

**National report on
Monitoring progress and promotion of water demand management policies
CYPRUS**

Overview and conclusion

Cyprus with a semi arid climate has always been confronted with the problem of inadequate water both for its domestic and its irrigation needs. At present, and after most of the water resources of the island have been developed, the problem still persists. There is no one cause of water scarcity in Cyprus. A number of geographic, climatic, economic, and political factors all combine to exacerbate the water problems. Innovative strategies are needed to enable the continued growth and prosperity of Cyprus in the face of limited water resources and frequent drought.

Of all possible dams that engineering can construct in Cyprus, a large list taken from the more attractive opportunities has already been implemented. More dams are possible but carry a high price tag: the cost of water from new sources is higher than the cost of water that has already been developed.

The Regulation Index (average flow of water resources controlled compared to natural irregular flow) has been calculated as being 69.7%. This indicator measures the efforts made and the extensive control of water resources by the construction of dams, i.e. the annual security of supply.

Two desalination plants are presently in operation producing 0.031km³/year. A substantial amount of recycled water is reused and has become available for agriculture and the urban and rural environment. It is estimated that by the year 2012 an amount of approximately 0.03 km³ of treated sewage effluent will be available for use.

Agriculture is the main user with 69% of the total water use. Domestic supply accounts for 25% analysed into 20% for the residents and 5% for tourists. Industry consumes 1%, and 5% is considered to be used for environmental reasons such as landscape irrigation and protection of special ecological areas.

The Exploitation index of renewable natural resources is 34%. As this is based on the maximum potential water resources “offered by nature” on average, and since only a part of these (about 0.70) are exploitable because of various technical-economic and environmental constraints, this indicator is estimated to be about 49% .

The most common water quality problem is the contamination of groundwater caused by seawater intrusion. The majority of the groundwater bodies have been over-exploited for many years, resulting in seawater intrusion of large parts of the coastal aquifers.

The estimated loss of storage due to the silting up of dams amounts only to about 2%.

All areas, urban and rural, have house to house water connection. Both the proportion of the population having a durable access to an improved water source and to an improved sanitation system (total, urban, rural) is practically 100%. The share of collected and treated wastewater by the public sewerage system is 60%.

The irrigation network in Cyprus is highly efficient. It generally consists of closed systems with an overall conveyance efficiency averaging 90-95%. Field application efficiency averages 80-90%.

The efficiency index of drinking water use is in the range of 76%, 65%, and 63% for the main cities, the municipalities and the villages respectively.

In retrospective, the high cost of water development projects and the frequent occurrence of serious droughts occurring every 10 years or so and lasting from 1 to 3 years, led all concerned to recognize early on the value of water demand management.

Effective strategies towards improving water use efficiency have been implemented, such as: improved irrigation systems; water rationing; conservation of groundwater; water pricing; cropping patterns; raising “water awareness” and educating consumers; reuse of treated sewage effluent; reduction of unaccounted domestic water; legislative measures for domestic water conservation (“hose ban”) and, incentives for the use of marginal water for gardening and other purposes.

The main obstacles encountered for better efficiency in water management are: fragmentation of responsibility in water management; lack of an umbrella law covering water; relaxed supervision and control, and lack of effective water pricing.

In prospective, the Water Development Plan until 2015 places emphasis on water demand management to be considered together with the Water Framework Directive implementation. Basic targets of this Plan are: reallocation of the water resources; change of cropping patterns; subsidies to be faded out; adjustment of water prices; control of conveyance and distribution losses and water awareness campaign. The forecast for the agricultural demand is that it will stabilize to the current levels of 0.182 km³/yr and that it will be supplemented by some 0.040 km³/yr of recycled water. The water demand for urban and tourism uses is expected to increase significantly from 0.067 km³/yr in 2000 to 0.100 km³/yr by 2020. The industrial sector demand may increase to 0.007 km³/yr by the year 2020.

Reducing unaccounted water to 15%, the savings of 0.004 to 0.012 km³/yr on the current demand will increase to 0.006 to 0.018 km³/yr for the projected demand of 2020.

Considering the environmental objectives within an integrated policy for water resources in retrospective, point out that the past policies, which were carried out at a time when the environmental concerns were not as prominent, had as a main goal the increase of the availability of supply. Changes in water policies by strengthening and taking into account environmental objectives, were formulated as early as 1991 with the enactment of the law on the Control of Water Pollution and as result of the process of harmonization and the accession to the European Union. Estimates of the water needed for the environment of 0.0125 km³/year have been presented. The instruments that will be implemented for the identified water bodies of ecological value under the WFD will be part of the River Basin Management Plan for protecting, maintaining and/or improving their quality to keep them in “good” status.

