

Facing the Future: Concluding Remarks

Phoebe Koundouri, Ekin Birol, and Cahit Ezel

Abstract This concluding chapter proposes a holistic way forward for water resources management in Cyprus within the framework of the European Union (EU) Water Framework Directive, given the climatic, hydrogeological, socio-economic, historical, political and ethical dimensions of this interesting resource allocation problem.

Keywords Natural resource allocation problem • Holistic water resources management • Efficient and effective policies • Water Framework Directive • Single management unit

Introduction

This concluding chapter aims to propose a holistic way forward for water resources management in Cyprus within the framework of the European Union (EU) Water Framework Directive (WFD 2000/60/EC), given the climatic, hydrogeological, socio-economic, historical, political and ethical dimensions of this interesting resource allocation problem. A review of water services in Cyprus is provided in the next section.

P. Koundouri (✉)

Department of International and European Economic Studies, Athens University of Economics and Business, 76 Patission stry, GR-104 34 Athens, Greece
e-mail: pkoundouri@aueb.gr

E. Birol

Department of Land Economy and Research Fellow at Homerton College, University of Cambridge, London, United Kingdom

and

International Food Policy Research Institute (IFPRI), 2033 K St, NW, Washington DC 20006-1002, USA
e-mail: e.birol@cgiar.org

C. Ezel

Eastern Mediterranean University, Cyprus via Mersin 10, Famagusta, Turkey
e-mail: cahit.ezel@emu.edu.tr

The main outcomes of the research undertaken are summarized and conclusions of the contributing authors on water resources management in the country, recent trends concerning water use and supply, as well as the administrative and policy framework that governs the use of water resources are discussed. A holistic approach to water resources management is the overall contribution of this book and is shortly presented. In the last section of the chapter highlights the importance of treating the whole of the island (both the area controlled by Cypriot Government and the Turkish-Cypriot administered area) as one management unit is discussed.

A Proposal for a Holistic Water Management in Cyprus

Traditionally, Cyprus used to rely on surface water and groundwater for meeting domestic and irrigation demands.¹ The reduction of rainfall in the East Mediterranean region as a result of climate change and the greenhouse effect, accompanied with an increase in water demand as a result of economic development, has intensified the water scarcity problem over the last years. In the light of the scarcity of water resources available on the island and the steadily growing demand for water, state authorities have adopted a series of measures in order to mitigate water stress conditions and reduce the environmental impact of water resources overexploitation. Desalination plants were set up with the aim of eliminating the dependency of the potable water supplied to the large urban and tourist centers on rainfall. As stressed in Chapter 3, the government's water policy is not restricted to the issue of desalination plants but is also focused on the exploitation of other non-conventional water sources, such as recycled water. Further, the deterioration of the water scarcity problem resulted in the construction of the Southern Conveyor Project. This project transfers water that used to be lost to the sea, to areas facing serious water shortages.

Despite the substantial investments made in water development, water resources remain scarce, requiring prudent management. Cyprus is extremely sensitive and vulnerable to water resources pollution, and ground water resource overexploitation. These are exacerbated by the island's small size and geographical constraints, and the existing institutional weaknesses and legal and regulatory deficiencies as underlined in Chapter 5. The existing institutional framework of the water sector is deemed fragmented and inadequate. The author of Chapter 5 explains in detail that until recently, water legislation was developed on a demand driven basis: Over 20 different laws existed for the development, distribution, pollution and management of water resources, and many more regulations have been adopted pursuant to these laws. Different agencies were responsible for the implementation of different laws. This institutional framework resulted in the inconsistent and unorganized management of the island's most scarce natural resource. In addition, no legislative framework

¹Domestic and agricultural use of water are the two most important water-consuming sectors in Cyprus, both in terms of their significance to the overall economy of the country and in terms of the cost associated with the provision of water services. See Chapter 2 for a detailed analysis.

existed to facilitate overall environmental planning and control. Although today the legislative arrangements have considerably improved with the accession of Cyprus to the EU, the institutional framework needs further restructuring. In particular, it needs to be strengthened in order to ensure coordinated and collaborative efforts for sustainable management of Cyprus' water resources, as per the EU WFD.

