

# Water pricing in Europe and around the Mediterranean Sea: issues and options

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4th EWA Brussels Conference.  
**European Water Management and the Economic aspects  
of the Water Framework Directive”**

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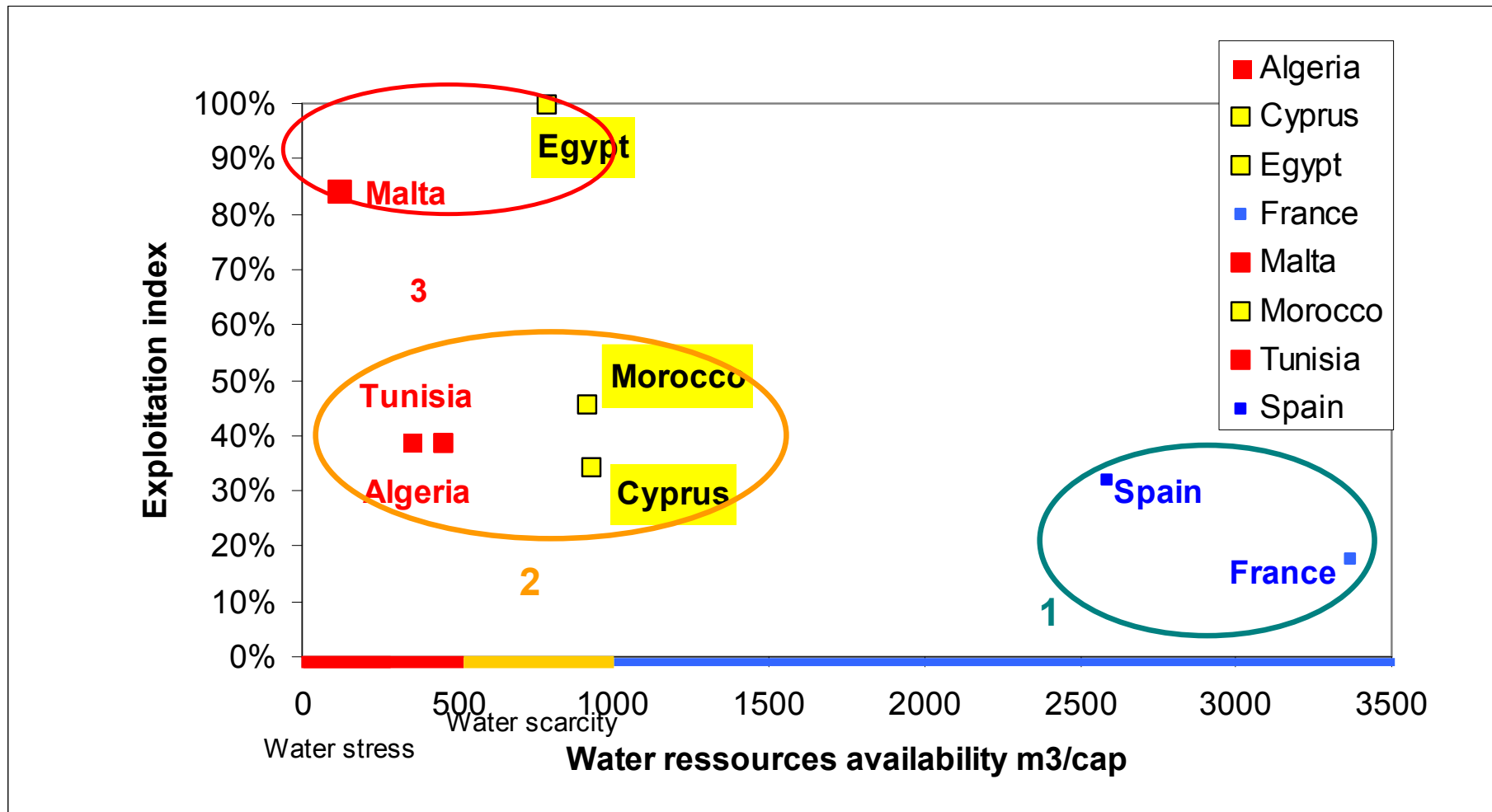
- Historical perspective: pricing water where does it come from ? Why ?
- Selected experiences: policies and instruments in Mediterranean and European countries (Maghreb, Malta, Cyprus, France, Spain)
  - Pricing water: a diversity of contexts / several policy options
  - Zoom 1: agriculture sector
  - Zoom 2: drinking water sector
- Future challenges

