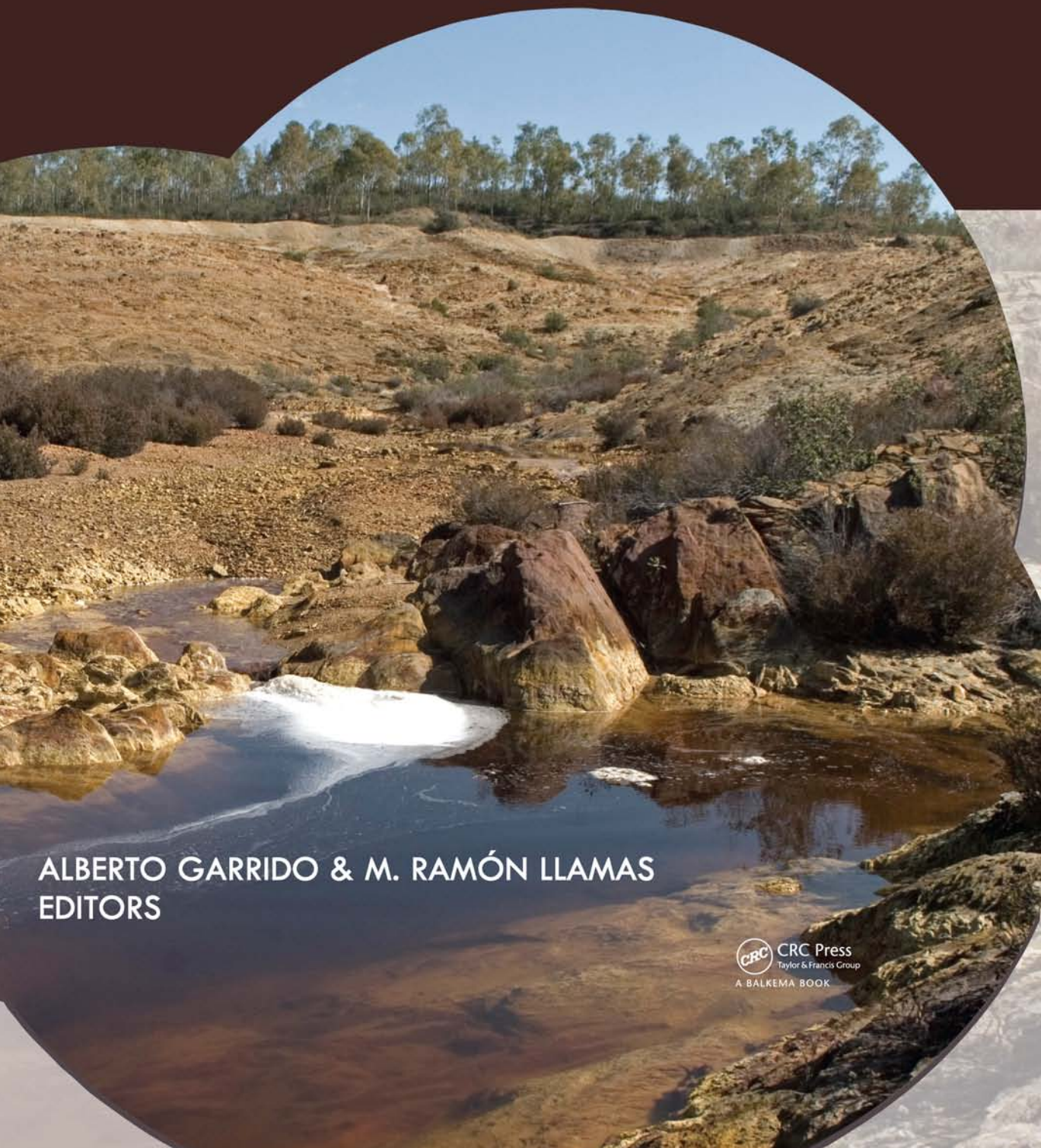


WATER POLICY IN SPAIN



ALBERTO GARRIDO & M. RAMÓN LLAMAS
EDITORS

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WATER POLICY IN SPAIN

Water Policy in Spain

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Dedications

To my parents, Ginés and Amparo.

