WATER SCARCITY, RISK AND DEMOCRACY IN THE MEDITERRANEAN AND BEYOND

INSTITUTE FOR EUROPEAN STUDIES, CORNELL UNIVERSITY

ATHENS CULTURAL CENTER, APRIL 12-13, 2013

COMING CHANGES IN WATER POLICY: THE CASE OF SPAIN

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FUNDACIÓN BOTÍN

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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 Spanish situation 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)

- IWRM is a “desiderátum”, a Nirvana, and so on.

- See the recent book:
  Water, agriculture and the environment in Spain: can we square the circle?

- “We cannot square the circle” but we should try to get something as close as possible

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

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

SIGNIFICANT INTANGIBLE WATER VALUES IN SPAIN

1. Pervasive **"HYDROCENTRISM".** Exaggerated nexus of water and **GDP** and the consequent inter-regional water conflicts.
2. General acceptation of usual perverse subsidies, mainly in agriculture.
3. Intensive groundwater development revolution in the last five decades.
4. Chaotic situation of groundwater management due mainly inappropriate regulation.
5. Great leverage of farmers' lobbies.
6. Economic failure of the spanish desalination plants program.

4. THE DRIVERS OF CHANGE (I):
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 (II): a) 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 (III): a) 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 (roads, failed governments).

4. THE DRIVERS OF CHANGE (IV): b) Membrane Technology

- The Advances in Membrane technology have decreased dramatically the cost of desalinating brackish and seawater, and also waste urban and industrial water.
- Nevertheless, the cost of desalinated seawater is not less than US$0.5/m^3 for large desalting plants working full time. The capital costs are in the order of 50%. Therefore, if the use of the plant is smaller, the real cost of water increase proportionally.
- For instance the cost desaliting plants in Singapore and Israel is in the order of US$0.5 /m^3 but in Spain is probably in the order of US$ 2/m^3.

4. THE DRIVERS OF CHANGE (V):

c) The groundwater intensive use silent revolution

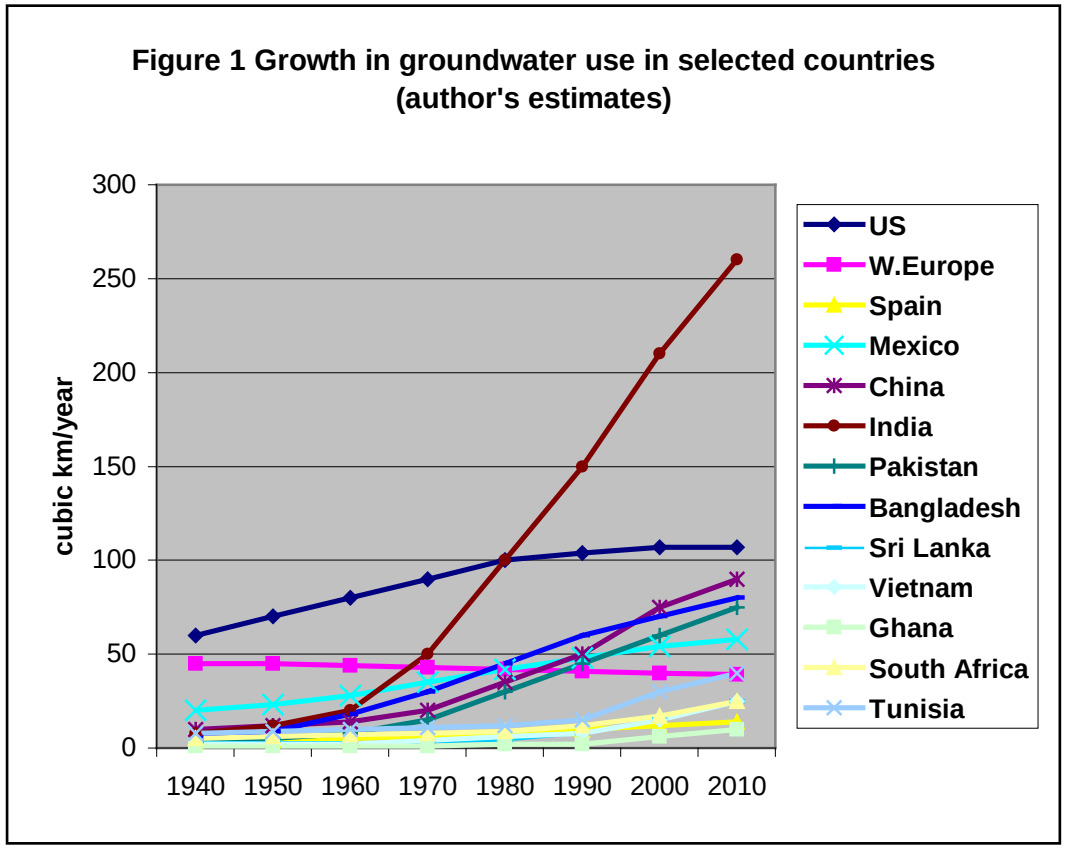
- The use of groundwater has increased dramatically during the last half century: from 100 to 1000 km^3/year.

