Chapter 8
Residential Water Pricing in Italy

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Abstract This chapter analyses the residential water pricing system in Italy and reviews the empirical outcomes of water tariffs in the Po-River Basin District (P-RBD), and especially in the Emilia Romagna administrative region (RER). The tariff system is imbedded in a composite regulatory framework governing the water supply and sanitation (WSS) services that was instituted in the 1990s. The scope of the review embraces both the outcomes of the WSS reform and the accomplishments of the per-capita and social water tariff variant introduced in RER, along with the service performance criteria meant to encourage better service provision and conservation of water resources. Starting from 2011 the regulation of the water tariffs has been progressively reorganized. As the reorganisation is not yet fully realised, and our analysis concentrates on the ex-post review and assessment, we concentrate on the water tariff system in place until 2012.

Keywords Residential water tariffs • Emilia Romagna • Social tariff • Water pricing reform • Abrogative referendum

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8.1 Introduction

A residential water tariff is a price that domestic users pay for water supply and sanitation (WSS) services; that is abstraction, storage, potabilisation, conveyance, wastewater collection and treatment. Water tariffs may be designed and structured so as to encourage water conservation and greater water use efficiency; with tangible environmental benefits. In doing so, water pricing may pursue multiple policy goals, seemingly at odds but reconcilable in principle: *water use efficiency*, that is avoiding wasteful use of water; *allocation efficiency*, thus maximising overall society's benefits from water uses; *financial viability*, meaning ability to compensate capital, skills and technology needed to ensure water services and sanitation; and *social equity*, usually referring to the affordability of the water service as a public interest good.

The EU Water Framework Directive (2000/60/EC), the flagship of Community water-related policies, compels an *adequate* contribution of the different water uses, including the households, to the *recovery of the costs* of water services. What is an *adequate* level of cost recovery is left to the discretion of the EU Member States (MS), based on the '*social*, *environmental and economic effects of the cost recovery as well as the geographic and climatic conditions of the region or regions affected*' (Directive 2000/60/EC). This requirement has not been fully translated into Italian WSS regulation. As a results, the water tariff system plays a limited role.

In this chapter we analyse water tariff system in Italy and the tariff variant introduced in Emilia Romagna administrative region (RER). The tariff system is a part of a comprehensive legislative and regulatory framework that determines the organisational and management structure of the service provision, and the competences and jurisdiction of the respective authorities. The framework had been laid down in the law 36/1994 (so-called Galli law), later incorporated into the law 152/2006 (so-called Environmental code). According to this system, the central government exercised authority over the conceptual design of water tariff system, whereas the power of articulating the water tariff structure and levels was delegated to lower authorities. The water services are organised within water supply and sanitation (WSS) districts (the so-called optimal territorial areas, ATOs). According to the Environmental code, the water tariffs were designed as a price-cap system in relation to the quality of service, amortisation of physical capital, costs of maintenance, and return to capital investments. The price-cap refers to the difference between real and reference operational costs which cannot exceed 30 %. The remuneration of invested capital, set to 7 % of the envisaged investment capital of the water utility, has been at the centerstage of the public abrogative referendum (June 2011). The referendum responded to a 2009 law requesting that water services are either commissioned to entirely private or public-private companies. In the latter case the private constituent should account of at least 40 % of company's capital. The referendum succeeded both to block what has been labelled as 'privatisation' of WSS, and to abolish the return to capital investments as a part of the WSS tariff method. Starting from 2011, the authority over water tariffs design has been partially transferred to the Authority for energy, gas, and water services who initiated, as a

transitory measure, a new tariff method. The changes of tariff systems after 2011 are not subject of our analysis, both because the new system is not yet finalised and reorganisation is not yet fully realised, and our review concentrates on the ex-post assessment of empirical evidence.

8.2 Setting the Scene: Challenges, Opportunities and EPIs

Italy is characterised by abundant but unequally distributed renewable water resources. Besides, the relative high climate variability is likely to be further reinforced as a result to medium- to long-term effects of human-induced climate change. The Po-River Basin District (P-RBD) is one of the eight river basin districts (RBDs) established under the EU Water Framework Directive (2000/60/EC) and the legislative decree 152/06 which transposes the WFD into national legislation (the so-called Environmental Code). It is the largest single river basin (RB) in Italy, and an engine of economic growth. The per-capita gross domestic product in the 26 provinces comprised by P-RBD ranges between 21,000 and 38,000 PPS (purchasing power standards) and is above the EU average for all but a few provinces. The administrative Region of Emilia Romagna (RER) situated in the North-East of Italy and partially included in the Po-River Basin District (P-RBD). Emilia Romagna extends over 22,445 km^2 and is home to 4,432,500. The Region includes nine districts (Provinces), nine WSS districts (ATOs) and intersects seven primary water basins among which the most important is the Po-River Basin.