Alberto Garrido

*To all the secretaries who have suffered my awful handwriting
with almost infinite patience and understanding.*

M. Ramón Llamas

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Foreword

When we started working on this volume, we had a clear idea about the topics that should be covered to provide a fair view about Spain's water policy. Although a generation stands between us, we were both convinced that Spain was undergoing a profound transition from an almost exclusive supply-side type of policy to the much more complex and conflicting context in which most mature water economies typically evolve. We seized the opportunity to assemble a collection of essays about water policy in Spain convinced that the volume would need to contain a clear vision on how to face the most pressing needs and challenges. In 2004 the change of Government brought to power new ideas and seemed ready to embark in a new era, after a decade of discussions and two failed attempts to pass a National Hydrological Plan. The book, we thought, would go to print by the time the new Government should have had the time to put forward new water policies. These, we surmised, would be more targetted to address the most pressing environmental problems, to facilitate more efficient water allocation, and to solve or mitigate the current water political conflicts.

Unfortunately, the swinging regime of Spanish water policies did not stop, and in fact one would come to the conclusion that the pendulum now moves more erratically than before, and more heavily influenced by policies that are drafted and approved at the European Union level, such as the upcoming reform of the Common Agriculture Policy (the famous 'CAP' health check') or the application of the Water Framework Directive. Yet, as editors, we felt the obligation to ensure that the most updated and forward-looking strategic thinking had a voice in the volume. Second thoughts, however, suggested otherwise. For, in the absence of structured and clear strategy, it was far more valuable to let the reader build his or her own conclusions about the future. We are convinced that the analysis of the successes and failures of the Spanish water policy may be useful for water decision-makers in arid and semiarid countries where irrigation is the main water use.

Our purpose, then, was to provide all the needed background as well as cover the present and past policies, together with a description of the state of water resources in Spain in sufficient detail. In writing this foreword, we are tempted to entertain the hypothesis that drafting 20-year national water plans and getting them approved and accepted is similar to Penelope's weaving of Laertes' shroud by day and undoing it by night. Perhaps it is impossible to have such a robust and detailed plan, a conjecture that would be followed by the conclusion that Spain has lost 15 years searching for such chimeric goal. On the other hand, technological and political advances, generally positive, are so rapid and relevant that the adaptation to them may be one of the most important aspects for any water policy. Fortunately, despite such never ending discussions about what best water planning is or should not be, the country learned a lot and both the lay public and experts became more educated on complex water problems. Ultimately, this is what this book is about.

Despite the fact that the reader will run into that so-called and demised National Hydrologic Plan in many chapters, the objectives and the constraints too have changed as a result of a better understanding of what is economic and politically feasible. Since problems related to water resources have been aggravated as a result of economic growth and increasing water demand, policies below the national level (regional or local) have proved to be far more superior, efficient and expedite in many instances. In addition, the European Union's Water Framework Directive (WFD) passed in 2000 has added more constraints and put the environmental objectives just below ensuring a sustainable and reliable water supply to the people. However, more than in any other European country, the main water consumptive use is for irrigation (75%). Therefore the issues or conflicts

with farmers are far more relevant than in most European countries. In numerous respects, Spain began the WFD race ahead of many other EU Member States because it has fairly well developed and resilient water institutions. So the elements for terminating the transition period and for implementing a national strategy for water are now in place. It is the policy delivery part what most volume's contributors seem to be missing, and we are not in a position to make that up.

Nevertheless, our final perspective is rather optimistic. There are already now some available technological improvements that hopefully will contribute significantly to solve the current problems. For instance, communication technologies (internet) is going to be a great help in order to improve education of farmers and the public at large, and to facilitate stakeholders participation thanks to a greater transparency in data information. Another relevant aspect is that seawater desalination technology and a cheaper and faster transport of food is going to change the concepts of water and food security.

