The regulatory reform of water infrastructure in Italy: overall design and local variations

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Abstract

In 1994, the Italian Parliament passed a reform which aimed to radically change the economic regulatory institutions of the water sector in the country. The implementation of the reform, which lasted about twelve years, resulted in a new regulatory regime which combined selected features of public ownership, franchise allocation, and discretionary regulation. The reform was implemented in different ways across the country, resulting in different forms of organisation and management of water services at the local level. Drawing from this case, this paper aims to discuss two issues, namely why water regulatory reforms are designed as ‘hybrids’ between different regulatory ‘models’, and why, within a given regulatory institutional framework, water regulatory reforms may be implemented in different ways at the local level. This paper, therefore, aims to contribute to a broader scholarly discussion regarding the rationales for institutional variety of water infrastructure regulation at the national and sub-national levels, and regarding the practical implications for managing the implementation of water regulatory reforms.

Keywords: ‘Hybrid’ regulatory systems; Institutional variety; Italy; Regulatory reform implementation; Water reform

1. Introduction

In 1994, the Italian Parliament passed a reform which aimed to radically change the economic regulatory institutions of the water sector in the country. Until that time, water infrastructure in Italy had been mostly regulated through direct public ownership and management of water supply, sewage, and wastewater treatment systems. Water services were managed by a plethora of local governments, municipal companies, regional government-owned and state-owned entities and, in minimal part, by some business companies, which totalled about 23,500 operators in the country. The 1994 water reform aimed to reduce the fragmentation of the water sector by calling on the regions to establish a limited number of water districts (Ambiti Territoriali Ottimali or Optimal Territorial Areas, henceforth OTA), in which one only water firm would be awarded the concession to manage the whole water services process.

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(Servizio Idrico Integrato or ‘integrated water service’). The water firms would deliver water services and carry out infrastructure development plans subject to regulation provided by local water authorities (Autorità di Ambito, or here called OTA authorities) jointly established by the local governments in each OTA, which would set water tariffs according to the criteria provided by a semi-independent national authority (Comitato di Vigilanza per l’Uso dele Risorse Idriche: the Supervising Committee on the Use of Water Resources). This redesign of water regulatory institutions was expected to bring about service quality improvement, cost recovery, and an increase of investments in water infrastructure.

The experience of the 1994 regulatory reform of the water sector in Italy offers the possibility of shedding light on two issues regarding water infrastructure regulation.

First, the scholarly literature on water regulation and regulatory reform has often addressed the question of how water infrastructure and water services should be regulated. At least four different ‘models’ of regulation are identified, namely (from the most pervasive presence of the public sector to the least): public ownership, public franchise allocation, discretionary regulation, and private ownership in conjunction with liberalization and regulation of access, prices, and quality (Gómez Ibáñez, 2003; Ballance & Taylor, 2005; Rouse, 2007).

Regulation through public ownership of monopolistic water firms builds on the expectation that mechanisms of political control and accountability lead to the pursuit of public interest goals (Swann, 1988; Waterson, 1988; Tenbu¨ken, 2006). Regulation through public franchise allocation consists of the government awarding a concession to a business company, usually through competitive tendering, to manage water services in monopoly conditions (Ogus, 1994). Discretionary regulation consists of a regulatory agency having the power to unilaterally set business companies’ tariff and service standards. In this kind of regulation, legislation broadly states the general principles that the regulatory agency must follow when setting tariff and service standards, but it leaves the detailed decision criteria unspecified in order to allow the regulatory agency some discretion. Lastly, regulation through private ownership in conjunction with liberalization and regulation of access, prices and quality builds on the expectation that the mechanism of competition and the contestability of the market (Baumol, 1982) provide enough pressure on business companies to pursue the public interest. This classification of regulatory models presented in Gómez Ibáñez (2003) partially overlaps with the categorisation of different types of public–private partnerships (PPPs) (e.g., Shaeffer & Loveridge, 2002). In the rest of this discussion, however, we will refer to these four models of regulation as alternative institutional and organisational systems to affect water firms’ behaviour, rather than alternative ways of public–private collaboration.

In some countries, the water regulatory systems quite closely match any of these four ‘models’, e.g., discretionary regulation in England and Wales, and franchise allocation in France. In other countries, however, the water regulatory system combines selected features of different ‘models’. Groom et al. (2006), for example, discussed the benefits of regulating water infrastructure by blending franchise allocation and public ownership. They argued that such a ‘hybrid’ regulatory system can lead, amongst other things, to more accountability, better transparency, less chances of capture, and less influence of short-term political gains, although the conflict of interest of the public authorities (which are both the franchisers and the owners of the franchisee water firms) can prevent the full enforcement of the franchise contracts and undermine private participation. There are a number of issues, then, regarding why ‘hybrid’ regulatory systems of the water sector arise, and whether they actually deliver the expected net benefits. An analysis of the 1994 water regulatory reform in Italy, which resulted in the combination of selected features of public ownership, franchise allocation, and discretionary regulation, can help shed some light on why water regulatory reforms are designed as ‘hybrids’ between different regulatory ‘models’.
Second, scholarly literature on water regulation and regulatory reform has generally focused on the questions of how water infrastructure is regulated in different countries and what accounts for the differences of the regulatory institutions, organisational structures and performance of the regulated water industry across countries (Spulber & Sabbagh, 1994; Winpenny, 1994; Merrett, 1997; Dinar, 2000; Finger & Allouche, 2002; Douglass Shaw, 2005). Relatively less attention has been placed, instead, on explaining the variation of the regulation of water infrastructure within the same country. This gap can be understood because, generally, water infrastructure is regulated in a uniform way within any state jurisdiction. Recent tendencies towards enhanced ‘regionalism’ or ‘federalism’ in formerly centralised public governance systems, however, lead to the possibility that reforms result in quite different ways of regulating water infrastructure at the sub-national level. In 2001, for example, a constitutional reform in Italy decentralised various competences (including those on water management) to the regions, which started developing specific approaches to the regulation of water infrastructure. In a different way to other regions, for instance, in 2003 Lombardy ruled that local governments may transfer water infrastructure assets to mixed public–private ownership firms (but local governments should retain a majority of shares) and that asset ownership may be separated from service management. An issue arises, then, regarding what factors account for the variation of regulatory systems of water infrastructure across regional or local areas within the same country, provided that a common regulatory institutional framework is supplied by state legislation for the country as a whole. Analysis of the 1994 water reform in Italy can contribute to addressing this issue, because the reform resulted in different organisational forms for managing water services and infrastructure at the local level in spite of the uniform overall regulatory institutions provided at the state level.

