Water Pricing in Agriculture

on track for a fair and efficient policy in Europe?

Warsaw, 14 September 2011

Allocation of Water and Irrigation Water Pricing Policies in Cyprus

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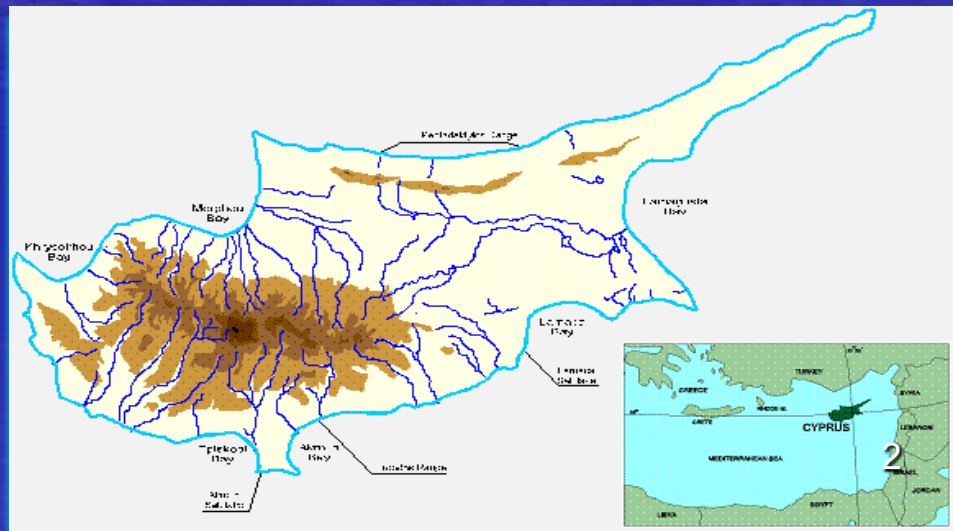
Cyprus Water Characteristics

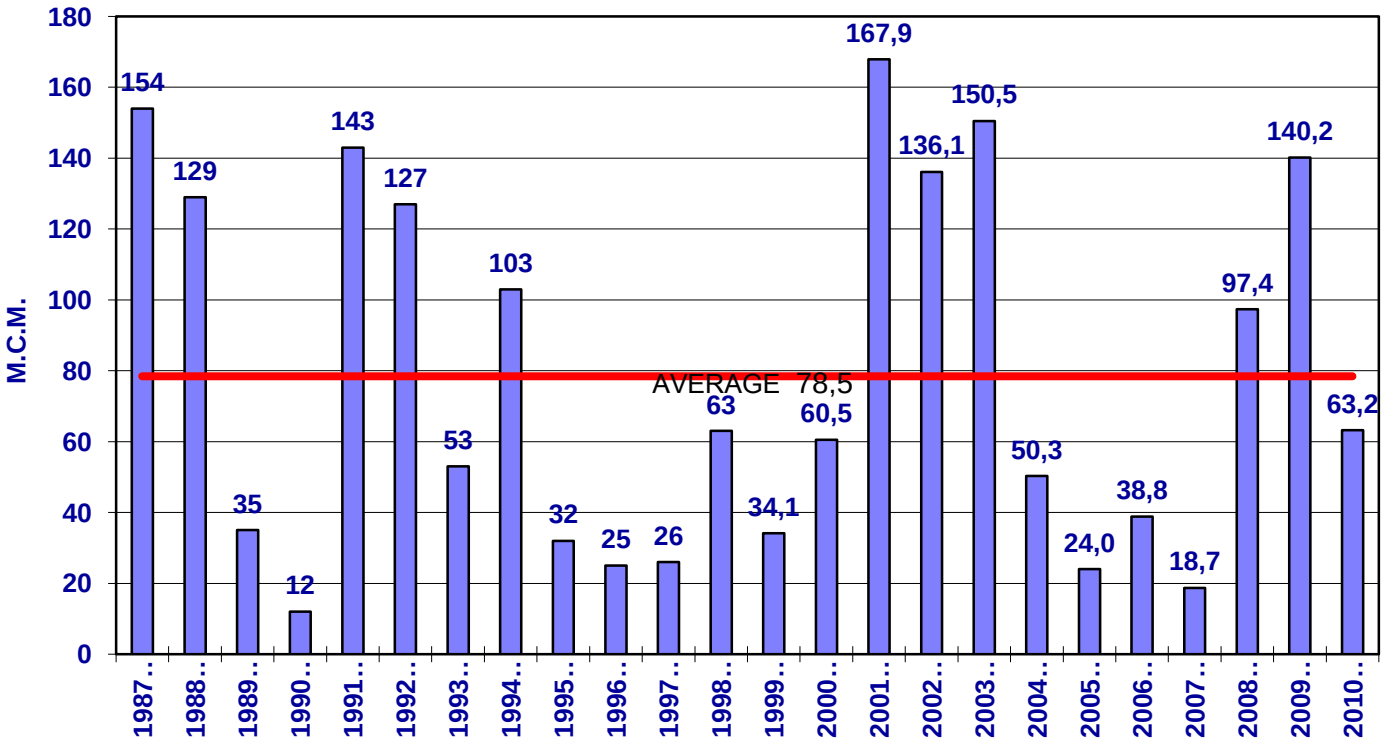
Location: Eastern Mediterranean in a semi-arid region. Classified (together with Malta) as one of the "water poor countries" in Europe, with the most acute water shortage.

