

WORKING PAPER

The Water Sector in Spain



Olga RUIZ CAÑETE & Dolores DIZY MENÉNDEZ

CIRIEC N° 2009/04

CIRIEC activities, publications and researches are realised
with the support of the Belgian Federal Government - Scientific Policy
and with the support of the Belgian French Speaking Community - Scientific Research.

Les activités, publications et recherches du CIRIEC sont réalisées
avec le soutien du Gouvernement fédéral belge - Politique scientifique
et avec celui de la Communauté française de Belgique - Recherche scientifique.

ISSN 2070-8289

© CIRIEC

No part of this publication may be reproduced.

Toute reproduction même partielle de cette publication est strictement interdite.

The Water Sector in Spain

Olga RUIZ CAÑETE
& Dolores DIZY MENÉNDEZ

Universidad Autónoma de Madrid (Spain)

Working paper CIRIEC No. 2009/04

CONTENTS

1. INTRODUCTION
2. REGULATORY FRAMEWORK
3. WATER SUPPLY AND URBAN WASTE WATER MANAGEMENT AS A LOCAL SERVICE
 - 3.1. Management modalities
 - 3.2. Planning and investment
 - 3.3. Demand and supply
 - 3.3.1. Indicators of urban water supply
 - 3.3.2. Indicators of sewage and wastewater treatment
 - 3.4. The tariff system in Spain
 - 3.5. Cost and cost recovery of water services in Spain
 - 3.6. Quality of services
4. SUMMARY AND CONCLUSIONS
5. REFERENCES

1. INTRODUCTION

Our analysis of water sector in Spain must begin with a reference to three introductory aspects: the difficulty of this analysis in Spain, the specifics of water management and, finally, the substantial synergies of such market.

The first issue to highlight is the difficulty of this analysis in Spain for two reasons:

1. The institutional framework of the water sector is very complex: involving many actors (both public and private) in both the service delivery and in the financing or construction of infrastructure; the participation of different levels of administration (national, regional and local), frequently overlapping, and the split between ownership and management, with a variety of entities, agencies and companies involved.

Each of the stages that make up the “integral water cycle” may fall under the tutelage of a different level of Government, may therefore be managed through a different model of management and can be funded by pricing formulas of different legal nature.

2. The statistical sources available are scattered and not uniform.

The other issues are, on the one hand, the specifics of water management¹ and, on the other, the substantial synergies of such a market that give a competitive advantage².

2. REGULATORY FRAMEWORK

The most relevant regulation in Spain concerning water resources management and protection can be summarised in the next legislation:

¹ These are the recurrent revenue not fastened to business cycles, long-term contracts (with an average between 25-30 years), low pricing, reduced lateness, and the existence of barriers to entry to the market due to high human and technological specialisation and high initial investments needed.

² The integral management of water, technological innovation and quality of service (letter of quality service, attention to the customer, virtual office and fast answer of maintenance).

- **European legislation** (especially Water Framework Directive 2000/60/CE).
- **The Revised Water Law Text** (Texto Refundido de la Ley de Aguas), approved in July 2001, represents nowadays the basic national legislation concerning water resources protection and exploitation regime³.

The basic framework for the exploitation of water resources is set out in this basic law. The main subjects it considers are the public property of water, the river basin as hydrological cycle unit and the hydrological planning⁴.

This law specifically considers as hydraulic infrastructures all infrastructures involved in the urban water cycle. By this means, the Central Government (State General Administration) assumes a key role in the construction of public local services infrastructure and can become manager of these services.

- **The Law of Local Regime** (Act 7/1985). According to this law water supply and waste water management in Spain are public services falling within the competence of the municipality and they are provided mandatory by the municipality.

So municipalities, large or small, are the holders and responsible bodies for water supply and urban waste water management (extraction and purification), and each of them provides the service with full sovereignty.

Nevertheless, water services go beyond municipal competence and this activity must be carried out, taking state and autonomous community laws into consideration. This is clear for different reasons:

- a) The nature of this kind of service includes a set of clearly separable functions (production, distribution, sewage and wastewater treatment)
- b) The development of these functions takes place in different geographic and more specifically, administrative ambits.
- c) So local action is not enough for reaching a correct integral water management service and it must be coordinated with supra-municipal actions (regional, national or supranational).

³ The Water Law refers to surface and groundwater, whilst mineral and thermal water have their own legislation.

⁴ It is carried out through the River Basin Hydrological Plan and the National Hydrological Plan.

Specifically, in Spain, Autonomous Communities are closely involvement in the legislation of water supply and wastewater management. In fact, their laws are frequently against the local autonomy principle that inspires the water service management.

To illustrate this involvement, we can analyse the nature of the rule (local or autonomous), governing the various activities that comprise the service provided. The breakdown of these rules is presented in Table 1.

Table 1. Nature of the rule regulating water services
(in % of municipalities)

	Local regulation	Autonomous regulation
Water supply	51%	49%
Sewage	68%	32%
Wastewater treatm.	9%	91%

Source: AEAS 2004

As can be seen from this Table, the rule regulating the water supply service is a local one in fifty-one percent (51%) of the municipalities and is autonomous in forty-nine percent (49%).

In the rules of sewage, the figures are sixty-eight percent (68%) and thirty-two percent (32%) respectively, while for wastewater treatment the largest municipalities (91%) are already regulated by rules of an autonomous community, while the remaining 9% are local.

The intervention of the Autonomous Authorities is thus very high in the wastewater treatment services. There are two fundamental reasons behind this high intervention: the synergies and economies of scale of these activities, and, above all, the high costs spent on them by municipalities.

The Autonomous Administration also exercises financial control in tariffs through the so-called Committee on Prices (dependent on the Autonomous Community), which establishes a system of authorised prices. For this reason, prior administrative authorisation is required to increase the price.

The Committees on Prices is involved in the rates of 63% of the population served, with or without the participation of the Full City Council, as shown in Table 2. By contrast, in the smaller municipalities of 20 000 inhabitants, the Full City Council is the body that approves the predominant supply

rates (97% of the population), with or without the participation of the Committee on Prices.

Table 2. Agency responsible for approving the tariffs. Year 2004
(in % of population)

	Water supply		Sewage	Wastewater treatment
	>20 000 inhabitants	< 20 000 inhabitants		
Pricing committee + Full City Council	37	51	11	4
Pricing committee	25	1	28	33
Full City Council	22	46	58	27
Other	16	2	3	36

Source: AEAS 2004

3. WATER SUPPLY AND URBAN WASTE WATER MANAGEMENT AS A LOCAL SERVICE

The supply and treatment of water is an essential service that comprises four principal activities: production (capture, damming, conveyance by pipes and deposit), distribution (elevation of water and delivery to individual reservoirs), the sewer network and final treatment (purification). These activities are directly assigned to the municipalities (Local Regime Regulation Law (1985) articles 25 and 26). The activity must be carried out taking state and autonomous community laws into consideration.

