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# Privatisation of urban water and sewerage services in Turkey: some trends

*Tayfun Cinar*

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*This article describes the experience of privatised urban water-supply and sewerage services in Turkey, focusing on the cases of three cities that have opted for such privatisation. The article opens with an examination of the management of urban water and sewerage services in Turkey and explores the development of water services and water policies in local government institutions. The second section introduces case studies of cities that have transferred the management, operation, and maintenance of urban water services to private operators.*

KEY WORDS: Governance and Public Policy; Social Sector; Aid; Western and Southern Europe

## Introduction

Many countries regard water services as public services supplied and financed by local authorities in co-operation with the central government. However, the water sector has been increasingly characterised by a trend towards privatisation, including private financing initiatives and public–private partnerships. Private-sector involvement has thus gradually become apparent in the public water sector, leading to new organisational structures and types of contract, with diverse results depending on country-specific conditions.

Turkey has implemented various water-privatisation models, and the transformation of public services in the water sector has been guided by the international finance institutions (IFIs) as well as the political support of successive governments. The role of central government bodies is not the same as in the past. With the advent of decentralisation, public credit in the form of subsidies for investment in local infrastructure has fallen from favour, and municipalities are encouraged to apply for private finance. Responsibility for drinking and wastewater operations was transferred through contracts involving private-sector participation. Multinational corporations also became increasingly involved in the provision of urban water infrastructure, and in investment, management, and service delivery.

## Management of urban water and sewerage services in Turkey

According to Turkey's Water Law and Municipality Law, municipalities are responsible for the urban water supply and sewerage services. Various publicly owned utilities are responsible for the management of these services, depending on the size of the municipality. Where the population is less than 10,000, the municipal public-works department is responsible for the water supply, which is financed from its own budget. In this case, both water supply and sanitation services are grouped with other public services.

In municipalities with a population of 10,000–50,000, it is common to have a directorate or 'water office' that is responsible for the water supply. These offices do not have a separate legal entity. In municipalities with a population greater than 50,000, water supply is generally combined with other municipal services in a separate operating unit established by the municipal council as a legal entity. These service providers are specific organisations rather than autonomous commercial units, and they have budgets assigned to them. Municipalities usually prefer to combine water and urban transport services as a means of obtaining revenue and cross-subsidising public services. In these non-metropolitan areas, the primary concern of local government is usually water supply rather than waste-water disposal and treatment. However, separating water supply and sewerage services under different management lines precludes the possibility of an integrated approach.

Metropolitan areas have faced serious sewerage problems as a consequence of population increases from the 1980s. This has encouraged the establishment of new organisational models which link water and waste-water management. Starting with Istanbul and the establishment of Istanbul Water and Sewerage Administration (ISKI) in 1981, autonomous entities were created with the responsibility for the planning, design, construction, and operation of all water-supply and sewerage services in metropolitan areas. At the beginning, ISKI was independent of the Istanbul Municipality, but after the reorganisation of the municipality as metropolitan administration in 1984, the two were merged. ISKI is now a public entity with an independent budget, albeit subordinated to the Istanbul Metropolitan Municipality. This water and sewerage administration model was extended to cover other metropolitan municipalities, such as Ankara in 1987 and Izmir in 1989. Today there are 16 water and sewerage administrations within metropolitan municipalities.

The establishment of ISKI aimed to increase accountability and efficiency and enable a public utility to operate under a commercial regime which facilitates the mobilisation of financial resources via foreign loans. The law that set up ISKI allowed for the setting of drinking and waste-water tariffs with a minimum profit rate equivalent to 10 per cent of all expenditures, including operation and maintenance, amortisation, and rehabilitation. The objective was to price water not as a basic necessity but as an economic good (Turkey Country Report 2003: 30–1).

In some of the larger non-metropolitan municipalities, the water and sewerage departments can propose the tariff structure for domestic and industrial use to be endorsed by the municipal council. Subsequently water tariffs are submitted for the formal approval of the governor as the highest-ranking central-government representative in the province. In contrast, in the metropolitan municipalities, the water and sewerage administrations are free to set their own tariffs, which are endorsed by the municipal council without the formal approval of the central government authorities.

The authorities that set tariffs for drinking water must steer a course between political acceptability and the need to cover cash deficits. Tariff rates are often determined by considerations of political acceptance and are therefore subsidised. When pricing drinking-water services, municipalities and their utilities generally prefer to use Increasing Block Tariffs (IBTs),

whereby water consumption is divided into blocks, with the price of the additional cubic metre depending on the block into which it falls. Water charges in the first block are the lowest and ensure that a minimum volume of water should be available to all at low tariffs. Different charges are then applied to different groups of subscribers such as households, large constructions, industrial and trading establishments, public establishments, common fountains, and parks and gardens. The IBT charge structure can thus be used to discourage water consumption.