Chapter 4 concludes that the EU WFD provides Cyprus with an unprecedented opportunity for introducing and implementing water policies, which cannot only enhance the quality and quantity of the water resources, but also ensure sustainable use of water resources and the environment. In addition, the consideration of the island as a single river basin, as required by the WFD, presents a great opportunity for sustainable water management, as well as collaboration and cooperation between the two communities on the island. The effective implementation of the WFD in Cyprus requires appropriate infrastructure; considerable effort from the Cypriot government and Cypriot public alike; long term planning; a structural change in the tradition of thinking; efficient allocation of adequate financial resources, as well as strong political will.

To achieve sustainable water resources management for the benefit of present and future generations, protective and preventive water sector-specific actions need to be undertaken. Further to actions aiming to curb water resource pollution and depletion threats caused mainly by the agricultural and industrial sectors, efficient water pricing policies should be addressed. Prices under the prevailing pricing policy are lower than the efficient level. This problem is further compounded due to the complete disregard of the environmental and resource costs in water pricing. Chapter 7 suggests that water tariffs should be revised upwards. This revision, however, should happen in discrete stages. According to the author of Chapter 4, the tariff for irrigation water should be at least 38% of the weighted average unit cost, while for domestic and industrial water the tariff should cover the full supply costs. The recovery of the full water services cost, including environmental and resource costs is highly underlined in the WFD. Specifically, Member States should adopt, by 2010, water policies that provide adequate incentives for efficient use of water resources by relevant users.

A fully developed and operational environmental management scheme (the Master Plan) (Demetriades 1998) which will be effective until 2020, is expected to be an efficient tool in this respect. The Plan suggests a multitude of measures that should be applied holistically. These include demand management measures, which aim to the increase of water tariffs (for all water uses) to those levels that approach full cost-recovery. These measures, which are described in detailed in Chapter 6, aim to increase the overall efficiency of water use by all sectors, as well as to raise public awareness for water conservation. Efficient water resources management is further promoted through the implementation of the EU's reformed Common Agricultural Policy (CAP). The implementation of the 'new' CAP will lead to a gradual reduction of production related subsidies, which have not been successful in achieving their goal of providing the farmers with incentives for wise use of environmental resources. According to the 'new' CAP, agricultural subsidies are now given on a per hectare basis, through the agri-environmental schemes, which are independent of agricultural production but dependent on environmental conservation.

The Cypriot economy is currently facing new challenges as far as sustainable development is concerned. By shifting from an agricultural to an urban, mainly tourism and services-oriented economy, Cyprus has achieved a remarkable economic growth since independence, and especially over the last 3 decades. This rate of economic growth, however, has put a strain on the country's environmental quality and natural resources. Although economic growth has led to higher income per capita and better living standards, its costs on environmental degradation and natural resource depletion have been significant. Despite its partial degradation, however, the environmental quality of Cyprus is on the whole at ecologically acceptable threshold levels.

In order to be able to design and implement efficient and effective policies for water management and conservation, the total value of the benefits generated by its several uses, services and functions need to be realized and captured. Today, many of these benefits are not reflected in the market prices of water. This leads to spatial and dynamic misallocation of water resources between the different uses. Economists should attempt to estimate the total economic value of water, including current use values (direct and indirect), option and existence values. These values can be estimated through the use of alternative non-market valuation techniques. In Chapter 8 an economic valuation method, namely a contingent valuation study, is undertaken to estimate the economic value of the Akrotiri wetland, which is the most important wetland in Cyprus. Results indicate that the Cypriot public attaches positive and significant economic values to the Akrotiri wetland. The estimated economic values can provide the policy makers with the necessary economic information for the construction of sustainable and efficient management strategies for Akrotiri wetland. This case study also provides implications for other similar wetlands in Cyprus, as well as in other European countries, given the current mandate for wetland conservation under the EU's WFD.

In line with this, the case study of the Kouris watershed is presented in Chapter 10. In the study a variety of economic valuation techniques are employed, including Hedonic Pricing Method, Contingent Valuation Method, Travel Cost Method, Mathematical Modeling and Distance Function Method, to assess the social value of water in the different uses (agricultural, domestic, touristic, industrial). The proposed approach allows for the determination of the efficient pricing strategy, which can achieve the allocation of water between the various water demands that guarantees maximization of social welfare. Issues of equity and sustainability are also addressed.

Cyprus as a Single River Basin

In order to successfully apply the proposed holistic water management in Cyprus, and to effectively implement the WFD (EU 2002), the issue of political separation of the island needs to be dealt with. For this reason, we want to conclude this book by pointing to the importance of treating the whole of the island (both the area controlled by Cypriot Government and the Turkish-Cypriot administered area) as one management unit.