# Water pricing policies... a brief history

- Water demand management in the Mediterranean: 1997 Fréjus, 2002 Fiuggi, Zaragoza 2007
  - Economic instruments as incentives to reduce water consumption, water use efficiency
  - Barcelona Convention 2005: Mediterranean strategy for sustainable development –IWRM, WDM
- Water Framework Directive, 2000 : importance of economic tools in IWRM
  - From financial cost recovery to economic value
  - Polluter/user pays principle: full cost of water
  - Pricing water: incentives for efficient water use - change in consumption patterns- and water protection

# A diversity of situations

- Very high pressure on water resources :
  - Malta, Egypt (exploitation index >75%)
- High pressure : Morocco, Algeria, Tunisia, Cyprus, combined with increasing demand in Morocco, Algeria
- Low pressure : northern European countries but local or temporal stress combined with pollution and ecological issue



Source : elaborated from Blue Plan and FAO aquastat data

- Group 1 : moderate global pressure on water resources and high water availability per capita, but local specificities
- Group 2 : exploitation index 25-50% but low or very low water availability per capita, water stress in Algeria and Tunisia
- Group 3 : Very high exploitation rate, and limited resources, increase in demand will have to rely on non conventional resources

# Importance of water uses

- Irrigated agriculture remains the major use of water in Southern Mediterranean countries:
  - Algeria, Tunisia, Spain: 70% to 80% of water resources for irrigation
  - Morocco: irrigation > 80% of water resources, social and economic importance (45% of agricultural value added and 75% of agricultural exports)
- Qualitative issue arising: Sebou, Morocco

# The different responses of water policies (1)

- The technical approach with economic incentives
  - Irrigation water saving strategy in Tunisia: 300 000 ha, with 75% equipped with subsidised water saving techniques
  - water saving program Morocco (PNEI), Financial incentive for irrigation water saving techniques - objective: 550000 ha with localized irrigation
  - Irrigation modernization plan Spain (localized irrigation)
  - Drinking water: water saving incentives Cyprus, subsidies for private tubewells, connection of toilets to tubewell water and greywater recycling systems
- The supply approach based on non conventional resources
  - Non conventional water resources development strategy : desalination of sea water in Algeria (energy available), Malta, Morocco, Spain “Programa Agua”
  - Water re-use : Malta (project 3 treatment plants), Tunisia, Egypt, Spain

# The different responses of water policies (2)

- The institutional approach: improve water management - allocation among uses
  - IWRM: river basin agencies and institutional reforms Algeria, Morocco
  - Participative management and transfer to water users (Tunisia, Morocco)
  - Public-Private Partnerships (El Guerdane Morocco) for increased cost efficiency/water productivity and access to financing for new investments
- The “economic approach”: economic instruments
  - EU: WFD
  - Morocco: Full-cost recovery principle, “sustainable cost” in irrigation schemes. User pays principle applied: drinking water, irrigation water (public schemes). Polluter pays principle, water law 1995