At the sub-national level, water services and infrastructure can be managed by quite different kinds of firms. In France, for example, water services and infrastructure are managed either by local government-owned firms or by private operators, according to the terms stipulated in various forms of public–private partnerships. Similarly, in Italy after the implementation of the 1994 water reform, water services and infrastructure were managed by various kinds of firms, as the OTA authorities awarded water concessions to either fully local government-owned companies, or to mixed public–private ownership companies, or to local government-owned companies whose shares were floated on the stock exchange, or to business companies selected through tender offer competitions. But how did this variety of water firms originate? The 1994 water reform provided that the OTA authorities, once established, awarded the water concessions, but it did not prescribe whether water service and infrastructure should be managed by public or private ownership water firms or any form of public–private partnership. It is interesting, therefore, to investigate how, in the process of implementing the 1994 water reform, the OTA authorities chose to award the water concessions to various kinds of water firms.

The implementation of the 1994 water infrastructure regulatory reform in Italy is used here as a case study of setting up a water regulatory system which combines selected features of different regulatory ‘models’ and which resulted in different kinds of firms for managing water services and infrastructure at the local level. Evidence for the case has been collected through primary, secondary, and tertiary sources. Primary sources consisted of interviews with 18 directors and managers of OTA authorities and with 12 directors and managers of water firms. Secondary sources consisted of reports issued by the Supervising Committee on the Use of Water Resources, by papers published by policy research centres (Passarelli, 1995; Caselli, 1996; Barbaresi & Meucci, 1997; De Angelis, 1997; Caporale, 1999; Petretto, 2001; ASTRID, 2008; Utilitatis, 2008), and by the business press. Tertiary sources consisted of scholarly papers on water regulation in Italy after the 1994 water reform (Goria & Lugaresi, 2002;
The case is analysed by tracing the process through which the 1994 water reform was implemented in the country, and identifying different types of ‘trajectories’ of the implementation process which led to the award of water concessions to different kinds of water firms. In a similar way to this study, previous research has been done on the implementation of the 1994 water reform in Italy, in particular, by Citroni et al. (2007) and Carrozza (2008). By analysing the implementation of the water reform in the country as a whole and in the region of Tuscany in particular, the work of Citroni et al. (2007) highlighted that the local political economy of the water sector fundamentally affected the implementation of the water reform, and led to a new water governance system different to that originally intended in the reform statute. Unlike the work of Citroni et al. (2007), this study also aims to explain the variation of water reform implementation outcomes across the country rather than explaining the overall implementation process. Carrozza (2008), instead, analysed the water reform implementation as a sequence of ‘decision rounds’ and conceptualised four ‘ideal types’ of water reform implementation outcome according to the degree of openness of water services to the market, namely, opening the water sector to new entrants, fostering the growth of incumbent water firms, protecting the incumbent water firms, and paralysis of the implementation process. Unlike the work of Carrozza (2008), this study aims to define an empirically grounded taxonomy of water reform implementation outcomes based on the institutional and organisational features of the water concession awards, rather than fitting instances of the water reform implementation at the local level into a preconceived scheme.

This study follows the case study method, which has well-known strengths and limitations (Ragin & Becker, 1992; Yin, 1994; Stake, 1995). The case of the implementation of the 1994 water reform in Italy is used as an exemplar instance of the process of setting up a regulatory system which combines different regulatory ‘models’ and which results in various forms of water concession awards. The case, therefore, provides the empirical support for a deeper understanding of how ‘hybrid’ regulatory systems are produced, and for trying to identify, through systematic comparisons, what factors account for variations in the kinds of firms which manage water services and infrastructure at the local level.

The rest of the paper is organised as follows. The next section will briefly narrate the implementation of the 1994 water reform in Italy during the period between 1994 and 2006. Section Three will analyse why the 1994 water reform implementation resulted in a ‘hybrid’ system which combined selected features of public ownership, franchise allocation, and discretionary regulation. Section Four will analyse why the 1994 water reform implementation resulted in different organisational forms for managing water services and infrastructure at the local level. Finally, Section Five will discuss the findings from an analysis of the case with respect to the broader scholarly discussion regarding the set up of regulatory systems of water infrastructure, and the rationales for the institutional variety of water infrastructure regulation at the sub-national level.


In the late 1980s, investments in water infrastructure in Italy progressively declined because of growing stress on public finance, which led to the termination of government-funded infrastructure development programmes, and constraints placed on water firms, who were prevented from charging cost-recovering tariffs because of inflation-control policies. Facing the need for investments in order to
comply with increasing water quality standards set by EU directives, the national association of municipal companies, Federgasacqua, lobbied for a water reform which built on the principles of integrated watershed management, comprehensive water resource preservation and planning of water use, cost-effectiveness, and full cost-recovery. The reform was expected to lead to the consolidation of the sector, which at that time counted about 23,500 operators — including local government branches directly managing water services, municipal companies, local governments’ consortia, other public bodies, and private business companies. As shown in Table 1, most of the operators were local government branches (about 81.9%), which supplied, however, only 34.5% of water and produced 43.9% of the turnover value of the sector. In contrast, municipal companies numbered relatively few (1.4%), but they supplied about 24% of water and produced about 25.3% of turnover of the sector. Relatively large water supplies and turnover values were achieved by local governments’ consortia, while other public bodies (e.g., regional government-owned water companies, such as Acquedotto Pugliese in Puglia and Basilicata, EAF in Sicily, and ESAF in Sardinia) managed relatively large water supplies but generated relatively little turnover value. Private business companies, finally, played a relatively marginal role in the sector.