We formulated the objectives and broad contents of the book after extensive thinking and numerous conversations. But we have benefited to no measure by the clarity with which the whole project was conceived from Dr. Ariel Dinar, Professor at the University of California, Irvine. We can only express words of gratitude and professional respect for his advise, generosity and clear ideas.

We are also indebted to Javier Herrero (Iberdrola), José María Fluxá (Foro del Agua) and Guido Schmidt (WWF-Spain, Madrid) for going through Chapter 20 and providing valuable suggestions. Alberto Garrido must personally acknowledge the Department of Agricultural and Resource Economics of the University of California, Berkeley, for hosting his 2005–06 sabbatical, coinciding with part of the volume's work. The economic support of the Spanish Ministry of Education and the Universidad Politécnica de Madrid for spending one year at Berkeley is also acknowledged. We are heartily grateful to Beatriz Salgado, Alberto Garrido's wife, for helping with the tedious but necessary task of formatting the chapters and making a thorough review of the whole material. Last but not least this book could not have been edited without the chapters' authors. We are indebted for their work, their friendship and their patience.

The Editors

Alberto Garrido & M. Ramón Llamas

Note:

All contributors use the following exchange rate €1 = \$US1.3 when making conversions to the American currency, as this was the exchange rate in July 2008. In terms of measurement units, the volume uses the metric system (1 hectare = 2.5 acres; 1233 cubic meter = 1 acre-foot; 1 cubic hectometer = 1 million cubic meters (Mm³) = 811 acre-feet = 1 gigalitre).

List of acronyms

AC	Autonomous Community – Spanish Regional Governments (<i>Comunidad Autónoma</i>)
AEAS	Spanish Association of the Water and Wastewater Treatment Companies (<i>Asociación Empresas de Abastecimiento y Saneamiento</i>)
AGUA	Water Management and Use Programme (<i>Actuaciones para la Gestión y la Utilización del Agua</i>)
ATLL	Waters of Ter and Llobregat (<i>Aguas del Ter y Llobregat, Catalonia</i>)
CAP	Common Agricultural Policy—The EU farm programs
CA	Albufeira Convention (<i>Convención de Albufeira</i>)
CADC	Commission for the Development and Implementation of the Convention (<i>Comisión para el Desarrollo y Aplicación del Convenio</i>)
CIP	Common Implementation Strategy of the Water Framework Directive
CofP	Conference of Parties in the context of the Albufeira Convention
CYII	Madrid Water Company (<i>Canal de Isabel II</i>)
EC	European Commission
EPTI	Provisional Scheme of Important Matters (referred to the Basin plans, in Spanish: <i>Esquema Provisional de Temas Importantes</i>)
EU	European Union
FCR	Full cost recovery rates
GNP	Gross National Product
GVA	Gross Value Added
ID	Irrigation Districts (<i>Comunidades de Regantes</i>)
ICG	General Quality Index (<i>Índice de Calidad General</i>)
IGME	Spanish Technical Institute of Geology and Mining (<i>Instituto Geológico Minero de España</i>)
INAG	Portuguese National Water Institute (Instituto da Água, I.P.)
INE	National Statistics Institute of Spain (<i>Instituto Nacional de Estadística</i>)
IWA	International Water Association
MAPA	Ministry of Agriculture, Fisheries and Food of Spain (<i>Ministerio de Agricultura, Pesca y Alimentación</i>), now called the Ministry of Environment and Rural and Marine Affairs, after merging with the MIMAM in 2008.
MERMA	Ministry of Environment and Rural and Marine Affairs (Ministerio de Medio Ambiente, y Medio Rural y Marino)
MIMAM	Environment Ministry of Spain (Ministerio de Medio Ambiente)
NHP	National Hydrological Plan (the Law of ..., <i>Ley de Plan Hidrológico Nacional</i>)
NIP	National Irrigation Plan
OECD	Organisation for the Economic Cooperation and Development
OPA	Offer of Public Purchase (<i>Oferta pública de adquisición de derechos</i>)
O & M	Operation and Management
PEAG	Especial Plan of the Upper Guadiana (<i>Plan Especial del Alto Guadiana</i>)
PG	Plan Gasset
RBA	River Basin Authority (<i>Organismo de Cuenca Hidrográfica</i>)
SC	Spanish Constitution
TST	Tagus-Segura (Water) Inter-Basin Transfer
WFD	Water Framework Directive (see the list of laws and statutes)
WWF	World Wide Fund for Nature, also known as World Wildlife Fund (USA)
yr	year