- India is the main user of groundwater: more than 250 km^3/year and 20 million water wells. In Spain, only 7 km^3/year and 1.5 (?) million water wells.

- Groundwater management is usually chaotic in most countries. It has produced stupendous benefits but also some problems.

4. THE DRIVERS OF CHANGE (VI):

c) The groundwater intensive use silent revolution



From 100 Km^3/year

to

1.000 Km^3/year

in 50 years

Source: Shah (2004 and 2009

4. THE DRIVERS OF CHANGE (VII):
c) The groundwater intensive use silent revolution

- The main drivers of this “silent revolution” have been:

  a) The improvement of drilling technology
  b) The turbine pump
  c) The Hydrogeology as a reliable Science

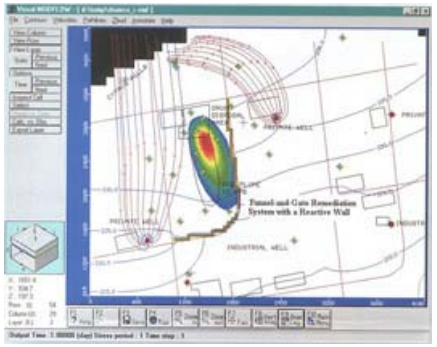
4. THE DRIVERS OF CHANGE (VIII):

c) The groundwater intensive use silent revolution

From the dug-well to the deep borehole.

From the water wheel to the pump.