The design of the 1994 water reform, which was enacted in Act 36/1994, built on a few key principles (Citroni et al., 2007). First, water services were to be comprehensively organised and managed in relatively large territories (the OTAs) in order to reduce the fragmentation of the industry and allow water firms to gain economies of scale. Second, all the segments of the water services (i.e., water catchment, transport, distribution, sewage, and wastewater treatment) were to be managed ‘under one roof’ by one only water firm in each OTA, in order to better coordinate the different stages of the water management cycle. Third, planning and control functions were to be separated from those of operational management and service delivery (the former being assigned to local regulatory authorities formed by local governments, and the latter to the water firms) in order to improve the entrepreneurial management of the water firms. Lastly, water tariffs were to cover the full cost of water services, including investment depreciation and return to capital invested, in order to allow water firms to achieve financial self-sufficiency, finance infrastructure development, and attract private investors.

The institutional structure provided by the 1994 water reform provided that regional governments would design the OTA territories within each regional jurisdiction, and that they would provide the details of the rules regarding the establishment of the OTA authorities and the award of water licences. The reform was expected to lead to the consolidation of the sector, which at that time counted about 23,500 operators — including local government branches directly managing water services, municipal companies, local governments’ consortia, other public bodies, and private business companies. As shown in Table 1, most of the operators were local government branches (about 81.9%), which supplied, however, only 34.5% of water and produced 43.9% of the turnover value of the sector. In contrast, municipal companies numbered relatively few (1.4%), but they supplied about 24% of water and produced about 25.3% of turnover of the sector. Relatively large water supplies and turnover values were achieved by local governments’ consortia, while other public bodies (e.g., regional government-owned water companies, such as Acquedotto Pugliese in Puglia and Basilicata, EAF in Sicily, and ESAF in Sardinia) managed relatively large water supplies but generated relatively little turnover value. Private business companies, finally, played a relatively marginal role in the sector.

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Table 1. Percentage of operators and percentage of water volume served, per type of water firm (Sources: ISTAT, 1991; Supervising Committee on the Use of Water Resources, 1997, 1998).

<table>
<thead>
<tr>
<th>Operators</th>
<th>% number of operators</th>
<th>% water volume supply</th>
<th>% turnover</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local government branches</td>
<td>81.90%</td>
<td>34.50%</td>
<td>43.90%</td>
</tr>
<tr>
<td>Municipal companies</td>
<td>1.40%</td>
<td>24.00%</td>
<td>25.30%</td>
</tr>
<tr>
<td>Local government consortia</td>
<td>12.40%</td>
<td>18.50%</td>
<td>18.10%</td>
</tr>
<tr>
<td>Other public bodies</td>
<td>2.20%</td>
<td>17.70%</td>
<td>7.70%</td>
</tr>
<tr>
<td>Private business companies</td>
<td>2.10%</td>
<td>4.50%</td>
<td>4.90%</td>
</tr>
</tbody>
</table>

1 Total water volume supply in Italy in 1996 was about 7,900 million m³ (Supervising Committee on the Use of Water Resources, 1996).
2 Total turnover of the water sector in Italy in 1996 was about €3,700 million (2008 € value) (Supervising Committee on the Use of Water Resources, 1996).
concessions. After being established, the OTA authorities would draft and issue water infrastructure development and tariff plans, taking into account the criteria (the so-called ‘normalised method’) set by the Supervising Committee on the Use of Water Resources. The OTA authorities would award the water concessions either to business companies selected through tender offer competitions or to local government fully- or partially-owned water firms. As most of the water firms were relatively small with respect to the OTA jurisdictions (which where expected by central government to include about 0.5 million users, on average), water firms were expected to merge in order to gain a minimal size to fit the requirements for awarding the water concessions. The Supervising Committee would also monitor the implementation of the reform and report to Parliament on the state of water resources on a yearly basis.

Since the very beginning, the implementation of the 1994 water reform proceeded relatively slowly because of the resistance of sub-national governments. Local governments, in particular, generally neglected to collaborate with the regions in the definition of the territorial boundaries of the OTAs and in the forms of cooperation for pooling together the water planning and control functions, because they claimed that central government had not filled the details of the new regulatory systems as required by Act 36/1994. In 1997, concerned with the delays in spending the funds provided by the 1994–1999 Community Support Framework (CSF), an EU programme for financing infrastructure development, central government threatened the regions with exercising substitutive powers and removing their competences on water policy if they did not transpose the water reform into regional legislations. Most of the regions then speeded up the transposition of the reform, which they mostly completed by 1999.

Southern regions passed regional laws which transposed the water reform relatively quickly, because they anticipated that this task was a requirement for appropriation of the 2000–2006 CSF funds; northern regions proceeded relatively slower, like the north-eastern border regions Friuli-Venezia Giulia, which only fully completed the transposition in 2005. The total number of regions which passed regional laws the water reform is illustrated in Figure 1.

After the regions had passed the regional laws, local governments slowly started to establish the OTA authorities. The first case of a water concession award took place in the OTA ‘Alto Valdarno’ in Tuscany, whose Authority awarded the water concession to a mixed public–private ownership company (Nuove Acque) on 1 June 1999. In most of the OTAs in the country, however, local governments neglected implementing the water reform, which was generally regarded as threatening local governments with losing their control of the local water services and related business and job opportunities. Rather than establishing the OTA authorities and making them award the water concessions, some local governments even directly awarded or renewed concessions to local government-owned water firms in order to exploit exemption clauses that the reform granted to incumbent operators.

