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“WATER SERVICES AND SANITATION IN
SPAIN”

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1. Water resources

Spain suffers from severe droughts, mainly in the South. In 2001, in order to solve the problem of the water scarcity in the South-East of Spain, The National Hydrological Plan tried to transfer surface water from the south of Ebro River to cities on the Mediterranean coast. But this plan had a lot of critics and opposition because of the environmental impact it would cause in the Ebro area, the huge infrastructure needed and the potential water scarcity there. Because of it, in 2004, with the change of government, these plans were shelved in favour of seawater desalination and the A.G.U.A. Plan was signed, adding to 700 desalination plants around the Mediterranean coast.

Attending to the water supply in Spain, we can see that data about water sources and uses vary according to the source of information. According to the National Statistical Institute of Spain: 63% of the water supply comes from surface water, 33% from groundwater and 4% from other sources, as desalination plants. But according to ASOAGA: 74% of the water supply comes from surface water, 19% from groundwater and 7% from other sources. This water supplies an average of 157 l/p/d of water use everyday by people in Spain. Spain is characterized by universal access and generally good service quality, while tariffs are among the lowest in the EU.

2. Policy and regulation for water supply and sanitation

The legal framework for water supply and sanitation includes the European regulation Directive 2000/CE and the Spanish one, the 1985 Water Law. The last one regulates now the Basin Agencies (Confederaciones de Cuencas Hidrográficas) that divide the Spanish territory. But the first basin agencies were created in the Ebro basin and in the Segura basin in 1926, followed by the Guadalquivir in 1927 and the Eastern Pyrenees in 1929. It was in 1961 Basin Agencies were created in the entire country.

The Basin Agencies are in charge of:

- Planning, building and operating major water infrastructure such as dams;
- Elaborating basin plans;
- Granting permits to use water, as well as inspecting water facilities for which permits were granted;
- Setting water quality targets, as well as monitoring and enforcing them;
- Undertaking hydrological studies;
- Providing advisory services to other entities at their request.

Each Agency is headed by a President who is proposed by the Minister of Environment and then is nominated by the Cabinet; each one has a

Board, a council and a user assembly to ensure the participation of various stakeholders in planning and operations of the decision-making process.

There are a total of 15 Basin Agencies in Spain for rivers that flow through more than one autonomous community (administration limits in which Spain is divided into). When a river runs entirely by just one autonomous community, the water resources of this river are managed by the water administration of this autonomous community, instead of being managed by a Basin Agency. There are differences between the water regulation of the autonomous communities and the Basin Agencies, so it is not always an easy issue to solve.

3. Services provision and management

Although Basin agencies play an important role in determining the framework for the provision of water and sanitation services, they do not provide such services.

The responsible for the service provision are more than 8,000 Spain's municipalities. Municipalities can provide services:

- Directly or through a **municipal public company** (54% of market share),
- Through concessions to a **mixed public-private company** (13%)
- Through a **private company** (33%)

In some cities, as Barcelona and Madrid until 2008, sanitation services are provided directly by the municipality, while water supply is the responsibility of a company.

The largest of the private water companies, with a market share of about 50% of the private concessions, is Aguas de Barcelona (AGBAR). However, the large cities are all served by public companies, except Barcelona (AGBAR) and Valencia (EGEVASA).

3.1. AGBAR

Agbar is a private company dedicated to services, distribution and treatments of water. The company was founded in 1867 in Liège as "Compagnie des Eaux de Barcelone" by an investor from France and Cataluña (Spain). The group is present in almost all the continents as North America, South America, Asia and Europe. The headquarters are in Barcelona and the chairman is Àngel Simon i Grimaldos.

Agbar is constituted by more than 230 companies and with more than 140 years of history. Agbar is worldwide leader as much in the scopes

that constitute the essential axis of their activities related to the cycle of the water like in the sectors of activity that the new society demands, especially in those of services of health, certification, construction and communications networks.

In Spain, this company provides water services to about 13 million people in more than 1,000 localities under concession contracts. Sewer services are provided to 8.25 million people in 365 localities, and wastewater treatment is carried out for 9.3 million people in 445 localities.

3.2.EGEVASA

Egevasa is the private water company of Valencia. Performs its services in all phases of the water cycle:

- Assuming the recruitment, transportation, purification and distribution of potable water.
- Collection and purification of waste water which is return to the natural environment with the least impact on the environment.

It manages about 140 treatment plants in more than one hundred municipalities. This plan eradicates the problem of nitrate contamination associated with traditional intensive cultivation of citrus in the region.

