

## Ecological Crisis and Water Supply

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# Ecological Crisis and Water Supply

*The Case of Andalusia in the Spanish  
Hydrological Context*

*Edited by*

Juan Manuel Matés-Barco and María Vázquez-Fariñas



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# Preface

The main objective of this book is to analyse the origin, development, and evolution of the public water supply service in Andalusia (1800–2020). Highly important issues have arisen in relation to the provision of this service which has acquired great relevance in recent years. In essence, the main objective is to contribute to furthering the knowledge and the analysis of the processes of municipalisation and/or privatisation of this service in Andalusia. Similarly, another aim of this work is to contribute to providing those responsible for local governments and administrations, on both a political and technical level, with a useful reflection and illustrative information on the use of municipalisation and/or privatisation as an instrument for reforming the local public sector.

To achieve this objective, we believe that the book should be based on several perspectives. First, the historical perspective is important in order to understand how the management of this public service has evolved over the last 200 years. To a large extent, this knowledge allows us to understand many of the current actions. Second, the economic perspective should be considered since it is useful to gain an idea of the level of efficiency of the drinking water supply service in Andalusia. Third, the legislative perspective illustrates how the regulatory framework of each era has determined the management and service provision models. And finally, the ecological and environmental perspective is highly important in the light of the New Water Culture and in the protection of the resource.

Within this context, the book is oriented towards the CHALLENGES of Andalusian society. Specifically, it focuses on the fifth challenge: Climate action, environment, resource efficiency and raw materials, which seeks a more efficient economy and society in the use of natural resources and water. Among the various lines of action of this challenge, the research focuses on environmental protection and the sustainable management of natural resources, water, biodiversity, and ecosystems, in order to provide knowledge and instruments that contribute to the management and protection of natural resources, enabling a sustainable balance to be achieved between the scarcity of resources and the current and future needs of Andalusian society and the economy. To achieve this, we will propose water management models that allow for an efficient and sustainable administration of water resources. In addition, we will provide knowledge and tools that enable effective decision-making and public commitment.

The nineteenth century saw the emergence of the “Modern Water System”, which resulted in the model that is currently used in towns. Our intention is to study the process of how this new system was implemented: a universal,

continuous, and permanent service, the introduction of a tariff system, the emergence of private companies, municipalisation processes, the emergence of public companies, etc.

The expansion and modernisation of municipal utilities and network industries requires the design and incorporation of new management and regulatory models. Western Europe was a pioneer in this respect, transplanting its public service management models to other countries. On the one hand, the French experience was notable for its decentralised pattern of public service at the municipal level, structured around private enterprise and with the introduction of competition through tendering processes and concession contracts. On the other hand, the British model stood out for its process of consolidation of the “service provider” in order to take advantage of economies of scale, privatising the agents that provided the service and creating a sophisticated system of economic regulation (Milward 2004 and 2007).

Spain has largely imitated the French model and the drinking water supply is based on public ownership by local administrations, but with the transfer of management to private companies. This system underwent a back-and-forth process, culminating in a system of concessions to both public and private companies (Matés-Barco 2013, 2014 and 2016). Subsequently, regulation has been used as a public policy technique. The direct control of services has been replaced, by way of concessions, with contracts with private companies operating on a monopoly basis.

Approaches to regulation are manifold and have generated much debate (Bel 2006). The academic literature, especially British and American publications, has addressed economic regulation from very different perspectives. Some authors have stressed the need for state intervention to smooth market failures, especially in the presence of monopolies or oligopolies. This control has been exercised through state regulation, so as to avoid the shortcomings of private agents and possible systemic risks in the economy. Others have shown the drawbacks of public interventionism (state, regional or municipal) arising from agency problems (Stiglitz 2009; Moss and Cisternino 2009).

In the case of Spain, studies can be found from the perspective of both administrative law and economics. There has been a tendency to reduce the role of the public sector, with the consequent promotion of privatisation, due to a desire to improve the functioning of public services. Terms such as nationalisation and monopoly have begun to be questioned and new concepts such as competition regulation and regulatory bodies have emerged. The continuous social, technical, and economic change promoting variations in management methods and formulas that adequately regulate these commercial activities is sought (Ariño, De la Cuétara, and Martínez 1997; Bel



2006; González-Gómez 2006; González-Gómez and García-Rubio 2008; Mirás and Piñeiro 2006; Matés-Barco 2017a, 2017b and 2017c).