From 1999 onwards, however, the number of OTA authorities established started to grow, in particular in the southern regions, where this task was required in order to access the 2000–2006 CSF funds. Further progress in the implementation of the water reform took place from 2001 onwards. In December 2001, Parliament passed Act 448/2001 which contained, in article 35, a reform of local public services. The reform provided the general rule that local public services of industrial relevance (i.e. infrastructure services) should be contracted out through tender offer competitions. Special

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3 Only 19 of the 20 regions in the country were required to implement the water reform, because, in 1996, the Constitutional Court ruled that the reform did not apply to the special-statute Alpine region, Trentino-Alto Adige.

4 The problem of direct assignment of water concessions by local governments, in apparent violation of the water reform, was highlighted by the Supervising Committee in the 1997 and 1998 Reports to Parliament.
provisions, however, applied to water services: the reform allowed an exemption regime for those water concessions which had already been assigned to water firms without any tender offer competition, and which could be extended for a period from 3 up to 9 years (provided certain conditions were met, like floating the shares of the water firm on the stock exchange), and the reform allowed a transitory regime for directly assigning water concession to water firms fully owned by all the local governments included in the OTAs within 18 months from the passing of the reform. These provisions opened up the possibility for local governments to make their water firms restructure and be awarded with the water concessions without applying the tender offer competition rules, which would exposed them to the risk that new entrants (e.g., private business operators, such as the French multi-national water companies) could successfully win the concessions.

Following an infraction procedure from the EU Commission concerning some provisions of the 2001 local public services reform which contrasted with EU directives on public sector contracts, in September 2003 the government issued another reform of the local public services (Legislative Decree No. 269). The 2003 reform restated the general rule that local public services should be assigned through tender offer competitions, but it also provided that local public service concessions could be directly assigned to mixed public-private ownership companies in which the private partners had been chosen through tender offer competitions, or to firms which were fully owned by the local governments serviced by the same firms, and which were so tightly controlled by local governments that it was as if they were branches of local government (the so-called ‘in house’ firms5).

The 2003 reform, therefore, offered to local governments the option to make the OTA authorities legitimately assign the water concessions to their water firms, provided that they restructured in such a way as to include all the serviced local governments as shareholders. Between 2001 and 2006, the

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5 The ‘in house’ firm had been found by the European Court of Justice to be a legitimate way of awarding local public services in Teckal vs. local government of Viano (Italy) (case C-107/98) on 18 November 1999. The case originated from the appeal of Teckal, a business company, against the direct award of heating services for certain municipal buildings by the local government in Viano to a fully local government-owned business company. The Court ruled in favour of the local government, on the basis that the local government can contract out a local public service to a third party, juridically distinct from itself, without any tender offer competition and in derogation of sector-specific rules, if the local government is able to exercise on the entity a control analogous to the one on its own offices, and the other entity delivers most of its services to the controlling local government.
number of OTA authorities established steadily grew along with the number of water infrastructure development and tariff plans approved, and the number of water concessions awarded (Figure 2). Quite often, the OTA authorities awarded water concessions to the water firms fully owned by the same local governments, according to the ‘in house’ provisions.

In 2006, the implementation of the 1994 water reform came to an end. In April 2006, the government issued Legislative Decree 152/2006, which transposed EU directive 2000/60/CE on the preservation and safeguard of water resources. The decree established eight water districts in the country, whose authorities would be charged with responsibilities for the preservation and protection of water resources. The decree, moreover, abrogated Act 36/1994, therefore putting an end to the implementation process which had been conducted over the previous twelve years or so. The economic regulatory institutions of the water sector, however, kept operating according to the agreements made between the local governments to establish the OTA authorities and the water concessions which had been awarded.

After 2006, the water sector in Italy presented 67 OTAs in which water concessions had been awarded according to the 1994 water reform, amounting to about 79% of the country’s population. Generally, in each OTA the water concession had been awarded to one water firm only, which resulted from the merger of incumbent local government-owned water firms. After the implementation of the 1994 water reform, therefore, the water industry had consolidated, and a few major ‘regional-scale’ operators had emerged – most notably, Acca based in Rome (serving about 7 m users), AQP in Puglia (4.5 m), Hera in Bologna (2 m), Smat in Turin (2 m), Abbanoa in Sardinia (1.6 m), and Iride in Genoa (0.9 m). The water industry, however, still included hundreds – possibly thousands – of smaller water firms, mostly controlled by local governments and enjoying exemption or transition regimes.

3. Explaining the regulatory design of the water infrastructure in Italy

The implementation of the 1994 water reform in Italy led to a regulatory system which, by and large, combined selected features of public ownership, franchise allocation, and discretionary regulation.
Similar to the regulatory system in England and Wales, Italy’s regulatory system regulates water tariffs through a price cap mechanism, which takes into account econometric estimates of the efficiency gains that water firms may achieve, and a fair return on capital invested that water firms are allowed to gain. In a similar manner to the regulatory system in France, entry to the water industry is regulated through franchise allocation mechanisms which, in principle, should follow tender offer competition rules. Analogous to the German regulatory system, local governments play an important role in planning and controlling water services through public ownership of water firms. All in all, the regulatory system of the water infrastructure in Italy has emerged with a ‘hybrid’ configuration which regulates water services according to selected features from different regulatory ‘models’.

As highlighted by Groom et al. (2006), multiple regulatory mechanisms may simultaneously operate in the same water regulatory system. An issue arises, then, regarding whether the benefit of such concurrent regulatory mechanisms outweighs the costs of redundant regulation and delivers efficient outcomes. Groom et al. (2006) rightly highlight some potential benefits arising from designing tight regulatory systems which rely on combinations of public ownership and franchise allocation. Unlike Groom et al. (2006), however, the case of the implementation of the 1994 water regulatory reform in Italy suggests that such a combination of different regulatory ‘models’ may result from the political economy of putting reform into place rather than from any deliberate design. Accordingly, the rationales for the resulting regulatory system are found in the fragmentation of decision arenas which come to shape the overall regulatory system, rather than in the presumed net benefits of the ‘hybrid’ configurations.

