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

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European Water Management and the Economic aspects of the Water Framework Directive”
Contents

• 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

  – 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
• 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.

Source: elaborated from Blue Plan and FAO aquastat data.
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 see 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
LOOKING AT WATER PRICING IN THE AGRICULTURE SECTOR
## Selected experiences in irrigation

<table>
<thead>
<tr>
<th></th>
<th>Pricing mechanisms</th>
<th>Price levels</th>
<th>Additional measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Algeria OPI</td>
<td>Volumetric flat rate</td>
<td>0.03 €/m³</td>
<td></td>
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<tr>
<td>Morocco ORMVA</td>
<td>Volumetric flat rate</td>
<td>0.03 €/m³ (ORMVA) (0.02-0.06 €/m³)</td>
<td>Quotas per crop Tubewell water spot markets Subsidies, water saving technologies</td>
</tr>
<tr>
<td>Tunisia</td>
<td>Volumetric seasonal pricing Increasing block rate pricing experience</td>
<td>0.05-0.10 €/m³</td>
<td>Subsidies water saving technologies</td>
</tr>
<tr>
<td>Malta</td>
<td>Two part tariff, Increasing block rate</td>
<td>0.38-0.4 €/m³</td>
<td></td>
</tr>
<tr>
<td>Spain</td>
<td>Per area (most common)</td>
<td>60.6€/ha Duero Basin (equivalent to 0.01€/m³) 0.12 – 0.25 €/m³ (Almeria. 2005)</td>
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</tbody>
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Comparison of water bills

Water bill depending on water consumption

Water bill €/ha vs. Consumption in m³

- Algeria
- Malta
- Morocco
- Tunisia summer
- Spain Almeria
- Spain Duero
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 subsides 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.
## Pricing experiences: drinking water

<table>
<thead>
<tr>
<th>Pricing mechanisms</th>
<th>Initial price €/m³ (first 30m³/quarter)</th>
<th>Average price increase (from 30 to 100m³/quarter)</th>
<th>Additional measures</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drinking water</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td><strong>Algeria</strong></td>
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<tr>
<td>Two-part tariff. Increasing block rate</td>
<td>0.09</td>
<td>2.8</td>
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<tr>
<td><strong>Morocco</strong></td>
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<tr>
<td>Two-part tariff. Increasing block rates</td>
<td>0.36 (Régies) 0.46 (Casablanca)</td>
<td>0.55 (Régies) 0.57 (Casablanca)</td>
<td>1.6 2  River basin agency: abstraction tax</td>
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<tr>
<td><strong>Tunisia</strong></td>
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<td>Two-part tariff. Block rate with a unique price level depending on block level</td>
<td>0.14</td>
<td>2.3</td>
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<td><strong>Malta</strong></td>
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<td>Two-part tariff. Increasing block rate (per person)</td>
<td>0.39</td>
<td>4.8</td>
<td>Social tariff (free basic volume)</td>
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<td><strong>Cyprus</strong></td>
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<tr>
<td>Two-part tariff increasing block rate</td>
<td>0.16-0.66</td>
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<td>Subsidies to water saving measures</td>
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<td><strong>France</strong></td>
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<tr>
<td>Two-part tariff most frequent (decreasing block rate in 30% of cases, small districts)</td>
<td>1.36</td>
<td>2.66</td>
<td>“green tariffs” for outdoors consumption</td>
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<td><strong>Spain</strong></td>
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<td>Volumetric, two-part tariff increasing block rate (3 to 5 blocks in large cities)</td>
<td>0.52 (Barcelona) From 0.4 to 1.6</td>
<td>0.98 (including abst tax)</td>
<td>Abstraction tax</td>
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</tbody>
</table>
Water bills comparisons

Domestic water bill (excluding taxes) depending on water consumption

- Maroc Onep
- Tunisia
- Algeria
- Maroc Meknès
- Barcelona (incl. abstraction tax)
- Maroc Casablanca
- Malta

Source: ONEP, Limam (2007), Lydec, Aigues de Barcelona, WSC Malta
Pricing experiences

- Spain: spatial modulations depending on cost of supply, high price for drinking water in Canaries islands (desalinated water) 1.7€/m³ against an average of 0.7€/m³ 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

![Cost recovery, drinking water, Morocco](source: elaborated from Radeef, 2005; ONEP and DRSC data)
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€/m³ in the mid-1980s to 0.4 €/m³ 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

Blue plan, SIMEDD Database, www.planbleu.org


Ifen www.ifen.fr
References (2)


Expected impact on water demand in the Boutonne river basin

Cereal farms

Mixed milk farms
Required price increase to restore the environment

- Cyprus: from 0.17 €/m³ to 1 €/m³
- Spain: (1) from 0.03 €/m³ to 0.22 €/m³; (2) from 0.03 €/m³ to 0.08 €/m³; (3) up to 1 €/m³ - 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 €/m³ up 0.45 €/m³ (-50%) or 0.525 €/m³ (-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