



## Potable Water Tariffs in Mexico City: Towards a Policy Based on Demand Management?

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**ABSTRACT** *This paper evaluates whether potable water tariffs in Mexico City<sup>1</sup> are directed towards the administration of demand management, or whether they are primarily a continuation of historical policies which have always put the main emphasis on supply management. The paper also reviews some technical aspects of tariff-related issues in Mexico City, as well as the situation at the national level.*

### Introduction

This research was carried out between April and September 2002, through the collection of documentary and statistical information and interviews with different officials. The interviews were conducted on the basis of a semi-structured questionnaire that considered issues such as the institutional situation of the water supply throughout the preceding decade, the tariffs and the costs.

The hypothesis underpinning the research is that while significant changes were made in pricing policies in the 1990s, they never fully achieved the characteristics of a change towards demand management. This is because the tariff structure was never designed in a rational manner, and the exact cost of the water remains unknown, as does its relationship to the average tariff. Yet that relationship is fundamental in establishing the dimensions of each range of consumption and is the key criterion in assigning the corresponding price. Nor, at an institutional level, has sufficient progress been made in creating a body that could integrate all the attributes relevant to the management of potable water and that could, on the basis of precise knowledge of the income and expenditure, establish a coherent tariff structure which would contribute to water conservation while taking account of all the social, economic and political restrictions that characterize Mexico City, the nation's most important urban centre.

### Tariffs in Mexico

Water began to be regarded as an economic asset from the beginning of the 1990s. Various laws have been passed with the aim of lowering the level of subsidies, achieving economic self-sufficiency of the utilities, and establishing prices as a function of the relative scarcity of water and of the real costs of

storage. Another objective was the promotion of private-sector participation in the management of water systems (Martínez Omaña, 2002). In the early 1980s, the water rights system was introduced to use national waters at rates which varied in accordance with regional availability and specific activity. In the case of water utilities, these charges ought to have been a reference for the establishment of tariffs. This, however, was not to be, as we will see later. In institutional terms, these changes formed part of a long process of decentralization in which responsibility for the management of potable water services was transferred to municipalities. By the end of the 1980s, autonomous utilities were set up to manage the service, a trend that was consolidated by the establishment in 1989 of the National Water Commission (CNA). The new utilities lacked technical capacity, had very low tariffs and equally low rates of revenue collection. It was decided that the water utilities would be strengthened administratively, and they would be given legal capacity and their own capital so as to convert them into decentralized bodies at the state or municipal level. Their boards, rather than local legislatures, were given the power to set tariffs that took account of their financial needs and the costs of the service, and they were given the right to cut off the service to non-payers. By the end of the 1990s, substantial legal changes had placed 77% of the nation's potable water systems under municipal control; in 95% of them, tariffs were fixed by the municipality or the water utility; about 85% of the potable water systems had authority to grant concessions; and 56% were empowered to cut off the service to non-payers (MBIA-Capital Advisors, 1999, p. 36).

Despite these legal changes, the pricing policy for potable water continues to face a crisis. In 1991, metering was introduced nationwide as the basis for charging in place of a system of fixed quotas. The tariff system was established in incremental blocks, with a minimum and maximum consumption set for each of them, and each user was to be charged in accordance with the metered consumption. Tariffs were normally applied in accordance with ranges of consumption and with the type of user: domestic, commercial and industrial. However, even 10 years later, the tariff structures still contain serious limitations, among which are a wide variance between minimum and maximum consumption levels; in the setting of the minimum level itself; and in the price charged per cubic metre. The width of the minimum consumption band is still very variable: in Monterrey and Mexico City, it varies from zero to 10, while in Tlaxcala, it runs from zero to 30. The same goes for the price per cubic metre which ranges from 0.3 pesos in Monterrey to 3.7 pesos in Pachuca, and for the volumes and prices applied to the maximum levels of consumption (Table 1).

