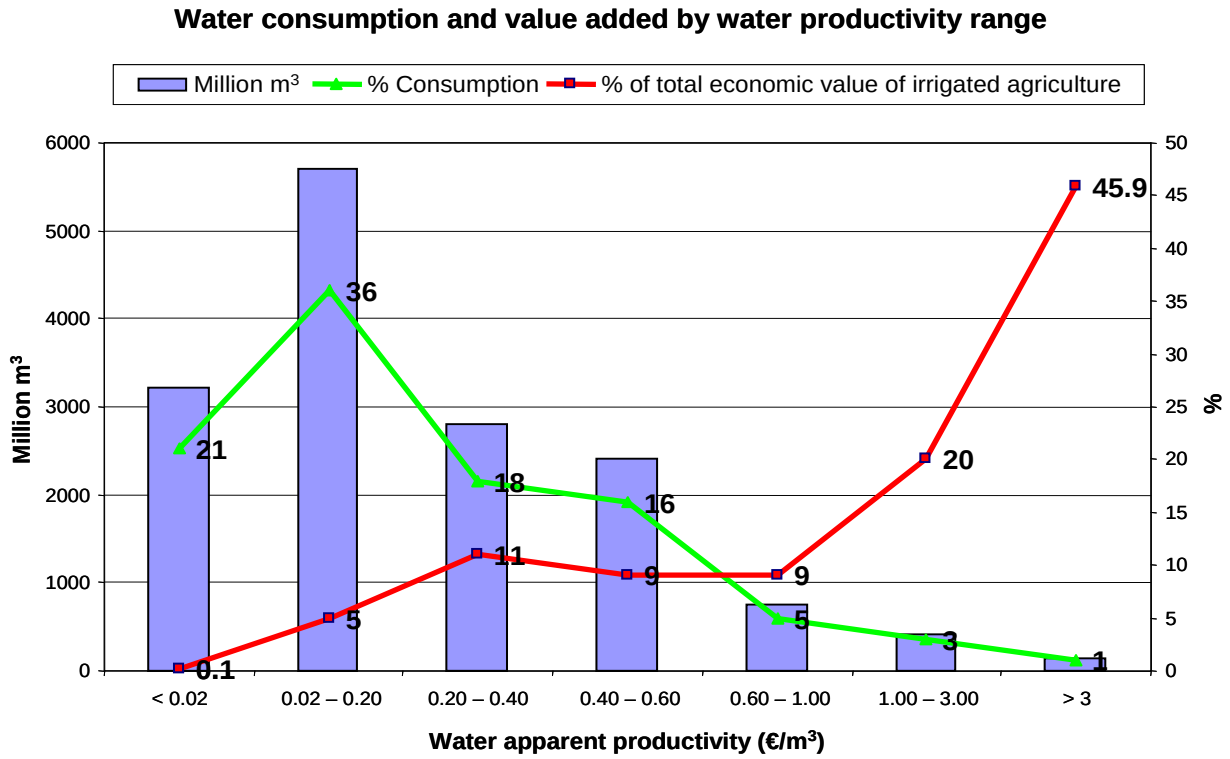


5. PECULIARITIES OF SPAIN (X):

d) The new motto "MORE CASH AND CARE OF NATURE PER DROP"

IRRIGATED AGRICULTURE IN SPAIN

BLUE WATER CONSUMPTION (10^6 M^3), % OF BLUE WATER CONSUMPTION, AND % OF TOTAL ECONOMIC VALUE OF IRRIGATED AGRICULTURE VERSUS WATER APPARENT PRODUCTIVITY (€/M^3) (AFTER ALDAYA ET AL., 2008).