- **Water resources rely on the annual rainfall which is highly variable and they are scarce and expensive to exploit.**
- **Availability varies significantly from year to year and water demand and supply are rarely in balance condition.**
- **Statistical analysis of rainfall in Cyprus reveals a stepped drop in the early 70's, which persists, leading to 40% surface runoff reduction.**

The climatic conditions along with the economic development and the increased water demand in all sectors of the society led to severe water scarcity



Inflow in the Dams



Major Dams Inflow

Agricultural Characteristics

- The agricultural sector (crops &l ivestock) has experienced a downwards trend, both in economic output and employment
- 2007: 3,2% of GDP & 7,9% of total employment)
  - Small average agricultural holdings size (average 3,5HA)
  - Low average income from agriculture per household
  - Ageing of population in the sector
  - Low employment rates in agricultural families (urbanization)
  - production is highly depended on water availability
- Agricultural land covers 30% of the total area of the island;

  28 % of the agricultural land is irrigated area
  - 33% of the water demand - permanent crops
  - 67% of the water demand – seasonal crops

Natural Water Resources

Groundwater

Over the past, it used to be the most obvious accessible source for drinking water supply and irrigation. Today,

- Groundwater aquifers are highly overexploited
- Piezometric levels decrease rapidly
- Aquifers' deterioration - quantity and quality - seawater intrusion

Surface water (very few watercources with continuous flow)

- Period 1960-2000: water development of major importance
- Construction of the **Governmental Water Projects (GWP)**
  - Supply drinking water to Local Water Authorities (on a wholesale basis) and irrigation water to individuals and to local Irrigation Organizations
  - Dams were constructed on almost all watercources (storage capacity increased from 6 MCM to 327 MCM, water treatment plants, conveyance systems, distribution systems etc)
  - Water management measures promoted