The largest public municipal company is Canal de Isabel II that serves the metropolitan area of Madrid.

3.3.CANAL DE ISABEL II

This public municipal company was founded in 1851. This modern system of water supply produces the increase of the population and the industrial activities. In 1984 it began to depend on Autonomous Community of Madrid and it organized the sanitation treatments and river conservation, which consists on returning the wastewater to rivers after being treated in depuration plants.

The water supply distribution has more than 16000 Km. This company manages 14 reservoirs in Autonomous Community of Madrid with 945.9 hectometres cubits of water; the biggest is "El Atazar". To assure the water quality it has 13 treatment stations, 9 laboratories and 31 automatic control stations that did 3.189.024 water analyses per year.

The sanitation treatments are formed by 150 depuration plants and more than 6800 Km of sewers. It saves more than 70 hectometres cubits of water waste per year for industrial activities. The water of the company is

provided by 7 rivers, which are in Guadarrama's Mountains: Alberche, Guadarrama- Aulencia, Guadalix; Manzanares, Lozoya, Jarama y Sorbe. It also has 85 installations for groundwater with 6 extraction areas to incorporate the resources extracted aquifer to the supply tap water.

Some data from the Canal de Isabel II...

- **Water Collection**

Canal de Isabel II manages 14 reservoirs with a storage capacity of 946 million cubic meters. The largest capacity is the Atazar, with 425 million. These contributions are obtained from 7 rivers of the Sierra del Guadarrama: Alberche, Guadarrama-Aulencia, Guadalix, Manzanares, Lozoya, Jarama and Sip.

- **Reservoirs**

Reservoirs managed by Canal de Isabel II are distributed in the area of the Sierra de la Comunidad de Madrid. Only five reservoirs in the basin of the river Lozoya, up nearly two-thirds of the total capacity of water in the region. The other supply reservoirs, collecting water from the rivers Jarama, Guadalix, Guadarrama, Manzanares, and Alberche Aulencia.

RESERVOIRS	AGE	CAPACITY (Hm ³)
Cuenca del Lozoya		589,0
El Villar	1879	77,4
Puentes Viejas	1939	53,0
Rosequillo	1958	50,0
Pirilla	1967	38,1
El Atazar	1972	425,3
Cuenca del Jarama		55,7
El Vado	1960	55,7
Cuenca del Guadalix		40,9
Pecrezuela	1968	40,9
Cuenca del Manzanares		102,0
Manzanares el Real	1912-1971	91,2
Navacerrada	1969	11,0
Cuenca del Guadarrama		132,0
Navalmedio	1969	0,7
La Jarosa	1969	7,2
Valmayor	1976	124,4
Cuenca del Alberche		26,0
Los Morales	1988	2,3
La Aceña	1991	23,7

- **Groundwater**

Company has 85 facilities to collect groundwater extraction with 6 zones that incorporate the resources extracted from aquifers to large pipes and tanks of the overall supply. For the extraction of groundwater, aquifers take advantage of tertiary detrital limestones Torrelaguna, which have a very good water quality.

- **Distribucion**

Large set of facilities pipelines, pumping stations and standpipes, and finally, the distribution network of around 16,000 kilometres.

- **Pumping stations**

Canal de Isabel II has 20 lift stations and 104 substations that catch water deposits and to raise the water supply with adequate pressure, the higher areas of the Community of Madrid.

TANKS	AGE	POWER (Kw)	Potencia instalada (kW)
Picadas		1967	13.425
Colmenar del Arroyo I (Picadas I)		1967	8.243
Tres Cantos		1978	4.240
Valmayor		1981	700
Sant Ilana		1981	1.720
Santillana II		2004	3.000
Colmenar Viejo		1982	1.413
Plaza de Castilla		1983	2.650
Majadahonda		1991	1.880
Valgollojos		1991	1.542
Pinilla		1992	1.600
Velilla de San Antonio		1992	1.351
Villalba		1992	1.987
Navacerrada		1992	1.377
Hortaleza		1993	1.250
San Juan		1994	19.000
Colmenar del Arroyo II (SAN JUAN II)		1994	13.000
ETAP Majadahonda		2007	550
Tielmes		1999	300