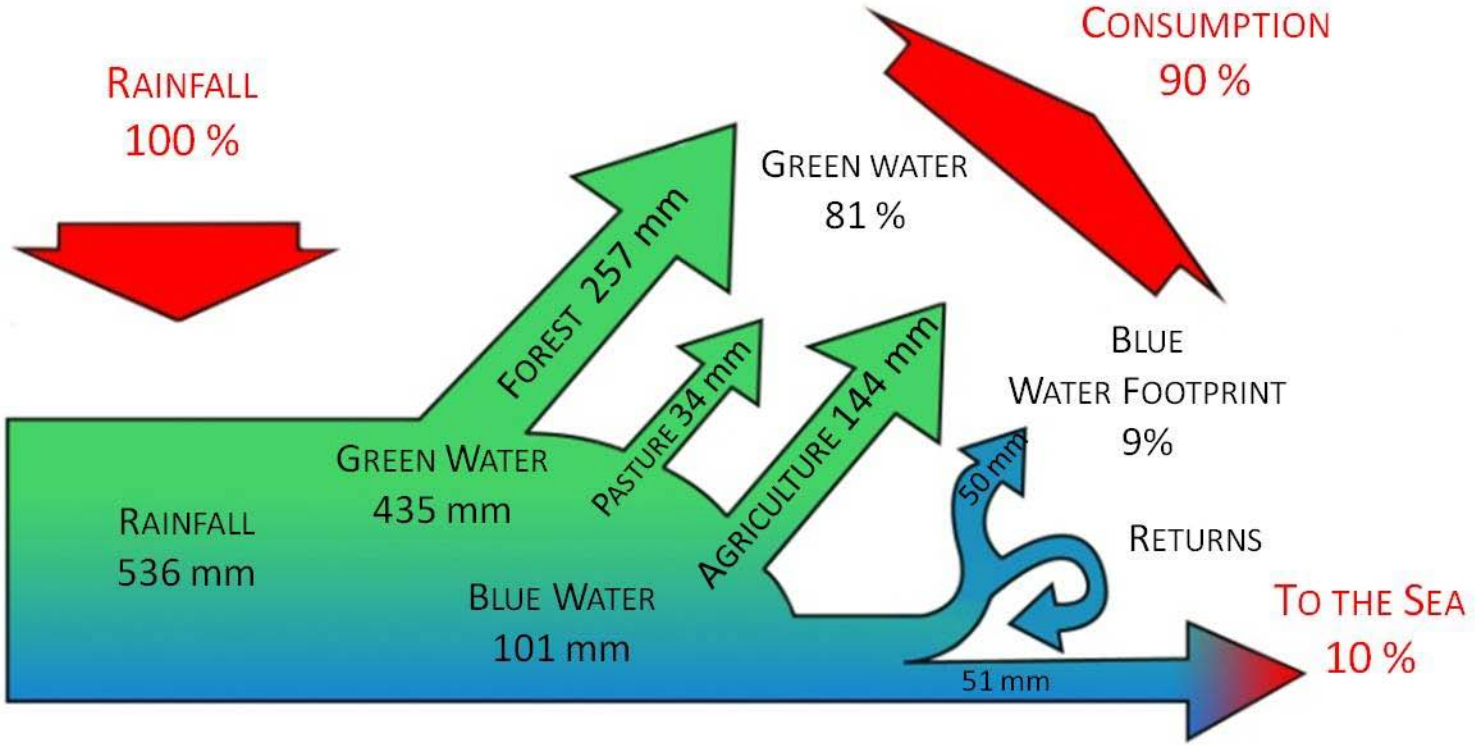


5. PECULIARITIES OF SPAIN (XI): e) Looking for a WATER PACT

- Recently –two years ago– some relevant Spanish politicians advocate the need of a WATER PACT among the main political parties.