Owing to continued population growth and the high level of rural–urban migration, the efficiency of applying IBTs in metropolitan areas is called into question, given the frequency of inadequate maintenance and the lack of investment in water services. Water supply, sewerage systems, and waste-water treatment became a top priority for local authorities in the 1990s, due to the need to tackle increasing problems in accessing water supplies and responding to higher physical or commercial losses.

The volume of water supplied in 1994 was 3.235 million m<sup>3</sup>. This figure rose in 2004 to 4.956 million m<sup>3</sup> distributed by network systems. Eighty-eight per cent of the municipal population was connected to a drinking-water system in 1994, compared with only 67 per cent for the population as a whole. In 2004 the figures were 99 per cent and 78 per cent respectively. (See Table 1.)

The volume of treated drinking water rose from 973 million m<sup>3</sup> in 1994, or 23 per cent of the total population, to 2.081 million m<sup>3</sup> in 2004 (34 per cent). In 1994, 69 per cent of the population living in municipal areas was connected to the main sewerage system (52 per cent for the population as a whole). By 2004 the rates had rose to 86 per cent and 68 per cent respectively.

A total annual volume of 1.510 million m<sup>3</sup> waste water was discharged in 1994, of which only 150 million m<sup>3</sup> passed through treatment plants. In 2004, the volume of waste water discharged reached 2.923 million m<sup>3</sup>, of which 1.901 million m<sup>3</sup> was treated. Whereas only 10 per cent of the population was discharging to sewerage systems connected to treatment plants in 1994, this figure had risen to 36 per cent by 2004. Waste-water treatment plants are generally found only in metropolitan municipalities. The non-metropolitan municipalities either have primary treatment systems or do not have the capacity to operate the existing treatment plants.

High non-revenue water (NRW) rates have been applied for a long time, especially in the metropolitan municipalities, and have been the most common characteristics of municipal water-supply systems across Turkey. A significant proportion of the total drinking-water potential is lost in the supply networks. According to the Gas and Water Statistics, water loss was 40 per cent in 1980s, rising to 58 per cent in 1989. According to the Electricity, Gas and Water Statistics for 1994, while 36 per cent of the collected water was lost in the network of non-metropolitan municipalities, NRW rate was 42 per cent in the metropolitan municipalities.

The NRW rate had reached 50 per cent in 2001 across the country, of which 20 per cent was recognised as commercialised loss and 30 per cent was caused by technical reasons. The main reasons for commercialised losses stemmed from problems in the user-registration system, for example illegal consumption and meter inaccuracies. Technical losses were attributed to reservoir overflows, pipe breakdown, lack of timely maintenance of pipeline and network connections, leakages, and technical inefficiencies (ENVEST 2005: 10–14).

In addition to various inefficiencies, the population pressure in urban areas has increased the demand for urban infrastructure services. Consequently, investment in infrastructure has become a top priority for municipalities, although their finances are already strained. Deficiencies in financing the water-supply and sewerage services have compounded the problems related to the organisation of these services. Until the 1980s, municipal investments in the water sector were almost entirely funded by central government, namely through the General Directorate of the Bank of Provinces (Iller Bank) and the General Directorate of State Hydraulic Works (DSI).

**Table 1:** Main municipal water and waste-water indicators

Years	1994	1995	1996	1997	1998	2001	2002	2003	2004
Total number of municipalities	2.663	2.724	2.750	2.758	2.757	3.227	3.227	3.227	3.225
Number of municipalities providing drinking-water network services	1.962	2.134	2.194	2.329	2.577	3.092	3.140	3.161	3.159
Percentage of total population served by drinking-water networks	67	70	70	72	71	75	76	77	78
Percentage of municipal population served by drinking-water networks	88	92	92	94	93	95	97	97	99
Volume of water supplied (million m <sup>3</sup> /year)	3.235	3.725	3.931	4.073	4.168	4.664	4.815	4.920	4.956
Volume of drinking water treated by treatment plants (million m <sup>3</sup> /year)	973	1.135	1.253	1.357	1.550	1.667	1.711	1.894	2.081
Percentage of total population served by drinking-water treatment plants	23	21	21	24	27	27	29	31	34
Number of municipalities connected by sewerage systems	1.188	1.347	1.383	1.493	1.647	2.003	2.115	2.195	2.226
Percentage of total population connected by sewerage systems	52	54	55	58	59	64	65	67	68
Percentage of municipal population connected by sewerage systems	69	72	72	77	78	81	83	85	86

(Table continued)

**Table 1:** Continued

Years	1994	1995	1996	1997	1998	2001	2002	2003	2004
Volume of wastewater discharged (million m <sup>3</sup> /year)	1.510	1.633	1.679	1.922	2.091	2.301	2.498	2.861	2.923
Volume of wastewater treated by treatment plants (million m <sup>3</sup> /year)	150	169	202	366	590	1.194	1.312	1.586	1.901
Percentage of total population connected by waste-water treatment plants	10	9	10	14	17	27	28	30	36

Source: TURKSTAT

Iller Bank and DSI are responsible for the planning and financing of the main water and sewerage infrastructure and for providing technical support to the municipalities. While DSI is the main executive government agency for overall water-resources development, planning, design, and implementation for cities of more than 100,000 inhabitants, at the user level water supply is undertaken by municipal utilities. Iller Bank supports municipalities in financing, developing, and implementing infrastructure-investment projects, including water supply and sewerage. However, limitations on access to highly subsidised funding have led to delays or interruptions in project implementation by the Iller Bank. In this regard, the option of reforming Iller Bank to enable more efficient transfer of public funds to the municipalities has become an agenda item.