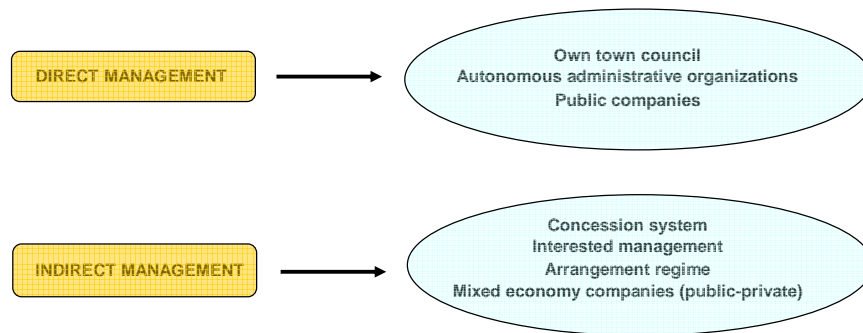
The central idea of the Local Regime Law is the management of public service as a whole. Usually, in Spain, the activity of distribution is unlike that of treatment, and the providers of services are therefore different. So municipalities bid separately for these previous two activities. However, it is not uncommon to grant integrated management of supply, sewerage, drainage and water purification to the same company by efficiency reasons. In particular in the municipalities of small and medium size (this is the case of Vigo, with 293 255 inhabitants). In the case of the sewer network there is indirect management through concession on activities relating to conservation and maintenance of the sewerage network.

3.1. Management modalities

Spanish legislation establishes two forms of management of the local public services:

- **Direct management**, carried out by the municipality itself or by entities belonging to the same
- **Indirect management**, in which private companies assure the provision of local services under a contract system on behalf of the municipality.

Figure 1: Management modalities in the provision of water



As shown in Figure 1, indirect management (through private companies) allows, in turn, different forms: concession, interested management, arrangement system or public-private companies⁵.

Concession system⁶:

- Service Concession: a private operator takes over existing infrastructure for a certain period of time (usually 20 to 30 years, with a maximum of 50 years), with a pre-established commitment to renew and make new infrastructure. During this period the operator takes over the complete management of the service and finances its activity, including investments, with the rates it receives from users.

⁵ Law 30/2007, of Public Sector Contracts, introduced certain changes and new forms such as public-private partnership contract.

⁶ The leasing service is a particular case in order not to invest in new buildings; the contract period is therefore usually reduced to 10-20 years.

- Public Works Concession: this is a contract under which a private company builds and operates a particular installation or infrastructure in exchange for a specified price or remuneration paid by the owner of the service entity. After a period (usually between 10 and 25 years), the facility is returned to the owner. It is the formula known as BOT (build, operate and transfer). The company may have a minority share of the public sector.

Service contract: A private company must perform a certain task or activity. Goals and levels of compliance are also identified. This involves: reading meters, maintenance of data, conservation and maintenance of water distribution networks and sewerage assistance to the operation of water treatment stations and sewage treatment plant.

Interested management: A private or mixed public-private company assumes management responsibility for operating the service. In return the company receives remuneration from the holder of the service entity, usually associated with the implementation of certain management objectives. Investments are made by the owner of the service entity.

The degree of responsibility for the private sector, both in investment and in the management of the service, in each of the modalities of indirect management is different. The concession implies more responsibility both in terms of investment and management than other modalities. In Spain, the concession represents almost sixty per cent (60%) of all forms of indirect management (in % of population served).

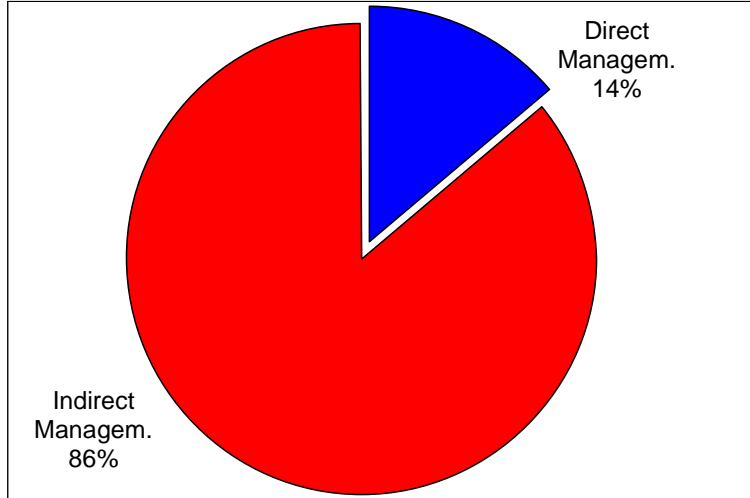
Local authorities decide in each case the management formula (direct or indirect, public or private) that best suits their circumstances. This choice depends primarily on the funding needs and the level of indebtedness of the Local Entity.

It is important to stress that the public sector's role varies depending on the type of management chosen. In direct management, the public sector is therefore responsible for both the regulator and the management role. Meanwhile, the public sector is responsible only for the regulator role in indirect management.

Private management does not mean free competition. These are reserved services or monopolies. The main type of competition is therefore competition for the contract, not in the contract. Each time you bid for the management of the service when it is put up for competitive tendering.

As shown in Figure 2, indirect management dominates in Spain. It accounts for more than eighty-five percent (85%) of the total market.

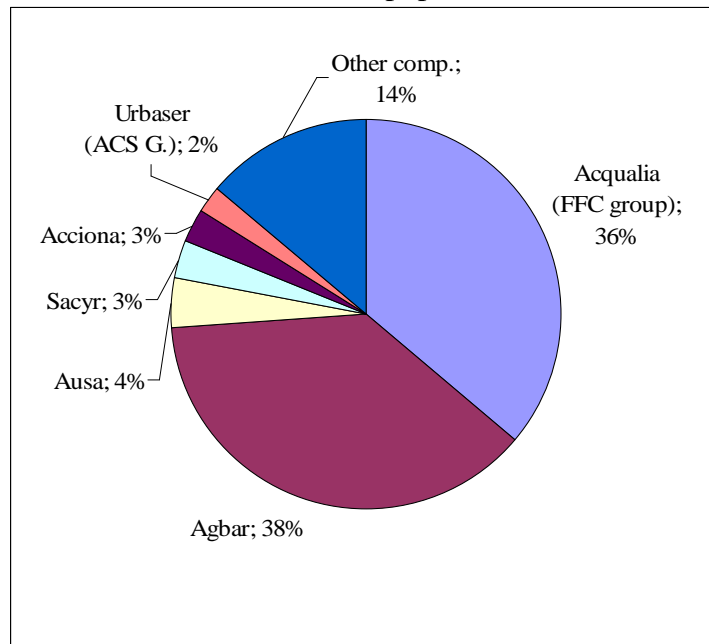
Figure 2: Supplied and treated water. 2008 (e)
(In % of population served)



Source: Own estimation

The distribution of the market among major private operators shows two incumbents: FCC Group and Agbar Group. They represent over seventy percent (70%) of the market.