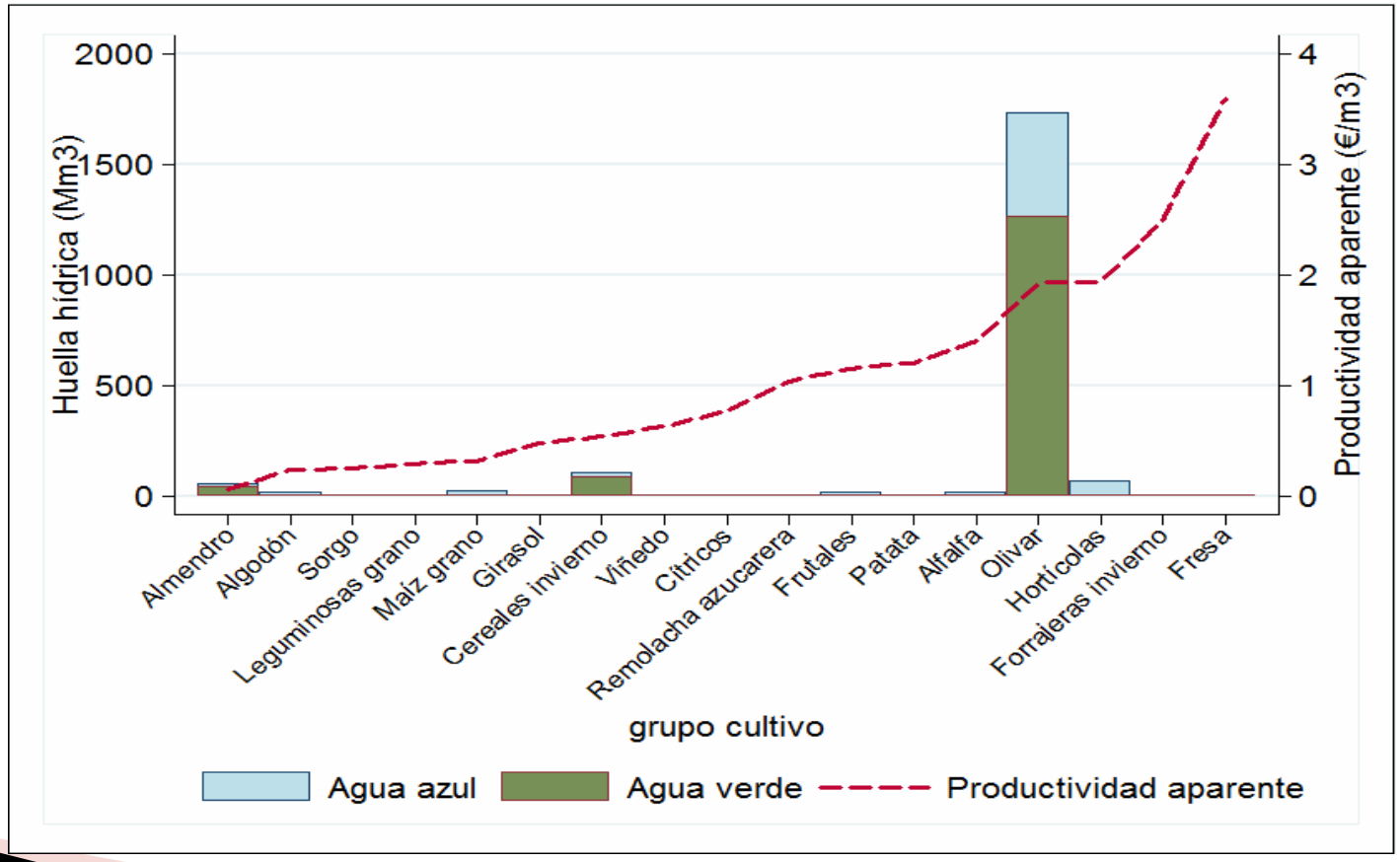
- Wait and see!