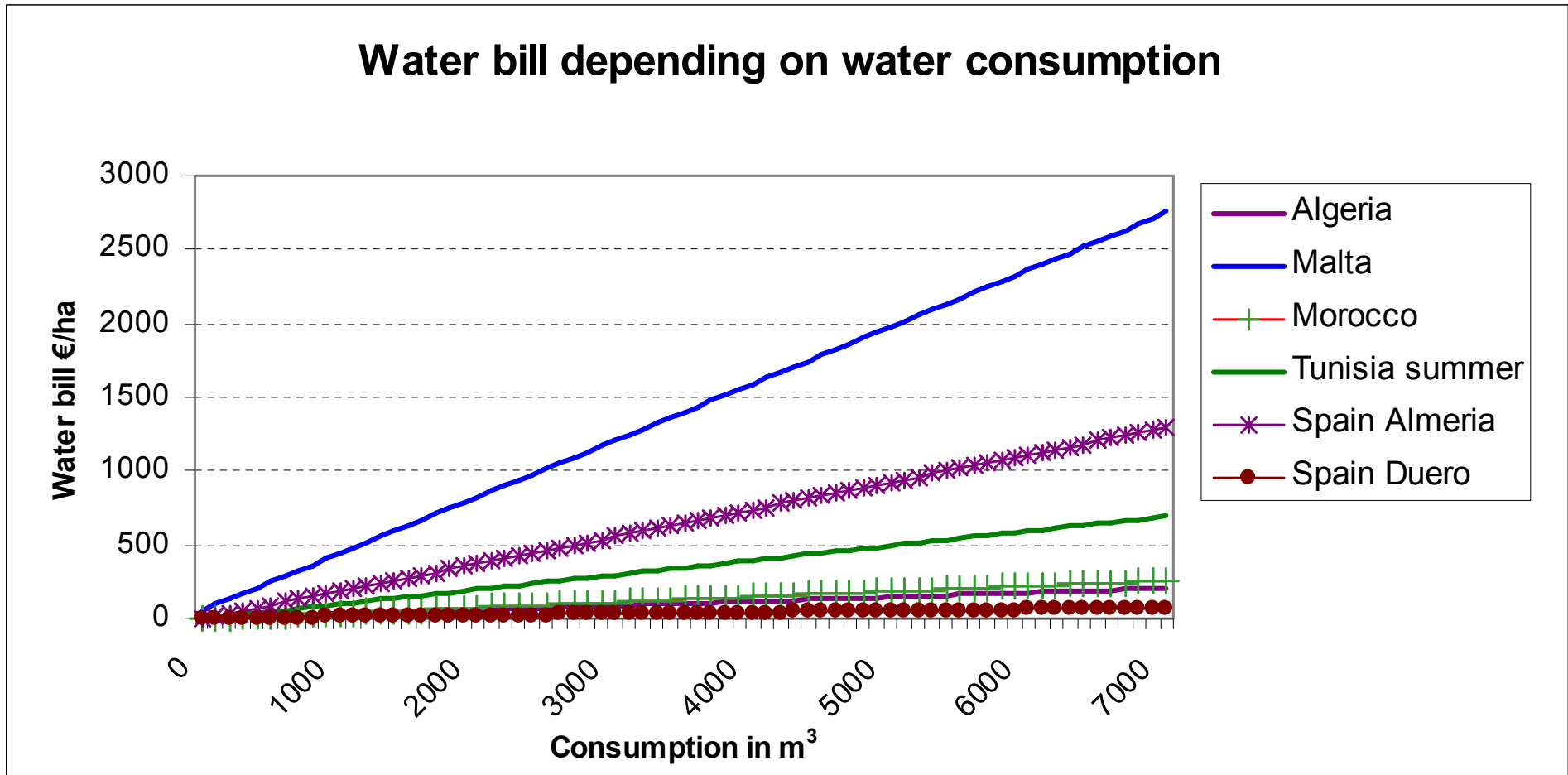
*Zoom 1*

# **LOOKING AT WATER PRICING IN THE AGRICULTURE SECTOR**

# Selected experiences in irrigation

	Pricing mechanisms	Price levels	Additional measures
Algeria OPI	Volumetric flat rate	0.03 €/m <sup>3</sup>	
Morocco ORMVA	Volumetric Flat rate	0.03 €/m <sup>3</sup> (ORMVA) (0.02-0.06 €/m <sup>3</sup> )	Quotas per crop Tubewell water spot markets Subsidies, water saving technologies
Tunisia	Volumetric seasonal pricing Increasing block rate pricing experience	0.05-0.10 €/m <sup>3</sup>	Subsidies water saving technologies
Malta	Two part tariff, Increasing block rate	0.38-0.4 €/m <sup>3</sup>	
Spain	Per area (most common)  Volumetric	60.6€/ha Duero Basin (equivalent to 0.01€/m <sup>3</sup> )  0.12 – 0.25 €/m <sup>3</sup> (Almeria. 2005)	



# Comparison of water bills




# Pricing principles and practices

- Public schemes:
  - Towards « sustainable cost » in Morocco, regular price increases in public schemes with a target equilibrium price
  - Water pricing reform Tunisia: efficiency, equity and financial objectives
  - Algeria: below the average operation cost in spite of 100% price increase in 2005 after a period of stagnation
- Self-service, Morocco:
  - recovery of financial cost
  - but possible subsidies (water saving techniques) and cross-subsidies (energy)
- Difficulties to apply user pays principle or polluter pays principle

# Expected impacts (1)

- Impact on water demand : Malta, Cyprus, France, Spain (linear programming economic models)
  - Significant impacts foreseen (above some price levels...) 
  - Different reduction in water abstraction required depending on local environmental/water scarcity conditions 
- Impact on cost recovery :
  - Morocco: ~75% of sustainable cost
  - Algeria: 50% of O&M cost recovery, vicious circle of low price, low maintenance, poor water service, financial difficulties of management agencies - worsened by water scarcity, lack of water management and competition with priority sectors

# Expected impacts (2)

- Incentives to save water – but at which scale ?
  - Low economic incentive (Morocco, Algeria, Spain...) but surface water use limited by water allocation (equivalent to “quotas”)
  - Groundwater use: no pricing/encouraged by subsidies to water saving techniques and pricing of energy (subsidy to gas in Morocco)
  - Increase water use efficiency (field level ) compensated by extension of irrigated area (Tunisia) or shift to high value (high water-consuming) crops (Morocco, Guerdane)
  - Water costs: 3% of total costs for growers (intensive greenhouse agriculture in Spain), do not encourage efficiency. Where “town” water is used, efficiency becomes a priority
- Economic and social impacts:
  - Price increases can reduce water demand of risk adverse farmers but have economic and social impacts - lower farmers margins, reduction of employment but also positive environmental impacts (including reduction in nitrogen pollution) – the magnitude of this impact depends on capacity to adapt? 
  - Risk of social conflict: marginalisation of small-scale farmers in El Guerdane, Morocco.