Wide differences also exist in the timescale over which tariffs are adjusted. According to the CNA (2001a) tariffs rose between 1999 and 2000 by 41% in Aguascalientes, 25.7% in Guadalajara, 27.1% in Guanajuato, 19.4% in Mexico City, 59.5% in Pachuca, and 10% in Guadalajara. In Monterrey, there was no increase, and in Puebla tariffs were cut by 29.8%. This erratic behaviour of tariffs at a national level has been attributed to differences in the availability of water and in operating costs, as well as to the pricing policies of local governments. In addition, it should be pointed out that there seems to be no methodology to establish the criteria and procedures necessary to develop the structures. Another factor is that few of the utilities have met their obligations under the 1982 ruling that established payments for the use of national waters in accordance with regional availability, and the use to which the water was put, with the aim

**Table 1.** Minimum and maximum tariffs of potable water for domestic consumption for some cities in Mexico, 2000

City	Minimum		Maximum	
	Range (m <sup>3</sup> )	Cost (pesos)	Range (m <sup>3</sup> )	Cost (pesos)
Aguascalientes	11–20	3.6	76–100	56.1
Guadalajara	0–17	0.9	250 +	15.0
Guanajuato	14–20	3.3	191 +	9.2
Monterrey	1–10	0.3	191–200	23.1
Distrito Federal	0–10	1.2	1500 +	29.0
Pachuca	0–15	3.7	15 +	6.1
Puebla	0–15	2.3	40–50	6.3
Tlaxcala	0–30	2.4	501 +	18.0

Source: CNA (2001).

of recovering the costs of administration, planning and investment. As a result, the payment of rights has been of no use as an obligatory reference in determining tariffs. In general, the tariffs are not sufficient to cover the overall costs of the utilities, and even less so if the costs of wastewater treatment is included. By the mid-1990s, of an approximate supply cost of 240 pesos per cubic metre, tariffs recovered only 40 pesos. Of each 100 litres delivered for distribution to consumers, only 60 reached their destination because of the poor state of the networks; 40 were invoiced and only 30 were paid for (Bitrán, 1999). At the national level, the average tariff is 3.50 pesos per cubic metre, while the breakeven point that would cover all expenses, including investment in potable water and treatment, would be 5.90 pesos (CNA, 2001b, p. 146).

The income of the utilities is a function of the tariffs and of the efficiency of the infrastructure, the administrative and commercial systems, and, because of the weak organizational level, in general efficiency is low. According to Bitrán (1999), the commercial efficiency of the utilities, measured as a coefficient of water that is paid for, and water supplied to the locality, in general is between 40 and 50%. Few utilities have achieved the organizational requirements, as in the cases of León, Monterrey, Querétaro, Tijuana and Culiacán, where the commercial systems include a constantly updated register of users, billing systems, contracts for service provided, promotion and publicity, metering and tariff systems (Rodríguez, 2002).

At a national level there is little sign of a major switch towards relating changes progressively to the volumes consumed or of coherent progress towards a common methodology that sets minimum and maximum levels of consumption, the amount to be charged per cubic metre, and when and on what basis tariffs are to be adjusted. As a result, funds are insufficient to ensure the healthy development of potable water and sanitation systems, most of which function barely enough to meet their operating and maintenance costs. The water utilities are also highly dependent on government subsidies when they carry out works to expand their services. Another key aspect, which prevents tariffs from being an instrument with which to administer demand, is the lack of organizational

development of the utilities, which translates into technical and commercial management that leaves much to be desired.

### **Water Strategy for Mexico City**

The focus of this section is on domestic use which, according to the Mexico City Water Commission (CADF), accounted in 2001 for 54% of a total estimated at 1.104 billion cubic metres, including 34% of losses. During the 1980s, it became obvious that the volume of the Lerma river was insufficient to meet the demand of water. A decision was taken to bring more water from the Cutzamala river in a project that won international financial backing on condition that the city administration: (1) introduced metering for all outlets; (2) established a system of charging in accordance with the volume consumed; and (3) took action to detect and correct both visible and invisible leaks that were leading to a 30% loss of the whole water supply. Legislation was enacted to establish a tariff that would rise in accordance with consumption, and the Programme for Efficient Water Use (PUEDA) set about the task of installing meters in homes and small businesses. The installations, however, were later suspended (Martínez Baca & Martínez Baca, 1999) because of problems of coordination among the different institutions, lack of funds, and the reluctance of users to switch to a system that would cost them more money (Haggarty *et al.*, 2001). Given the PUEDA's failure, at the end of the 1980s, it was decided to establish a series of measures based on the concept of water as an economic asset and on private sector participation in provision of potable water service (Linares, 1990).