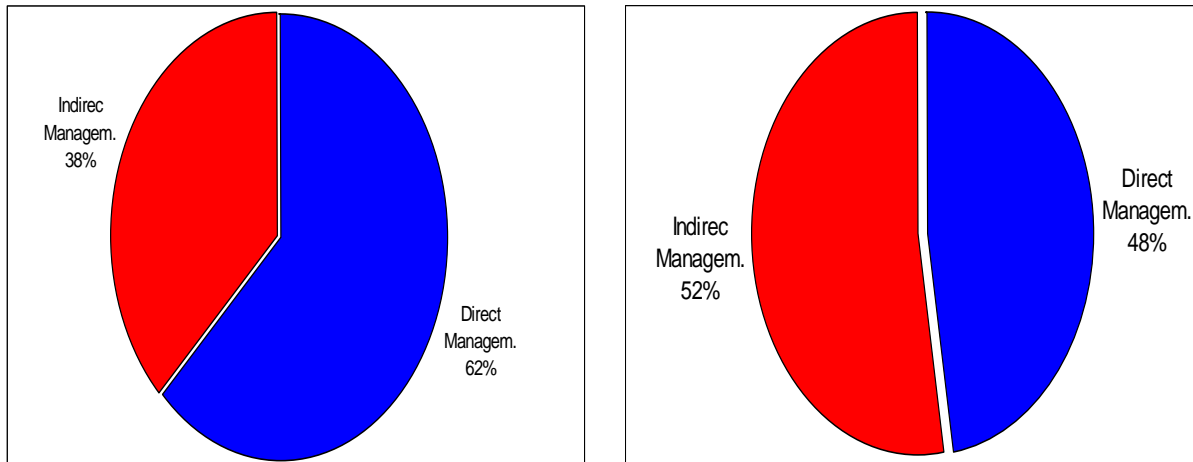
Figure 3: Supplied and treated water. Private management market share. 2008 (e) (In % of population served)



Source: Own estimation

As shown in Figure 4, there is a clear and growing tendency towards indirect management in Spain, which represented only 38% of the supply market in 1992.

Figure 4: Water supply. 1992-2004
(In % of population served)



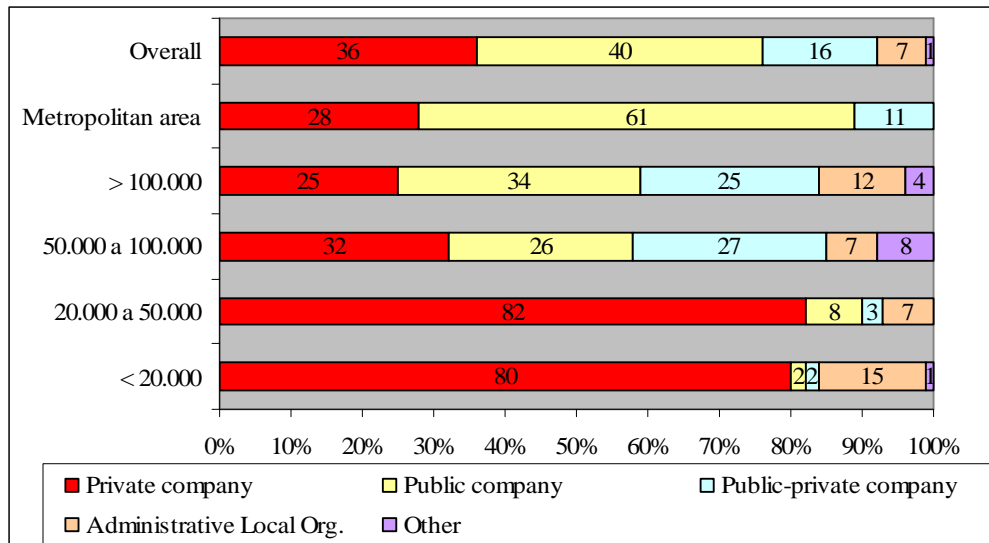
Source: AEAS 2004

Nevertheless, the supply management system varies considerably with the size of the population, as shown in Figure 5. In municipalities of less than one hundred thousand (100 000) inhabitants, the population is supplied mostly through private companies (about 60% of the total population).

In contrast, larger municipalities (more than 100 000 inhabitants, including metropolitan areas), are supplied mainly by public entities, either by the corporation itself or by public companies (approximately 40% of the total population).

The form of management by public-private partnership (joint venture) is more common in the context of growing population sizes.

Figure 5: Supply Management systems by size of population 2004
(In % of municipalities)



Source: AEAS 2004

Table 3 shows the water management system⁷ in different Spanish cities (sorted by population size). This table shows the predominance of private management followed by mixed⁸, regardless of the political party holding the government (PP - Popular/Conservative Party - or PSOE - Socialist Party -).

⁷ Private company, public company or mixed (public-private partnership).

⁸ With the single exception of the city of Madrid.

Table 3. Water management system in major cities in Spain

Municipality	Province	Population 2006	Service /Company	Management	Government (Political Party)
Madrid	Madrid	3.128.600	Canal de Isabel II	Public	PP
Barcelona	Barcelona	1.605.602	Aguas de Barcelona-(Agbar)	Private	PSC-PM
Valencia	Valencia	803.304	EMVASA	Mixed	PP
Palmas de Gran Canaria (Las)	Las Palmas	377.056	EMALSA	Mixed	PSOE
Alicante	Alicante	322.411	Aguas de Alicante (Agbar)	Mixed	PP
Vigo	Pontevedra	293.253	Aqualia	Private	PSOE
Gijón	Asturias	274.472	UTE FCC-Aqualia	Private	PSOE
Hospitalet de Llobregat	Barcelona	246.150	Aguas de Barcelona (Agbar)	Private	PSC-PM
Santa Cruz de Tenerife	Santa Cruz de Tenerife	223.148	EMMASA	Mixed	CC-PP
Badalona	Barcelona	221.520	Aguas de Barcelona (Agbar)	Private	PSC-PM
Elche	Alicante	219.032	Aguas de Barcelona (Agbar)	Private	PSOE
Cartagena	Murcia	208.609	Aqualia	Private	PP
Terrassa	Barcelona	199.817	Aguas de Terrasa	Private	PSC-PM
Almería	Almería	185.309	UTE FCC-Aqualia	Private	PP
Santander	Cantabria	182.926	Aqualia	Private	PP
Salamanca	Salamanca	159.754	UTE FCC-Aqualia	Private	PP
Logroño	La Rioja	147.036	Aguas de La Rioja	Private	PSOE/pR
Tarragona	Tarragona	131.158	EMATSA	Mixed	PSC-PM
Lleida	Lleida	125.677	Aguas de Lleida-UTE FCC	Mixed	PSC-PM
Jaén	Jaén	116.769	Aqualia	Private	PSOE
Algeciras	Cádiz	112.937	Aqualia	Private	PSOE
Ourense	Ourense	108.137	AQUAGEST	Private	PP
Lugo	Lugo	93.450	SACYR	Private	PSOE/BNG
Torrevieja	Alicante	92.034	Aqualia	Private	PP
Girona	Girona	89.890	Aguas de Barcelona (Agbar)	Private	PSC-PM
Talavera de la Reina	Toledo	83.793	Aqualia	Private	PSOE
Ferrol	A Coruña	76.399	EMAFESA	Mixed	PSOE/BNG
Ciudad Real	Ciudad Real	70.124	AQUAGEST-Agbar	Private	PP

Source: www.cyii.es and own elaboration.