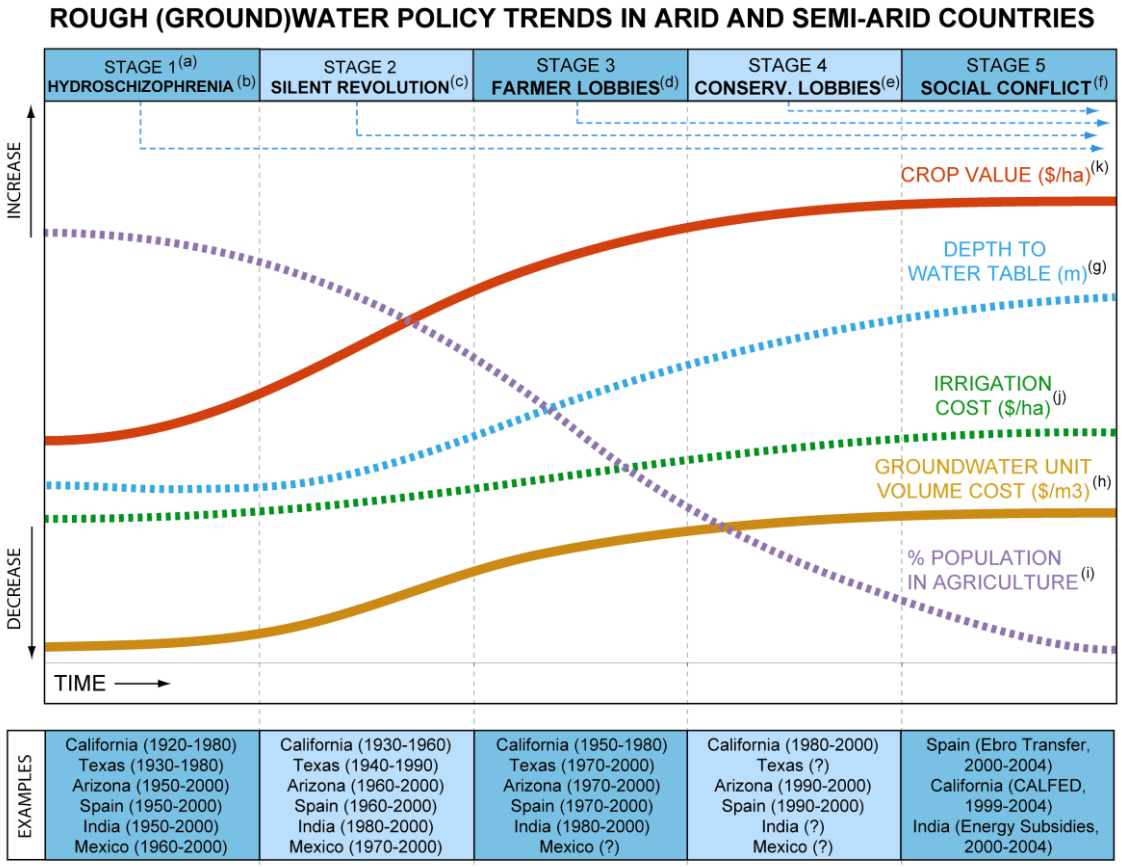
From the water-witches to Hydrogeology.



4. THE DRIVERS OF CHANGE (IX):

c) The groundwater intensive use silent revolution

The five (six) stages in groundwater silent revolution



4. THE DRIVERS OF CHANGE (X): d) The Information Technology

- The great advances in the Information Technology have had also a great influence in the changes in the Global Water policy Paradigms

- Internet and mainly the cell phones have introduced new dimensions in the way to educate and inform to the public at large.

4. THE DRIVERS OF CHANGE (XI): d) The Information Technology

- This is going to facilitate:

  a) Transparency on the hydrologic and economic data

  b) Accountability of the water managers and of the users.

  c) Stakeholders participation in water management

4. THE DRIVERS OF CHANGE (XII):
e) The Urbanization

- All over the world there is a trend of emigration from rural to urban areas. This is especially relevant in developing countries.
- As usual, this new situation has pros and cons in relation to the Water Policy.
- The problems are mainly related to the need of increasing the urban water supply to the new megacities (e.g. Mexico city, Sao Paolo, Cairo and many others). This may need the construction of great infrastructures to import water.

4. THE DRIVERS OF CHANGE (XIII):
e) The Urbanization

- From a general perspective the urban water supply is usually only a small fraction of the blue water consumed in irrigation.

- In many cases the solution can be buying the water for the urban water supply to the farmer growing water intensive and low value crops and importing the corresponding staple food from water rich countries. Again, this shows the relevance of the virtual water trade and the need of a better regulation by the WTO.

- In some cases the seawater desalinating plants may be a good solution. E.g. Singapore, Israel, Canary Islands, Barcelona and others.

4. THE DRIVERS OF CHANGE (XIV): f) Others

- "Natural resources are limited but human ingenuity is boundless"
- There are many promising research areas that will probably facilitate solving the future water problems but it has been considered more prudent counting only in those advances that are already available and relatively cheap.
- Climate change or global change?
- Among the new areas: nanotechnology, sea agriculture, aquaculture, GMO, and many others.

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 a almost mature democracy.
- 5. The value relative 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

SARAGOSSA, Oct 2002

BRUSSELS, Sep 2001

VALENCIA, May 2003

CLAMOROUS SOCIAL CONFLICTS IN SPAIN

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

- This situation forbids water mid and long term planning.