It was not until 1992 that a strategy was launched in an effort to promote a profound structural change in water management. Officials reasoned that water could no longer be regarded as public property to be subsidized by the State, but as an economic asset subject to the rules of private property. Emphasis was placed on the need to eliminate subsidies because on the one hand they encouraged waste and, on the other, because they were proving a barrier to expansion of the service to the neediest social sectors. Schemes were proposed to encourage private-sector participation in various stages of the water cycle (CADF, 1993, pp. 2–3). The Federal District (or Mexico City) Water Commission (CADF) was established by presidential decree on 14 July 1992 as a decentralized administrative body that would take overall charge of provision of the public potable water service, drainage, and treatment and recycling of residual water (CADF, 1993, p. 7). The objectives of the CADF are to provide, either itself or through third parties, the public potable water service for industrial, commercial and domestic use; drainage; and the treatment and recycling of wastewaters in Mexico City. Its other responsibilities are to manage, operate and conserve the infrastructure necessary for these services and for any others that the city administration assigns to it (CADF, 1995, p. 4).

The then administration considered it necessary to eliminate the participation in water issues of the wide range of diverse bodies and their consequent overlaps, and to establish the foundations of a system that would balance the sector's finances in the medium term, so achieving better coordination between the functions of distribution and billing with appropriate incentives that would help to balance spending with income. To this end, an institution would be created that, itself or through third parties, would provide the public potable water service, drainage and the treatment and recycling of residual waters and

would operate, manage and maintain the necessary infrastructure (Beristain, 2002). This author maintains that a decision was taken to delay creation of the new body for fear of possible labour disputes, natural resistance to change and a concern over the possibility of a sharp initial fall in income. Instead a partially autonomous body was created in the hope that it would evolve in the medium term into a fully decentralized institution that would take control of all aspects of water management. The justification that was finally presented for the legal and administrative modality was: (a) conversion of water dues into tariffs made this aspect easier to update and administer; and (b) water programmes would be made more financially self-sufficient by linking spending to the income from the sectors (Beristain, 2002, pp. 6–7). The creation of the CADF meant the beginning of a new water strategy for Mexico City whose aim was to ensure the ecologically sustainable supply of potable water on the basis of enforcing metered consumption for all and a drastic improvement in the distribution networks.

To this end, officials decided to promote participation of private companies which could contribute capital and modern technology (CADF, 1993). The first tender inviting international bids for the provision of services under the control and responsibility of the city authorities was published in 1992. A three-stage plan was drawn up as a means of gathering the necessary information before advancing to a contract with performance-based incentives. The three stages, which were envisaged as taking 10 years in all, were: (a) the development of the infrastructure needed for measurement (updating of the users' register, installation of meters and valuations of the potable water and drainage systems); (b) the operation of the commercial system; and (c) the operation, maintenance and rehabilitation of the potable water and drainage systems. During the initial stages of the plan, while information on the system was being gathered, contractors were to be remunerated for specific tasks, such as the installation of meters and the printing of bills, while in the final stage, payment was to be based on a formula that established a price differential between the water supplied to the contractor and the income from its retail distribution, at the level of the authorized tariffs (CADF, 1995, p. 6). The city was assigned to four Mexican companies associated with leading transnationals in the potable water sector.<sup>2</sup> The idea was to avoid the creation of a monopoly and encourage competition (Martínez Omaña, 2002) through the use of an economic regulator based on benchmarking (Beristain, 2002; Haggarty *et al.*, 2001).

### **The Potable Water Pricing Policy**

Strictly speaking, the change in potable water pricing policy can be traced back to 1989 when the then administration made a major readjustment of tariffs, establishing differences between the rates paid by domestic and non-domestic users, and instituted payment by volume consumed in place of a fixed charge (Centro de Investigaciones Económicas, Administrativas y Sociales (CIECAS), 2000, p. 35; Linares, 1990). In addition, the administration ordered the annual revision of tariffs as a means of defending the system's finances. Since 1994, the city legislature (the Legislative Assembly of the Federal District) has been empowered to carry out the annual review as part of a political reform in which the city government, previously a department of the federal administration, was granted autonomy.