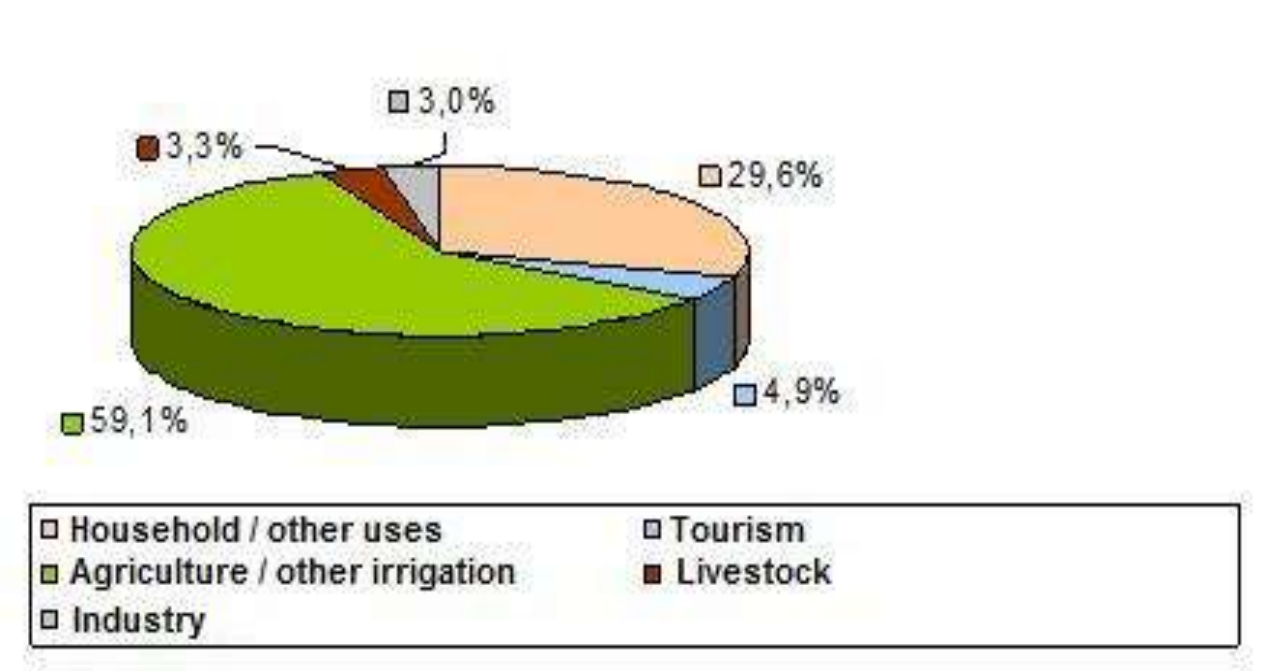
Non Conventional Water Resources

Despite the supply enhancement and the demand management measures, the adverse climatic conditions and the increase in demand led to the introduction of non-conventional water resources.

- **Desalination:** Allocated through the GWP and used for the supply of drinking water.
  Despite the environmental and financial cost, it is the only means to increase water security and independence of the drinking water supply from the climatic behavior.

- **Tertiary treatment** of sewage effluent: Used for irrigating agricultural crops (under specific legislation regarding the quality standards and given code of practice). Also used for irrigating recreational areas , green areas as well as for GW aquifers' recharge.
  It is a highly stable source, with significant environmental benefits.

Water Uses



Almost 90% of the drinking water consumed is supplied from the GWP

Demand Management Measures (1)

Long Term Demand management

- Use efficient conveyance & distribution systems
- use of improved on farm irrigation systems (95% of the total irrigated area). Estimated saved water: 75 MCM/yr
- Promotion of irrigation scheduling
- leakage detection methods and telemetry systems
- metering of water consumption in all uses
- water charges on a volumetric basis for all uses, combined with other charging mechanisms (rising block tariffs, penalty charges for overconsumption in irrigation)
- measures to promote a water-saving culture (water saving campaigns, education, peoples' awareness etc).
- Replacement and improvement of drinking WS networks
- Legislation modernization and improvement
- Promotion of less water demanding cultivations
- Code of good agricultural practice (sensitive areas)
- Revision of legislation

Demand Management Measures (2)

