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Andrea Guerrini
Giulia Romano

Water Management in Italy

Governance,
Performance, and
Sustainability



Springer

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**SpringerBriefs in Water Science
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Chapter 1

Introduction

Water is essential for life and for the economy and is one of the main environmental topics of European Union (EU) policy. Even if most Europeans have historically been shielded from the social, economic, and environmental effects of severe water shortages, the gap between the demand for and availability of water resources is reaching critical levels in many parts of Europe. Climate change is likely to exacerbate current pressures on European water resources. Moreover, much of Europe will increasingly face reduced water availability during the summer months, and the frequency and intensity of drought is projected to increase, particularly in the southern and Mediterranean countries. Thus, the EU is showing increasing concern regarding drought events and water scarcity, and policy-makers and utility managers must face the challenge of balancing the increasing human demand for water with the protection of ecosystem sustainability. The Water Framework Directive (2000/60/EC), the most relevant European Water Framework, is based on the idea that water management needs to take account of economic, ecological, and social issues and that its prime objective is the sustainable use and management of water resources.

In Italy as in many other countries, an intense debate over the water industry is ongoing. Policymakers are looking for the most effective strategies for efficient water management, focusing on governance and organizational choices. Italy is facing many problems in terms of the technical efficiency, economic profitability, and financial sustainability of its water utilities as well as water scarcity and inefficient water use, since leakages accounted for around 36 % of the water fed into Italy's water grid, with an average maximum of 43 % in the south.

According to Eurostat data, Italy's total freshwater abstraction by public water supply is the highest in Europe. The Italian unit price of household water supply and sanitation services is among the lowest among Organization for Economic Cooperation and Development (OECD) countries, though it has increased, rising an average of 5 % from 2007 to 2008 and 6 % from 2004 to 2008. Moreover, due to low tariffs, water consumption in Italy is still higher than in other European countries. Italy's household water consumption in 2002 was 206 l, with a decrease over the subsequent 10 years of around 15 % (Istat 2013). However, data show that the average water usage per person in Italy is the highest among European countries.

This book is an attempt to discuss the most relevant issues concerning water management in Italy. Using the most recent available data and starting from the extant international literature, it focuses on the features of the Italian water industry, the water utility firms' efficiency, the investment policies and funding choices of the water companies, and the sustainable practices put in place by the utilities to reduce water consumption and spread virtuous behaviors.

Chapter 2 analyzes the evolution of Italy's legal framework, starting from the first relevant water reform in 1994, then highlighting the current framework. Starting with the full list of Italian institutions (1,235 firms and public bodies) operating in the water industry, it then analyzes the main features of the industry by collecting data from the National Authority for Energy, Gas and Water Services (AEEG) database, the Bureau Van Dijk AIDA database, financial statements, and corporate websites on institution type, geographical localization, and water services provided (i.e., collection, potabilization, adduction/transportation, distribution of water for civil use, sewerage, and wastewater treatment).

Focusing on 304 water firms, the study examines diversification strategies (either mono or multiutilities), firm size (considering the number of employees), ownership type (i.e., public, private or mixed-ownership), and number of shareholders.

Chapter 3 focuses on the determinants of Italian water utility performance. Starting with a literature review on the effects of ownership and political connections on firm results and the existence of economies of scale, scope, and population density, the chapter empirically studies the factors affecting the performance of 98 mono-utility water companies involved in integrated water services (the simultaneous provision of all of the main water services—collection, adduction/transportation, distribution of water for civil use, sewerage, and wastewater treatment) covering a period of 5 years (from 2008 to 2012).

Performance was assessed through the Data Envelopment Analysis Method in order to describe firm efficiency; then, statistical analyses were conducted to determine whether firm size, customer density (measured as the ratio of population served to kilometer of main length), geographical localization (north, center, or south) and ownership (public or mixed-private) are relevant factors affecting firm efficiency.

Chapter 4 examines the investment policies and funding choices of Italian water utilities. Starting with a description of the investments needed to improve water services, implement new technologies, and reduce water leakages and waste, the chapter reveals the differences between expected investments in the last few years and the investments effectively realized.