In place of a budget imposed by the central government, the City legislature was given powers to set an annual budget, and water tariffs formed part of it. On the basis of these reforms, a tariff structure was established in 1993 with the following characteristics: (a) where consumption was measured, the tariff structure was progressive, with an exception for the first range of consumption of 10 m<sup>3</sup> for domestic users and 8 m<sup>3</sup> for non-domestic users; and (b) where fixed quotas were charged, they were based on valuations of the neighbourhood in which the property was located in the case of domestic users; for the non-domestic sector it was based on a range of 15 diameters of take-up point. It should be noted that consumption could only be measured by the installation and reading of meters, and that constituted a problem since 70% of homes and 20% of other establishments had no meter. Because of budget shortages, the meters that had been installed had not received maintenance and their accuracy was questionable. As a result, the law kept alive the possibility of charging by fixed quotas (Martínez Vaca & Martínez Vaca, 1999), and the metering system had little impact because of the commercial deficiencies; meters were read twice a year to estimate bills that were sent out every two months. This tariff structure lasted until 1996. However, the biggest increase in income was thanks to progress in the installation of meters in homes and the launch of a system based on their readings from the fourth quarter of 1995.

The new system proved unpopular with users, above all those who had been paying very low fixed charges in their homes (Martínez Vaca & Martínez Vaca, 1999), not least because it coincided with a new adjustment of tariffs that aimed to bring them back to the levels before the 1994 financial crisis and subsequent devaluation of the peso (CIECAS, 2000, pp. 35–36). As a result of protests, the authorities decided to modify the system in order to avoid sharp changes in the amounts payable on rising from one range to another and to benefit those who consumed less than 90 cubic metres every two months. That level was chosen because 90.6% (1 602 700) of all consumers fall within it and because the World Health Organization reckons that 90 cubic metres is sufficient over two months for a family of five on the basis of 300 litres a day. An additional quota was established per cubic metre consumed in excess of the lower limit (Martínez Vaca & Martínez Vaca, 1999). From 1993, the Mexico City Water Commission (CADF) had been given faculties to cut off domestic users who failed to pay on time (CADF, 1993, p. 8).

In 1996, the City government, together with the CNA and the government of the State of Mexico, signed an agreement with the Inter American Development Bank (IADB) to finance improvements to the water system, according to the CADF. Under this agreement, which led to the creation of Trust 1928, the City administration promised to improve the system's efficiency (in physical, metering and charging terms) within 10 years. The agreement established that, during the first stage the tariffs had to be readjusted (a) with efforts to help the city's inhabitants to adapt to a system of charging based on the amount consumed and not as a straightforward increase in tariffs; and (b) taking into account the purchasing power of users. To this end, the aim was to keep tariffs steady in real terms for the following five years, after which increases would be 10% a year in real terms.

### **Results of the New Strategy**

The change in water pricing policy that was launched at the beginning of the 1990s is obvious, and it forms part of a bigger change regarding management of

potable water in Mexico City. In the first place, the tariff has been established in incremental blocks so that charges are based on measured consumption and not, as before, on fixed quotas (Table 2).

The tariff structure has been modified several times in order to establish consumption ranges based on historical information obtained from the meters. The aim is to avoid sharp jumps in consumption that would inevitably be followed by substantial increases in the amounts billed. Subsidies are still in place, but they are of a different type. The general subsidy on operating costs has been kept. Between 1996 and 2001, average tariffs fell in real terms by 34.7% as the government strove to avoid affecting the personal finances of users, particularly those on low incomes. Nevertheless, income from the service has increased by 66.8% in real terms thanks to greater physical and commercial efficiency; the volume of water sold over the period rose by 147.2% (Table 3). The tariff structure of incremental blocks allows for the redistribution of income among and within groups of users; in other words, cross-subsidies. Real tariffs for small domestic consumers have fallen significantly, while those for large consumers have risen substantially. The tariff for those in the 10.1–20 cubic metres range fell in real terms from a base of 100 in 1996 to 73.4 in 2002, a 25.6% drop, while that for those in the 660.1–960 cubic metres range rose in real terms by 1154% (Table 4). At the same time income was transferred from groups of non-domestic users to the domestic sector (Haggarty *et al.*, 2001, p. 35).

The present tariff policy has eliminated the payment exemptions previously granted to specific social sectors and institutions. The exemptions were officially abolished at the beginning of the 1990s but only now has the measure been put into practice. As part of the updating of the register of users in the mid-1990s, the CADF began to ask various government institutions (public sector organizations and companies, hospitals, universities and so on) to pay off their debts. In general, the request was met with a favourable reply. Most institutions have paid off their debts and are keeping up with current payments. Only one exception persists: pensioners, on request, are granted a discount for a year at a time.