In the case of the implementation of the 1994 water reform in Italy, the original design of the reform provided a set of loosely specified regulatory institutions rather than a fully-fledged combination of selected features from different regulatory ‘models’. Act 36/1994 provided, in particular, the basis for an industrial reorganisation of the water sector into larger service areas than had been traditionally managed by water firms in the past, for the separation between planning and control functions from the operational management ones, and for the adoption of a price cap method for tariff setting. The 1994 water reform, however, was silent on the allocation of property rights (i.e. public or private ownership of water firms) and on the regulation of market entry (i.e. direct assignment of water concessions or award through tender offer competitions). The resulting regulatory system, namely the combination of selected features of public ownership, franchise allocation, and discretionary regulation, therefore, needs to be understood as the effect of ‘filling the gaps’ of a regulatory system design which left ‘room to manoeuvre’ to sub-national governments and to incumbent water firms during the implementation process.

The implementation of the 1994 water reform in particular was affected by the political economy of the sector, in which the local governments and incumbent local government-owned water firms resisted implementing the reform until the institutional changes brought about by the 2001 and 2003 local public services reforms opened up the possibility of their retaining control of water services. Before the 2001 local public services reform, very few OTA authorities had awarded water concessions, while most of them were still in the process of being established, or planning water infrastructure developments and tariffs. Local governments generally benefited from the delays, which allowed them the time needed to restructure local government-owned water firms and make them suitable to be awarded the water concessions for whole OTAs. After the 2001 and 2003 local public services reforms, the OTA authorities could award water concessions, set to last for about 20–25 years, to water firms fully or majority-owned by local government. In such a way, local governments effectively forestalled the opening of competition to the award of the water concessions for several years to come.
The water infrastructure regulatory system in Italy, therefore, resulted from a combination of some traits of discretionary regulation (i.e. the price cap mechanism for tariff setting provided by Act 36/1994), franchise allocation (i.e. the procedure for awarding water concessions provided by the local public services reforms), and public ownership (i.e. the control of water firms retained by local governments) because of the effective ‘manoeuvring’ of local governments during the water reform implementation process. Another issue arises, however, as to whether such emergent regulatory system brings any net benefits in terms of water infrastructure and service performance. The performance of the water industry is notoriously difficult to assess (Ballance & Taylor, 2005; Rouse, 2007) because of the many performance dimensions (e.g., tariff level, water quality, service quality, investments, cost of regulation, etc.) and the little information publicly available. Nevertheless, recent reports on the state of the water sector (ASTRID, 2008; Supervising Committee, 2008) can provide some insights into the recent performance of the water industry in Italy.

According to a survey of 53 OTAs conducted by the Supervising Committee (2008), in the first 3 years of water management under the new regulatory regime the surveyed water firms carried out €2,120 million investments, an amount lower than that originally expected in the water infrastructure development and tariff plans (€4,380 million) and lower than the sum required to comply with the current EU pollution and quality standards (about €3,000 million per year for the next 10 years, as estimated in ASTRID, 2008). From a sample of 27 water infrastructure development and tariff plans, moreover, the Supervising Committee (2008) showed that water firms mostly financed their investments through self-financing (46%), EU funds (21%), corporate debt (14%) and equity (11%). This financial mix is quite different from the one originally expected in the water plans, which showed higher levels of self-financing (55%) and debt (23%) and lower levels of EU funds (15%) and equity (1%). The difference between the expected and the actual financial mix may be explained because of lower water tariffs, which curb profitability and operational cash flow and make the water firms reliant still on public funds for financing infrastructure development. Water tariffs in Italy, in fact, are relatively lower than in other main EU countries (in the main cities, tariffs are in the range of 0.56–0.75 €/m³), such as Spain (where tariffs in the main cities are in the range 0.78–0.90 €/m³), France (1.93–2.72 €/m³), Germany (2.87–4.30 €/m³), and the UK (2.08–4.39 €/m³) (ASTRID, 2008). Apart from the important role still played by EU funds (which, however, are expected to decrease as some southern regions of the country will not be eligible to the 2007–2013 CSF because of rising per capita income with respect to the average in the EU), water investments have been supported by equity more than originally required6.

4. Explaining the variety of water infrastructure regulatory reform implementation

The implementation of the 1994 water infrastructure regulatory reform in Italy resulted in quite different forms of water management at the local level. In some of the 67 OTAs where water concessions

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6 The data provided by ASTRID (2008) do not explain why water firms were financed by more equity than originally required. One possible explanation is that, given the difficulty to self-finance and to access debt financing (because of the relatively low tariffs and operating cash flow prospects), water firms had to resort to more equity capital from local government owners than was originally envisaged. In this sense, what water firms’ financial reports show as ‘equity’ should really be understood as public sector financing, rather than funds provided by private investors.
have been awarded, more than one firm has been involved in water service management, resulting in a total of 102 water concessions. Water concessions have been awarded to ‘in house’ water firms 58 times, 13 water concessions have been assigned to mixed public–private ownership firms, 13 to local government-owned firms traded on the stock exchange or partially owned by financial institutions, 11 to safeguarded public sector firms (i.e. water firms enjoying transition or exemption regimes), 6 to private operators selected through tender offer competitions, and 1 to a private firm in a negotiated temporary regime (Table 2). In the other 25 OTAs, in which no water concessions have been awarded according to the new water regulatory system, the water services are still operated by an uncertain number (hundreds or possibly thousands) of local government firms. A question arises, then, regarding why the implementation of the water reform resulted in so many different kinds of firms receiving concessions at the local level.