3.2. Planning and investment

The so-called Master Plan (Plan Director) is a fundamental and strategic tool for planning at the municipal level (prepared for 75% of municipalities). In fact, Master Plans are strategic tools for making decisions.

The Plan begins with a survey of water resources, quality, demand and infrastructure in place and raises future action to ensure water quality and quantity in the municipalities.

It can be prepared by each municipality or by the Autonomous Community (case of La Rioja, which made the Plan coordinated with municipalities and supported by them).

Investment in urban water services has been important in Spain. In fact, in addition to the investments made by private and public companies⁹, there has been a substantial public funding.

Table 4. Public agents who finance infrastructure for the provision of local water services

Source	Destination
European Union	Hydraulic infrastructure projects of Public Administration
Central Administration	Hydrographical confederations Autonomous Administration Local Administration Irrigators Communities
Autonomous Administration	City Councils Municipal Associations (County) Irrigators Communities
Local Administration	City Councils Municipal Associations (County)

Investments financed by public agents other than the holders of the services (municipalities) come from the following agents:

⁹ Investment in renovation of distribution networks, according to AEAS, amounted to 159 million euros in 2004.

- a) Ministry of the Environment (Central Administration)
- b) Provincial Councils (Local Authority)
- c) Autonomous Communities
- d) European Funding (Cohesion Fund)

Table 5. Financing urban water infrastructure (1992-2002)
(in million euro and %)

Ministry of Environment	Provincial Councils	Autonomous Communities	Cohesion Fund	TOTAL
1 877	1 134	1 666	2 979	7 656
25%	15%	22%	39%	100%

Source: Ministry of Environment (2007)

During 1992-2002 there was a major national public funding (61% of total aid). The total amount was 4 678 million euro: Ministry of Environment (1 877 million euro), Provincial Councils (1 134 million euro) and Autonomous Communities (1 666 million euro).

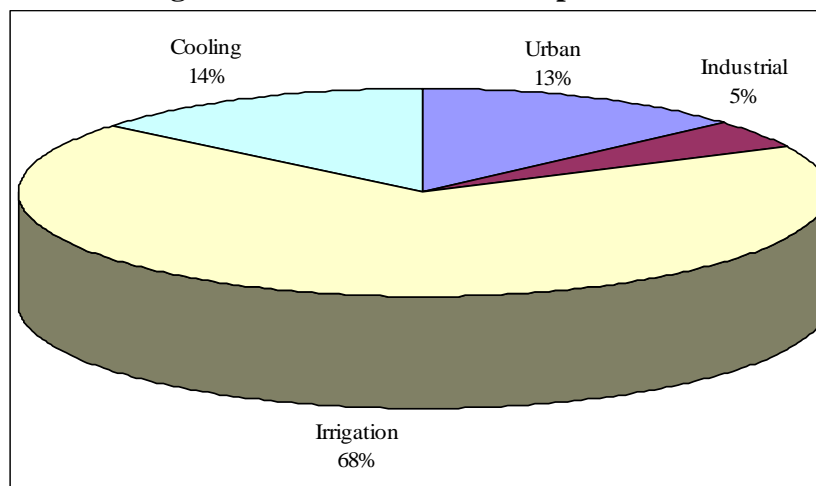
The importance of European Funding (Cohesion Fund) to urban water services is evident. The Cohesion Fund, with an amount of 2 979 million euro, represented nearly 40% of the total aid for financing urban water infrastructure during 1992-2002. These resources were used to finance a major fulfilment of the requirements in relation with the construction of sewage treatment plants and collection of urban waste water (70% of total aid).

The quantities provided by the Cohesion Fund and the national authorities are not generally charged to users of the service, considered as sunk. In terms of historical value, the depreciation of investments financed by the national/european authorities and not passed on to users could therefore be quantified at around 360-400 million euro annually (approximately 10% of the total costs of providing these services).

3.3. Demand and supply

Overall water demand in Spain amounted 35 323 hm³/year in 2005. The breakdown between the different uses is presented in Figure 6. It may be noted that irrigation demand is 68% of the total, whereas urban demand represents only the 13% of the total.

Figure 6: Water demand in Spain. 2005



Source: INE (2008)

Spanish forecasts indicate an increase in total demand to an amount around 44 000 hm³/year in 2015.

3.3.1. Indicators of urban water supply

The development of the volume of water available, water supplied and losses in the distribution network are shown in Table 6 and Figure 7.

Table 6. Urban supplied water
(litres/capita/day)

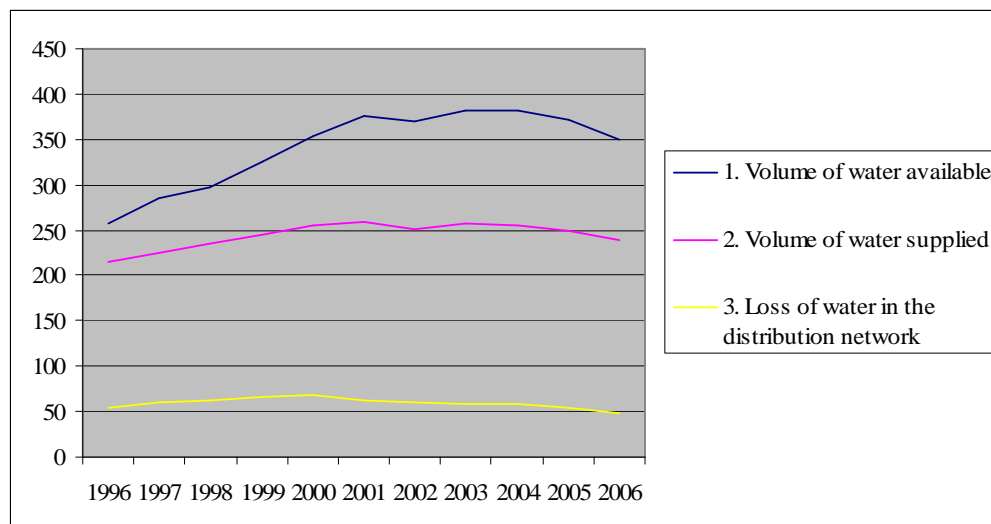
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
1. Volume of water available	257	286	298	326	353	375	370	381	381	372	349
1.1 From own capture	220	235	244	265	272	281	269	270	266	253	235
1.1.1 Surface water	172	179	185	194	197	203	192	184	188	174	153
1.1.2 Groundwater	41	47	50	61	63	65	65	76	69	71	75
1.1.3 Other water resources	7	9	9	10	12	13	12	10	9	8	7
2. Volume of water supplied	215	225	235	246	256	260	252	258	256	249	240
2.1 Household	146	153	159	165	168	165	164	167	171	166	160
2.2 Other uses (industry, commerce, services)	69	72	76	81	88	95	88	91	85	83	80
3. Loss of water in the distribution network	54	60	63	67	68	63	61	59	59	54	48
3.1 Water lost in the distribution (in %)	20	21	21.1	21.4	21	19.4	19.4	18.7	18.7	17.9	16.7