Nonetheless, the pricing policy needs to be clear, more transparent and more understandable so that users can know how to meet the basic objectives being sought: efficiency, fairness, and the recovery of costs. In the first place, there is no precise information on the cost per cubic metre of water (Aguilar, 2002), although it is calculated at eight pesos (Martínez Santoyo, 2002). Secondly, there is no precise information on how the average tariff is covering operational costs (according to the CADF, it covered 50% of costs in 2001). Thirdly, nobody knows the way in which income is redistributed between and among the various sectors on the basis of different prices per cubic metre for each stratum of consumption. It must be said that what is missing in all this process is a tariff study that would, on the one hand establish the cost of the service and, on the other, design the tariff structure in accordance with the levels of consumption.

According to interviews with officials, none of the administrations in charge of potable water since 1988 has carried out a study that could form either the basis of a tariff structure or of the annual adjustments. As a result, the increases in tariffs at the end of the 1980s were essentially an attempt to bring in more money to boost the finances of the water system after the hit they took from the inflation of the preceding years. The 1996 adjustments were made for the same reason, though to a lesser extent. However, what stands out in both cases is the

**Table 2.** Administration of tariffs for potable water in Mexico City before and after the implementation of the ‘New strategy for water in Mexico City’

	Before the strategy	After the strategy (from 1992)
Different users	No	Yes, domestic and non-domestic
Payment	Fixed quotas	According to consumption
Adjustments	Variable	Annual
Criteria to update prices	None	Inflation rate
Administration responsible	Mayor of Mexico City	Legislative Assembly
Subsidies		
a) Groups of users	<ul style="list-style-type: none"> <li>• No</li> </ul>	<ul style="list-style-type: none"> <li>• Yes</li> </ul>
• Domestic		• Yes
• Non-domestic		• Yes
b) Exemptions	<ul style="list-style-type: none"> <li>• Yes</li> </ul>	<ul style="list-style-type: none"> <li>• No</li> </ul>
c) Operational costs	<ul style="list-style-type: none"> <li>• Yes</li> </ul>	<ul style="list-style-type: none"> <li>• Yes</li> </ul>
Exemption of payment	Lower consumption groups, pensioner, public schools, government and army offices.	No. Discounts to pensioners upon request (annual renewal).
Financing	Federal Government	Mexico City Government
Cut-off of the service	Prohibition by Ministry of Health	To non-domestic users
Institutional arrangements	There is no single water utility. Institutions involved: DGCOH, Treasury, Delegaciones, Delegaciones.	There is no single water utility. Institutions involved: DGCOH, Treasury, Delegaciones <sup>a</sup> , CADF and private sector.

Source: Field work, Mexico City, May–September, 2002.

<sup>a</sup> Delegaciones = political and administrative entities in Mexico City.



**Table 3.** Income and average tariff for potable water, Mexico City, 1996–2001

Year	Nominal income (million pesos)	Real income (1996 prices, million pesos)	Real index (1996 = 100)	Nominal tariff (pesos/m <sup>3</sup> )	Real tariff (1996 prices, pesos/m <sup>3</sup> )	Real index (1996 = 100)	Volume of water sold (million m <sup>3</sup> )	Index (1996 = 100)
1996	1080.0	1080.0	100.0	4.9	4.9	100.0	218.5	100.0
1997	1508.3	1303.4	120.7	4.3	3.7	75.8	350.8	160.5
1998	2053.5	1496.1	138.5	4.5	3.3	67.5	452.1	206.9
1999	2504.9	1624.8	150.4	4.8	3.1	63.7	520.3	238.1
2000	2788.4	1660.0	153.7	5.2	3.1	62.8	539.3	246.8
2001	3159.9	1801.9	166.8	5.6	3.2	65.3	540.2	247.2

Source: CADF (2001); Banco de México (2001).