Apart from central government's funding constraints, higher investment needs for the provision of local services have forced municipalities to seek alternative sources of finance. Metropolitan municipalities and their utilities have been encouraged to mobilise their own resources beyond the Iller Bank mechanism and to finance large-scale urban infrastructure investments through foreign loans under the Treasury Guarantee Scheme (TGS). In turn, this has stimulated privatisation initiatives in the delivery of local services in Turkey.

Some of the municipalities that used private financing options also opted to privatise operation and maintenance services in the urban water, sanitation, and sewerage sector, and contracts with the private sector have been concluded, albeit with mixed results. The factors specific to individual local authorities have determined the kinds of privatisation model adopted by them, examples of which are reviewed in the rest of this article.

## Privatisation of urban water and sewerage services: case studies

The involvement of multinational companies in water infrastructure has taken a number of forms, including long-term concessions and build–operate–transfer (BOT) agreements. The largest global water companies owned the water-supply concession for ten years in Antalya, and the operating concession of the Yuvacik Dam was transferred to a global company for 15 years in Izmit (Hall *et al.* 2003: 19–20). In addition, in 2003 the Union of Cesme and Alacati Municipalities (CALBIR) signed a contract with a private consortium to operate and maintain the water supply and sewerage services for a ten-year period.

*The Antalya case*

Antalya was the first case in Turkey where multinational companies were involved in urban water infrastructure, investment, management, and service delivery. In Antalya, the need for a waste-water treatment system became very urgent in view of the city's rapid population growth and significant demand for water during the tourist season. According to the census of the State Institute for Statistics (SIS), the municipal population rose from 602,194 in 1990 to 866,529 in 1997, compared with a mere 53,972 in 1950. See Table 2.

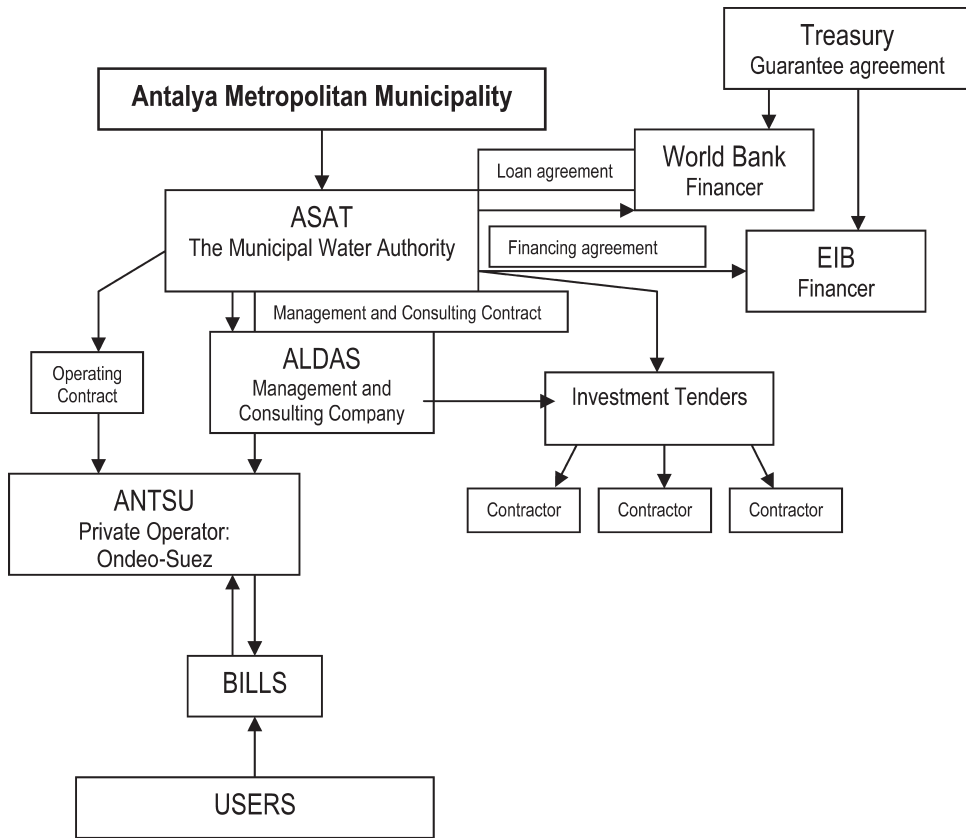
Water supply and sewerage have always presented a serious infrastructure problem in Antalya, where NRW ratios were above the Turkish average. Although various DSI and Iller Bank projects were designed to overcome this problem, the results were disappointing. According to the Gas and Water Statistics, the NRW rate deteriorated from 75 per cent in 1986 to approximately 50 per cent in 1990.