Source: INE (2008)

When considering demand evolution over time, there is an upward trend of individual consumption in Spain. This growth is a consequence of the improvement in general welfare (income and wealth) and changes in consumer habits and urbanisation¹⁰. However, the growing trend of individual consumption is lower where price increases have been higher.

While there is a change in the last two years, 2005 and 2006, with a decrease in the volume of water available and also in the volume of water supplied.

Figure 7: Urban supplied water
(litres/capita/day)

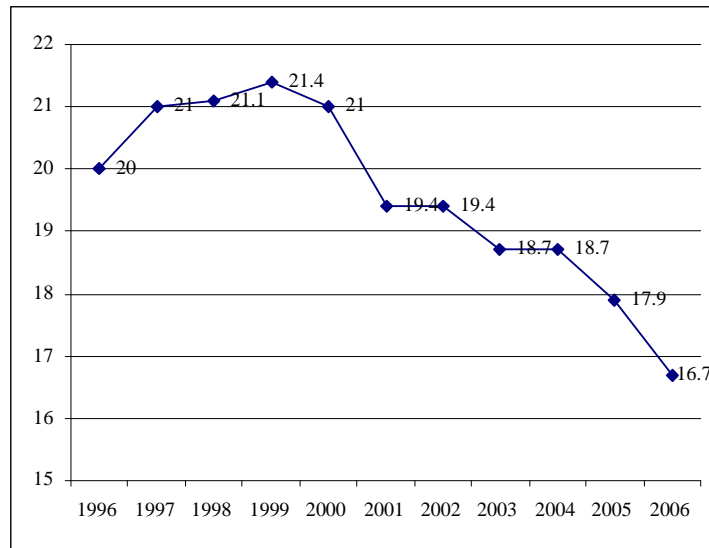


Source: INE (2008)

The increase in consumption has been offset by improvements in technical efficiency in the system of domestic water supply. This improvement is due to the reduction of losses in the distribution networks (see Figure 8) and the improvements in the extent of consumption and reduction of fraud.

¹⁰ That is single housing with garden and swimming pool, leisure and tourism (golf).

Figure 8: Water losses in distribution
(in %)

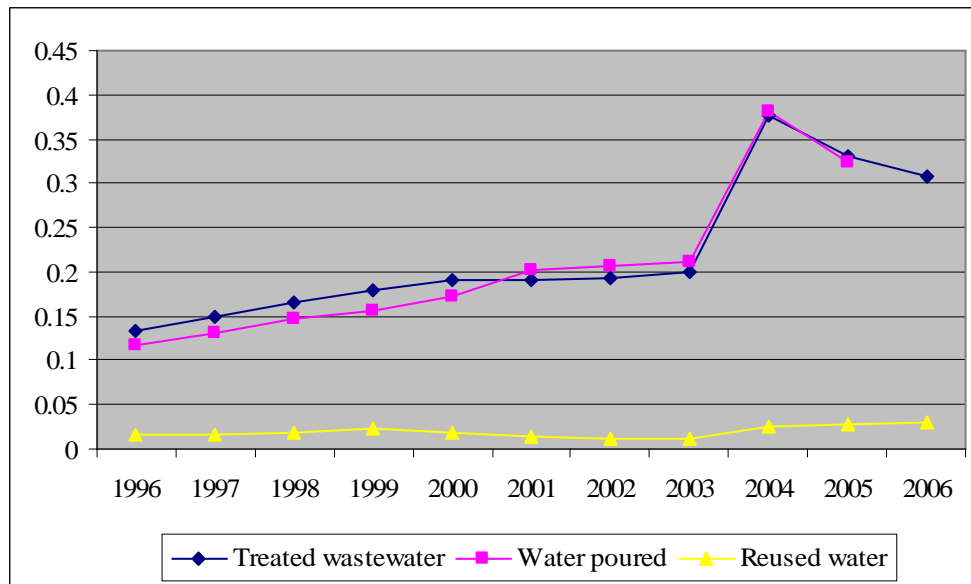


Source: INE (2008)

3.3.2. Indicators of sewage and wastewater treatment

As shown in Figure 9, there has been considerable improvement in wastewater treatment and reused water in Spain.

Figure 9: Urban supplied water
(m³/capita/day)



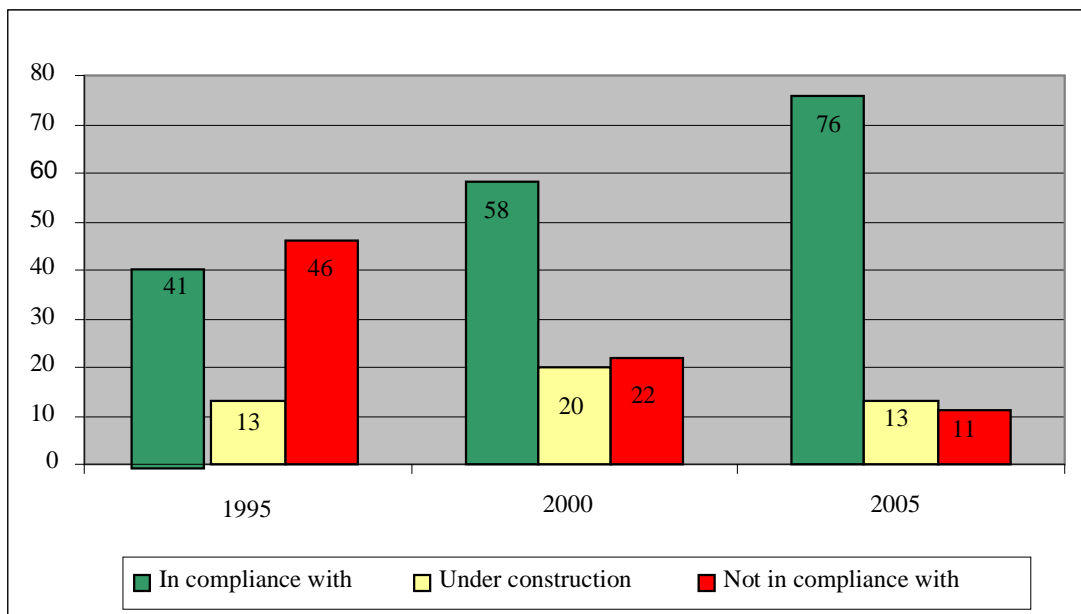
Source: INE (2008)

This positive trend is the result of the application of the National Plan of Sewage and Water Treatment (1995-2005). This Plan included significant investments for building new treatment plants in order to meet the EU rules (about 11.400 millions euro).