The decline in precipitation in recent years has further intensified the chronic water problem of both the South and the North of the island. The introduction of non-conventional water resources (e.g., water recycling, desalination plants, and water transport from Turkey) has not solved the problem neither in the South nor in the North. Some measures have been taken on both sides to shift water policy from supply augmentation to demand management; however these measures have not been sufficient to meet the increasing demand for water. Demand for water is increasing on both sides as a result of population growth; development of tourism and increases in the standard of living. Moreover, these developments are exerting additional pressure on the insufficient endowment of water resources. These resulted in excessive pumping, which caused seawater intrusion into main aquifers. “Furthermore, intensive agriculture and excessive use of fertilizers have resulted in nitrate pollution of many aquifers. Similar nitrate pollution problems appear in aquifers in inhabited areas, due to direct sewage disposal in absorption pits (Water Development Department and FAO 2002)”.

One can argue that new policy reforms, coupled with the implementation of the WFD, can alleviate the water related problems in Cyprus. However, this argument can only be valid for the internationally recognized Republic of Cyprus, which operates under the de facto Greek Cypriot control. That is, due to the de facto division, the EU laws do not apply in the northern part of the island, which is under the de facto control of Turkish Cypriots. Hence, the WFD is only being implemented in the South, with the provisions of the Water Framework Directive being transported into national legislation through the “Water Protection and Management Law of 2004” that was adopted by the House of Representatives on the 5th of February, 2004. In the North, so far the administration has not initiated the process of reviewing the status and particularities of its water resources and developing its own national implementation strategy. Partial implementation of the WFD in Cyprus contradicts with some of the key elements of the Directive.

Firstly, the WFD requires cross border cooperation between countries and all involved parties. No such cooperation has officially been initiated in Cyprus. In Cyprus there exist “common aquifers” and “common rivers”² which are appropriated by both residents in both the South and the North. Hence, the collaboration and cooperation between Greek and Turkish Cypriots regarding their management and safeguarding is essential for their sustainable use. Cooperation is also essential for the protection of coastal waters, which is an important element for the sustainable development of the tourism sector, which contributes to the economic development of both sides in a considerable way. The WFD is a good opportunity to bring the two sides together as in the case of by-communal projects explained in Chapter 9. The Nicosia case study, demonstrates that policy networks are important in that they enable communication between the two communities without the political

² A “common aquifer” refers to any aquifer extending into the areas of both sides. A “common river” refers to any river or any portion of a river flowing from the area of one side to the area of the other. These terminologies are adapted from the Annan Plan (Foundation Agreement, Annex III, Attachment 12).

implications that direct contact usually entails. Since water is essential to life and the existence of both communities, and since both of their economic activities are fully dependent upon water, the WFD may contribute even more to the level of cooperation between the two societies.

Secondly, the WFD ensures active participation of all stakeholders. However, in Cyprus stakeholders in the North are not involved in the process of implementation of WFD. Cooperation between Greek and Turkish Cypriots is crucial to ensure that the whole process is carried out efficiently and transparently. The involvement of two communities must be maintained so that there is a balance of interests between the environment and those who depend on it.

Thirdly, the WFD requires setting up a system of management within river basins, which recognizes that water systems do not stop at political borders. Cyprus is a good example of this issue, as de facto division cannot stop the common use of ground, surface and coastal waters at certain areas of the island. The behavior of one party directly affects the other, and therefore cooperation is essential to ensure that both sides benefit.

It can be asserted that both communities would benefit greatly from coordination in the management of this scarce, economically, socially and politically important resource. If two separate river basins are identified as North and South, and if the island of Cyprus is not considered as one river basin, then the implementation of the WFD only in the South without any cooperation between two sides may not yield the desired outcome. Moreover, lack of cooperation between the North and the South may have adverse effects on the financial cost of implementing the WFD.

Finally, it can be argued that consideration of the whole island of Cyprus as a single river basin and implementation of the WFD on both sides with close cooperation between competent authorities, will benefit both societies economically, financially, socially and politically. Such a policy will also contribute to bringing the two sides even closer, and providing them with the opportunity to establish and maintain a sustainable and integrated water resource management plan for the whole island. If this is achieved, people in Cyprus will be in a better position to combat the challenges of water scarcity and it will be relatively easier to provide them with sufficient, safe, and reliable water for domestic, agricultural, industrial and tourism sectors, while safeguarding the natural and environment resources.

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