From the early 1990s, environment and sewerage projects appeared on the policy agenda, and loan negotiations were negotiated with the World Bank (WB). A feasibility study was prepared for an alternative model of water and sewerage services in 1992. Discussions were accelerated when Antalya became a metropolitan municipality in 1993. Following the WB's recommendations, the Antalya Water and Public Transport Services (ASO) Directorate became the Antalya Water and Wastewater Administration (ASAT), established along the lines of the ISKI model. The General Directorate of ASAT is now a legal public entity with a separate budget attached to the Antalya Metropolitan Municipality; it is responsible for water-supply and sewerage services in Antalya, controlled and operated from a single centre. Besides the loan agreement signed with the WB, ASAT also secured a loan of 35 million

**Table 2:** Volumes of water produced, water sold, and network loss ratio in Antalya (1986–2001)

Years	Total volume of water produced (m <sup>3</sup> )	Volume of water sold (m <sup>3</sup> )	Water loss rate (%)
1986	40.996.800	10.246.865	75,0
1987	41.627.520	11.717.763	71,9
1988	23.783.400	13.051.331	45,1
1989	23.789.400	14.222.424	40,2
1990	23.809.680	12.413.364	47,9
1991	24.377.328	15.188.006	37,7
1992	27.219.875	16.417.343	39,7
1993	27.219.875	17.239.189	36,7
1994	36.000.000	20.221.449	43,8
1995	37.900.000	22.000.000	42,0
1996	39.725.681	23.725.681	40,3
1997	40.367.970	24.367.970	39,6
1998	72.000.000	25.058.829	65,2
1999	77.305.320	24.886.669	67,8
2000	77.305.320	26.733.758	65,4
2001	73.360.985	26.945.488	63,3

Sources: SIS, Gas and Water Statistics (various years) and Electricity, Gas and Water Statistics (various years)



**Figure 1:** Antalya water-contract organisation

ECU from the European Investment Bank (EIB) for the Antalya Wastewater Project (Kayir *et al.* 1999: 65–7). See Figure 1.

In 1995, six months after the establishment of ASAT, a World Bank loan of US\$ 100 million was obtained by the Antalya Metropolitan Municipality. The preconditions set by the WB included the improvement of water supply and sanitation infrastructure; and the transfer of the monopoly of public-water utility after one year to the private sector in line with the French *affermage* (leasing) model.

ASAT then launched an international tender for the operation of its water services. One of the loan conditions stipulated that ASAT should establish a separate company for administrative and financial services to oversee the tender process. It thus set up the Antalya Infrastructure Management and Consulting Services Company (ALDAS), which was then contracted for a 12-year period to deliver services in the fields of water and sewerage, and collection and disposal of all kinds of solid waste within the boundaries of Antalya Metropolitan Municipality.

As required by the WB, in 1996 ALDAS transferred the water-supply operations to Antalya Water Management Company (ANTSU), which is a subsidiary of ONDEO, part of the Suez group, one of the leading multinationals in the water sector. Following a transition period, in 1997 ANTSU took over the responsibility for providing, managing, and operating water and waste-water services. Under ANTSU the provision of water-supply services was regulated for a ten-year period.



**Table 3:** Water tariffs for household subscribers and numbers of consumers in Antalya (1990–2005)

Years	Annual lowest price (TL/m <sup>3</sup> )	Annual lowest price (\$/m <sup>3</sup> )	Number of consumers
1990	750	0,26	67,850
1991	1,200	0,24	119,027
1992	2,000	0,23	122,225
1993	3,500	0,32	143,828
1994	5,000	0,17	154,598
1995	12,500	0,27	164,968
1996	21,000	0,26	166,748
1997	26,000	0,17	183,957
1998	58,557	0,22	197,839
1999	206,551	0,49	207,287
2000	368,750	0,59	210,773
2001	595,000	0,49	214,709
2002	1,271,136	0,84	226,040
2003	1,538,123	1,03	231,230
2004	1,350,000	0,95	254,925
2005	1,000,000	0,75	263,026

Sources: ASAT Annual Activity Report; SIS Gas and Water Statistics (various years); Electricity, Gas and Water Statistics (various years)

ASAT was expected to set the drinking water and wastewater tariffs on the basis of a minimum profit rate of 10 per cent, in line with the ISKI law and the operator's margins. In the contract, the operator's payment is based on fixed annual tariffs per cubic metre of water paid by the subscribers. Nevertheless, due to the high inflation rate, charges were actually reviewed each quarter (Letondot 2002: 52), so inevitably water tariffs rose. See Table 3.