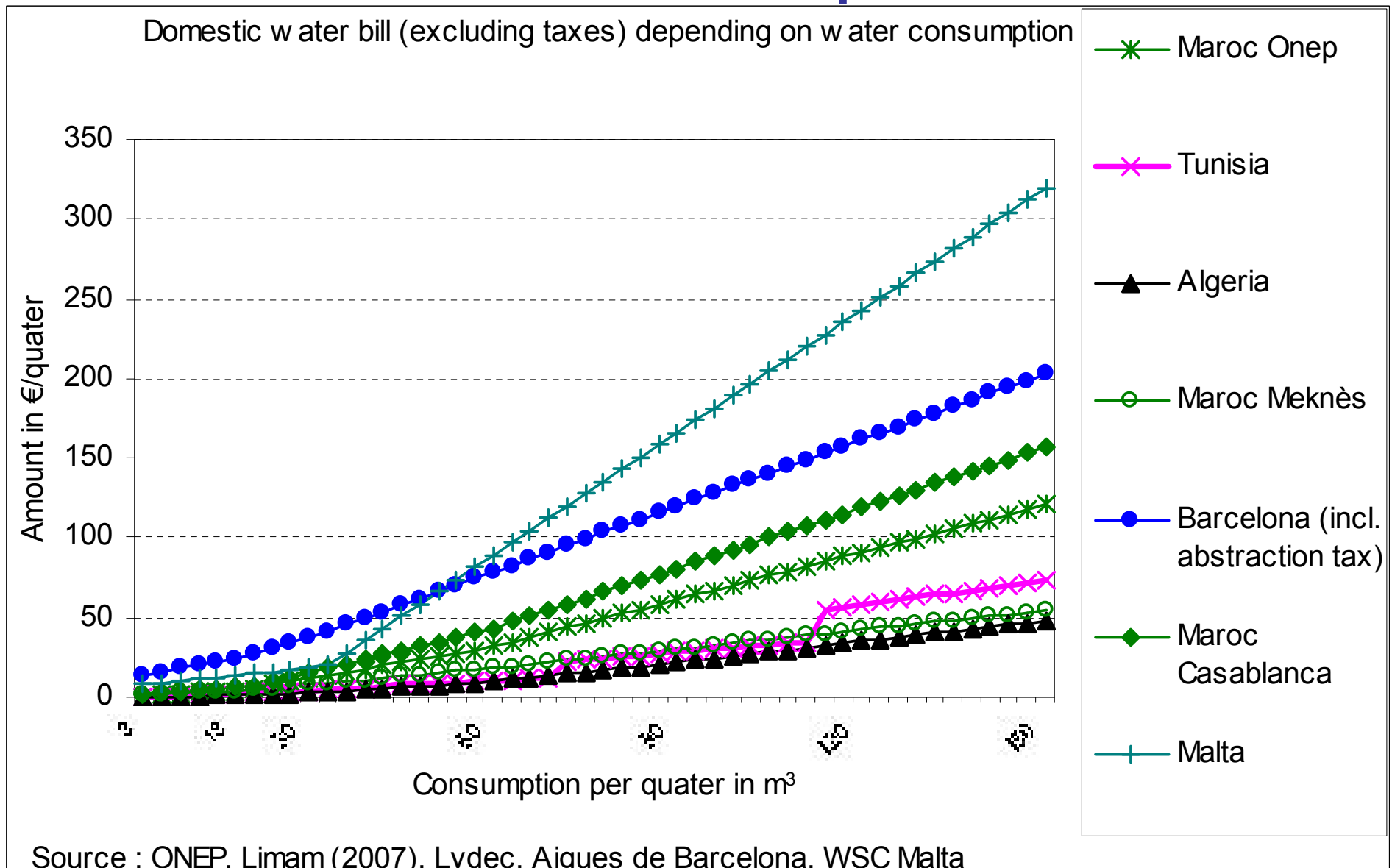
*Zoom 2*

# **LOOKING AT WATER PRICING IN THE DOMESTIC SECTOR**

# Pricing experiences: drinking water

	Pricing mechanisms	Initial price €/m3 (first 30m3/quarter)		Average price increase (from 30 to 100m3/quarter)	Additional measures
		Drinking water (Domestic)	Drinking water and sanitation		
Algeria	Two-part tariff. increasing block rate	0.09		2.8	
Morocco	Two-part tariff. Increasing block rates	0.36 (Régies) 0.46(Casablanca)	0,55 (Régies) 0.57(Casablanca)	1.6 2	River basin agency: abstraction tax
Tunisia	Two-part tariff. Block rate with a unique price level depending on block level	0.14		2.3	
Malta	Two-part tariff, Increasing block rate (per person)	0.39		4.8	Social tariff (free basic volume)
Cyprus	Two-part tariff increasing block rate	0.16-0.66			Subsidies to water saving measures
France	Two-part tariff most frequent (decreasing block rate in 30% of cases, small districts)	1.36	2.66		"green tariffs" for outdoors consumption