Official and shortened names of laws and statutes

Official denomination	Shortened name
◦ Water Act 1866	1866 Water Act
◦ Water Act 1879 (Act of 13th June, 1879)	1879 Water Act
◦ Public Infrastructure and Water Works Act, 1911	1911 Water Works Act
◦ Spanish Constitution of 27th December 1978	Spanish Constitution or SC
◦ Water Act 29/1985 of 2nd August 1985	1985 Water Act
◦ Water Act 46/1999 of 13th December 1999	1999 Water Act
◦ Directive 2000/60/EC of the European Parliament and of the Council of 23rd October, establishing a framework for Community action in the field of water policy	Water Framework Directive or WFD
◦ Consolidated text of the Water Act, 2001 (Royal Decree 1/2001, 20th July 2001)	2001 Consolidated Water Act
◦ National Hydrological Plan Act 10/2001 5th July 2001	NHP Act 2001
◦ Transposition of the Directive 2000/60/EC has been translated into Spanish Act through Act 62/2003 of 20th December, modifying the Consolidated Water Act, passed by Executive Order 1/2001 of 20th July	Transposition of the WFD
◦ Amendment of the National Hydrological Plan Act (Royal Decree 2/2004, 18th June 2004)	NHP Act 2004
◦ Concessions Act of May 23, 2003 for the regulation of the Concession Contract for Public Works	Concessions Act 2003
◦ Law 62/2003 Title V	2003 Consolidated-WFD Water Act
◦ Act by which the National Hydrological Plan Act 2001 is amended (Law 11/2005 of 22nd June)	NHP Act 2005

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I

Introduction

CHAPTER 1

Scope and objectives

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1 INTRODUCTION

While the modern Spanish State was formed in the 15th century, historical records of works, statutes, and water utilization date back to at least two centuries BC. Its ecological wealth and its mild climate, plus the relatively abundant watercourses flowing from inland Spain to the Mediterranean and Atlantic coasts, favored long-term human settlements, which soon traded with other Mediterranean cultures.

Roman engineers built outstanding hydraulic structures in Spain, many of which can be still admired today. The Muslim occupation of most of the Iberian Peninsula in the 8th century brought new methods of water supply and management. Until 1858, for example, the city of Madrid was supplied with water mainly through infiltration galleries (khanats), a technology imported by the Arabs from Iran. They also set up bottom-up institutions to manage the scarce irrigation water and avoid social conflicts. The well-known *Tribunal de las Aguas de Valencia* (Valencian Water court) conserves over nine centuries of records.

Surface irrigation systems were also developed in many other regions of Spain, but almost exclusively on the flood plains of many rivers. Their stream flow was diverted by small dams. A third of Spain's present irrigated acreage was already cultivated at the end of the 19th century.

The main concern of Spanish politicians and social philosophers during the 17th and 18th centuries was to make the country's rivers navigable. The attempts to emulate the situation in other European countries failed because of Spain's rugged topography, and the low flows during the dry season. In the 19th century private entrepreneurs made several attempts to develop hydraulic systems, mainly for irrigation, in a similar way to the development of railroads. Most of them were economic failures.