During 1996–2002, when the private operator was in charge, minimum water tariffs for households rose by 26 cents to 84 cents per cubic metre. This trend continued in 2003 after the withdrawal of the private operator from the contract. Despite the reduction applied to water tariffs in 2004 and 2005, the price of the water was still high, compared with the early 1990s.

In Antalya, water tariffs are determined by IBTs, as in most municipalities in Turkey, which aim to encourage water saving by means of a sliding scale, charging more to those consumers who use more. However, a private company providing the same service will naturally encourage water consumption, since its profit comes from selling water for fixed fees per cubic metre. During the ANTSU period the volume of water attracting the lowest tariff for households was increased from 20 m<sup>3</sup> to 30 m<sup>3</sup> in 2000 and 50 m<sup>3</sup> in 2001, in order to stimulate consumption (Gorer 2003:189).

Although this was beneficial for the urban poor, the benefits were in practice offset by the fact that the operator issued water bills on a bi-monthly basis instead of a monthly basis. From 2004 the limit for lower tariff was reduced to 25 m<sup>3</sup>.

During the ANTSU period, the aim was also to reduce consumption by clamping down on illegal water usage and reducing the volume of free water supplied to collective municipal services such as fire protection, street fountains, street washing, and mosques (Gorer 2003: 190). Although these measures contributed to a fall in NRW, this reduction did not satisfy ASAT,

which was expecting ANTSU also to invest in the renewal of the network. However, the private operator argued that the modest reduction was due to insufficient investment in replacing old and leaking water-distribution pipes. ANTSU argued that ASAT had to invest more in infrastructure. The unclear organisational division of roles and responsibilities and contradictory expectations created disputes and confusions between the two entities.

Before the contract was due to expire in 2007, ANTSU decided to dissolve, in accordance with the provisions of Article 324 of Turkish Commercial Law in 2002, and to seek international arbitration to settle the dispute caused by the unwillingness of ASAT to assume the responsibilities defined in the contract. The reasons for applying international arbitration were stated by the private operator as uncontrollable increases in operating expenses and significant losses due to the misdirected investment, increasing illegal use, and inefficiencies in the network (Letondot 2002: 53–4).

ANTSU demanded compensation of US\$ 30 million from ASAT, which responded by demanding counter compensation of US\$ 40 million under international arbitration. In the first verdict in 2005, both sides were awarded far lower levels of compensation than they had demanded (Kayir and Akilli 2006: 348–50).

Following the dissolution of ANTSU, delivery of the urban water and sewerage services reverted to ASAT, which then introduced new personnel policies resulting in an increase in the number of employees from 50 in 2000 to 350 in 2004.

### *The privatisation of bulk water supply: Izmit Yuvacik Dam*

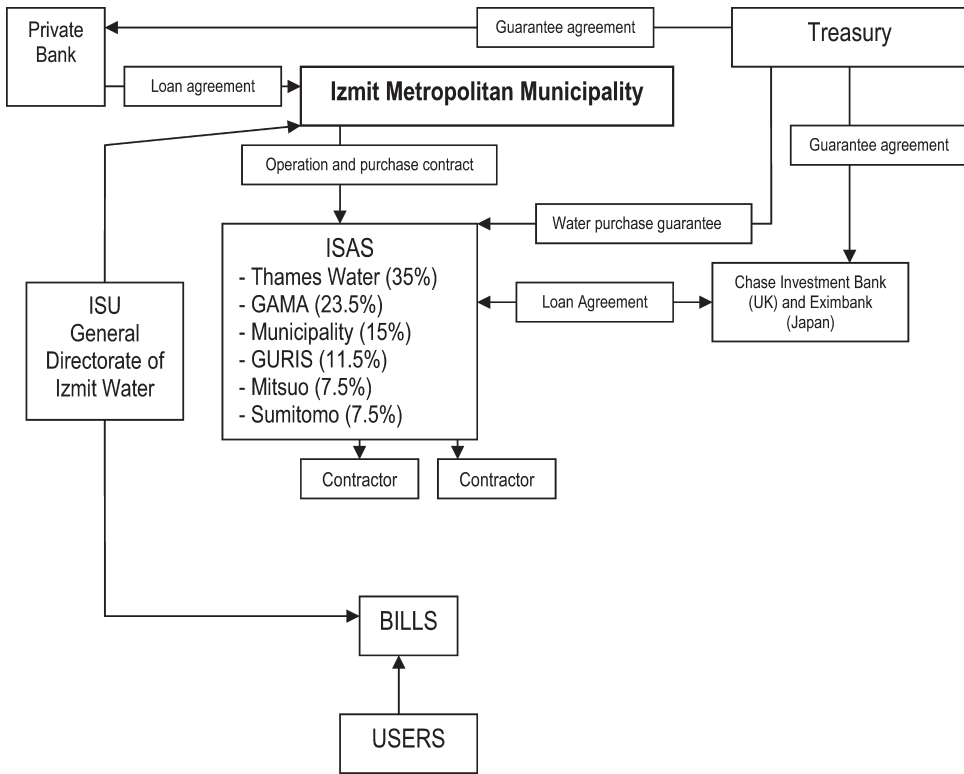
The provision of concessions under the BOT model for dam operation and construction by consortia of companies and private finance institutions forms a predominant pattern for the privatisation of aggregate water supply. The construction and operation of the Yuvacik Dam in the framework of Izmit Urban and Industrial Water Supply Project was the first application of the BOT model in the water sector in Turkey.