The consideration of water demand management within an integrated policy for water resources in retrospective, points out the “created” additional irrigation demand as a result of the major irrigation projects that were developed. At the same time, the successful policy for establishing Cyprus as a quality tourist destination has developed a significant water demand by this very important economic sector of activity.

The trends for water demand with possible consequences have been presented. With agriculture stabilizing to present levels and with domestic demand increasing to 0.100 km³/year the overall demand may increase by 13%. Meeting this demand will put an extra stress on the water resources or on the economy if further desalination is put into stream since the surface water resources have already all been practically developed with the more attractive surface reservoirs having been already implemented and the aquifers already being over-pumped.

The overall range of possible savings through leakage control and increased efficiency of use may result up to 0.018 km³/yr from the future domestic sector alone since irrigation is considered to be already highly efficient.

In examining the evolution of water policies in the island, three basic periods have been identified: the first (1960 to 1990) was for water supply development; the second (1970s onwards) was for water

conservation and the third is for water reallocation and demand management. Sustainability and the “good quality status” of water resources is also becoming of significant importance with the Water Framework Directive.

A number of overall or local cost-effective studies carried out in the island have been outlined such as: Water Banking suggested as a water management strategy option facilitating voluntary reallocation of water from farmers to domestic water users and tourism; the Regulation of the Market for Irrigation Water in Cyprus – Facts, Policies and Options providing expert advice and consultation in the area of pricing of irrigation water; and, the studies (2004) regarding the overall cost for irrigation water, domestic water and recycled water as well as cost effectiveness analysis and economic analysis of water uses that have been carried out within the study for the implementation of Articles 5 and 6 of the Water Framework Directive in the island.

The total unit cost for bulk domestic water has been estimated¹⁹ at 1.6 US\$/m³ for 2005 and for the total unit cost for irrigation water 0.26 US\$/m³. The financial unit cost associated with the provision of recycled water has been estimated at 0.60 US\$/m³. The cost recovery rate for domestic supply is calculated at 73.1%, and 62.1% if environmental and resource costs are incorporated while for irrigation supply this has been estimated¹⁷ to be 76.6%. The same for the recycled water was low, reaching 15.4% due to the reduction of tariffs in 2004 (to 0.09 US\$/m³) mainly due to the aim of promoting its use.

The public expenditure and investment devoted purely to water demand management (subsidies for drilling and use of marginal water and awareness campaigns) as indicated in the Development Expenditure budget of the Water Development Department for 2006 of US\$ 37.8 million was US\$ 0.28 million or a low 0.7%. If training of staff on integrated water management and EU programs are considered, then this increases to 2%. Furthermore, if the expenditure for improving Village Water supply systems and the expenditure for development and exploitation of treated effluent are considered and added to the above, then the percentage devoted to WDM becomes 30%.

Integration of water demand management in the programmes of higher level training and research establishments is low and efforts in this direction should be increased.

The possible actions to reach the objectives set or proposed in terms of water demand management have been identified and are, in an order of priority: control of leakages; increase of water prices; reduction of demand per capita through conservation education; reduction of the total area of irrigated crops; change of crop planting patterns to more efficient crops; further improvement of irrigation efficiency; limit of water uses; and, use of marginal water for certain uses.

Cyprus participates in a number of regional cooperation initiatives and programs that could assist in water demand management activities. The role of these to date, remain at the level of information and knowledge exchange and to the training through participation in seminars and workshops. Considering the water scarcity problems facing the country and the relative small budget allocation for water demand management activities, proposals for strengthening the contribution of the cooperation and development aid policies for water demand management should be worked out. Pilot projects demonstrating the viability of water demand management and efficiency policies, promoting and regulating the installation of simple water-saving devices, would also be very applicable. Other projects on WDM could be: a review of water demand and pollution control experience across the region and identification and examination of replicable strategies and techniques, and a review of effective water saving and water conservation awareness campaigns and adaptation to local socio-economic and cultural conditions.

The implementation of the EU WFD is expected to develop a new impetus to WDM policies within the tools that can be used within the measures to be taken to maintain the good status of waters.