The chapter analyzes the factors limiting the investment realizations in the Italian water sector by examining the case of Acque Veronesi s.c.a r.l., a medium-sized utility operating in Veneto, in the north of Italy.

Finally, after a comprehensive literature review on this issue, an empirical study using information on the abovementioned 98 mono-utility water companies covering 2008–2012 is conducted. Considering the relevant financial indicators of investment and funding choices, the study enquires if firm size, customer density, geographical localization, and ownership are significant factors affecting firm decisions.

Chapter 5 provides an overview of the increasingly important issue of the sustainable use and management of water resources. It reports a literature review of the most relevant studies on the implementation and effectiveness of the instruments used by water utilities to implement water conservation policies (such as water pricing, incentives for the implementation of high-efficient appliances, rationing policies, and information campaigns to improve awareness of activities useful in reducing water consumption). Moreover, it provides an empirical analysis of the willingness of Italian water utilities to provide through their corporate websites information about reducing household water consumption and the water quality they provide to customers. Finally, it describes the wastewater technologies used to reduce environmental impacts.

The book concludes with an analysis of the most pertinent strengths, weaknesses, opportunities, and threats facing the water industry in Italy, with the aim of providing policymakers, decision leaders, utilities managers, and interested citizens a comprehensive framework for informing later steps in water management and achieving the objective of offering the proper attention, the necessary economic resources, and the required commitment to solve the “water issue.”

The book aims to contribute to the current EU environmental policy mainstream focusing on the need to reconcile the triple objectives of wealth creation, social cohesion, and environmental protection, being aware that “scientifically sound tools to support decision-making by measuring and assessing policies’ impact are needed for the successful implementation of genuinely sustainable policies.”¹

Last but not least, we deeply thank all the researchers and practitioners who have contributed to the development of this book, created as an attempt to effect a close collaboration between university researchers, utility managers, and policymakers in compliance with the EU Horizon 2020 framework stressing the importance of cooperation between the public and private sectors and between universities and business.

Reference

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¹ http://ec.europa.eu/research/environment/index_en.cfm?pg=tools.

Chapter 2

The Italian Water Industry

2.1 A Brief Overview of Italian Water Reforms: A Twenty-Year Excursus

The Italian Integrated Water Supply system presents a very complex landscape. Italy's water main and wastewater treatment plant network is very heterogeneous. Best practices exist, where entire areas are fully served by drinking water flowing directly to their homes all day, but there are other areas where the water flows from the tap only a few days a week. Municipalities served with high-quality water by innovative technologies coexist with poor areas characterized by outdated mains providing low-quality water.

The same applies to the sewerage systems and, above all, the treatment plants. There are many efficient and innovative wastewater treatment plants and many plants built years ago and now abandoned or poorly maintained. The European Community (EU) has begun several infringement proceedings against Italy, as it is not meeting the deadlines for the transposition of EU directive 271/91 for wastewater: the terms of adoption have long expired. In 2012, the European Commission took Italy to the EU Court of Justice for its failure to ensure that wastewater from agglomerations with more than 10,000 inhabitants discharging into sensitive areas is properly treated. In 2011, the Commission informed Italy that over 143 towns were still not connected to a suitable sewage system and/or lacked secondary treatment facilities or had insufficient capacity. While considerable progress has been made, 14 years after the deadline expired (in 1998, as the EU legislation required), at least 50 agglomerations still have shortcomings. The Commission claimed that the lack of adequate collection and treatment systems poses risks to human health and to inland waters and the marine environment.¹

Sections 2.1, 2.2 were written by Bettina Campedelli, Luciano Franchini and Giulia Romano, while 2.3 was written by Giulia Romano.

¹ http://europa.eu/rapid/press-release_IP-12-658_en.htm.

The Italian water industry needs to provide the investments required to address this critical situation. If we consider the infrastructure needs for the entire water supply sector, the total volume of investments needed reaches € 64 billion (D'Angelis and Irace 2011). However, the scarcity of funds available to national and local governments and the effects of the EU Stability and Growth Pact limit municipalities' investment capacity for water infrastructure and service improvements.