6. THE GUADALQUIVIR RIVER BASIN WATER PLAN (I)



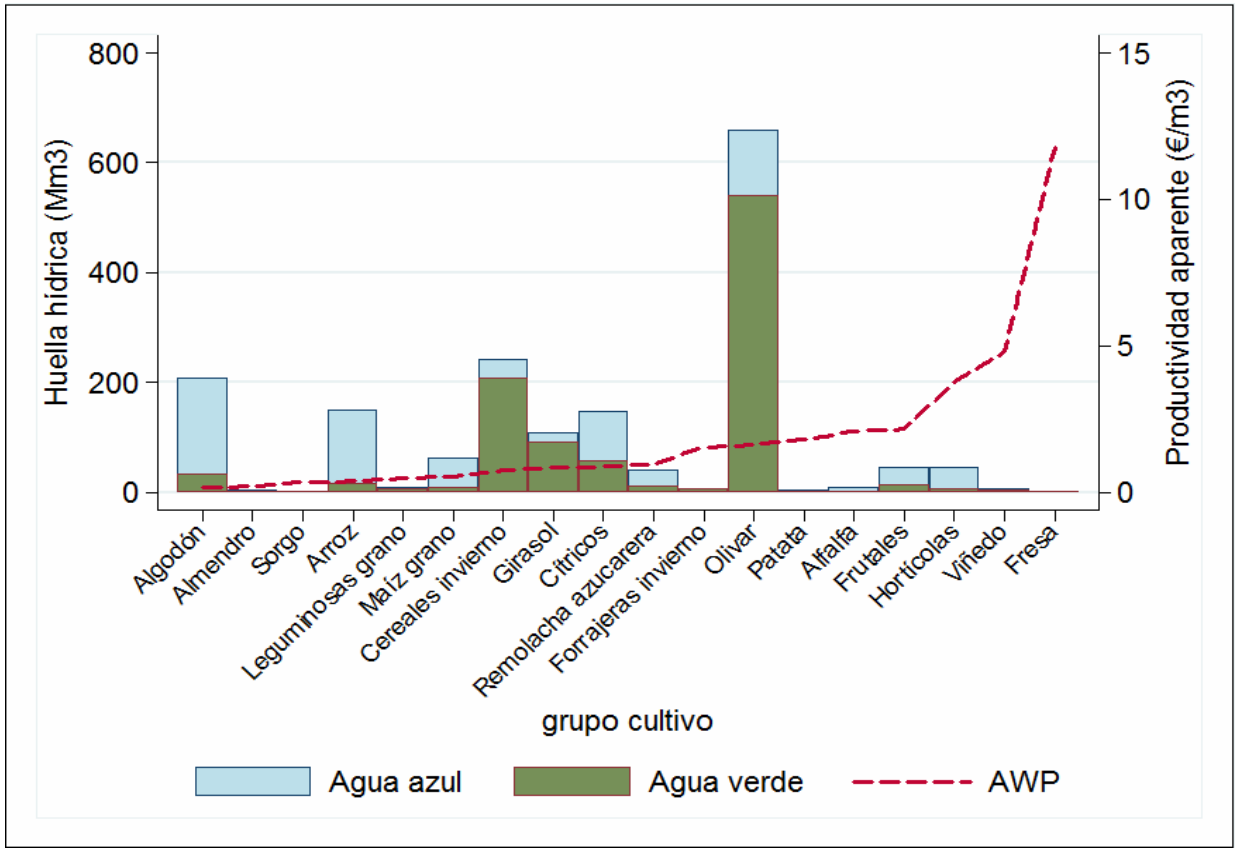
6. THE GUADALQUIVIR RIVER BASIN WATER PLAN (II)

UP STREAM GUADALQUIVIR BASIN.
WATER (BLUE AND GREEN) USES VERSUS APPARENT (ECONOMIC) PRODUCTIVITY (€/m³).