In recent years, investment for building new treatment plants have been intensified to meet the deadlines laid down in Directive 91/271/EEC and according to the National Plan of Sewage and Water Treatment. In fact, some regions have reached levels exceeding debug legally required (Valencia and Aragón).

This advance is clearly shown in the Figure 10. The degree of compliance has risen from 41% to 66% as set out in Directive 91/271/EEC.

Figure 10: Degree of compliance as set out in Directive 91/271/EEC
(as % of population)



Source: Ministry of Environment (2008)

The implementation of the Plan has been a remarkable breakthrough in the field of purification, but not sufficient to fully comply with the targets set by EU rules and this situation may include significant penalties for Spain.

Hence the new National Plan of Quality Water (2007-2015). The new Plan aims to ensure the fulfilment of the European Union Directives (Directive

91/271/EEC and 60/2000/EC). The total cost is estimated at about 19.000 million euro.

3.4 The tariff system in Spain

The charge structure is very complex in Spain. This complexity is due to the diversity of concepts covered and different management systems used. Table 6 shows a summary of the different payments made by water users.

Table 7. Aggregate tariff: Different concepts

Concept	Holder (Recipient)	Management modality (typical)	Costs which finances (usually)
Capture and regulation - Regulating canon - Rate of use of water	Central/ Autonomous Administrations	Public Organizations/ Public Enterprises	Investment and management
Treatment and adduction - Canon infrastructure - Tariff in discharge	Autonomous Adm. /municipal associations (county)	Public enterprise/ Public Administration	Investment Management and investment
Distribution - Service tariff	Municipality	Private enterprise/ Public enterprise	Management and investment
Sewage - Sewage rate	Municipality	Local Administration	Management
Wastewater Treatm. - Depuration canon - Service tariff	Autonomous Adm. /municipal associations (county)	Public enterprise/ /municipal associations (county)	Management and investment
Landfill - Landfill canon	Hydrographical confederations	Public Organizations	Management and investment

Service costs of urban water supply through the distribution networks are covered by the service tariffs. These rates affect the cost of capture, extraction, transportation and distribution water services. While the costs of collection and treatment of urban waste water are paid through the Sewage rate, the purification rate or the service tariff.

In relation with urban water tariffs, there are four noteworthy aspects: first, the provision of the service is independent of the recovery method; second, even the service provision is compulsory, each municipality decides what it takes and how it collects; usually the production and the treatment are

financed by the municipal budget and the distribution is financed by the users through a charge that is paid in the receipt; finally, the council never bills the user directly for the service provided.

There are two types of tariffs (domestic and non-domestic¹¹): tariff with rising blocks and tariff at a fixed price.

There is a dominance of tariffs with rising blocks, mainly in domestic consumption. That is, charges with fixed terms (independent consumption) and variable terms (according to consumption). There are also charges at fixed price and non-domestic (industrial) consumers benefit from these fees in higher proportion.

Since there is a high proportion of service fee that does not depend on the volumes consumed, the charges are little incentive to reduce consumption. Disincentive exists only in the consumption of large volumes. Nevertheless, charging by volume is driving the improvement of incentives to reduce consumption.

Table 8 shows that the average price of water for urban use in the municipalities stood at 1.17 euro/m³ in 2004. The range of prices at provincial level ranges from 0.49 euro/m³ in Lugo to 2.06 euro/m³ in the Balearic Islands.

The prices paid by households for water include the integral cycle (supply - extraction, damming, storage, processing and distribution - sewage and wastewater treatment). The different prices of water services in different territories are due to various reasons, including the type and quality of services provided, investments and the source of water.

¹¹ The average price of water for domestic use is higher than that for water for industrial use.

Table 8. Tariffs and water billed per capita. 2004

Autonomous Communities	Water billed		Tariffs	
	Water billed (litres/capita/day)	Annual variation (%)	Tariffs (Euro/m ³)	Annual variation (%)
Andalucía	189	2,72	1,12	5,66
Aragón	162	-4,14		
Asturias	172	0,58	0,91	13,75
Baleares	142	9,23	2,06	2,49
Canarias	147	8,89	1,76	0,57
Cantabria	187	1,08	0,75	4,17
Castilla-La Mancha	172	2,38	0,89	15,58
Castilla y León	179	-2,72	0,8	5,56
Cataluña	174	-4,92	1,45	4,32
Com. Valenciana	178	9,2	1,01	13,48
Extremadura	178	9,2	1,04	15,56
Galicia	155	8,39	0,95	5,56
Madrid	171	3,01	0,97	6,59
Murcia	161	8,05	1,72	9,55
Navarra	144	-5,26	0,77	8,45
País Vasco	150	0,67	1,21	19,8
Rioja	141	3,68	0,76	7,04
Ceuta y Melilla	142	2,16		
Spain	171	2,4	1,17	5,41

Source: Ministry of Environment (2008) obtained from AEAS and INE

The average price of water has increased significantly since the early 90s (more than 4% *per annum*). The areas that have increased most (and this trend is expected to continue) have been the treatment of wastewater and the rate of sanitation, mainly due to implementation of the European Directive.

3.5. Cost and cost recovery of water services in Spain

Various approximations have been made to estimate the total cost and degree of cost recovery of water services in Spain. They have variously reached rather different conclusions. This is because this exercise is not easy, for different reasons:

- Many of the infrastructures that provide these services are multifunctional¹², which means that only part of the costs of such infrastructure can be passed via tariffs.
- Many facilities have either been funded by public budgets (sunk) or, due to the time elapsed since construction, have already been redeemed, so that their costs do not affect current prices.
- An important part of the infrastructure (distribution networks) has already exceeded their useful life. Hence, its replacement has not been taken into account at the tariffs. If we take into account the resources needed to restore such infrastructure, the rate of recovery of costs would be reduced significantly.