**Table 4.** Real index of the evolution of tariffs in the domestic sector depending on consumption, Mexico City, 1996–2002 (1996 = 100)

Consumption in m <sup>3</sup>	1996	1997	1998	1999	2000	2001	2002
10.1–20.0	100.0	96.0	81.0	82.9	76.1	72.9	73.4
20.1–30.0	100.0	172.8	169.4	162.6	149.4	143.1	144.2
240.1–420.0	100.0	293.0	275.5	292.7	306.6	319.7	322.7
420.1–660.0	100.0	582.1	613.3	653.6	684.5	714.0	720.7
660.1–960.0	100.0	978.7	1049.9	1138.1	1192.0	1243.0	1254.7
Number of strata	10	12	14	14	14	14	14

*Source:* Gobierno del Distrito Federal, 1996–2002. Table based also on data from the National Index of Prices for the Consumers, Bank of Mexico (at an annual inflation of 4% for 2002) (Banco de México, 2001).

absence of a study of the sensitivity of the system to both prices and income. That is, there were no estimates of elasticity of demand to prices and income as the basis for decisions to raise tariffs. However, so far the new tariffs policy, together with the rehabilitation of the infrastructure and the strengthening of the commercial apparatus, has led to an improvement in the finances of the potable water system.

According to the CADF (Table 5), between 1996 and 2001 major progress was made in water management. Physical efficiency appears to have risen from 62.6% to 69.2%, with a correspondingly notable drop in water losses.<sup>3</sup> Over the same period, the efficiency of measurement has risen from 49.1% to 90.1% as a result of the installation of meters and the switch from a system based on fixed quotas.<sup>4</sup> Collection efficiency has risen from 19.9% to 51.8% thanks to progress in updating the register, billing and collection. (According to the agreement with the IADB, physical efficiency should have reached 70% in 1996 and maintained that level thereafter; efficiency in measurement should have risen each year, reaching 95% in 2001; and collection efficiency should have increased to 72% by 2000 and 90% by 2006). Overall efficiency, measured as the product of these three indicators, rose from 19.9% to 51.8%, a huge increase compared with estimates of 10% at the end of the 1980s.

Any evaluation of these achievements in water management must underline something that is both novel and controversial: the participation of the private sector in the commercial sphere and not simply in carrying out public works, where it has always been present. It should be noted that privatization of water management has not been achieved because responsibility for operation and maintenance of the secondary network has not been transferred from the DGCOH (Dirección General de Construcción y Obras Hidráulicas) to the CADF, which was then to have handed it on to private companies that would buy water in blocks. This is a topic that goes beyond the aims of the present investigation, but fieldwork identified two aspects worthy of debate. The first is that the type of payment agreed with the companies for each activity includes different cost structures for the same activity (billing, for example). The second aspect is the relationship between the companies and users: the companies apparently have been accused of high-handedness in dealing with customer complaints on amounts billed and meter readings. Compared with what went before, major progress has been made on tariff policy. However, much less has been achieved

**Table 5.** Efficiency indicators for potable water management, Mexico City, 1996–2001

	1996	1997	1998	1999	2000	2001
<i>Relative data</i>						
Physical efficiency <sup>1</sup>	62.6	63.0	64.5	66.3	68.0	69.2
Measurement efficiency <sup>2</sup>	49.1	80.0	86.0	88.5	90.3	90.1
Collection efficiency <sup>3</sup>	64.8	63.5	76.0	64.3	79.3	83.1
Global efficiency	19.9	32.0	42.1	37.7	48.7	51.8
<i>Absolute data</i>						
Physical efficiency						
Water delivered (million m <sup>3</sup> )	686.6	690.6	691.9	720.2	752.8	752.2
Water produced (millions m <sup>3</sup> )	1096.9	1096.1	1072.8	1086.3	1107.0	1087.0
Measurement efficiency						
Number of users with bills (thousand)	1477.5	1620.2	1644.0	1681.1	1720.0	1769.1
Micro-meters installed (thousands)	737.2	1051.6	1137.3	1187.1	1228.6	1255.9
Number of bills with meters (thousands)	725.6	1260.6	1408.3	1505.1	1552.8	1582.7
Number of bills produced (thousand)	1478.2	1575.7	1637.6	1701.2	1720.0	1756.0
Collection efficiency						
Water paid (billion pesos)	1.1	1.5	2.1	4.6	2.8	3.2
Water billed (billion pesos)	1.7	2.4	2.7	7.2	3.5	3.8

*Notes:*<sup>1</sup>Volume of water delivered/Volume of water produced<sup>2</sup>Number of bills with meters/Number of bills produced<sup>3</sup>Water used/Water billed*Source:* CADF (2001).