Spain	Volumetric, two-part tariff increasing block rate (3 to 5 blocks in large cities)	0,52 (Barcelona)	0.98 (including abst tax) From 0.4 to 1.6		Abstraction tax

# Water bills comparisons



# Pricing experiences

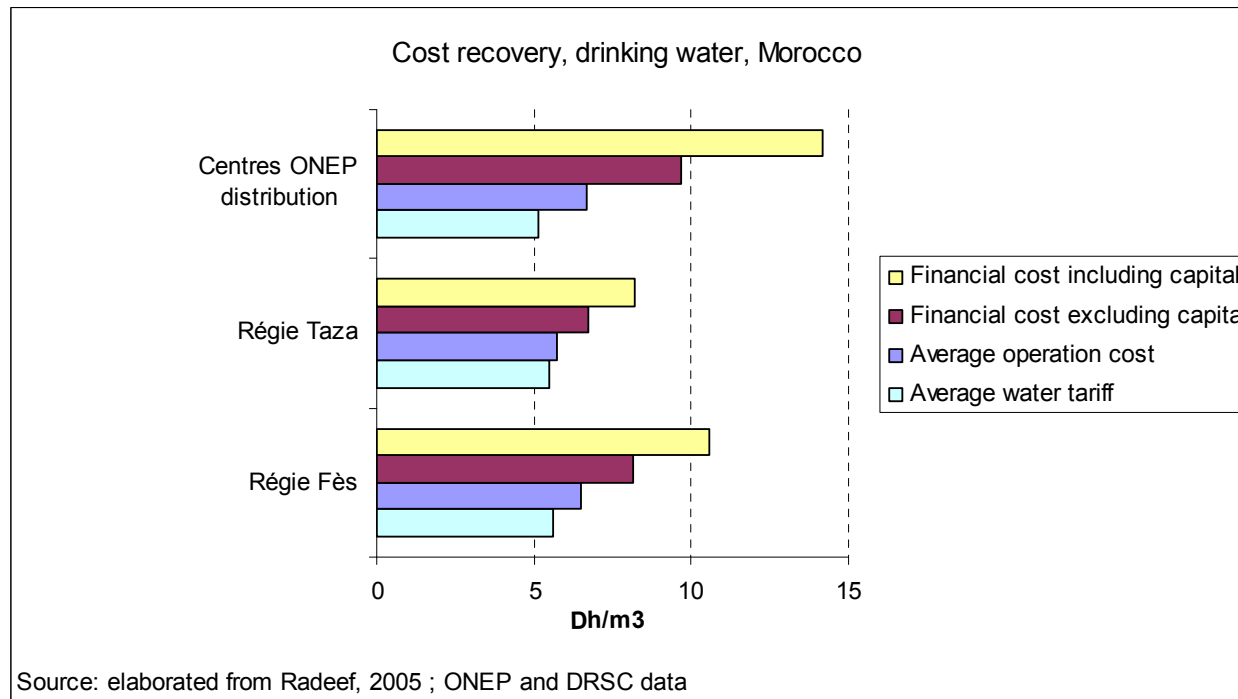
- Spain: spatial modulations depending on cost of supply, high price for drinking water in Canaries islands (desalinated water) 1.7€/m<sup>3</sup> against an average of 0.7€/m<sup>3</sup> in 2002
- France: cost recovery is the main objective – lower cost-recovery in rural areas
- Increasing block rate: Tunisia, Morocco, Cyprus, Malta
  - Financial, social and economic efficiency objectives
  - Trend towards reduction of the social block
  - High progressivity of price in Malta (but not always paid...)
- Wastewater charges limited to volumes supplied by water services in large cities without taking into account self-services in particular of industries (Morocco)
- Polluter taxes: applied in France, Spain, Malta... Under discussion in Morocco