As an industrial city and the hinterland of Istanbul, Izmit has witnessed rapid population growth, and consequently the need for water became very serious. According to the SIS census, in 1990 the municipal population was 583,000 and reached 723,000 in 2000 (compared with only 85,000 in 1955).

The history of the construction of Yuvacik Dam goes back to 1972, when the Council of Ministers determined that it was to be implemented by DSI. The Izmit-Kirazdere project planning report was prepared in 1982–1983. The DSI feasibility report stated the aim of producing 142 million m<sup>3</sup> water, of which 100 million m<sup>3</sup> was planned to be transferred to Istanbul at the initial stage. In this context, as a result of the 1986 tender, construction work was started by GAMA Industry in 1987 (Topcu 2006: 303–4).

The water shortages in Istanbul were recognised as one of the most serious political and social problems in 1989–1990. In this period, water was shipped from Yalova to Istanbul and artificial rain was created by ISKI. During the same period, the water shortage became serious also in Izmit, and underground water resources had to be over-used, by industries in particular. The problem had become a top priority for the central government and it intended to solve this crisis by finalising the Yuvacik Dam Project, using the BOT model, to provide water for Izmit, as well as an urgently needed extra source of water for Istanbul. The project, which was initiated by DSI, but not finalised on time, was thus transferred to the Izmit Metropolitan Municipality in 1995.

Izmit Water Company (ISAS) was established in 1995, originally as a joint venture of the Turkish GAMA, GURIS, and the English company Thames Water (bought out by the German energy giant RWE in 2000). Izmit Metropolitan Municipality then became a partner



**Figure 2:** Izmit Yuvacik Dam Water Contract Organisation under the BOT model

of ISAS, as decreed by the Council of Ministers. US\$ 19.5 million foreign debt guaranteed by the Treasury was borrowed by the Izmit Metropolitan Municipality to buy a 15 per cent share of ISAS. Given that the municipality could not repay its debt, the Treasury had to make payment to the financing institution in the framework of the guarantee agreement. In return, Izmit Metropolitan Municipality has become a debtor of the Treasury. In this process General Directorate of Izmit Water (ISU) was established in 1995 as the water and waste-water administration of the Izmit Metropolitan Municipality. See Figure 2.

Izmit Metropolitan Municipality signed an ‘operation and purchase contract’ with ISAS in the same year. In the framework of the contract, the water would be purchased for 15 years at a negotiated price, based on a guarantee that each year 142 million m<sup>3</sup> of water is to be purchased by Izmit Metropolitan Municipality. In addition, for the possibility that the water could not be purchased by the Municipality, the mentioned volume of purchase was guaranteed by the Treasury at the price fixed. Under the agreement, as another condition, an international arbitration process was identified for the settlement of the disputes, even though it was not yet introduced in Turkish law.

The project, which cost approximately US\$ 900 million, is the largest privately financed water-supply scheme in the world (Bennett *et al.* 1999: 9). Credit worth approximately US\$ 786 million, guaranteed by the Treasury, was provided for the project by the leadership of Chase Investment Bank and Eximbank–Export Import Bank of Japan. US\$ 133 million of the total investment cost was provided from own sources. The construction of Yuvacik Dam was completed in 1998 and it became operational in 1999. ISAS as the operator of dam started to provide purified water to ISU’s water storages (Court of Accounts 2002: 11–12).

In the mid-1980s the total volume of annual water production was approximately 20 million m<sup>3</sup>. When Yuvacik Dam became operational, this volume rose to 97 million m<sup>3</sup> in 2000; it gradually increased to 124 million m<sup>3</sup> in 2006. Although the project aimed to provide water to the neighbouring municipalities in 2006, Izmit Metropolitan Municipality had to make water-purchase agreements with the other municipalities in order to provide water to Izmit city.