This variety of firms is particularly intriguing if their geographical distribution is also taken into account (Table 3). The award of water concessions to ‘in house’ firms is particularly frequent in the northern regions (equivalent to 78% of all the water concessions awarded in the northern regions, as opposed to 33% in the central regions and 38% in the southern). The award to mixed public–private ownership firms, instead, is relatively more frequent in the central regions (22%) than in the southern (15%) and the northern (7%) ones. No water concession has been awarded to firms traded on the stock exchange or partially owned by financial institutions in the southern regions, while this kind of firm is present in the northern (11%) and central (19%) regions. Most of the safeguards of incumbent water firms are based in the central regions (22%) rather than in the northern (4%) and the southern ones (8%). Finally, tendering out the water concessions to private firms has been more frequent in the southern regions (31%), while only one such case is recorded in the central regions.

One key to analyse the variety and geographical distribution of the kinds of water firms which have been awarded concessions is to identify different types of trajectory of the water reform implementation at the level of the regions and of the OTAs. Some regions are characterised by the relative frequency of certain kinds of water firms to which the water concessions have been awarded. For example, in the northern regions of Piemonte and Lombardy most of the water concessions have been awarded to ‘in house’ water firms (29 out of 37 concessions awarded). In Emilia Romagna, awarding water concessions to firms traded on the stock exchange has been relatively common, accounting for 6 such awards out of 13 in the whole country. In Tuscany, most of the water concessions have been awarded to mixed public–private ownership firms, which are relatively more frequent than elsewhere (accounting for 5 such awards out of 13 in the whole country). The use of tender offer competitions to award water concessions

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Table 2. Distribution of the kind of firms which have been awarded water concessions, 2008 (Sources: Supervising Committee on the Use of Water Resources, 2008; websites of the OTAs, surveyed in May 2009).

<table>
<thead>
<tr>
<th>Kind of water firm</th>
<th>Number of water concessions awarded</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>In-house water firms</td>
<td>58</td>
<td>57</td>
</tr>
<tr>
<td>Mixed public–private ownership firms</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>Local government-owned firms traded on the stock exchange or partially owned by a financial institution</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>Safeguarded public sector firms</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>Private firms selected through tender offer competitions</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Private firms in a negotiated temporary regime</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>102</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>
Table 3. Distribution of the kind of firms awarded water concessions, by region, in 2008 (Sources: Supervising Committee on the Use of Water Resources, 2008; websites of the OTAs, surveyed in May 2009).

<table>
<thead>
<tr>
<th>Region</th>
<th>No. OTAs which have awarded concessions (No. OTAs established, in brackets)</th>
<th>‘In house’ firms</th>
<th>Mixed public–private ownership firms</th>
<th>Firms traded in stock exchange or owned by financial institution</th>
<th>Safeguarded public sector firms</th>
<th>Private firms selected through tender offer competition</th>
<th>Private firms in negotiated transitory regime</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Piemonte</td>
<td>6 (6)</td>
<td>17</td>
<td>3</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td>24</td>
</tr>
<tr>
<td>Valle d’Aosta</td>
<td>0 (1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>11</td>
</tr>
<tr>
<td>Lombardy</td>
<td>6 (12)</td>
<td>8</td>
<td>1</td>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td>24</td>
</tr>
<tr>
<td>Veneto</td>
<td>7 (8)</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td>13</td>
</tr>
<tr>
<td>Friuli-Venezia Giulia</td>
<td>1 (4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Liguria</td>
<td>2 (4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Total northern regions</td>
<td>22 (35)</td>
<td>42 (78%)</td>
<td>4 (7%)</td>
<td>6 (11%)</td>
<td>2 (4%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>54</td>
</tr>
<tr>
<td>Emilia Romagna</td>
<td>9 (9)</td>
<td></td>
<td></td>
<td>6</td>
<td>3</td>
<td></td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>Tuscany</td>
<td>6 (6)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Umbria</td>
<td>3 (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Marche</td>
<td>4 (5)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Lazio</td>
<td>4 (5)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Abruzzo</td>
<td>6 (6)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Molise</td>
<td>0 (1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>Total central regions</td>
<td>32 (35)</td>
<td>12 (33%)</td>
<td>8 (22%)</td>
<td>7 (19%)</td>
<td>8 (22%)</td>
<td>1 (3%)</td>
<td>0 (0%)</td>
<td>36</td>
</tr>
<tr>
<td>Campania</td>
<td>2 (4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Puglia</td>
<td>1 (1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Basilicata</td>
<td>1 (1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Calabria</td>
<td>3 (5)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Sicily</td>
<td>5 (9)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Sardinia</td>
<td>1 (1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Total southern regions</td>
<td>13 (21)</td>
<td>5 (38%)</td>
<td>2 (15%)</td>
<td>0</td>
<td>1 (8%)</td>
<td>4 (31%)</td>
<td>1 (8%)</td>
<td>13</td>
</tr>
<tr>
<td>Interregional OTAs</td>
<td>0 (1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>67 (92)</td>
<td>58</td>
<td>14</td>
<td>13</td>
<td>11</td>
<td>5</td>
<td>1</td>
<td>102</td>
</tr>
</tbody>
</table>
to private firms has been more frequent in Sicily than elsewhere (4 tender offer competitions launched and only 1 in the rest of the country).

In 56 out of the 67 OTAs, the OTA authorities awarded the respective water concessions to one water firm only. In some cases, like in the OTAs of Puglia, Basilicata, and Sardinia, the concessions were awarded to water firms which originated from large regional-scale public sector incumbents (Acquedotto Pugliese, Acquedotto Lucano, and ESAF). In other cases, the concessions were awarded to water firms which originated from the merger of several small-sized local government-owned incumbents. In the OTA called ‘Verbano Cusio Ossola e Pianura Novarese’ in Piemonte, for example, the water concession was awarded to a water firm which originated from the merger of more than 20 companies and about 100 local government-owned organisations. In the other 11 of the 67 OTAs, the OTA authorities awarded concessions to two or more water firms, as for example in the OTA Cuneese, where water concessions were given to 10 water firms (7 ‘in house’ firms and 3 water firms partially owned by financial investors).