# Impacts

- Demand:
  - decrease in domestic demand in Tunisia, price elasticity of demand in the upper blocks of consumption. Inelastic industrial and touristic demand
  - Domestic water price doubling by 2015 in Almeria will cause a 15-20% reduction of water demand per head
- Access to drinking water for the poor? Equity?
  - “Social block” subsidies do not target specifically the poor
    - common meters: ~30% of water meters in Casablanca, up to 50% for vulnerable groups in 2001 but recent efforts to install individual meters
    - Size of the first block: tends to represent a large share of consumption -40% of water volumes in the Sebou River Basin, Morocco for 14% of water sales; 59% Algérienne des eaux- Casablanca, subsidies benefit in a higher proportion to upper level consumers
    - Case of Tunisia: social tariff for less than 10% of total consumption
    - Social pressure against the reduction of the size of the block: Casablanca
    - Non connected populations do not benefit from “pricing subsidies”
  - Casablanca social programs: “branchements bleus” pricing conditions/no access to water for the poor; “branchements INDH”

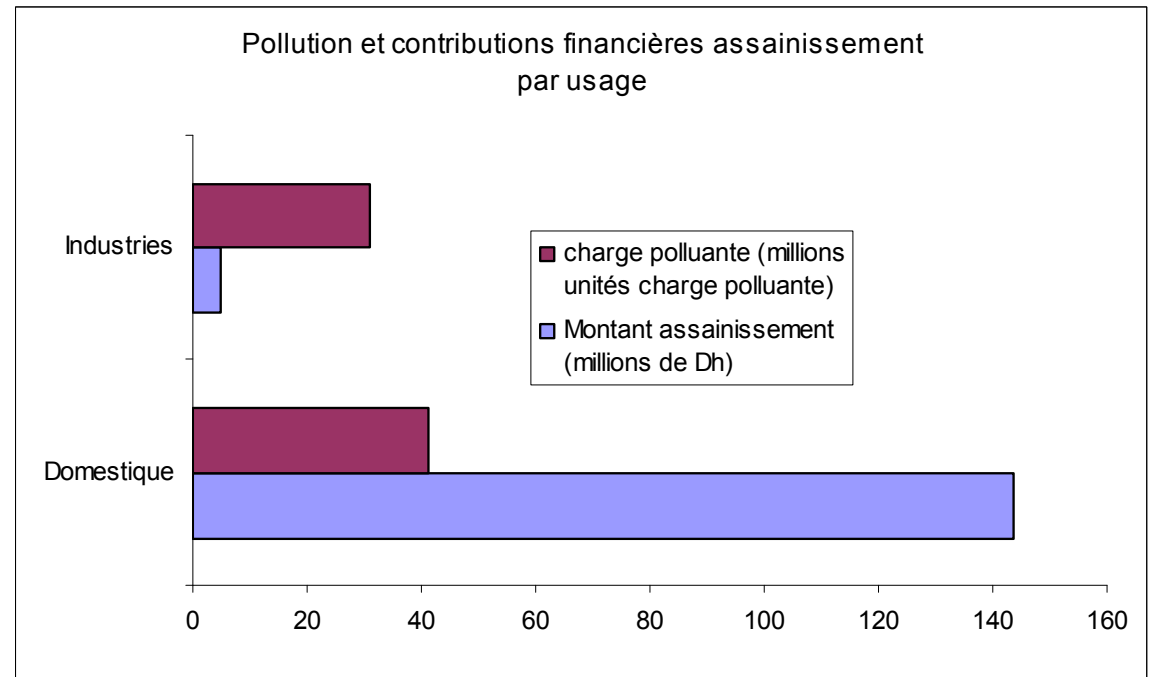
# Impacts

- Cost recovery, Morocco (Ec'Eau Sebou Project)
  - 75-90% operation costs (excluding capital cost)
  - 30-60% (including capital cost)
  - Deficit covered by transfers from the electricity sector, cross subsidies



# Impacts

- Full cost recovery
  - Algeria: very low price of drinking water that may not even cover energy costs.
  - Difficulty to apply pollution pays principle, Morocco, Sebou



# Conclusions and future prospects

- Implementation of economic instruments:
  - Often a compromise between financial cost recovery, water protection (efficiency), users' access to water resources (equity)
  - Social impacts: PPP experience El Guerdane, high price of agricultural water encourages more crops per drop but risk of marginalisation of small scale farmers and social conflicts
- Supply approaches are not abandoned:
  - Dams (renewed interest with climate change)
  - Desalinated water plants with decreasing cost (from 2€/m<sup>3</sup> in the mid-1980s to 0.4 €/m<sup>3</sup> or less, or more... depending on energy prices?)