The Ministry of the Environment has estimated the total cost of water services in Spain at 6 330.4 million euros per year (2002)¹³. As Table 9 shows, the cost of providing urban water services (urban distribution and sewage and wastewater treatment) is estimated at 4 100 million euro¹⁴. This amount represents the majority of the total cost (66% of total), while the distribution of irrigation water accounts for 20% of the total and water "on high" (extraction of groundwater, surface water harvesting and transport) absorbs 15% of the total.

Table 9. Annual cost of water services in Spain. 2002
(in million euro and %)

Surface water capture and transport	Extraction of groundwater	Distribution		Sewage and wastewater treatment	TOTAL
		Urban	Irrigation		
437.9	529.2	2 662.9	1 285.1	1 415.3	6 330,4
7%	8%	42%	20%	22%	100%

Source: Digital Water Book. Ministry of Environment (2008)

The level of cost recovery for the provision of all water utilities in Spain would be covered in the range of 65%-96% depending on the service, users and the region in question.

The Ministry of the Environment estimates an average level of cost recovery in urban water services (distribution, sewage and urban sewage

¹² They meet other uses besides the supply of water (regulation flows, flood protection or recreational use).

¹³ 0.9% of GDP.

¹⁴ The third part of that cost is to sewage and wastewater treatment.

treatment) around 80%, with a variation range between 57% and 95%, depending on the service, users and the region in question

The breakdown of the level of cost recovery between the different services provided is as follows:

- **Distribution:** In the most populated urban municipalities, the service costs of water distribution are fully recovered, while municipalities with smaller populations do not recover the total cost (mainly investment ones¹⁵).
- **Sewage:** The costs of upkeep and maintenance of network and sewage system for collecting urban wastewater are funded almost entirely by the users of the service. However, a part of the service charges, which are primarily investment costs, are not recovered for several reasons¹⁶.
- **Urban sewage treatment:** The values of cost recovery are very different. In some cases, recovery levels reached almost 90% of total costs. However, in other watersheds cost recovery reached values below 50%.

The survey conducted by AEAS (the Spanish Water Supply and Sewerage Association) reflects a better relationship between prices and costs. Its National Survey, covering 2004, states that approximately 82% of the population is supplied by entities recovering all costs with fees charged to the user.

And finally, Agbar, the dominant operator in the market, indicates that charges do not cover 60% of total cost. The incumbent specifies that water tariffs in more than half of water services in Spain do not cover investment in the infrastructure necessary to provide the service and, in over one third of Spanish municipalities, charges no longer cover even operating costs.

¹⁵ Indeed there is no recovery of that investment cost because the investments supplied by other public administrations than government holder services (Local Administration) are understood as being sunk costs.

¹⁶ On the one hand, part of the capital costs of infrastructure is due to the provision of public goods (rainwater collection and sanitation of public roads). And, on the other, funding from government other than the holder of the services (Local Government) is not passed on to users through Sewer Rates.

3.6. Quality of services

If we consider the opinion of the users of the local public services the level of satisfaction is generally high as regards the quality of service offered, continuity in the supply and prices.

At national level, the population perceives that water quality is fit for consumption in over 60% of cases (Ministry of Health, 2008). In the Autonomous Communities the lowest values were reached in Valencia, in Murcia and in the Balearic Islands (31%, 32% and 36% respectively), while La Rioja, the Basque Country and Madrid showed the highest level of satisfaction (95%, 93% and 89% respectively).

However, most citizens are not aware whether the supplier company is public or private and, in any case, they show their rejection of privatisation as this is thought to reduce control over essential services. This rejection has been highlighted by the recently approved partial privatisation of the public company Canal de Isabel II (with a contribution of 49 percent of private capital). Political parties, unions and NGOs have spoken out against this privatisation, claiming that it will have a negative impact on citizens, both in terms of quality of service and prices.

4. SUMMARY AND CONCLUSIONS

We can draw the following conclusions from our work:

- The institutional framework of the water sector is very complex. So that, each of the stages that make up the “integral water cycle” may fall within the competence of a different level of government, may be managed by different management models and may be funded by pricing formulas of different legal natures.
- In Spain, water supply and wastewater management are, according to the regulatory framework, public services falling within the competence of the municipality and they are provided in mandatory fashion by the municipality.

Nevertheless, water services go beyond municipal competence and this activity must be carried out taking state and autonomous community laws into consideration. More specifically, in Spain, the Autonomous Communities are closely involved in the legislation of water supply and wastewater management.

- The Spanish legislation establishes two forms of management of the local public services: direct management (by the municipality itself, or by entities belonging to the same) and indirect management (with private companies providing the services). Diversity and flexibility of organisational arrangement is a central feature of the Spanish experience.

Indirect management dominates in Spain. It accounts for more than eighty-five percent (85%) of the total market. The distribution of the market among major private operators shows two incumbents: FCC Group and Agbar Group.

Private management does not mean free competition. These are reserved services or monopolies. The main type of competition is therefore competition for the contract, not in the contract.

- Investment in urban water services has been important in Spain. In fact, in addition to the investments made by private and public companies, there has been substantial public funding.

The familiar trend of lack of investment in infrastructure replacement is changing in Spain. This, coupled with new investment needs especially in sewage and wastewater treatment (from the EU directives on water), and new investments needed to increase the supply capacity of water, may lead to increased costs to be reflected in prices.

- Throughout the period studied there is an upward trend in individual consumption in Spain. Although there was a slight decrease towards the end of the period (2005 and 2006), it is also noted that the growing tendency of individual consumption is lower in those regions where the price increases have been greater.

The increase in consumption has been offset by improvements in technical efficiency in the system of domestic water supply. This improvement is due to the reduction of losses in the distribution networks.

- There has been a major improvement in wastewater treatment and reused water in Spain. This positive trend is the result of the application of the National Plan of Sewage and Water Treatment (1995-2005) with investments around 11 400 millions euro.

The implementation of the Plan has been a remarkable breakthrough in the field of purification, but insufficient to fully comply with the targets set by EU rules; this situation may include significant penalties for Spain. Hence the new National Plan of Quality Water (2007-2015), to ensure fulfilment of the European Union Directives. The total cost is estimated at approximately 19 000 million euro.

- The charges structure is very complex in Spain. This complexity is due to the diversity of concepts covered and the different management systems used.

There is a dominance of tariffs with rising blocks, mainly in household consumption. Since there is a high proportion of service fee that does not depend on the volumes consumed, the charges are little incentive to reduce consumption. Nevertheless, charging by volume is driving the improvement of incentives to reduce consumption.

Current prices are low in urban water services. The average price of water for urban use in the municipalities stood at 1.17 euro/m³ in 2004. The range of prices at provincial level is from 0.49 euro/m³ in Lugo to 2.06 Euro/m³ in the Balears. The prices paid by households for water include the water integral cycle (supply -extraction, damming, storage, processing and distribution- sewage and wastewater treatment). The different prices of water services in different territories are due to various reasons, including the type and quality of services provided, investments and the source of water.