In 1898 Spain lost Cuba and the Philippines, its last colonies. This was one of the lowest points in Spain's history. A group of scholars and politicians, known as the *regenerationists*, tried to explain and overcome this depression in Spain. One of the most pervasive mottos was that the Spanish people needed *Escuela y Despensa* (education and abundant food). As this book compellingly claims, the regeneration of Spain laid the foundations for a century on irrigation and water policies. Water projects and land reclamation were the means of dragging Spain out of poverty and illiteracy. However, this development could not be achieved by private initiative. It had to be a public or government-led action, and many politicians and intellectuals supported these ideas.

In 1902 the Ministry for Development prepared the "Gasset Plan" (GP), named after the engineer commissioned to draft this National Waterworks Plan. This first comprehensive national plan was first and foremost an inventory of dams and canals, primarily meant to provide water for irrigation. Incidentally, the GP was passed in the same year that the US Bureau of Reclamation, which shared similar aims, was set up. Both were preceded, during the 19th century by similar plans drafted by British engineers across the British Empire, mainly in India. This is what Allan (1999) describes as the "hydraulic mission".

Hardly any of the infrastructures listed in the GP were built in the following four decades, probably because of political unrest and Spain's economic difficulties. Nevertheless, it helped to raise public awareness about the indisputable importance of water management and irrigation. In 1926 the Government set up the *Confederación Hidrográfica del Ebro* (Ebro River Basin Authority) for the integrated management of water in the Spanish basin. In less than two decades all surface water in Spain was managed by such path-breaking institutions. Present-day water institutions are still founded on the basin authorities.

In 1933 the Ministry of Public Works prepared a draft National Water Plan. This included the transfer of water from northern (Ebro river) to southeastern Spain. The Government never formally approved this National Water Plan, but most hydraulic engineers considered it to be a good solution. It was basically the same model as designed and later implemented in California to solve the scarcity of water in the southern part of the State.

Spain passed its first Water Act in 1866 (amended in 1879), which all experts agree to be a monument of fine legal drafting. While the 1866 Act was to remain in force until the 1985 Water Act was passed, which attests to its value and adequacy, it was actually meant to provide the foundations for modern governmental water policy and planning initiatives. Surface water rights for irrigation, urban water supply and hydropower could be soundly established in the framework of the 1879 Water Act. In Spain groundwater was under private ownership, as it still is today in other countries like the USA (California and Texas), India or Chile.

Between the end of the Civil War in 1939 and the enactment of the Spanish Constitution in 1978 that restored democracy in Spain, the country experienced an intense rate of waterworks construction. Spain almost doubled its surface water irrigated area, reaching 2.5 million hectares by 1975. The paradigms that drove the whole process remained unquestioned for five decades. Supplying water to the fields, controlling rivers and installing more hydropower capacity were undisputed objectives.

As a result of a steady pace of construction from 1950 to 2000 (during which about 20 dams a year were put into operation), Spain has about 1,300 large dams today. In terms of dams per capita, Spain is fourth in the world.

By the end of the 20th century, as this book details, Spain had a grand scheme of waterworks, and a whole institutional edifice had been erected. Even so, water problems peaked and came to the notice of most Spaniards. The policy thrust to start addressing the water problems of the 21st century was to come from the European Union.

While many aspects of the institutional foundations for beginning to think seriously about the most pressing water problems were already in place, the 1985 Water Act maintained the principles that secured very cheap water for hundreds of thousands of farmers, many of whom were also given houses, tractors and other capital goods to settle in semi-arid terrains and depopulated areas. Water allocation was governed by engineering constraints and, in times of droughts, rationed through strict administrative rulings.

The process of forming interdisciplinary teams involved in the preparation of the National Water Plans was similar to the one described by Dooge (1999), albeit a couple of decades later. Dooge divides the design and implementation of hydroprojects into several periods. Up until the 1950s engineers were the only decision makers. During the 1960s, economists began to play a part. In the 1970s environmentalists also started to participate. In the 1980s, the people affected by the project began to have a say. Finally, NGOs now play a significant role.