On the other hand, the NRW rate was under 50 per cent until 1999, when it rose to 72 per cent in 1999, declining to 59 per cent in 2001 and gradually decreasing to some extent in the following years. However, it was still very high compared with European countries. ISU was able to collect bills from the household subscribers at a price of 25 cents in 1999 and 2000. Between 2003 and 2005 the price of water gradually increased to 36 cents, 60 cents, and 67 cents respectively. By 2007 it had reached 73 cents. In 2003, 2006, and 2007, water tariffs were determined by IBTs in Izmit. In this direction, tariff rates were charged as two levels for households: 0–15 m<sup>3</sup> and more than 15 m<sup>3</sup> in 2003. The lowest water charge decreased from 15 m<sup>3</sup> to 10 m<sup>3</sup> in 2006 and 2007.

The plant cost far more than envisaged, and consequently one cubic metre of the water in the dam cost four US dollars. Owing to the high price, the possibility that the water could not be sold became a reality, and industrial users and neighbouring municipalities, mainly Istanbul Metropolitan Municipality, refused to buy water from the plant. Besides, Izmit Metropolitan Municipality had made no provision for paying for the water in its 1999 or 2000 municipal budgets. In this respect, the Treasury as the guarantor of the project had to pay US\$ 387 million in total to the company in 1999 and 2000 (Court of Accounts 2002: 2-4; 33).

In the following years payments were not made to the private operator of the dam, due to the high NRW and the difference between ISU water tariffs and the cost of water per cubic metre. The Treasury reimbursed US\$ 317 million in total between January and September 2004 for the local government repayments, of which 34 per cent, approximately US\$ 108 million, was repaid for the investment guarantee of the Izmit Water BOT project (Undersecretariat of Treasury 2004: 51).

The number of household subscribers, which was 69,000 in 1998, reached 478,000 in 2004. The main reason for this increase was the extension of the responsibility area of metropolitan municipalities, in parallel with the enlargement of their boundaries by a law enforced in 2004. With the introduction of this law, ISU's area of responsibility covered all provincial boundaries of Izmit.

According to Izmit Metropolitan Municipality Annual Activity Reports, the number of the non-metering activities carried out by ISU increased from 41,548 in 2003 to 263,701 in 2006. The issue of NRW had not been a top priority for ISU until 2004. Although ISU focused on this issue recently, the debt level of Metropolitan Municipality increased in the mean time.

The experience of Izmit Yuvacik Dam differs from the case of Antalya, where water tariffs have been the main discussion point. In Izmit the critical issue has been the level of debt owed by the Izmit Metropolitan Municipality to the Treasury, which provided a water purchase guarantee. One of the main targets of the project was not achieved, given that ISU could not sell water to ISKI as planned. As a consequence, ISU was forced to sell water only in its area of responsibility, where the NRW was high and water tariffs were low. Although ISU was able to reduce NRW rates to some extent, the reduction has not been sufficient to enable investments in the dam to be recovered. In this context, before ISU's capacity building is improved and procedures for billing and collection are regulated more efficiently, on-going problems of Yuvacik Dam seem likely to be the subject of discussion until the termination of the private operation in 2014.

*Privatisation via the union of municipalities: CALBIR*

The case of CALBIR has been one of the significant examples of private-sector participation in the operation of water supply and sewerage services via the union of municipalities. A concession similar to the Antalya case was introduced in Cesme–Alacati. The experience of Antalya was taken into account in the design of the Cesme–Alacati Water Supply and Sewerage Project. Although local administration unions have a long history in Turkey, the application of this model for drinking-water and sewerage services became popular in 1990s when municipalities developed close relationships with the IFIs (Guler 1999).

The Cesme–Alacati Water Supply and Sewerage Project was carried out via the Union of Cesme and Alacati Municipalities (CALBIR), established as a legal entity in 1997 by the Council of Ministers in line with the relevant articles of the former Municipality Law No. 1580. CALBIR is responsible for the development, management, and operation of water supply, waste-water, and solid-waste services in Cesme and Alacati; it has the authority to set tariffs for such services. It is managed by a Council, consisting of the mayors of Cesme and Alacati and representatives of the Municipal Councils.

Cesme and Alacati Municipalities are located on the Cesme peninsula about 80 km west of Izmir, Turkey's third-biggest city. They have become an important centre for tourism in the past three decades. The two municipalities have currently a total resident population of about 20,000, which rises approximately to 80,000 during the summer period, with a corresponding increase in demand for municipal services.

The water-supply and waste-water services were inadequate in Cesme and Alacati. Private wells and springs had been the only sources of water until the first municipal water-supply system became operational in 1979. The water-supply and sewerage projects for Cesme were included in the annual investment programmes in 1986 and 1987. Iller Bank developed plans for further expansion of these services in order to meet increased demand. Although Iller Bank began expanding the water system in 1989, the project could not be carried out efficiently with the limited resources available. In this context, the population was not fully connected to the municipal water system, and most households continued to obtain water from private wells. In addition, only about 4 per cent of the population was connected to the municipal sewerage system, while the waste water generated by about 80 per cent of the population was discharged into septic tanks; the remaining population used private sewage-treatment plants. Although most water connections were metered, physical and commercial water losses were high, at around 68 per cent of production (World Bank 1998: 7–8).