Annual average precipitation within the P-RBD is nearly 1,200 mm, or around 78 billion m^3. Civil water use accounts for around 12 % of the water withdrawals in the river district. The main source of water withdrawal are aquifers in the upstream part of the district whereas several provinces in the downstream part withdraw water from the surface sources and the Po river itself. The city of Ferrara, situated close to the river outlet, is supplied by 72 % from the Po river (ATO Ferrara 2006). The long term average discharge of the river at Pontelagoscuro is 1,540 m^3/s whereas the water abstraction for public water supply varies between 0.9 and 1.2 m^3/s. In summer 2007, river discharge at Pontelagoscuro was as low as 168 m^3/s, barely above the minimum environmental flow of 150 m^3/s, which exemplifies the vulnerability of the WSS provision.

The population in P-RBD amount to 17 residents (+6 % compared to 2001) mostly concentrated in small towns below 25,000 residents. Within the river district, the cities with above 100,000 resident are 11, with total population amounting to 3,400,400 inhabitants (or 20 % of the whole P-RBD population). According to the demographic projections, the population is expected to increase by 7–26 % by 2050. The average domestic water consumption in the main towns is highly heterogeneous, ranging from 240 l/day/inhabitant (l/day/pc) in Lodi to 132 l/day/pc in Reggio nell'Emilia (average 197 l/day/pc). The lowest consumption is typical for the Emilia Romagna region (RER) situated in the downstream part of the basin. The registered water losses are 21.6 % on average across the major town in the P-RBD, and ranging between 34.5 % (Torino) and 7.25 (Aosta).

The average tariff per capita are highest in the RER, whereas the citizens of other major regions comprised in the P-RBD (Piedmont, Valle d'Aosta, Lombardy) pay relatively less. The 2011 data (Federconsumatori 2011) shows that Reggio nell'Emilia is the town with highest average water prices (EUR 2.24[1]/m^3), while Milano's residents pay the lowest tariffs (EUR 0.67/m^3).

The RER government modified the method to determine the water tariffs by the regional decree 49/2006. The method introduced performance factor (PCn) that allows to 'penalise' water utilities not encouraging enough the final consumers to conserve water, while rewarding those who manage to do so. The regional decree 49/2006 introduced the obligation to connect the water tariff to the number of household members. The ATO Bologna fulfilled the obligation by implementing the so-called 'per-capita' tariffs (PCT). The PCT was experimentally introduced in five municipalities in 2008 and fully applied starting from 2009. The tariff is applied only to domestic water uses and includes a fix and a variable component, both dependent on the number of household members.

The domestic water supply is priced with fixed and volumetric components, the latter based on *increasing block tariffs* (IBTs). The tariff is set to recover financial costs of the service to some extent, that is investment costs, operational and management costs, and administrative and support costs. The environmental and resources costs are not included, contrary to what is required by the Water Framework Directive (WFD). RER deploys 'social tariff', subsidised by other user groups, in response to the affordability of household water services. The water tariff is connected to the quality of the service provided, assessed using a set of environmental and service performance indicators.

8.3 The Water Tariffs System in Action

8.3.1 The EPI Contribution

8.3.1.1 Environmental Outcomes

According to the latest available data,[2] the total water withdrawals[3] in RER declined by 1.6 % between 2005 and 2008. With exception of Modena, the withdrawal declined in all ATOs situated in the Emilia part of the region, and increased in the Romagna part, likely as a result of seasonal water demand of attractive touristic

[1] These tariffs are calculated based on reference consumption of 200 m^3/year by a family with two children. Hence the tariffs contain a higher share of the more expensive volume-price block.

[2] The data from the latest water census (published in 2014 and referring to water consumption in 2012) is not yet available in a disaggregated form (per WSS basin and major cities). The data used in our analysis refer to the water censuses in 2008 and before.