The average price of water has increased significantly since the early 90s (more than 4% *per annum*). The areas that have increased most (and this trend is expected to continue) have been the treatment of wastewater and rate of sanitation, mainly due to implementation of the European Directive.

- Various approximations have been made to estimate the total cost and degree of cost recovery of water services in Spain. They have variously reached rather different conclusions. The Ministry of the Environment estimates an average level of cost recovery in urban water services (distribution, sewage and urban sewage treatment) of around 80%, with a variation range between 57% and 95%, depending on the service, users and the region in question. The survey conducted by AEAS (the Spanish Water Supply and Sewerage Association) shows that approximately 82% of the population is supplied by entities that recover all costs with fees charged to the user. And finally, Agbar, the dominant operator in the market, shows that fees do not cover 60% of total cost.
- It is necessary to design appropriate pricing structures, both with respect to cost recovery and to promote transparency in the tariffs.
- The level of satisfaction is high as regards the quality of service offered and continuity of supply and prices. The population perceives that water quality is fit for consumption in over 60% of cases. The level of satisfaction in the autonomous communities varies significantly.

5. MAIN REFERENCES

AEAS (2006): *Suministro de agua potable y saneamiento en España (2004). IX Encuesta nacional*. Asociación Española de Abastecimiento de Agua y Saneamiento. Madrid. España.

Agbar Group (2005): “La gestión de la eficiencia y el ahorro de agua desde la empresa privada”. *Seminario sobre modelos de gestión del agua en las ciudades*. Zaragoza-Huesca. España

Canal de Isabel II (2008): www.cyii.es

INE (2008): *Indicadores sobre el agua. Serie 1996-2006*. www.ine.es

INE (2008): “Estadísticas e indicadores del agua”, *Cifras INE. Boletín Informativo del INE*. 1/2008. www.ine.es

Ministry of Environment (2008): www.mma.es

Ministry of Environment (2007): *El agua en la economía española: Situación y perspectivas. Informe integrado del análisis económico de los usos del agua. Artículo 5 y Anejos II y III de la Directiva Marco del Agua*. Ministerio de Medio Ambiente. Madrid. España.

Ministry of Environment (2007): *Precios y costes de los servicios del agua en España. Informe integrado de recuperación de costes de los servicios del agua en España. Artículo 5 y Anejo III de la Directiva Marco del Agua*. Ministerio de Medio Ambiente. Madrid. España.

Ministry of Environment (1998): *Libro Blanco del Agua en España*. Ministerio de Medio Ambiente. Madrid. España.

Ministry of Health (2008): *Encuesta Nacional de Salud. Año 2006*. Ministerio de Sanidad y Consumo. Madrid. España www.ine.es

This yearly series of working papers (WP) aims to publish essentially works in English or in French resulting from the scientific network of CIRIEC and more specifically its working groups. The WP are submitted to a review process and are published under the responsibility of the President of the International Scientific Council, the president of the scientific Commissions or the working groups coordinators and of the editor of the CIRIEC international scientific journal, the *Annals of Public and Cooperative Economics*.

These contributions may be published afterwards in a scientific journal or book.

The contents of the working papers do not engage CIRIEC's responsibility but solely the author(s').

Submissions are to be sent to CIRIEC, Université de Liège au Sart Tilman, Bât B33 (bte 6), BE-4000 Liège, Belgium.

Cette collection annuelle de Working Papers (WP) est destinée à accueillir essentiellement des travaux en français ou en anglais issus du réseau scientifique du CIRIEC et en particulier de ses groupes de travail. Les WP font l'objet d'une procédure d'évaluation et sont publiés sous la responsabilité du président du Conseil scientifique international, des présidents des Commissions scientifiques ou des coordinateurs des groupes de travail et de la rédactrice de la revue scientifique internationale du CIRIEC, les *Annales de l'économie publique, sociale et coopérative*.

Ces contributions peuvent faire l'objet d'une publication scientifique ultérieure.

Le contenu des WP n'engage en rien la responsabilité du CIRIEC mais uniquement celle du ou des auteurs.

Les soumissions sont à envoyer à l'adresse du CIRIEC, Université de Liège au Sart Tilman, Bât B33 (bte 6), BE-4000 Liège, Belgique.

Publications

- 2009/01 The water sector in Italy
Lorenzo BARDELLI & Lorenzo ROBOTTI
- 2009/02 Public waste management services in France. National analysis and
case studies of Paris, Rouen, and Besançon
Brahim DJEMACI
- 2009/03 The French system of water services
Pierre BAUBY
- 2009/04 The Water Sector in Spain
Olga RUIZ CAÑETE & Dolores DIZY MENÉNDEZ
- 2009/05 The reflexive assembly. Embryo of a virtuous circle in evaluating the
cooperative social economy
Carlos LA SERNA

CIRIEC (International Centre of Research and Information on the Public, Social and Cooperative Economy) is a non governmental international scientific organization.

Its **objectives** are to undertake and promote the collection of information, scientific research, and the publication of works on economic sectors and activities oriented towards the service of the general and collective interest: action by the State and the local and regional public authorities in economic fields (economic policy, regulation); public utilities; public and mixed enterprises at the national, regional and municipal levels; the so-called "social economy" (not-for-profit economy, cooperatives, mutuals, and non-profit organizations); etc.

In these fields CIRIEC seeks to offer information and opportunities for mutual enrichment to practitioners and academics and for promoting international action. It develops activities of interest for both managers and researchers.

Le CIRIEC (Centre International de Recherches et d'Information sur l'Economie Publique, Sociale et Coopérative) est une organisation scientifique internationale non gouvernementale.

Ses **objectifs** sont d'assurer et de promouvoir la collecte d'informations, la recherche scientifique et la publication de travaux concernant les secteurs économiques et les activités orientés vers le service de l'intérêt général et collectif : l'action de l'Etat et des pouvoirs publics régionaux et locaux dans les domaines économiques (politique économique, régulation) ; les services publics ; les entreprises publiques et mixtes aux niveaux national, régional et local ; l'économie sociale : coopératives, mutuelles et associations sans but lucratif ; etc.

Le CIRIEC a pour but de mettre à la disposition des praticiens et des scientifiques des informations concernant ces différents domaines, de leur fournir des occasions d'enrichissement mutuel et de promouvoir une action et une réflexion internationales. Il développe des activités qui intéressent tant les gestionnaires que les chercheurs scientifiques.



International Centre of Research and Information on the Public, Social and Cooperative Economy - aisbl
Centre international de Recherches et d'Information sur l'Economie Publique, Sociale et Coopérative - aisbl

Université de Liège au Sart-Tilman
Bât. B33 - bte 6
BE-4000 Liège (Belgium)

Tel. : +32 (0)4 366 27 46
Fax : +32 (0)4 366 29 58
E-mail : ciriec@ulg.ac.be
<http://www.ciriec.ulg.ac.be>