A comparison between the different trajectories of the 1994 water reform implementation at the local level can be structured according to two dimensions. First, the comparison takes into account the aims of the local governments for awarding the water concessions to a certain kind of water firm (or of not awarding it, or not yet), as collected from interviews with directors and managers of the OTA authorities. Second, the comparison takes into account the industrial and organisational change process of the water firms, as collected through a review of secondary sources and interviews with directors and managers of OTA authorities and water firms.

At the local level, the water reform has been implemented following five main types of trajectories. The first type of trajectory is the implementation of the water reform leading to the award of the water concession to only one fully local government-owned water firm per each OTA. This kind of trajectory could take place in two variants. In the first variant, the local governments aimed to keep control of the local water services and tariffs, to preserve the know how and expertise of their water firms, and to support their growth. The OTA authorities came to award the water concessions to fully local government-owned water firms which formed through mergers and acquisitions between the incumbent local government-owned operators. This variant of trajectory took place, for instance, in the OTA Torinese (where the water firm Smat serves about 2.0 million people), in the OTA Città di Milano (where the firm Metropolitana Milanese serves about 1.3 million people), and in the OTA Laguna di Venezia (where the firm Veritas serves about 0.7 million people).

In the second variant, the local governments agreed with the regional governments to consolidate the incumbent water firms around the large public sector water firms which already operated in the regions. According to this design, the OTA authorities came to award water concessions to fully public sector-owned water firms (mostly owned by local governments, although a minority share could be held by regional governments) which were formed through the acquisition of the smaller local government-owned operators by the large incumbent. This variant of trajectory took place, in particular, in the OTA Puglia (where the firm Acquedotto Pugliese serves about 4.0 million people), in the OTA Basilicata (where the firm Acquedotto Lucano serves about 0.6 million people), and in the OTA Sardegna (where the firm Abbanoa, which originated from the regional government-owned ESAF, serves about 1.6 million people).

The second type of trajectory is the implementation of the water reform leading to the award of a water concession to more than one firm fully owned by local governments in each OTA. This trajectory took place where the local governments intended to keep control of the local water services, which were already highly fragmented into several local government-owned water firms. The OTA authorities came
to award water concessions to more than one water firm because the consolidation process was not yet completed and various operators still managed part of the water services within the same OTAs. The OTA authority of the OTA Cuneese, for example, awarded concessions to 10 water firms (serving about 0.5 million people), and that of the OTA Bacchiglione assigned it to 4 operators (serving about 1.0 million people). This trajectory also took place in the OTA Provincia di Milano (where 2 water firms serve about 2.6 million people), in the OTA Veneto Orientale (in which 2 water firms serve about 0.8 million people), and in the OTA Veronese (in which 2 water firms serve about 0.6 million people). Many of the water firms operating in the same OTA have started forming syndicates to coordinate their activities, however, and further merger deals between them may be expected to take place in the future.

The third type of trajectory is the implementation of the water reform leading to the award of water concessions to one mixed public–private ownership firm in each OTA. This trajectory took place where the local governments aimed to keep control of the local water services and tariffs. Instances of this trajectory took place, in particular, in Tuscany, where the local governments had started merging their water firms from the early 1990s and the regional government provided the political clout to their efforts. The regional branch of the Democratici della Sinistra (Left Democrats) party, in fact, had come to favour awarding the water concession to mixed public–private ownership water firms, an organisational design which was also supported by the local governments’ councils where the Democratici della Sinistra held the majority. This trajectory took place, for instance, in the OTA Medio Valdarno (where the firm Publiacqua serves about 1.2 million people), in the OTA Basso Valdarno (where the firm Acque serves about 0.8 million people), and in the OTA Lazio Meridionale–Latina (where the firm Acqualatina serves about 0.6 million people). Also, in the OTA Sarnese Vesuviano, the water concession was awarded to a mixed public–private ownership firm, GORI (which serves about 1.4 million people), but this case presents unique features because the OTA Sarnese Vesuviano authority itself owns 51% of GORI.

The fourth type of trajectory is the implementation of the water reform leading to the award of water concessions to one firm traded on the stock exchange or partially owned by financial institutions. This trajectory also took place where the local governments aimed to keep control of the local water services and tariffs. Instances of this trajectory frequently happened in Emilia Romagna, where the local governments of all the 9 OTAs merged their water firms leading to the formation of two main players in the region (Hera, which operates in 6 OTAs, and Enìa, which operates in 3), and where the regional government supported the consolidation of the incumbents by providing longer water concession periods for larger water firms. The largest OTAs in which this trajectory took place are those of Lazio Centrale (where the firm ACEA ATO 2 serves about 3.6 million people), Bologna (where Hera serves about 0.9 million people), and Genovese (where the firm Iride serves about 0.9 million people).

The last type of trajectory is the implementation of the water reform leading to the award of water concessions to private business companies. These private operators were selected through tender offer competitions in four OTAs in Sicily (Palermo, Enna, Caltanissetta, and Siracusa) and in one in Lazio (Lazio Meridionale–Frosinone), and through a negotiated agreement in the OTA Reggio Calabria. Due to the lack of data collected on these few cases, the factors which led the authorities of these OTAs to award water concessions through tender offer competition (rather than through the direct assignment of public sector-owned water firms) could not be investigated deeply. The award of water concessions to private operators selected through tender offer competition has, anyway, been a
relatively rare type of implementation of the water reform in the country, and some recent events suggests that the involvement of private operators is unlikely to gain more popularity in the near future, e.g. ACEA ATO 5, which operates in the OTA Lazio Meridionale–Frosinone, missed delivering an expected €85 million investment programme (Associazione Consumatori Utenti, 2009 and has recently been subject to investigation by tax officials for illegally over-charging water bills (Lega Consumatori Lazio, 2009).