[3] This data refers to water withdrawn by water utilities serving specific WSS district (ATOs) and is not necessary indicator of water consumption, as significant volumes of water are transferred between WSS districts.

attractive place along the North Adriatic Sea. The observable changes range between −23 % in Piacenza to +15 % in Modena. Bologna, Parma and Ferrara ATOs show a reduction of −11, −3, and −1 % respectively. Overall, the water withdrawals for public distribution in RER amount to 121 m^3/year per capita (ISTAT 2009a), which is less than the national average (198 m^3/year per capita). The variation in the withdrawals per capita span from 48 m^3/year (Ravenna ATO) to 184 m^3/year (Forlì-Cesena).

Across the P-RBD, the major cities with highest reduction of water consumption includes Parma (−35 % over the period 2000–2011; from 201 to 137 l/day/pc), whereas only Cremona increased the consumption per capita (+3.5 %, from 203 to 211 l/day/pc). On average the water consumption in the P-RBD amounts to 197 l/day/pc.

Households' per-capita water consumption in the district towns in RER is commonly lower than in other cities within the river basin. The highest per-capita consumption is registered in Piacenza (78 m^3/year/person) and the lowest Forlì-Cesena (51 m^3/year/person). Also with respect to losses in water pipeline system RER performs better than most of the other regions. Compared to national average (32 %) and worst performer (Puglia, 47 %), the RER loss rate (24 %) is lower by one and three quarters respectively. Within RER the losses span between 18 (Forlì-Cesena) and 30 % s (Ferrara) (ISTAT 2009a).

Normally, the quantity of water withdrawn is negligible in the basin's water budget. However, during the recent drought spells in 2003 and 2006–2007, the preventive reduction of the domestic water consumption had sizeable effects (ARPA Regione Emilia-Romagna 2006). In the Romagna part of the region, supplied from the Ridracoli dam, the water shortage reached even more critical levels, triggering the declaration of state-of-the-emergency in May 2007.

The riverine ecosystems along the river network and the delta benefit from the combined effect of reduced water consumption in agriculture, industry and domestic sectors. Po-River Delta is one of the most valuable wetlands in Italy and a biodiversity hotspot – NATURE 2000 site – of European importance. The Delta is undergoing lasting changing under significant anthropogenic pressures, sea level rise and sea water infiltration upstream for a considerable distance from the mouth. Hence, the Po-River Delta is extremely sensitive to reduced river flow (RER 2009).

Decree 152/06 specifies the requirements put on quality and coverage of wastewater treatment, in compliance with the Council Directive 91/271/EEC concerning urban wastewater treatment. In RER, 2,163 wastewater plants served about 6.2 million PE[4] (81.6 % coverage) (ISTAT 2009a). The coverage of domestic users increased from 64.2 % PE in 2005 to 67.3 % (+2.9 %). The number of urban agglomeration below 2,000 PE without a wastewater treating (WTT) system in 2008 was still high (1,609). However, the number of larger settlements (>2,000 PE) not connected to treatment plant is only 21, down from 179 in 2005. According to the State of the Environment in RER, the quality of surface water bodies has not

[4] Person equivalent (PE) is a quantity of biodegradable organic substances from the civil use discharged in 24 h and corresponding to biochemical demand of oxygen equal to 60 g per day.

improved notably between 2004 and 2008. This is because agriculture remains the major source of pollution and reduced point pollution is not easily discernible in the quality of water bodies.

8.3.1.2 Economic Outcomes

Compared to the situation before 1994, the reform of the water services and sanitation had helped to modernise WSS, and reduce fragmentation in both service provision and water tariffs in place. Between 2001 and 2010, the number of water utilities operating in the RER went down from initial 157 to 18. The number of tariff basins – areas applying the same tariff structure and levels, was reduced from 214 to 37 (Table 8.1).

The reform however did not ensure level of investments necessary into extension and modernisation of water infrastructures. In 2007, the average annual per-capita investment in WSS amounted to EUR 37.00 (min-max range EUR 19–117) (CONVIRI 2008). According to the only study available, this is by far too little (Massarutto 2011). Most of the investments are designated for new infrastructure, whereas improvement of the existing infrastructure is dedicated only some 37 %. These shares tend to be opposite among the developed countries with high WSS connectivity (40 % for new infrastructures and to 60 % for maintenance of existing infrastructure) (CONVIRI 2008). According to (CONVIRI 2008), the new investments are financed predominantly from the collected revenues (46 %) and public transfers (21 %). Own capital investments and loans are represented by 11 % and 14 % respectively.