Attracting private investment could offer a solution, though investors are not currently interested in the Italian water sector because of its unstable legal framework (which has rapidly changed in the last 7 years) and the need to dialog with the local governments and politicians who manage a large part of the industry.

Although regulation of the Italian water industry began in 1865 (Marques 2010), the most comprehensive reform of water sector regulation began in the 1990s. In 1994, the Italian Parliament enacted the first law for the reorganization of the integrated water service (SII) in response to the emergency situation affecting a large part of the country. The SII covers the public collection, transportation, and distribution of water for civil use as well as sewerage and wastewater treatment for both mixed-use residential and industrial clients.²

Law 36/1994 (called the "Galli law," for Giancarlo Galli, the Italian parliamentarian who was its principal author) tried to reorganize water services management, promoting the elimination of all direct municipal management and all the micro-enterprises that remain part of the Italian water system.

The Galli law was approved in 1994 and then applied along with subsequent regulations, such as ministerial rule 01/08/1996 on tariffs (the so-called "Normalized Method") and law 152/2006 (the so-called "Environmental Code"). The main principles of the Galli law are the following:

- Surface water and groundwater, although not extracted from the subsoil, are public and must be maintained and used in accordance with the criteria of equity;
- Any use of water must safeguard the expectations and rights of future generations, so that they will benefit from a well-preserved natural heritage;
- Water use will follow the principles of water savings and renewal and must not affect water resources, the liveability of the environment, agriculture, fauna and aquatic flora, geomorphological processes, and hydrogeological equilibrium;
- Water use for human consumption has priority over other types of use, which are allowed when the resource is sufficient and preserving the quality of water for human consumption is possible.

The law aimed to overcome the permanent emergency affecting the integrated water services and promote the conditions for effective regulation of the industry. It provides, in the medium term, full water services coverage for the entire population and environmental protection through the construction of new sewers and wastewater treatment plants.

² National Authority for Energy, Gas and Water Services (AEEG).

Afterward, industrialization started to incentivize mergers and aggregations among utilities: large and diversified firms are best able to collect the necessary funds to cover all operating costs and finance infrastructure investments. In other words, the new law induced firms to try to produce economies of scale and scope by achieving cost efficiencies.

The law delegated to the regions the duty of identifying “optimal areas” (*Ambito Territoriale Ottimale*, or “ATO”) to be managed under the supervision of a local public authority for water services (*Autorità d’Ambito Territoriale Ottimale*, of “AATO”); however, though some regions quickly complied with the law (such as Tuscany and Lazio, which defined their ATOs in 1995 and 1996), other regions waited a long time to define theirs.

Law 36/1994 decrees that the management of the SII can occur under a private company, mixed-ownership company, or public company. In the case of a direct award to companies totally publicly owned or with a majority of public shares, an AATO, may entrust water services without recourse to competitive tendering. Otherwise, the AATO must conduct competitive tendering.

In order to maintain efficiency, effectiveness, and cost-effectiveness, local governments may provide for the management of the SII through a plurality of firms (e.g., one firm may provide the distribution and another the wastewater and sewerage).

In entrusting water management to an industrial company, a local authority negotiates with the concessionaires the required standards of service quality and investment needs. The execution of the plan and the service delivery are the utility’s responsibilities, while the municipality must periodically monitor activities through the AATO.

The Galli Law provided for the establishment of a tariff system based on the principle of a single tariff for each ATO, including the drinking water supply, sewerage, and waste water, to ensure full coverage of the operating costs and investment. The tariff is determined taking into account a variety of factors, including the quality of the water resource and the service provided, the investment and necessary maintenance, the extent of the operating costs, and the adequacy of the return on investment. These factors must all be weighed in relation to the financial plan for the investments: the tariff is determined on the basis of the “reference tariff,” used to adjust the tariff over time. To do this, the AATO takes into account the objectives of improved productivity and service quality and the current rate of inflation.