- **Tanks water regulators**

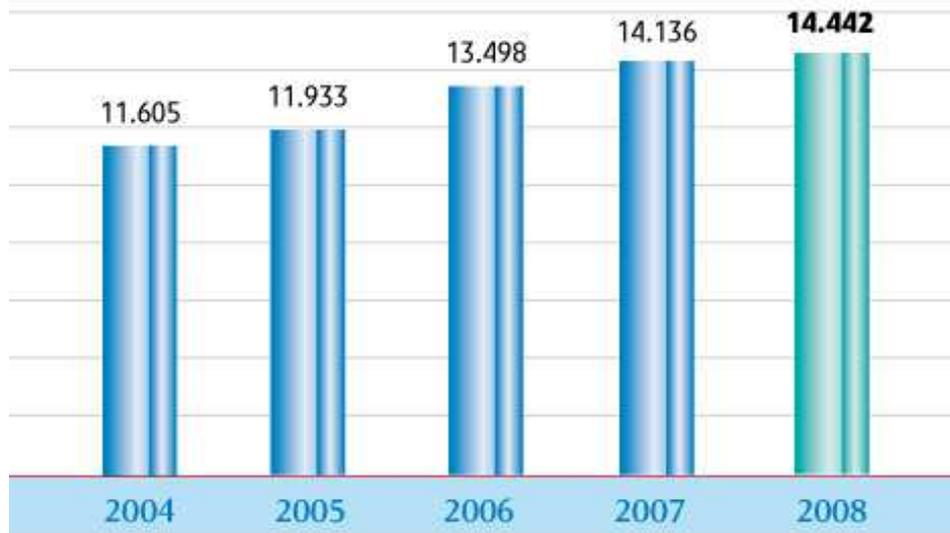
These are weatherproof enclosures where water is stored. Canal de Isabel II features 22 large tanks water regulators, the first one built in 1879, plus 240 smaller capacity.

TANKS	AGE	CAPACITY (m ³)
Bravo Murilo	1879	188.412
Islas Filipinas	1915	463.500
Valdelatas	1915	33.408
El Olivar	1919	44.232
Plaza de Castilla	1940	141.602
Hortaleza	1962	81.000
San Blas	1965	53.767
Valecas	1967	120.698
E Plantío	1967	143.176
E Goloso	1969	534.355
Retamares	1969	250.556
Getafe	1975	254.897
Valmayor	1976	94.967
Ciudad Tres Cantos	1978	78.624
Majadahonda	1984	40.000
Torreleguna	1989	13.500
Valgallegos	1990	20.500
El Chaparral	1992	19.000
La Jara	1992	18.400
Navacerrada	1992	20.000

- **Network**

The network of Canal de Isabel II was begun in 1851 and now reaches, the nearly 14,442 km. The annual investment company dedicated to the renewal of its pipes is around 30 million euros.

NETWORK EVOLUTION 2004-2008 (Km)



4. Tariffs and cost recovery

- **Tariff level:** A survey by the association AEAS in 2009 showed that the average tariff for water supply and sanitation in Spain was Euro 1.50/m³. On average, industrial users paid Euro 1.81/m³ and residential users Euro 1.40/m³. This is one of the lowest water tariffs in the EU. There are large variations between cities and regions. The province with the highest average tariff is the Balearic Islands (Euro 2.65/m³) and the region with the lowest is Lugo (Euro 0.61/m³). This study wants to explain the actual cost of water and make citizens aware of the need to pay the full costs of this service.

A survey carried out in 2009 by the Spanish consumer organization OCU the water bill was slightly higher than in the ANEAS survey at Euro 227 per year for a water consumption of 175 m³. However, the survey shows a slightly lower average water and sewer tariff at Euro 1.30/m³. The OCU survey also shows that annual bills are very different between cities, ranging from 112 to 413 Euro per year.

- **Affordability.** The average water and sanitation bill of Euro 191 per year accounts for only 0.6% of household expenditures.
- **Tariff structure.** 92% of Spanish cities used increasing-block tariffs (the tariff per cubic meter increases as consumption increases).
- **Cost recovery.** The Ministry of Environment estimates the cost recovery for water supply and sanitation at "between 50%- 90%". However, others sources estimate it to be as low as 30%.

5. Investment and financing

- **Investment:** According to a blog on "Sustainable Spain", Spain spends €6,330 million annually on the capture, transport and extraction of underground water, plus water distribution and sanitation.
- **Financing:** The European Union is a major financier of the Spanish water and sanitation sector, both through grants by the European Commission and through loans from the European Investment Bank. Between 1986 and 2008 Spain received Euro 21 billion in EU funding for water infrastructure. However, European funding to Spain is set to fall by 40% in the period to 2013, compared with 2000-2016.