This book analyses certain postulates of economic theory on the management of public services and, more specifically, on the management of the drinking water supply in cities. At the same time, it focuses on the case of Andalusia, analysing its historical evolution, the current situation of this public service and the existing management model in the Autonomous Region, using Cost-Benefit Analysis (CBA) or Cost-Efficiency Analysis (CEA) depending on the information available.

The editor and authors are researchers of recognised prestige, with extensive experience in this type of work and with a wide dissemination of their research. All of them have conducted studies that have been assessed by national accreditation agencies. Their work has been published in indexed journals and by prestigious publishers in Spain.

This book is a selection of works by prestigious professors from several Spanish universities (A Coruña, Cordoba, Granada, Jaen, Malaga) and the Spanish National Research Council (*Consejo Superior de Investigaciones Científicas*).

In the first chapter, Juan Manuel Matés-Barco (University of Jaen), analyses the management of the water supply in Andalusia between 1970 and 2000. He also proposes a possible explanation of the factors that have determined the management models. Within this context, he highlights the role played by European provisions, Spanish legislation, and the concept of public service in Europe.

Next, Jesús Mirás Araujo (University of A Coruña) and Nuria Rodríguez Martín (Complutense University of Madrid) study “An Incessant Thirst: The Water Market in a Dried-up Southern European Country, Spain, 1985–2022”. The aim of this chapter is to analyse the transformations that have taken place in water regulation and management in Spain since the advent of democracy (especially since the approval of the 1985 Water Act), the map of uses and the main operators working in a sector that, despite the public nature of the service, has undergone a growing process of privatisation that in recent times seems to have moderated and even changed direction.

In the third chapter, Maria Ana Bernardo and Ana Cardoso de Matos (both from the University of Evora), analyse the history of the establishment of modern water supply infrastructures in Portugal in the first half of the twentieth century, focusing on the solutions adopted for the management of water supply networks and the legal and institutional framework that led to them. They also compare the Portuguese and Spanish cases, based on the same chronology and perspective of analysis.

Based on her research on public services, Nuria Magaldi (University of Cordoba) addresses “Public Health, Sanitary Movement and Public Water Supply Services in the Nineteenth Century: The Cases of England and Spain”. The aim of her work is to analyse how the social hygiene movement was crucial to the development of the first public water supply mechanisms in Europe. In the nineteenth century, public health was largely based on the preventive dimension: its main objective was to preserve society from epidemic diseases and to provide it with better living conditions. To achieve this goal, the English sanitary movement (which spread throughout Europe, including Spain) strongly proposed to replace the traditional public fountains with a modern water supply system. The last part of the chapter, therefore, analyses how a modern public water supply service was created and managed in many municipalities in Spain, with a particular focus on the Andalusian region.

In chapter five, María Vázquez-Fariñas (University of Malaga), presents a case study after having carried out extensive research on “Water Supply in the City of Cadiz in the Nineteenth Century: *The Cadiz Water Works Company Limited*”. Water supply has been one of the most important services in Spain since the mid-nineteenth century. Therefore, this chapter presents an analysis of the public water supply service in the city of Cadiz (Andalusia, southern Spain) during the nineteenth century. Specifically, it studies the water supply in the city, the nature of the management and supply of this resource and its main characteristics. In addition, this work examines the group of private companies that emerged in the city of Cadiz, and which contributed to the development of the sector. In particular, it analyses the role played by the London-based company *The Cadiz Water Works Company Limited* in the provision of drinking water management and supply services to the city of Cadiz. Thus, this chapter seeks to address the main characteristics of this company and the sector, and the most relevant problems that prevailed in order to determine how the water supply and management service was developed in the city.

The sixth chapter is written by José Escalante-Jiménez (University of Malaga), Mercedes Fernández-Paradas (University of Malaga) and Carlos Larrinaga (University of Granada), who have conducted the study “The Improvement of the Water Supply Infrastructures in Antequera, 1818–1932”. This chapter addresses the main initiatives adopted by the local government of Antequera to improve the water supply between 1818 and 1932, in the context of the process of the modernisation of the municipal public services. These projects were characterised by a lack of continuity over time. The first, dating back to 1818, failed. The second, implemented between 1865 and 1867, resulted in a substantial improvement of the water supply. The third and most important project, developed between 1929 and 1932, was aimed at fully introducing the modern water supply system.

Next, Alberte Martínez-López (University of A Coruña) researches “Foreign Companies, Public Intervention, and Ecological Crisis: Water in Seville, 1871–1959”. This chapter seeks to analyse, from the perspective of business history, the role played by British capital in the management of the water supply in Seville for almost seventy-five years through *The Seville Waterworks company*. Using primary business and public sources, it examines the origins of the company, its shareholding and organisational structure and business results, which were conditioned by demographics and rainfall, different economic circumstances, and public regulations, all within the framework of the evolution of the water sector in Spain and British investment abroad.