5. PECULIARITIES OF SPAIN (V):

c) The new motto "MORE CASH AND CARE OF NATURE 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 (VI):
c) The new motto "MORE CASH AND CARE OF NATURE PER DROP"

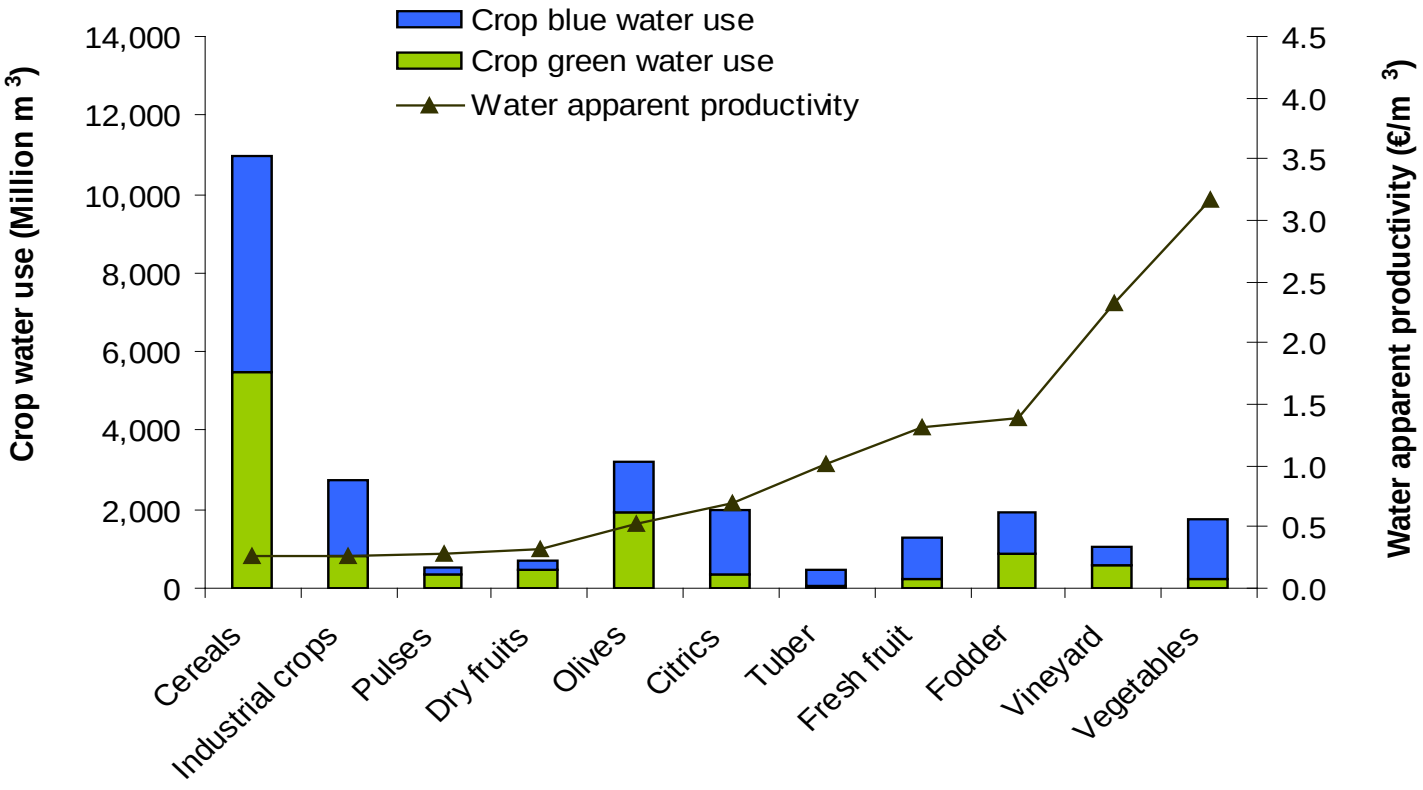
- Our suggestion is that it is important to pay more attention to the industrialized and emerging countries (from 5 to 6 billion people).