Table 8.1 Evolution of the water services and sanitation sectors in Emilia Romagna region (RER) between 2001 and 2010

ATO		POP 2006	2001		2005		2010*	
			WU	TB	WU	TB	WU	TB
1	Piacenza	278,224	30	47	28	30	2	3
2	Parma	420,077	26	47	26	40	4	7
3	Reggio Emilia	501,364	2	2	2	2	2	2
4	Modena	670,098	32	32	4	5	3	5
5	Bologna	954,682	50	50	4	7	2	8
6	Ferrara	353,303	2	2	2	2	2	2
7	Ravenna	373,449	5	5	1	3	1	5
8	Forlì-Cesena	377,993	8	8	1	3	1	3
9	Rimini	294,074	2	21	1	2	1	2
	Total ER	**4,223,264**	**157**	**214**	**69**	**94**	**18**	**37**

Source: Online sources of the italian Statistical Bureau (www.istat.it), own elaboration
Note: *POP 2006* population living in the different ATOs in 2006, *WU* number of water utilities operating in the RER, *TB* number of tariff basins
*Domestic tariffs only

Table 8.2 Actual and planned investment in ATO Ferrara

	HERA	CADF	TOTAL
Population (2006)			353,304
Aqueduct length (km)	2,420	2,264	4,684
Sewage system length (km)	928	905	1,833
Investments 2005–2007 (EUR)	25,872,000	14,039,041	39,911,041
Investments 2008–2012 (EUR)	53,074,000	20,100,000	73,174,000
Investments 2012–2024 (EUR/year)	10,000,000	4,300,000	1,300,000

Source: ATO 6 Ferrara (2007)

Table 8.3 Actual and planned investment in ATO Bologna

	HERA
Population (2008)	960,343
Aqueduct length	8,801 km
Sewage system length	3,504 km
Investments 2004–2006	EUR 82,000,000
Investments 2007–2009	EUR 108,000,000
Investments beyond 2010	EUR 194,720,565

Source: ATO Catchment Area Plan

In each ATO, water supply and sanitation services are commissioned to one or more water utility for the period up to 30 years. ATO Bologna commissioned the service until 2021 to HERA Group S.p.A; ATO Ferrara commissioned the service until 2024 to HERA Group S.p.A. and CADF S.p.A.; and ATO Parma commissioned the service to IREN S.p.A., Montagna 2000 S.p.A., Salso Servizi S.p.A. and Emilia Ambiente S.p.A (RER 2010). The two largest water service providers in RER (Hera and Iren) are multi-utility corporations with large turnover. Business diversification influence positively company's ability to access credits. The Tables 8.2 and 8.3 show the planned investments in the ATO Ferrara and ATO Bologna.

Over the period 1999–2008 Aosta and Sondrio registered the highest reduction of water losses (−72.3 e −62.9 % respectively) while Cuneo and Asti registered a substantial increase of losses (+184 e +102 % respectively).

The RER included an economic incentive for water utilities to reduce water losses and improve the quality of the services; the co-called performance factor (PCn). The PCn is determined by two sets of indicators with respect to quality of the service (e.g. unplanned service disruption, customer satisfaction, call centre service), and environmental performance (e.g., water losses and per-capita water consumption) (RER 2006).

The current tariff systems in Italy led to a great differences in water prices across the ATOs (Federconsumatori 2011). Calculated for a representative level of households' water consumption (200 m^3/year), the water bills across districts' capital range from around EUR 0.58/m^3 (Milan) and EUR 2.39/m^3 (Florence)

Table 8.4 Share of cost components in the water price

	Bologna (EUR/m^3)	Ferrara (EUR/m^3)	Parma (EUR/m^3)
Operating costs	0.019	0.025	0.049
Maintenance	0.042	0.043	0.062
Compensation for the invested capital	0.059	0.050	0.093
Investments in water treatment structures	0.119	0.119	0.205
Investments in water losses reduction	0.091	0.089	0.148

Source: RER (2005)

(Federconsumatori 2011). In 2010, average price of water in the tree district town analysed in this study was well above the national average: Bologna EUR 1.51/m^3; Parma EUR 1.91/m^3; and Ferrara EUR 2.03/m^3 (Federconsumatori 2011). In principle, water bills in Italy are lower than in most other European countries. These differences lie in the incomplete amortisation of water pipeline systems initially build using public money.

In 2005, the Water Conservation Plan estimated the incidence of some of the costs into the total amount of the tariff for each ATO in the Emilia Romagna region (Table 8.4).

8.3.1.3 Distributional Effects and Social Equity

The price of WSS increased substantially since the introduction of the Galli law. Yet compared to other European countries, Italy is still among the countries spending a relatively small proportion of household incomes on water service. However, the number of families which spend more than 3 % of their income for water is on the rise (AUTORIDSRU 2011).