at the institutional level. A large number of dependencies (DGCOH, the city treasury, the boroughs, CADF, the National Water Commission and the Valley of Mexico Administration) continue to be involved in the water system of Mexico City, yet there is no precise definition of the functions for which each is responsible. The result is an overlapping of functions and waste of resources. There is no overall vision of the system, from the harnessing of the water to the collection of bills in the case of potable water, and from collection through treatment and final disposal in the case of residual and rainwater (Martínez Vaca & Martínez Vaca, 1999, p. 262). The dispersion and overlapping of functions of the previous stage have yet to be overcome. The CADF was to have been the institution in overall charge of the basic functions of operation and maintenance of the secondary network as well as the commercial aspects. In practice, however, even more bodies have become involved in provision of the service. The CADF does get involved in maintenance of the secondary network, but so, too, do the DGCOH and the boroughs, though the intention is to phase out their participation. The CADF directly administers the billing of 'major users'<sup>5</sup> while the rest of the register is left to contractors. However, all the money recovered goes straight to the treasury, a dependency of the financial department of the city government, underlining the lack of financial autonomy of the CADF.

In addition, from July 2000, the CADF has become an auxiliary entity of the treasury for fiscal purposes by a decision of the legislative assembly. As a result, the CADF now depends on the Department for Public Works with regard to technical questions and on the finance department for fiscal issues. The result of this dispersion and overlapping of functions is that it remains difficult to have

an overall vision of the water problems of Mexico City. In terms of tariff policy, this means that there is no rational structure, nor precise information on the type and amounts of the expenses that ought to be included in cost estimates. Nor is there clarity regarding the relationship between tariffs and costs or on the cross-subsidies within and among different sectors. Information is also lacking on the criteria that underlie the subsidies, and on exemptions from payment, provided to institutions, such as the government and universities. Progress has to be made on building a single body for management of potable water in Mexico City.<sup>6</sup> Such a body should have financial and administrative authority and powers, currently in the hands of the legislative assembly, to define the structure and adjustment of tariffs. This body would also need to involve consumers in water management by appointing representatives of society as a whole to its board.

### **The Debate on Adjustment of Tariffs**

Before concluding, we should return to the question of the commitments established with the IADB in 1996 on the adjustment in tariffs. The issue is both important and topical. Under the terms of the agreement, tariffs were to have been raised by 10% a year beginning in 2001, but there are opposing views on what should be done. On the one hand, there are those who support the measure with the argument that it would put a necessary brake on waste and improve the finances of the water system. On the other hand, there are those who oppose the decision.

A document drawn up by the Mexico City Finance Department (*Secretaría de Finanzas del Distrito Federal*, 2002) maintains that a real increase in tariffs would be ill-advised because, rather than restrain consumption, it would simply lead to an increase in non-payment. The same document maintains that the current tariff structure meets the objectives of efficiency and fairness. In 2001, the inhabitants of Mexico City were in fifth place nationally with a per capita water payment of 351.1 pesos per cubic metre, 80% more than the 197.2 pesos paid in the rest of the country; and compared with the adjoining municipalities of the State of Mexico, those in the Federal District whose consumption is low pay less, but as the volume consumed grows so does the amount paid by comparison with those in the adjoining municipalities. The same document argues that in 1997, despite an average increase in tariffs of 40 times by comparison with the previous year, collection grew by only 15.5% in real terms. As a result, the document recommends that tariffs should not be increased by more than the inflation rate: to do so, it is argued, would hurt low-income groups and encourage late and non-payment.

Another factor that would make it difficult to impose the IADB accord is that what Mexicans call the 'no-pay' culture. The refusal to pay debts is deeply embedded among the inhabitants of the City, at least in part because of the succession of economic crises and the State's tradition of wiping the slate clean in order to retain the loyalty of citizens who have been regarded as clients. Martínez Santoyo (2002, p. 42) maintains that "in any fiscal period the payments do not necessarily correspond to that particular timescale but to previous years. In general terms, the percentage of delinquency varies from year to year, but one could say that between 30 and 40% of users never pay at all". Those who oppose tariff adjustments maintain that "first, the house has to be put in order". By that they mean the recovery of the CADF's 6 billion pesos bad-debt portfolio, which

amounts to more than double the 2001 income from provision of potable water. There is a positive precedent for this standpoint: a 1999 debt-recovery programme that was aimed at major private and state users proved to be largely successful.