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

5. PECULIARITIES OF SPAIN (VII):

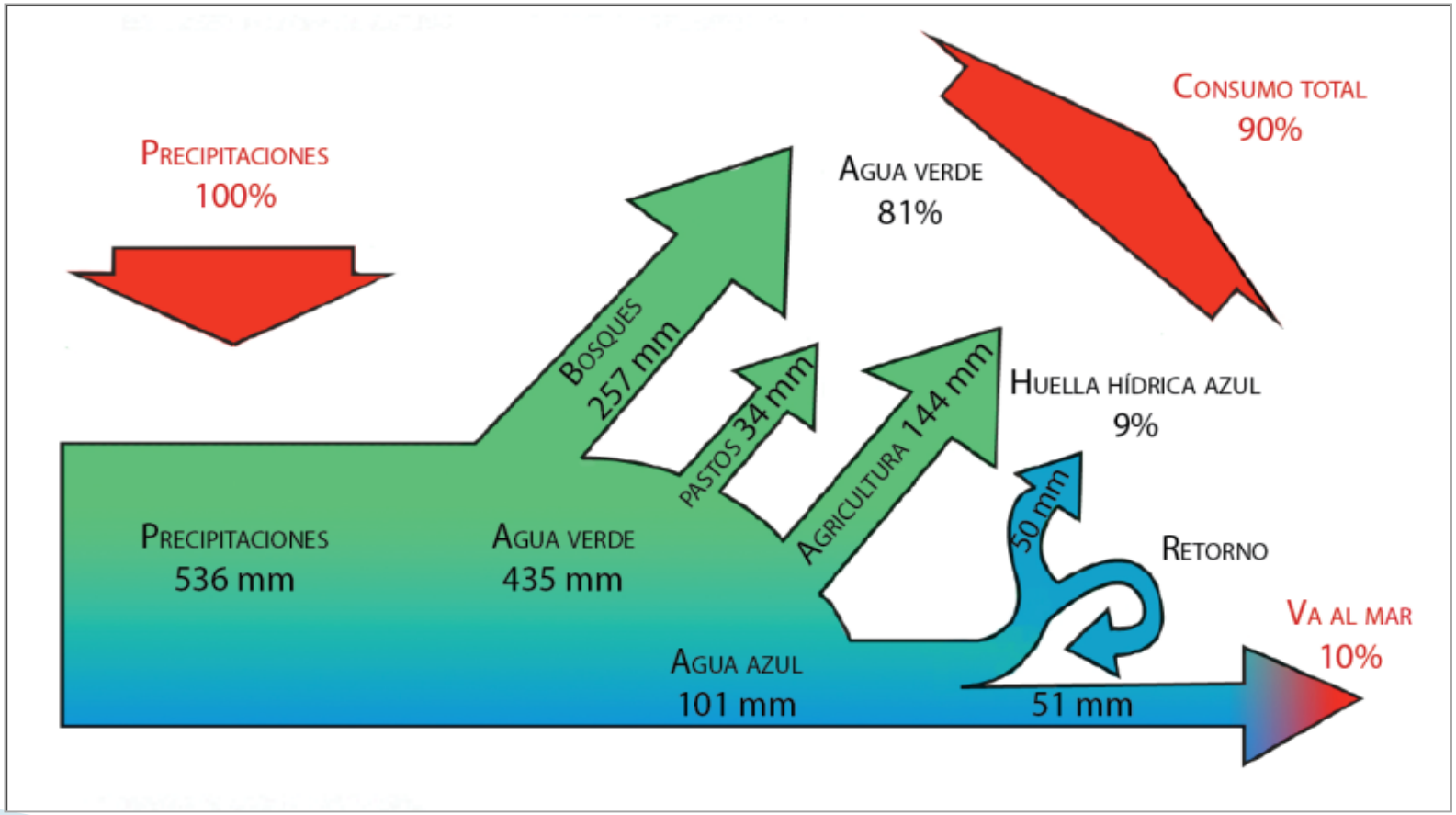
c) The new motto "MORE CASH AND CARE OF NATURE PER DROP"

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 (VIII):

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



5. PECULIARITIES OF SPAIN (IX): d) 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. CONCLUSIONS (I)

- The advances of Science and Technology may help to solve many of the current issues 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.

6. 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

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