Between 2001 and 2010, the average prices paid by households for water services rose by 66.7 % in Italy and by 68 % in the RER (Table 8.5). In some districts the price increase toped 200 %. To compare, from 2001 to 2007 the net household incomes increased only by 17 % in Italy and 14 % in RER (ISTAT 2009b).

There have been some attempts to define the highest socially acceptable share (SAS) of cost of water service in terms of household incomes, originating from studies on impacts of privatization of water services in 1980s and early 1990s in UK and Wales. Fitch and Price (2002) for example set the SES to 3 %, drawing on the measure of fuel poverty (>10 % of household income). The average cost of water service in Italy does not yet reach a level of concern, but raising poverty and related problems of access to services are being raised.

Poverty indicators show that on average 15.2 % of households in Italy and 9.5 % of households in the Region Emilia Romagna are considered poor according to the EUROSTAT indicator of deprivation. The number of households facing difficulties in paying bills for services (including water and heating), 10.6 % in the national average and 4.6 % in the Emilia Romagna Region, is especially high among single

Table 8.5 Average water charges (Euro per typical annual consumption of 160 m^3) in the Region Emilia Romagna (RER) in 2001 and 2010. National average for 2001 based on an annual consumption of 150 m^3 (AUTORIDSRU 2011)

	2001	2010	Difference
	EUR	*EUR*	*%*
Italy	**135**	**225**	
Piacenza	67	205	205.97
Parma	**135**	**274**	**102.96**
Reggio Emilia	160	295	84.38
Modena	113	205	81.42
Bologna	**152**	**189**	**24.34**
Ferrara	**186**	**284**	**52.69**
Ravenna	173	267	54.34
Forli-Cesena	196	270	37.76
Rimini	155	239	54.19
Minimum value RER	67	189	182.09
Maximum value RER	196	295	50.51
Medium value RER	**149**	**250**	67.79

parent households and elderly people. In these statistics, water consumption is not considered as a separate indicator. In 2009, 10.6 % of Italian households and 4.6 % of those in the Region of Emilia Romagna were facing problems in providing for adequate heating of their dwellings (AUTORIDSRU 2011). The same report estimates that in 2009, water bills amounted to 0.5 %, for waste collection to 0.6 % and heating to 3 % in terms of household incomes.

The resolution for the regional government n. 560/2008 adopted guideline for the application of social tariff as a way of protecting low-income households. The subsidised water tariffs are offered to all households below a certain threshold, determined with an indicator of wealth ISEE (*indicator of comparable economic conditions*, ISEE[5]). For the territory of the whole region, there is a single threshold that specifies the economically and socially most marginalised and vulnerable households. A second threshold is variable and is determined by each AATO. It specifies households exposed to less extreme economic and social hardship. The social tariff is financed through the application of higher water tariffs (up to 1 %) applied to wealthier consumers. Facing the second highest water tariff in RER, the ATO Ferrara was the first one to apply the social tariff (resolution n. 5 of 17 December 2007). In 2008, the water tariffs were increased 0.5 % and the proceeds collected were designated to co-finance the water consumption by disfavoured clients, elderly citizens and physically impaired persons. ATO Parma adopted the social tariff in 2009 (resolution n. 15 of 22/12/2009) (Tables 8.6 and 8.7).

The collected funds for social tariffs amounted in 2009 to EUR 59,075 in Bologna, EUR 193,088 in Ferrara and, in 2010, ca. EUR 300,000 in Parma.

[5] In Italian, *Indicatore Situazione Economica Equivalente.*

Table 8.6 Example of social tariffs in the selected ATO

ATO	Most marginalised groups (ISEE) (EUR)	Less marginalised groups (ISEE) (EUR)	Price increase for other users (%)
Ferrara	<2,500	2,500–5,000	0.5
Parma	2,500–5,000	2,500–5,000	

Table 8.7 Number of households- beneficiaries of social tariffs in 2009

	Bologna		Ferrara		Parma[a]	
	No of households	% of all households	No of households	% of all households	No of households	% of all households
First income band	643	0.2	555	0.3	2,400	1.2
Second income band	2,150	0.5	1,593	1	7,100	3.6
Total	2,793	0.7	2,148	1.3	9,500	4.8

[a]Values for Parma refer to 2010, the first year of the tariff in this area (AUTORIDSRU 2011)

The quality of the water supply and sanitation services is regularly evaluated in terms of customer satisfaction. Generally, the communication of water authority yields medium level of satisfaction, whereas price level receives lowest scores. Some areas within RER display a higher degree of dissatisfaction (AUTORIDSRU 2011). Half of the consumers does not drink tapped water or only or rare occasion, complaining "bad taste" (AUTORIDSRU 2011).