# Conclusions and future prospects

- Pricing water and water saving behaviour:
  - Limited knowledge of users about their own use limits effectiveness (see results of survey in Sydney)
  - Reasons
    - High proportion of fixed costs masks the cost of water actually consumed
    - Lack of individual metering system
  - Other indicators may be more understandable: comparative levels of consumption (in time, between users)
- Pricing policies need to be accompanied by educational efforts to raise awareness on water consumption levels (total, different activities) if they are to play a role in water conservation
- Link between water saving behaviour and tenure status (flat rental/house owner). Housing policies/water conservation
- Need to take into account behavioural complexity

# Conclusions and future prospects

- Cost recovery:
  - heterogeneous concepts and methods,
  - methodological difficulties to compute full cost figures: difficulties to take into account resource and environmental cost,
  - lack of transparency and adequate institutional context
  - Sanitation services/cost recovery: a challenge in Mediterranean countries
- Pricing issues and water conservation:
  - Limits of existing pricing instruments: diffuse pollution, groundwater management, sewage charges
  - Pricing as a component of integrated approaches
  - Coherence between pricing policies and other policies (agricultural, economic, energy...)

# Future challenge

- Euro-mediterranean partnership: global water issue around the Mediterranean sea
- Interest for policy convergence? How? What? When?

Thank you

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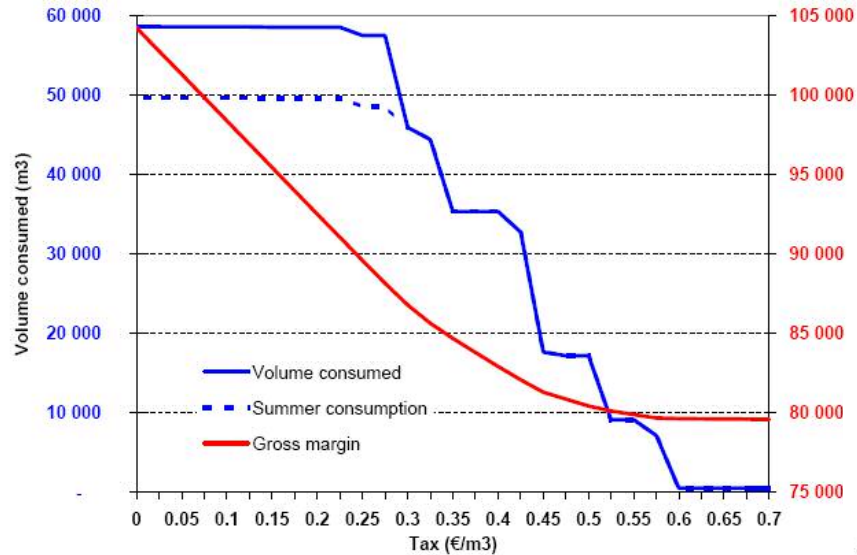
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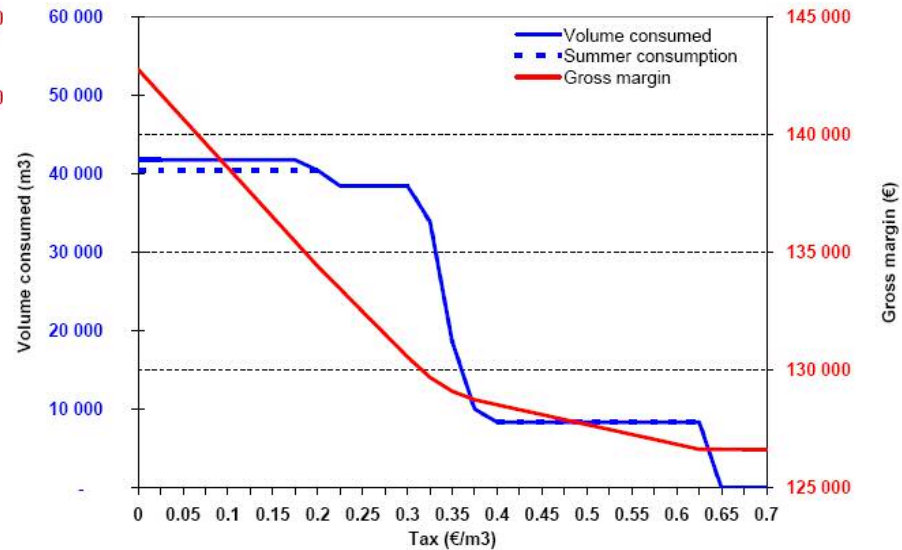
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# Expected impact on water demand in the Boutonne river basin



**Cereal farms**



**Mixed milk farms**



# Required price increase to restaure the environment

- Cyprus: from 0.17 €/m<sup>3</sup> to 1 €/m<sup>3</sup>
- Spain: (1) from 0.03 €/m<sup>3</sup> to 0.22 €/m<sup>3</sup>; (2) from 0.03 €/m<sup>3</sup> to 0.08 €/m<sup>3</sup>; (3) up to 1 €/m<sup>3</sup> - In areas with high value crops (citrus, olives and vegetables), prices on water abstraction needs to be substantially increased in order to achieve water savings.
- Boutonne: from 0.2 €/m<sup>3</sup> up 0.45 €/m<sup>3</sup> (-50%) or 0.525 €/m<sup>3</sup> (-80%)