In the other 25 OTAs (which include about 11.4 million people), the implementation of the 1994 water reform stalled before the OTA authorities awarded the water concessions. In some OTAs (e.g. those of Savona, Cremona and Lecco), the local governments aimed to keep control of the local water services and tariffs, but they did not manage to restructure the water firms because of the high fragmentation of the local water industry. In the OTAs based in Lombardy, restructuring water firms was also delayed because of the requirements, provided in the regional laws 26/2003 and 18/2006, to separate asset-owner firms from water service management firms. In some OTAs based in Sicily (Ragusa, Messina, Trapani, and Agrigento), no private operator submitted an offer in response to calls for the award of water concessions or acquisition of minority shares of mixed public–private ownership water firms, despite reiterated attempts. The largest OTAs in which water concessions have yet to be awarded are those of OTA Napoli Volturno (including about 2.8 million people) and OTA Varese (0.9 million).

In total, this analysis suggests that the variety of different kinds of firms which received the water concessions can be understood by identifying five types of trajectories of implementation of the 1994 water reform. Four of these different trajectories, namely those which led to the award of water concessions to only one water firm owned by local governments, or to more than one water firm owned by local governments, or to mixed public–private ownership firms, or to firms traded on the stock exchange or owned by financial investors, are generally characterised by the aim of the local governments to keep control of local water services and tariffs, and by a consolidation process of incumbent local government-owned water firms. The trajectory which led to the award of the water concessions to private operators has been a relatively rare one. In about one fifth of the OTAs established in the country, various factors may have played a role in delaying the full implementation of the water reform.

The definition of these types of trajectories of implementation of the 1994 water reform at local level can help sort out different explanatory factors which account for the institutional variety of regulatory reform implementation outcomes. As a tentative effort in hypothesis generation, this analysis suggests at least four factors. First, the agreement between the local governments to retain control of the local water services may facilitate the consolidation of the industry at the local level and lead to the award of water concessions to only one water firm but, if the local water industry is too fragmented, then concessions may be awarded to more than one water firm. Second, the presence of a large public sector-owned incumbent water firm may facilitate the consolidation of the water industry at the local level and lead to the award of the water concession to the incumbent operator, as happened in the OTAs of Puglia, Basilicata, and Sardinia. Third, the congruence of political preferences held by public officers at the regional and local government level may facilitate the award of the water concessions to a preferred kind of firm, as happened in the OTAs based in Tuscany. Fourth, the incentive of longer concession periods provided to larger water firms may affect the consolidation of water firms to which the water concessions are eventually awarded, as happened in the OTAs based in Emilia Romagna and elsewhere.
5. Conclusions

The analysis of the implementation of the 1994 water regulatory reform in Italy sheds some light on why water regulatory systems may be designed as a combination of selected features of different regulatory ‘models’, and why water regulatory systems may result in different kind of firms for managing water services at the local level. In sum, the analysis highlighted, first, the importance of the 2001 and 2003 reforms of the local public services, which offered to local governments the opportunity to restructure their local water firms and to retain control of the local water services. The analysis also showed that the local trajectory of the reform implementation was affected by such factors as the agreement between local governments on retaining control of water services (provided that the local water industry was not too fragmented), the presence of a large public sector-owned incumbent, the congruence of political preferences between the public officers at the regional and local level, and the incentives for longer concessions periods granted to larger water firms by the regional legislation.

In a broader perspective, these findings contribute to an explanation of the design of water infrastructure regulation, and the ways in which regulatory reform results in new ways of organising and managing water services in general. The design of water infrastructure regulation is affected by the events that take place in the implementation of the new regulatory system. During the implementation process, contemporaneous events can offer key veto players the possibility of choosing regulatory options which had not been contemplated in the original reform design. These regulatory options are likely to be chosen if they allow the veto players to better pursue their interests. The resulting regulatory design, therefore, may incorporate selected features of different regulatory ‘models’, regardless of any intended plan or deliberate intention to strengthen regulation through concurrent regulatory mechanisms. Moreover, the same regulatory system provided by a state-wise reform of water infrastructure may result in variations in the ways in which water services are managed, depending on the particular conditions at the regional and local levels.

These insights into the issues of designing water infrastructure regulation and the effects of regulatory reforms at the local level also have some practical implications. First, not only do water regulatory reformers need to place careful attention on the design stage, but also on the process of implementing the new regulatory system. Resistance to the reform from key veto players, in particular sub-national governments, may throw the implementation process into stalemate. Reforms carried out in related policy domains, such as public service concession rules for local public services, may spill over into the water policy domain in such a way as to introduce new regulatory options not originally contemplated by the regulatory reformers. Finally, careful attention should also be placed on the particular conditions at the regional and local levels, because they can affect the implementation of the new regulatory system and result in a variety of kinds of firms for managing water services.

Finally, this study should also acknowledge some limitations. First, the collected data do not allow all the variation of local water regulatory reform implementation outcomes to be accounted for. For example, no factors have been identified to explain how all local governments within an OTA came to agree to retain control of local water services, nor what explains the preference for awarding a water concession to mixed public–private ownership firms, or to a local government-owned water firm floated on the stock exchange, and what explains the choice of selecting a water operator through tender offer competitions in four OTAs in Sicily, and only one in Lazio. Collecting data at the local level proved difficult because of the fragmentation of data sources, the little publicly available information about the implementation of water regulatory reform at the local level, and sociological reasons (i.e. less openness...
of the interviewees at the local level, in particular in the central–southern regions of the country). Additional research is needed, therefore, to gain a better understanding of water concession award decisions at the local level. Second, this study does not address the important issue of whether the various kinds of firms managing the water services at a local level achieve different performance. Collecting data on water firms’ performance proved difficult because most of the water concession awards were relatively recent, and no common standards for service quality have yet been established. Further research, therefore, might investigate whether the variety of types of water reform implementation trajectories at the local level matter in terms of performance delivered.

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References