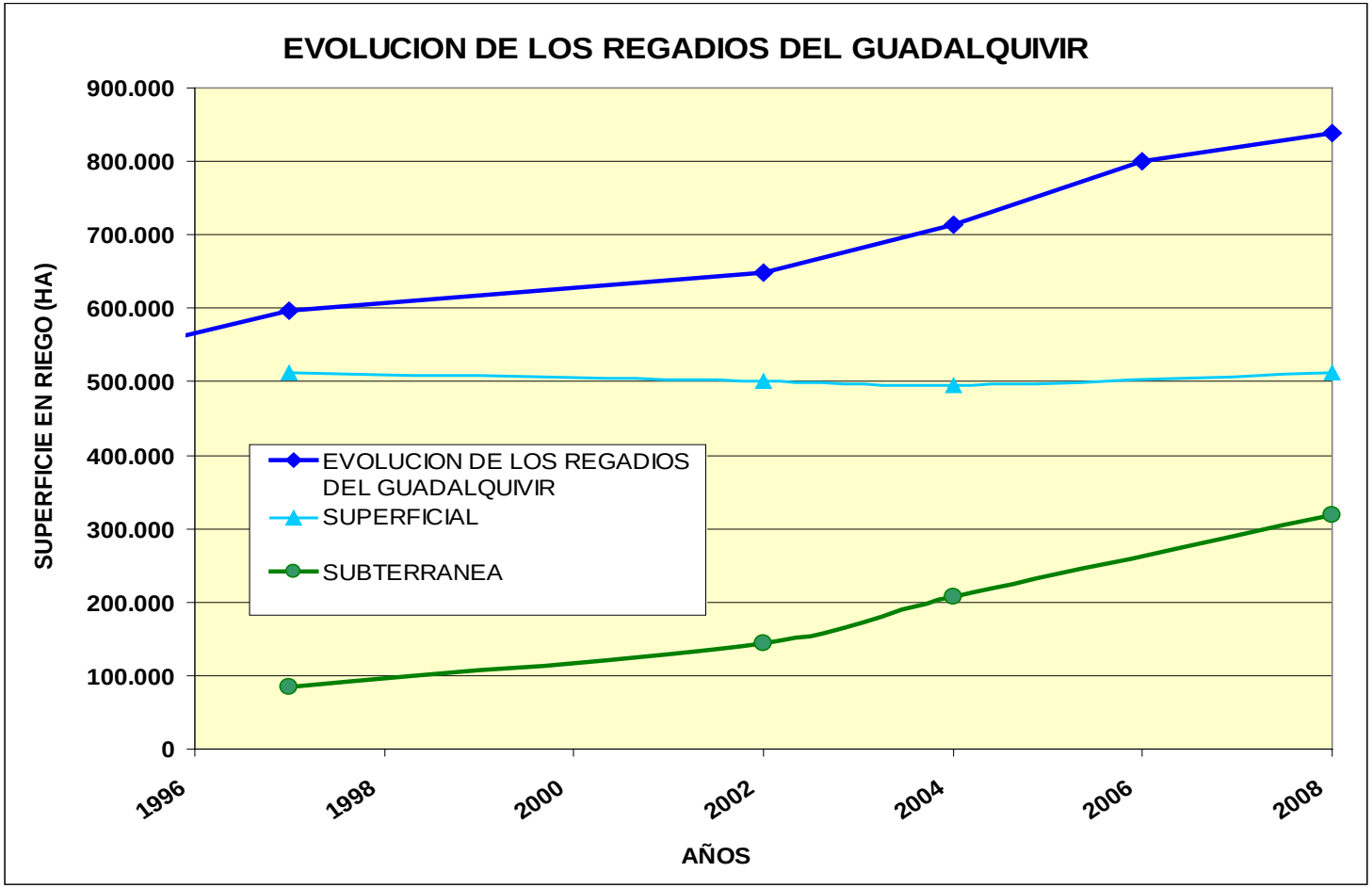
6. THE GUADALQUIVIR RIVER BASIN WATER PLAN (III)

DOWN STREAM GUADALQUIVIR BASIN.
WATER (BLUE AND GREEN) USES VERSUS APPARENT (ECONOMIC) PRODUCTIVITY (€/m³).



6. THE GUADALQUIVIR RIVER BASIN WATER PLAN (IV)

THE DRAMATIC INCREASE IN GROUNWATER USE



7. CONCLUSIONS (I)

- The advances of Science and Technology may help to solve many of the current problems or conflicts related to water and food scarcity (or security).
- But the technological-fix is not enough. The main obstacles for the implementation of these advances are of ethical nature.
- They are related to a mix of ignorance, professional bias, neglect, lack of solidarity, and corruption. The proportion of the mix varies from country to country.

7. CONCLUSIONS (II)

- Probably the most relevant action for solving the global current problems would be to achieve a more efficient, just, and equitable international regulation for the food trade.
- In Spain the most relevant actions will be:

  a) to increase transparency

  b) to achieve a WATER PACT

THANKS FOR YOUR ATTENTION