In Spain pre-1960 plans were prepared exclusively by civil and agricultural engineers. In the 1960s project documentation included cost-benefit analyses for the first time, but this had little or no impact at all on decision makers.

With its accent on water planning, the 1985 Water Act ushered in a new phase. Nevertheless, the 1993 draft of the National Water Plan attached little importance to economic analyses, and environmental impact assessment was practically nonexistent. The National Water Plan approved by the Spanish Parliament in 2001 did contain economic and environmental assessments. However, these assessments were strongly criticized by many scholars and conservation groups, especially members of the New Water Culture Foundation, as discussed in several chapters of this book.

These differences of opinion, together with the strong opposition to the Ebro water transfer by the regions of Aragon and Catalonia, a cause that had also been championed by the Government elected in 2004, put an abrupt end to the more than 100-year era of huge water projects.

Meanwhile a 'revolution' within groundwater uses in the late 1960s and early 1970s silently came to be the most intractable problem facing Spanish water policy in the mid-1990s. Looking back, it is ironic that the most productive agricultural water uses were those initiated by private individuals tapping groundwater resources and not those served by irrigation projects developed to make the *regenerationists'* dreams come true.

By the time the 1985 Water Act was passed, the Spanish Constitution already provided the umbrella for governments to administer the hydraulic public domain (all surface and ground waters) and to intervene in cases of groundwater 'overexploitation'. Yet, the enforcement of the 1985 Water Act provisions on groundwater resources failed on most accounts.

In 1986 Spain turned its back for good on a history of political unrest, isolation, conflict and swinging regimes when it became a member of the European Economic Community, now the European Union (EU). The Water Framework Directive enacted in 2000 by the EU is meant to deliver important ecological improvement on most EU water bodies by 2015. Most authors of this volume agree on the importance of two landmarks that has brought traditional Spanish water management to an end. The first is the passing of the European Union's Water Framework Directive, which all 27 member states must enforce. The second is the above demise of the grand Ebro inter-basin transfer, proposed formally in 2001 but conceived since 1998, and stopped in 2004. The two also spelled the end of the univocal definition of *common interest* and, with that, the broad consensus on water policies. Post-2004 water policies have to be diverse, less centralized and more focused on the environment. On these accounts, the period 2004–08 can be characterized by four simultaneous developments: (1) the devolution to the Autonomous Communities (as regions are called in Spain) of significant water competencies, (2) the failure to develop sufficient desalination capacity along the Mediterranean coast to substitute for the water supply that would have been serviced from the Ebro transfer, (3) the increasing use of water market exchanges and water banks, and (4) the recognition that implementing the WFD would entail enormous difficulties because of the severe environmental deterioration of many water bodies. These four ideas run across many of the books' chapters and are dealt in detail from diverse perspectives.

2 OBJECTIVES AND SCOPE

Against this turbulent history, this volume aims to offer a self-contained overview of water policy in Spain. This book aspires to bridge a gap that only the work of Maas and Anderson (1978), still a key reference on traditional Spanish water institutions, has been partially filled for English readers.

Specifically, the book intends to:

- provide a detailed description of Spanish geographical, climatic, and hydrological features;
- review the last hundred years of Spanish history to give an understanding of its water policy achievements and failures;
- identify the major water challenges that Spain needs to face;
- based on a detailed analysis, speculate about the country's potential to look after its water resources in an integrated manner and rely on demand management to meet its more pressing needs; and, lastly,
- list the lessons that are potentially applicable to countries and regions evolving similarly.

The book's structure is intended to offer a comprehensive overview of Spanish geographical and political diversity during four historical periods. The first ends with the beginning of the Spanish Civil War in 1936, when the grand water policy lines were traced and detailed, though not developed. The second ends with the death of General Franco in 1975, which paved the way for a political transition that culminated in the Spanish Constitution 1978. The third period came