## Conclusions

Policy on potable water tariffs in Mexico City has changed significantly in recent years from a focus based on the concept of water as public property to one that considers it an economic asset. This change has led to efforts to eliminate subsidies, make the operators financially autonomous and encourage participation by the private sector. Under the umbrella of the new market-orientated focus, the city authorities launched the 'New water strategy for Mexico City' which aimed, with the help of the private sector, to make the use of meters universal and get rid of subsidies as a way of discouraging waste and improving the collection of receivables. The tariff system has been restructured to establish various bands of consumption and a charge for additional consumption within each of them. Differentiated levels and readjustments of the tariffs permit the existence of crossed subsidies that favour lower-income groups. Increases in the tariffs have been insufficient to maintain them in real terms but, together with improvements in infrastructure and in commercial management, they have generated substantially more income. However, tariff policy is not sufficiently transparent: there is no precise information on the cost of water or on its relation to the average tariff, nor on how the subsidies function within and between different sectors. But what gives most cause for concern is the absence, thus far, of a tariff study which estimates the real costs of the service and which could provide the basis for a rational design of the tariff structure. On the institutional front, functions continue to be dispersed, despite the intention of turning the CADF into a decentralized body in overall charge of all aspects of water management. As a result, there is no way of formulating a pricing policy on the basis of a single, systematic vision of the information on costs and income. Nor does the CADF have powers to intervene in the process through tariff adjustments, since these may only be made by the Legislative Assembly. Any attempt to raise tariffs to their real levels in terms of costs would appear to be impossible in a city with marked social inequalities and in the midst of a severe economic crisis. To do so would simply invite protests, with consequent social instability, or reinforce the 'no-pay' mentality, with a consequent drop in income.

Neither is it possible, though, to think of water exclusively as public property since it is a resource in increasingly short supply. Perhaps the answer lies in a concept of it as 'intermediate' property that would allow for mixed private-public policies which resolve basic human needs while attending to the problems of shortages and waste (Quiñones, 2000). There is no one way out of the serious water problems faced by Mexico City. What is required is an integrated group of measures within which a pricing policy has specific weight. This implies raising tariffs for relatively well-off sectors by more than for low-income groups, the recovery of debt, and imposing tariffs that would encourage major industrial users to use recycled water, a measure that the CADF reckons could save 2.5 cubic metres per second of potable water. In addition, the use of meters could be extended from 91% to 95% of registered users with the installation of a further 150 000 meters and a subsequent increase in income. All those measures

would have to be carefully evaluated given the complexity of the tariff problem, above all in a city such as the Federal District with its peculiarities of supply, and its socio-economic differences, not to mention its political importance within the nation. The aim should be to achieve a balance of social and economic goals. The policy on tariffs for such a vital service as potable water must take account of human needs and the social and economic conditions of the population, while not forgetting the urgent requirement to send clear signals that combat waste and strengthen the weak finances of the bodies that provide the service. The present, demand-orientated policy on prices has failed to take full account of the other, long-term component that would promote water savings: a cultural change effected by educational and information programmes that would help society at large to understand the real situation of the water system and the need to 'turn off the tap'.

## Notes

1. The 'Mexico City' to which this paper refers is the Federal District, which lies at the heart of the conurbation and contains about half of its total population. The remainder of the municipalities fall within the state of Mexico, an administratively separate entity.
2. Servicios de Agua Potable (Constructora ICA–Compaine Generale des Eaux, of France), Industrias del Agua (Socios Ambientales de México–Severn Trent, UK), Agua de México (Grupo Gutsa–Northwest Water International, UK), and Tecnología y Servicios del Agua (Bufete Industrial and Lyonnaise des Eaux Dumez, France).
3. Nonetheless, experts on the Federal District's water system who were interviewed maintain that this evaluation is too optimistic. They said that, while the renewal of tubing has suppressed some leaks, the leaks have increased in other areas because of an increase in pressure.
4. Strictly speaking, the proportion of users whose consumption was measured would be 71% in 2001, but it is higher because of taking into account those who live in condominiums where only the general intake is metered and payment is in accordance with overall consumption.
5. The reference is to 16 000 users (0.91% of the total) who account for about 50% of total collection of charges for the potable water service, according to CADF information from 2001.
6. On 3 December, the Federal District government established the Mexico City Water System, a decentralized public institution to take charge of the overall management of the water system.

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