Short Term Management Measures - Allocation of Water from the GWP

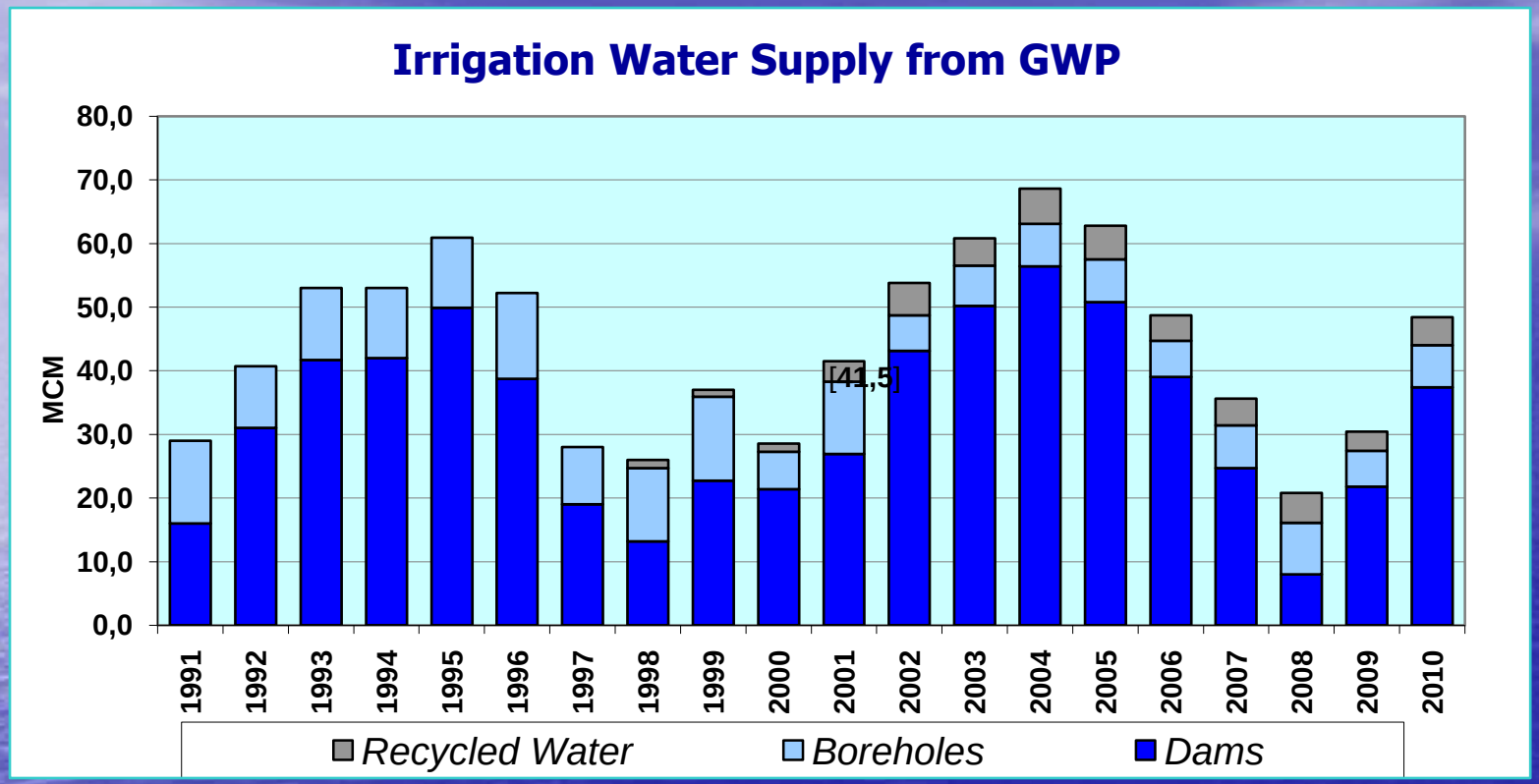
Theoretically, 50 % of the irrigation water demand was to be satisfied by the GWP. Due to water shortage and the allocation restrictions every year, the mean annual consumption from GWP reaches only 26% of the needs.

Water restrictions are implemented via a yearly allocation policy, used to ensure water availability to the different uses, by priority. Allocation scenarios are ready by the end of the rainy season (April)

- Drinking water (100%, considering health, social life and welfare)
- Recharge downstream for environmental reasons
- Quantities left for future needs
- Irrigation (applications, allocation, overconsumption charges)
  - Permanent crops and greenhouses (40 – 100%)
  - Seasonal crops (0 – 100%)
  - Other (green urban areas etc)

Water needs in agriculture (for normal production) are rarely fully satisfied (only in 2004, when the large dams were overspilling).

Water supply for irrigation



In the past, the gap between demand and supply used to be bridged by GW. Today, GW resources are not secure because of aquifers' deterioration, overexploitation and limited recharge.

After the new legislation, a more stringent procedure to permit and audit the sinking of wells is applied, with the ability to regulate abstractions, depending on the aquifer's condition (WFD and the new Integrated National legislation).

Abstraction charges proposed to be applied according to WFD – Art.9.

Water Pricing Policies 1960 - 2003

- A long tradition in domestic & irrigation sector from the 1960s.
- Volumetric pricing started with the implementation of the first GWP and gradually became the usual practice for all water providers (LWA & Irrigation Organizations).
- The aim was to recover the projects' financial cost, according to the National Law and Loan Agreements for financing the GWP (IBRD).
  - **Drinking water pricing (wholesale to LWA):**

    Full (financial) cost recovery
  - **Irrigation water pricing to individual farmers:**

    the price should reach at least 38% of the cost but not exceed 40% (or 65% under special conditions). Take account of the importance of the primary sector, food security, preservation of rural landscape, avoidance of urbanization (Most of the GWPs were part of Integrated Rural Development Projects).
  - Groundwater abstraction not charged. The full financial cost paid by the well owner (high due to the depth of the wells).

Water Pricing Policies 2004-2011

In 2004, after the final payment of the loans and in the light of WFD requirements (preparation for adaptation), irrigation water pricing from the GWP was revised.