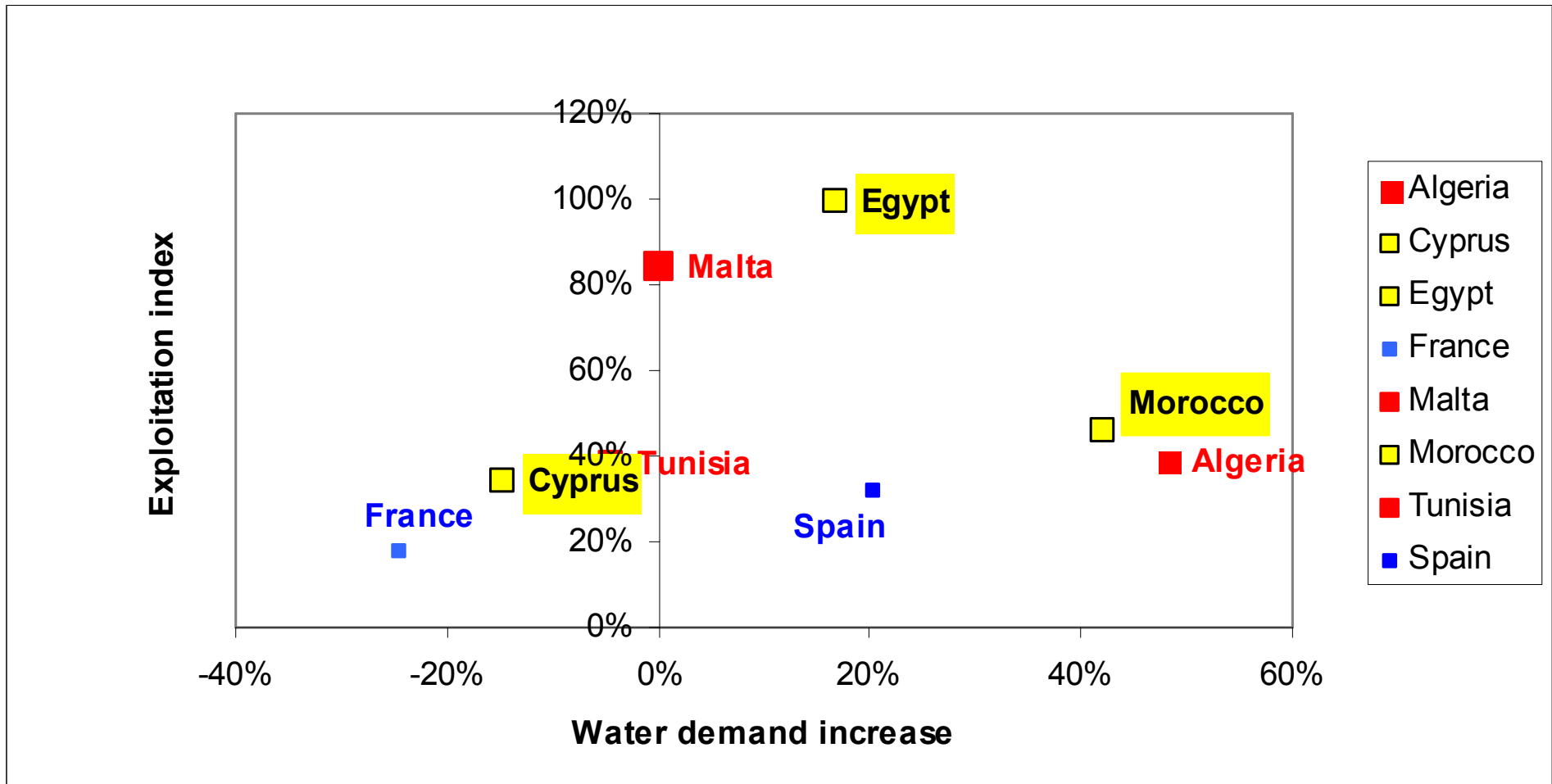


# Potential reduction in farm income

- Boutonne: reduction by -80% in summer abstraction leads to reduction in farm gross margin of 6.8 M€/year or **-20%** of actual total gross margin – cereal farms (-24%) more affected than milk producers (-11%).
- Spain: a reduction by 50% of irrigation abstraction leads to a reduction in gross value added of **-30% to -44%**
- Cyprus: reduction by 50% of total abstraction leads to **-14%** reduction in farm gross margin



# Pressures on water resources



Source : elaborated from Blue Plan and FAO aquastat data