On August 1, 1996, the Minister of Public Works established the so-called “Normalized Method” to define the cost components and determine the reference tariff.

The Galli law confers significant autonomy onto each local authority, empowering AATOs to reorganize and oversee the water system. However, the law generated a high level of heterogeneity across the country, allowing many different ways of arranging water services.

In sum, law 36/1994 is a general framework that needed further regulations to be effectively applied; it provides no standards for delegating water services management, which is left to the regions and local authorities.

A further limitation of the 1994 reform was its lack of an independent regulatory authority for water. In the beginning, supervision was carried out by a committee of the Ministry of Public Work, which was transformed into the Commission of the Ministry for Environment (*Commissione Nazionale per la Vigilanza delle Risorse Idriche*, or the Co.N.Vi.Ri). Both entities were closely linked to the government and lacked the autonomy and independence they needed.

Moreover, the 2000 Water Framework Directive established a framework for EC action on water policy. The Directive introduces two key economic principles: it calls on water users (i.e., households, industries, and farmers) to pay for the full costs of the water services they receive and on Member States to use economic analyses in the management of their water resources and assess both their cost-effectiveness and the costs of alternatives when making key decisions.³

Twenty years ago, Italy had an opportunity to reform its national water sector, but this goal has been only partially achieved. After the promulgation of the Galli law, many areas of the country remain without effectively organized water services. Thus, 20 years after the reform went into effect, its purpose has not been completely achieved, though progress has been made: many firms now integrate their water, wastewater, and sewerage services (Co.N.Vi.Ri 2009), and some are now multiutility, providing services for the gas, electrical energy, and waste industries.

Further legislative interventions occurred over the last 20 years, but they were not completely consistent with each other and did not substantially improve the sector's organization.

Twelve years after the Galli Reform, Law 152/2006 provided new standards for the organization and control of water services. It regulates the water sector in an organic way, incorporating Law 36/94 and dictating more precisely the tasks and activities relevant to the various institutional actors involved in the water industry. Under the new law, the AATOs are now defined uniformly across the country instead of according to regional regulations.

Law 152/2006 defines the powers and responsibilities within the water sector as follows:

1. A National Regulatory Authority should define the national framework under which all firms must operate, choosing the tariff method and the service contract type; then, it should periodically monitor the implementation of the rules in every area.
2. A Local Regulator Authority (AATO) is responsible for controlling the entities that locally manage the services.
3. An entrusted water utility company is the owner of service delivery and the implementation of the necessary infrastructure.

³ http://ec.europa.eu/environment/water/participation/pdf/waternotes/water_note5_economics.pdf.

The relationship among these three actors is characterized by an intense reporting flow. Every AATO draws up a plan of the structural and organizational changes required to achieve the water and service quality targets established through national law and negotiated in detail with the utilities. This document is then matched with a business plan that includes an income statement, an asset and liability statement, a cash flow statement, and the financial ratios for each year covered by the license. Both documents are periodically revised and sent to the National Authority for Energy and Gas (AEEG) for approval. A third document, called the “contract of service,” negotiated between the AATO and the utilities, defines the standard of services and identifies the key performance indicators the local regulatory authority must monitor. Water services might be entrusted to:

- a private company chosen through a public competitive tender;
- mixed-ownership company, the private partner of which is chosen through a public competitive tender;
- public company, with an in-house provision of services.

The decree of January 16, 2008, n. 4, changed Law 152/2006, particularly to admit more entrusted water utility companies to the same ATO.

A map of Italian ATOs was designed by regional local authorities to chart the hydrological basins and the administrative boundaries. The map’s divisions were intended to create large areas that could be financially self-sufficient through tariff collections.

Figure 2.1 shows the 2009 distribution of Italian ATOs. The most common service cluster is between 250 and 400,000 inhabitants; however, quite a few ATOs operate in the lower and upper clusters (20 and 24 ATOs, respectively).