The eighth chapter, written by Víctor Manuel Heredia-Flores (University of Malaga), is titled “The New Supply of Potable Water in Malaga (Spain) in the 1920s: A Sustainable System?”. The model of private management of the water supply service in the city of Malaga ended with its municipalisation in 1913. Serious problems with the quality and quantity of the supply continued until the 1920s. At that time, the engineer José Bores proposed a complete renovation of the system on new bases: a modern water supply without energy consumption, a new urban distribution network, a new sewerage network, a solution for industrial and agricultural use of the springs of Torremolinos, a hydrogeological study of the aquifer, sanitary control of the water and the establishment of an operation based on the use of meters. These aspects, especially the concern for the environmental preservation of the aquifer and its surroundings (creating a protection zone by planting trees) and the integral vision of the problem of supply and sanitation, made the Bores plan unquestionably modern and worthy of being studied in this book.

Jesús Raúl Navarro-García, a researcher at the School of Hispano-American Studies and the Spanish National Research Council (*Consejo Superior de Investigaciones Científicas*), is the author of the chapter titled “Water Supply in the El Aljarafe District (Seville Province, Spain): A Historical Perspective”. To date, there have been very few studies on water supply and treatment in rural Spain, but this study analyses the situation in a district very close to Seville, the capital of Andalusia. Although this region is now practically part of the metropolitan area of the city, it was almost entirely rural until the middle of the last century. Until then, the water supply had been characterised by the use of its own resources, until population growth and the increased pressure of human activities exposed the failures of a system based on the use of springs and public and private wells. In response, external water resources were sought, and confederal management was promoted with the support of the Seville Provincial Council. This led to the creation of the current public company, ALJARAFESA, which manages water for 30 small and medium-sized municipalities with populations ranging from barely six hundred inhabitants

to more than forty thousand, in a wide area with large pumping needs and many kilometres of pipes.

Next, María José Vargas-Machuca Salido (University of Jaen), presents the chapter entitled “The “Price” of Water in Andalusia: An Approach to the Tariff Systems of the Domestic Water Supply Service”. From a legal point of view, in Spain, water as a good does not have a price, as it forms part of the public domain. Domestic consumers do not pay for the water they consume per se but for the services for its supply and treatment. The local authorities are responsible for setting these charges and their legal nature will determine the legal form of these considerations. Following the Water Framework Directive 2000/60/EC, water tariffs have become an important tool for achieving economic efficiency, environmental sustainability, and social equity. In this chapter, after defining the framework of competence for approving and setting the tariffs in Andalusia, a comparative approach is adopted to analyse the tariff systems for domestic water supply services in the eight provincial capitals of this region.

Leticia Gallego-Valero (University of Jaen), Encarnación Moral-Pajares (University of Jaen) and Isabel María Román-Sánchez (University of Almeria), present a study on “Research on Wastewater Taxes: An Essential Contribution to Improving Environmental Management”. Wastewater taxes are an essential tool for the proper management of water resources, contributing to the sustainability of the planet. The bibliometric analysis carried out through was reveals the need for more scientific contributions on wastewater taxation, as there are insufficient results in this field of research for the period 2000–2020. A worldwide search yielded 144 results, representing less than 1.5% of the total research on all environmental taxes. Spain, the United States and China account for 50.68% of the total. This chapter is aimed at researchers in this field and seeks to enhance their understanding of the current research environment and to identify future trends.

Finally, Antonio Rafael Fernández-Paradas (University of Granada) and Rubén Sánchez Guzmán (Cultural Centre of the Madrid City Council), study “The Symbolic Configuration of Andalusian Rivers: Iconography and Artistic Values”. The aim of this research is to identify, analyse and contextualise the phenomenon of the identification of Andalusian rivers with allegories. This is a national and international phenomenon, which developed a series of iconographic particularities in Andalusia. It is also a topic that extended into the twentieth century.

With all the above, this book is a novel work, covering a wide variety of subjects that have never been studied before, but with an important nexus: the relevance of the water supply service and its configuration in Spain and, more specifically, in the main Andalusian regions. Therefore, this book aspires

to serve as a reference for all researchers, academics, teachers, students, and readers in general interested in the subject.

*Juan Manuel Matés-Barco*  
*María Vázquez-Fariñas*

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## Notes on Contributors

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