It was in these circumstances that WB loans were negotiated; as a precondition, the management, operation, and maintenance of the water-supply and sewerage services were transferred to the private operator. The feasibility study for the Cesme–Alacati Water Supply and Sewerage Project, financed by a Japanese grant, was carried out by the British consultancy firm ACER. In addition, the Ministry of Tourism played an important role in preparing the project, in co-ordination with the municipal authorities.

The US\$ 13.1 million loan agreement between the WB and the CALBIR was signed in May 1998. The total project budget was expected to be US\$ 24 million, including co-financing by the Ministry of Tourism and the CALBIR (US\$ 5.5 million and US\$ 5.4 million respectively). The actual figures were US\$ 8.3 million from the WB, US\$ 6 million from the Government of Turkey, and US\$ 1.9 million from the CALBIR.

The mayor who signed the loan agreement lost the municipal elections in 1999. The new mayor was not supportive of a private operator, and the process was slowed down. The contract, originally to be signed in 1999, was finally signed four years later. The CALBIR signed a contract in 2003 with a private consortium consisting of the French firm *Companie Générale des*

Eaux in a joint venture with a Turkish firm, Tekser Construction, to operate and maintain the water-supply and sewerage services for a ten-year period.

CALBIR provided all water and sewerage services through the private operator ALCESU, which is now part of a consortium of Veolia Water and Tekser Construction. The cost of the services provided has been covered by the tariffs and other operational revenues of the water and sewerage services, and paid on the basis of volume of water sold and the bill collection ratio.

Private-sector participation in CALBIR has various characteristics. First, the WB project failed to reach all its expectations. As mentioned in the WB's implementation-completion report, the bid prices were roughly twice as high as expected. According to the WB, the reason for the high bids was the private sector's perception of the increased risk posed by the 2001 economic crisis in Turkey and the withdrawal of the private operator in Antalya in 2002. In addition, the union was rather too small to enable an international operator to make the projected earnings. Second, despite expectations of increasing the percentage of water billed against production, reducing physical losses, and improving commercial practices, the project failed to reach some of these targets. In Cesme and Alacati only about 32 per cent of the water was billed – the combined result of physical losses, water provided free of charge, and inadequate consumption metering. It was planned that the NRW rate would be reduced from 68 per cent in 1997 to about 44 per cent by 2005, but in fact it gradually decreased from 75 per cent to 65 per cent over the period 1999–2003. The NRW rate was calculated as 57 per cent in 2004 and 56 per cent in 2005, both above projections (World Bank 2005).

The project had intended to introduce higher water tariffs during the tourist season. However, the new mayor refused to apply such increases. The average tariff per cubic metre was 72 cents in 1997. This amount gradually increased to 81 cents, 91 cents, and US\$ 1.18 in 1998, 1999, and 2000 respectively, rising to US\$ 1.55 in 2004 and 2005. Drinking water costs even more in Cesme and Alacati than in Izmir, Istanbul, and Ankara.

## Concluding remarks

Private-sector participation in the urban water and waste-water sector has become an alternative model for finance and operations in Turkey in cases where providing these services has exceeded the financial capacity of the central government organisations and municipalities. In each case, privatisation has been pursued only when on-going projects were already experiencing delays. In this context, private-sector participation through contracts with multinational corporations is introduced in the framework of investment projects. One of the most important components of such projects has been the transfer of the operation of water and waste-water services to the private operator.

The involvement of multinational corporations in urban water and waste-water services has taken a number of forms, including concessions and BOT agreements. While as a BOT agreement the Izmit Yuvacik Dam is to date the world's largest privately financed water-supply project, the cases of Antalya and CALBIR are similar to the French *affermage* model. Leading multinational corporations such as Thames Water, ONDEO, and *Companie Générale des Eaux* are involved as operators in the water and waste-water sector. In addition, multinational corporations usually establish joint ventures with the specialised domestic building firms that focus only on the construction works.

Private-sector participation in the water and waste-water sector has had mixed results. The unclear organisational division of roles and responsibilities and contradictory expectations have created disputes and confusion between local decision makers and private operators. The expectations of the respective parties have not always run parallel to each other. Although

government and local decision makers trust that urban infrastructure-investment needs will decline through the involvement of private finance, it has proved difficult to reduce the technical losses caused by leakages in network pipes because of the lack of public investment in their maintenance. Administrative losses declined to some extent with the private operators, but the water and waste-water services were not provided efficiently in the absence of adequate municipal infrastructure. In this regard, the investment responsibilities of public authorities should be clearly determined in the contracts.

Over and above private finance, Turkey needs public investment to improve the urban water and waste-water infrastructure, and perhaps also national public regulators to set the tariffs and establish nationwide investment needs. To date, the evidence is that the privatised provision of urban water and sewerage services does not in and of itself provide long-term solutions to the need to invest in municipal infrastructure.

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