8.3.2 The EPI Setting Up

8.3.2.1 Institutions

Water and sanitation (WSS) service in Italy are regulated by the law 152/2006. The service is organised within the WSS districts (so-called *optimal territorial areas* or ATOs) that in RER coincide with the boundaries of lower administrative districts (provinces). Until recently, each ATO was governed by an autonomous regulatory authority (*ATO Authority*, AATO). In 2010, these authorities were dismantled and their competences transferred to regional administrations. Each ATO is managed according to a plan (the so-called *optimal territorial area plan*, hereafter PA) that specifies priorities and future investments within the WSS basin, and specifies the water tariffs.

Article 154 of the Environmental Code (law 152/2006) equals water tariffs to compensation for water services and connects them to quality of water and water services, amortisation of physical capital, costs of maintenance and return to capital investments. Until 2011, the water tariff system was based on the so-called '*nor-*

malised method' (NM) introduced in 1996. Using the NM, the AATO determined the reference tariff within their jurisdiction. This in turn are translated into actual tariffs by taking into account organizational model of the management, water quantity and quality, the level of quality of water service, financial plan, and actual costs of the management. Typically, water tariffs for residential water use employ three blocks: the first is subsidised, second is regular and third penalises excessive water use. The tariff contains a fixed and a variable component of water supply, purification fee and sewage fee.

The Region Emilia Romagna (RER) transposed the law 36/94 by the regional law (RL) n. 25 of 6 September 1999.[6] In order to incentive water conservation, while respecting social equity aspects, the tariff blocks could be varied according to territorial criteria, users' type and volume of consumption.

The RL of 14/04/2004 n. 7 modified the RL 25/99 in a way that was at odds with the provisions of the law 36/94: it assigned the regional government the task of defining the water tariffs, while taking into account the recommendations of an expert commission established for this purpose, and the results of consultations involving syndicates, and key economic and social players. Among others, the tariff had to include incentives to use natural resources efficiently. Subsequently, the resolution n. 5749 of 16 April 2004 established an expert commission whose task was it to revise NM and make recommendation with respect to the reference tariff. In 2006, the regional government's presidential decree (DPRG) n. 49 of 13 march 2006 (modified successively by the DPRG n. 274 of 13/12/2007) adopted a tariff method for the integrated water service. The innovation of tariff system introduced in RER include among other the promotion of high quality service and water conservation through the water tariffs, higher flexibility with respect to the price-cap, and the option to disentangle the water supply and waste water discharge tariffs, more adequate remuneration of the invested capital.

The article 2 of the RL 10/2008 instead assigns the task of specifying the reference tariff to the regional government who is also asked to develop an economic and financial plan of integrated water service. The Constitutional Court, with the sentence 29/2010, ruled unconstitutional the two articles mentioned above. The Constitutional Court argued that the protection of the environment and the guarantee of market competition are of exclusively competence of Central State. The Court affirmed that the aims of water tariff discipline are to protect the environment and to apply a uniform tariff system in all the country without any difference among the various Regions. The regional government argued that the RL 10/2008 acted in order to prevent the specification of water tariffs in a fragmented way, individually for different ATO. With a circular PG2010.0103608 of 13/04/2010 the Directorate General for Environment of the RER confirmed the validity of the tariff method introduced by the RL 49/2006 (along with subsequent modifications).

The Water Conservation Plan of RER foresees water tariffs that incentive water conservation. The DPRG 49/2006 introduced the obligation that within 5 years, or

[6] Later modified by RL n. 27 of 21/10/2001, n. 1 of 28/01/2003, n. 7 of 14/04/2004 and n. 10 of 30/06/2008.

at the time of the first revision after 1/12/2007, the tariffs have to consider the number of household components (art. 10, comma 5). The ATO Bologna introduced another change, the so-called 'per-capita' tariffs (PCT), experimentally in five municipalities in 2008 and since 2009 in the whole territory of competence. The tariff is applied only to domestic water uses and includes a fix and a variable component, both dependent on the number of household members. The tariff is organised in five blocks, the first two of which are subsidised, the third is standard one, and the last two are penalising the excessive water use. The pro-capita tariffs are specified in five blocs: the first two subsidised, and the last two penalising the high water use.