- prices increased considerably (in some GWP were doubled) but kept at affordable levels
- prices, gradually reached a unified price in all GWP
- Prices for non agricultural use (e.g. green areas or play courses) are considerably higher, reflecting the financial cost.
- Overconsumption charges are applied for the quantities exceeding the yearly permissible (multiple of the regular price, strong barrier to overconsumption)

Despite the price reform in 2004 and the considerable price increase no change in the consumers' behavior in the GWP could be observed with regard to water usage (water supply was not stable thereafter)

Prices for recycled water are set to considerably lower levels despite the high cost; environmental benefits from the use; enter in the water balance; motives to use

Prices and Cost Recovery

Water Charges from GWP (2004-2011)

Description	Price
Irrigation Water (fresh water from dams)	
Agriculture	17 c/m^3
Green areas	34 c/m^3
Overconsumption	56 c/m^3
Irrigation water from Tertiary Treatment	
Agriculture	7 c/m^3
Green areas	15 c/m^3

Cost Recovery from GWP: 41% (mean supply)
From other sources: 61%
Average: 56%

Total Unit Cost for the supply of Irrigation Water (Art.9):

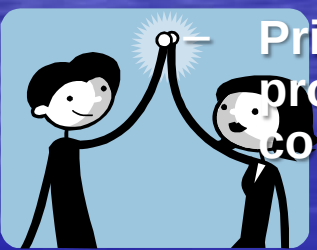
Description	Through GWP	Other sources
Financial	0,34	0,30
Environmental	0.10	0,16
Resource	0,01	0,03
Total	**0,45**	**0,49**

Environmental cost: damage in economic cost; (deterioration from a good quantitative and qualitative status)

Resource Cost: the cost of water body restoration in cases where the natural rate is surpassed e.g. GW over abstraction

Water Pricing Proposal: 2011
WFD-Article 9 Implementation

- Special study implemented (2008-2010); total cost re estimated including the cost to the environment and the natural resources
- The prices and the pricing mechanisms were re evaluated to meet the principles of the WFD-Article 9 (adequate contribution to the cost of water services, the polluter pays principle, taking into account the effects & the local conditions)
- Public Participation Process with all stakeholders; Administrative actions with the cooperation of the water service providers and the Water Management Advisory Committee.
- Formulation of the legislative regulations - adopted by the Council of Ministers; Proposed to the Parliament
  - The successful principles applied so far to be maintained.
  - Groundwater abstraction (for drinking and irrigation) to be charged, reflecting the cost to the environment and the natural resource.
  - Prices from the GWP to be increased, giving the signal of Art.9 provisions (cost to the environment and the natural resource – the consumers will being informed with every bill).



Water Pricing Proposal 2009-2011
WFD-Article 9 Implementation

- Drinking water: Full cost recovery, unified flat charge from GWP to LWA. Rising Block Tariffs from the LWA to the final consumers.

- Irrigation water from GWP: Considering the importance of the primary sector and the affordability analysis for each crop, the new proposal assumes that the increase in the irrigation water prices will not affect the economic value of the main crops and will be implemented without causing disruption to the agricultural production model.

- The cropping pattern was extensively discussed; to be assessed within the PM in a special study.

A new "water budget" is proposed to operate for the collection and management of resource and environmental revenues coming from the water charging. It will aim to the funding of measures introduced in order to support the sustainability of water resources & aquatic environment.

Cyprus Case - Summary Points (1)

- Agriculture is heavily influenced by the dry climate and the replenishment of water resources through rainfall.
- Farmers and agricultural production are based on water availability.
- Groundwater over abstraction and aquifers' deterioration is severe. Although easily accessible, today it is not as secure water resource.
- Water allocation from GWP gives priority to other uses/needs and agricultural needs are rarely satisfied. Demand & Supply not balanced.
- Striker restrictions and charges are to be imposed in GW abstraction.
- Water reuse is widely accepted and it is being further developed.
- Volumetric water pricing has been used for many decades.
- Acceptance of water pricing is high.
- On farm water efficiency measures are widely used. There is little room for improvement.
- The share of water cost to the total production cost is relatively low
- Overconsumption charge is a strong tool to convince the farmers to consume less and gives the right signal regarding availability; however, it actually stops irrigation and lowers production rather than acting as a water saving measure.

Cyprus Case - Summary Points (2)

- Water pricing in Cyprus has a lesser impact on water use than the other water efficiency techniques.
- Within the Art.9 implementation, pricing will be further improved, so as to include the environmental concerns of the WFD and give the right signals to the consumers.

THANK YOU
FOR YOUR ATTENTION

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