In 2008, nearly 15 years after the Galli reform, its planned changes had still not been fully achieved, despite certain improvements. The last report of the Co.N.Vi.Ri showed that, in 2008, only 75 % of AATOs had finished reorganizing

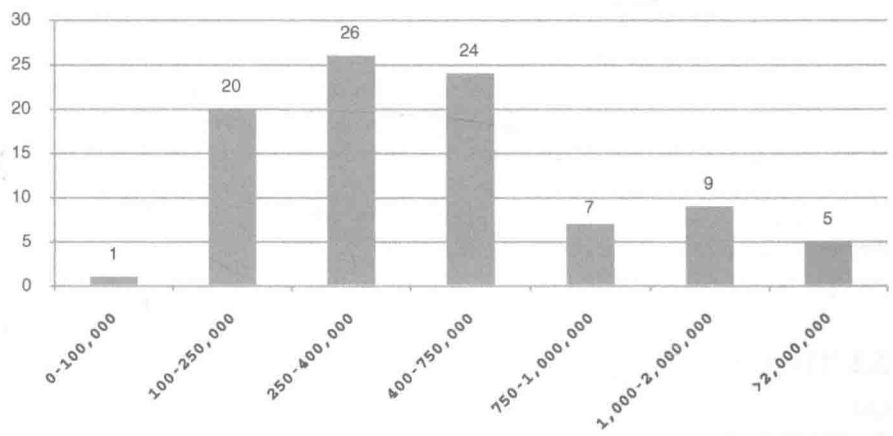


Fig. 2.1 Number of ATOs and size of population served. Source (Co.N.Vi.Ri 2009)

and franchising water and wastewater services to independent firms, serving 57 % of Italian municipalities and 66 % of the Italian population; in the remaining municipalities, most water services were still being provided by the municipalities (Co.N.Vi.Ri 2009 and 2011).

In response to this situation, the Italian government mandated the privatization of public services, including water and wastewater services (by modifying Law 133/2008, article 23 bis in November 2009). The intent of this reform is to improve SII performance through the introduction of private investors whom the Italian government considers to be more oriented toward efficiency and effectiveness than public investors are. Under this new reform, water and wastewater services had to be franchised to private or public-private utilities in which the private partner held at least 40 % of the shares; no water management franchises could be awarded to totally publicly owned utilities after December 2011 (Testa 2010).

This change prompted extensive political debate in Italy among a large part of the population: those in favor of water industry privatization believed that the private provision of water services would improve quality and efficiency and thus reduce tariffs, while supporters of public water systems were convinced that water services should not be privatized, being a natural monopoly, and that private players would not improve investments or water quality but only increase their profits. Moreover, they criticized the existing tariff system that allowed a 7 % assured return on invested capital even for inefficient firms (Guerrini and Romano 2013).

Two 2001 referenda on these issues attracted broad public participation. The outcome was that AATOs were no longer obliged to franchise water and wastewater services only to mixed or privately owned utilities; they could grant concessions to public companies financed by municipalities, as they could before the 2009 reform. In addition, the tariff-setting method changed: water tariffs no longer had to guarantee a return on invested capital.

The 2010 Law n. 42 mandated the deletion of the AATOs not later than January 1, 2011 (later extended to December 31, 2012), conferring the AATO's functions onto the regions through a new law. The number of AATOs dropped to 71, since four Italian regions (Emilia Romagna, Tuscany, Abruzzo, and Calabria) opted for unique regional AATOs. In Tuscany, for example, instead of six different AATOs, the A.I.T. (*Autorità Idrica Toscana*) has operated alone since the beginning of 2012.

In 2011, Law 214/2011 gave the AEEG the power to supervise the water sector, in addition to the gas and energy sectors it already regulated. The AEEG is governed by a committee of five members who sit for 7 years; each member is named by the Italian government and then approved by parliamentary committees, and they represent all the major political parties.

2.2 The Current Regulatory Framework

As reported in the previous paragraph, the current regulatory framework is the result of the many attempts to liberalize and modernize the SII made by various governments over the last two decades (Guerrini and Romano 2013;