8.3.2.2 Transaction Costs and Design

At the state level, the costs of regulation of water tariffs include the operative costs of the overseeing agency. The agency is set to collect the data about tariffs applied by ATOs across the country, verify the compliance with the state regulation, revise regularly the tariff system, and produce annual reports about the state of WSS in Italy. Since 1994, the agency changed twice, incurring further costs due to reorganisation and restructuring. The *Vigilance Committee for Water Resources* (CO. VI.RI.) was initially established in 1994 and abolished in 2009. Its successor, the *National Commission for Water Resources*, was abolished 2011. Later, the advisory and compliance control tasks have been assigned to the *National Agency for Water Resources Vigilance*.

At the level of the WSS districts (ATOs), the transaction or institutional costs are internalised through water tariffs and born by the consumers. These include costs of negotiated agreements among the participating municipalities, and the operational costs of the Authority of ATO. In addition, the costs of regional vigilance committee or tariff commissions such as that established in RER by the resolution n. 5749 of 16 April 2004.

Large proportion of the transaction costs are impaired by the litigation costs. Between 2008 and 2010, the Constitutional Court had intervened several times with respect to the water supply and sanitation service (sentences 335/2008, 246/2009, 307/2009, 29/2010, 142/2010 e 325/2010).

8.3.2.3 Implementation

The governance regime of water supply and sanitation in Italy is based on cooperative arrangements between state and regional governments. The centrally governed water tariff system in place until 2012 was a result of a negotiated agreement, and subject of a periodic review conducted in collaboration with the Ministry of Environment and the Ministry of Finance. The vertical disaggregation of regulatory competences respects the subsidiarity principle and power division between state

and regions. At the level of an ATO, the constituting municipalities cooperate for the sake of coordinated and more efficient water service provision.

In RER, the governance regime is a result of a constructive public debate. The regional legislation is a result of an extensive consultation between the regional authority and social stakeholders. In 2004, the social water tariff was negotiated between regional authorities and labour unions (CGIL, CISL and UIL), resulting in production of a guidance document and pro-capita tariff later codified in the regional law.

On 12–13 June a citizen initiated referendum was held in Italy to partially abrogate the law 166/09 (so-called Ronchi law), decree 133/2008 and legislative decree 152/06 (the so-called Environmental Code) referring to the public water supply. Two out of four quest of the referendum address the public water services. The first quest addressed the article 23bis of legislative decree 133/2008 concerning the privatisation of public services with economic relevance, modified by Law 166/2009. Since 1999, public water services were entrusted to public (in-house) or private companies – water utilities. The legislative decree 133/2008 put higher burden on commissioning water supply and sanitation to in-house public water utilities, encouraging greater private sector participation. The law 166/2009 went further and requested that by December 2011 water services are either commissioned to entirely private or public-private companies. In the latter case the private constituent should account of at least 40 % of company's capital. The public water utilities were admitted only in transitional mode or in situations in which the market mechanism is either inefficient or useful.

The second quest sought abrogation of article 154 of legislative decree 152/06, determining the return on invested capital (ROIC) by the normalised method (NM). The ROIC provides incentive to invest into modernisation of water infrastructure, modernising the water services and making them more reliable. The normalised method for tariff determination (NM) set the ROIC to 7 %. Before the referendum, the Constitutional Court backed the ROIC by ruling that public water service was essentially an economic service (judgment n. 325/2010).

The referendum reached quorum and both quests, as well as the additional two not referring to the water services, were approved by the public ballot. The abrogation of article 154 of legislative decree 152/06 concerning ROIC has uncertain legal outcomes. Unaffected by the referendum is also the article 117 of the legislative decree 267/00 requesting an adequate compensation of the invested capital based on prevailing market conditions.

8.4 Conclusions

The WSS reform in the 1990s reorganized the water service and set out for a more efficient and harmonised water service provision. The reform had helped to reduce fragmentation in both service provision and water tariffs in place, as shown by the evidence collected. Although the available data is patchy and rife with uncertainty

of many kinds, a decreasing trend can be observed in water abstraction/consumption pro-capita and water pipeline leakage. Similarly, the household access to WSS has steadily improved. RER performs better than the national average in all environmental outcomes, with a high variability across the WSS districts (ATOs). The price of a cubic metre of water and wastewater services, adjusted for inflation, increased significantly over the past years. Compared to other OECD countries, the water price adjusted by purchasing power parities is still low (OECD 2009), the main reason being that the initial capital investments borne by the central state are not amortised in the current tariff systems. On the downside, the tariff system has not guaranteed necessary investments into extension and modernisation of water infrastructures. The planned investments in water infrastructure are by far too low in order to guarantee a sustainable and reliable water services. The failed attempt to reinforce participation of public sector in WSS provision introduced a regulatory uncertainty discouraging from investments. The water utilities will have access to external sources of finance, such as loans, only if a sufficient and reliable stream of revenue is ensured.

Empirical evidence shows that water pricing is a suitable tool for encouraging water conservation and demand management. Water is a social good whose service provision can be governed by economic instruments. The recognition of right to water as a fundamental human right is not at odds with the participation of private sector in the water service provision. The access and affordability of water can be reconciled with water pricing in several ways. In RER, it is managed by social tariffs whose costs are distributed among the wealthier consumers. Alternatively, it could be managed either by income support (connected or not to water consumption), or by facilitated payments. See OECD (2009) for further discussion of both.

The extent of litigation with respect to regulatory authority over water supply and sanitation services underlines the unresolved issue of power sharing between the state and regions. Given the large economic and social disparity across the administrative regions, more flexibility and discretion is warranted at the regional level in order to adapt water pricing schemes to specific environmental and socio-economic conditions. The performance factor introduced in RER is an example of regulatory innovations that are worth to pursue. However, it should be based on a simple set of service quality indicators that can be easily collected and assessed. The water tariffs system in Italy and elsewhere is not shielded from political interference. The current water pricing regulation blurs the distinction between the regulator and regulatee. On the one hand, local governments of municipalities assembled in a single WSS district play a part in water services regulation and tariff specification. On the other hand, it is common that the water utilities to which the WSS is commissioned are controlled by local governments.

References

ARPA Regione Emilia-Romagna. (2006). Monitoraggio e caratteristiche idrologiche della magra estiva del Fiume Po nell'anno 2006.

ATO Ferrara. (2006). Piano di conservazione della risorsa, Agenzia di Ambito per i Servizi Pubblici, Ferrara.

ATO Ferrara. (2007). Piano d'Ambito per il Servizio Idrico Integrato annualità 2008 – 2024. Ambito Territoriale Ottimale n. 6, Ferrara.

AUTORIDSRU. (2011). Relazione annuale sullo stato dei servizi idrici, di gestione dei rifiuti urbani e sull'attività svolta. Autorità regionale per la vigilanza dei servizi idrici e di gestione dei rifiuti urbani, Bologna.

CONVIRI. (2008). Rapporto sullo stato dei servizi idrici. Comitato per la Vigilanza sull'Uso delle Risorse Idriche, Roma.

Federconsumatori. (2011). IX Indagine nazionale a campione sulle tariffe del Servizio Idrico Nazionale. Federazione Nazionale Consumatori e Utenti.

Fitch, M., & Price, H. (2002) Water poverty in England and Wales. Chartered Institute of Environmental Health. http://www.cieh.org/library/Knowledge/Environmental_protection/waterpoverty.pdf. Accessed 15 Sept 2014.

ISTAT. (2009a). *Censimento delle risorse idriche ad uso civile*. Roma: Istituto Nazionale di Statistica.

ISTAT. (2009b). *Il reddito disponibile delle famiglie nelle regioni italiane*. Roma: Istituto Nazionale di Statistica.

Massarutto, A. (2011, unpublished). *La riforma della regolazione del servizio idrico in Italia.*

OECD. (2009). *Managing water for all – An OECD perspective on pricing and financing* (p. 147). Paris: OECD Publishing.

RER. (2005). *Rapporto sulle attività di smaltimento delle acque reflue urbane e dei fanghi*. Bologna: Regione Emilia Romagna.

RER. (2006). *Metodo tariffario per la regolazione e la determinazione della tariffa del servizio idrico integrato in Emilia-Romagna*. D.P.G.R, n. 49/2006. See also Bollettino Ufficiale della Regione Emilia-Romagna 2-1-2008 – parte seconda – N.1.

RER. (2009). *Relazione sullo stato dell'ambiente della Regione Emilia Romagna*, Bologna.

RER. (2010). *Relazione annuale sullo stato dei servizi idrici, di gestione dei rifiuti urbani e sull'attività svolta Anno 2010. Autorità regionale per la vigilanza dei servizi idrici e di gestione dei rifiuti urbani Regione Emilia Romagna*, Bologna.