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GUIDELINES FOR IMPROVING THE FINANCIAL PERFORMANCE OF MUNICIPAL WATER AND SANITATION OPERATORS

USAID/MEXICO COMPETITIVENESS PROGRAM

Contract: EEM-I-00-07-0004-00

September 30, 2009

This report has been produced by Abt Associates Inc. for the United States Agency for International Development.

GUIDELINES FOR IMPROVING THE FINANCIAL PERFORMANCE OF MUNICIPAL WATER AND SANITATION OPERATORS

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Hankinson Denzel

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Table of Contents

Executive Summary

Few of Mexico's municipal water and sanitation operators recover their full costs of service through tariff revenues. This prevents the utilities from investing in sufficient rehabilitation and maintenance and expansion of service.

The challenges

Utilities are not recovering their full costs of service because:

- **Tariffs are too low.** In other words, average tariffs are below the average cost of providing service. This, in turn, is because:
  - **Costs of operation are high because efficiency is low.** According to CONAGUA, Mexico's average physical efficiency is only 55 percent.[1] Unaccounted-for-water is as high as 40 percent in many municipalities.[2]
  - **The cost of providing service and probably below what many customers can afford.** Tariffs are well below the cost of providing service. Data from the International Benchmarking Network for Water and Sanitation Utilities (IB-NET) show that Mexico's operators just barely recover their costs of operation and maintenance, but do not recover full costs through tariffs.

    Evidence suggests that tariffs are also well below what customers are able to pay. Families without service, or with unreliable service, spend much more money on water from "piperos" (water vendors) than they would from a piped network. A 2006 OECD Water Management Policy Brief stated that, in Mexico City, families with no access to piped water spend between 14.5% and 28% of their income on water while families who are connected spend between 0.70 percent and 3.84 percent.[3] A more recent study found that households in Parral, Mexico were willing to pay 1.8 percent to 7.55 percent of reported household incomes above their current water bill for safe and reliable drinking water services.[4]

[1] Comisión Nacional de Agua "La Situación de los Servicios de Agua en México" (presentation given at the México 2006 IV Foro Mundial del Agua, México, March 21, 2006).

[2] OECD Environment Directorate, "Water Management Policy brief for the Mexican Project," Organisation for Economic Co-operation and Development, *www.foropoliticaspublicas.org.mx/docs/Agua.pdf.*

[3] OECD Environment Directorate, "Water Management Policy brief for the Mexican Project," Organisation for Economic Co-operation and Development, *www.foropoliticaspublicas.org.mx/docs/Agua.pdf.*

[4] William F. Vásquez et al., "Willingness to pay for safe drinking water: Evidence from Parral, Mexico," *Journal of Environmental Management* Volume 90, Issue 11 (2009): 3391-3400.

- **Subsidies do not make up for revenue shortfalls.** Municipal operators can rely, to some extent, on transfers from state governments or cross subsidies to cover their costs. However, many meet revenue shortfalls by curtailing expenditure which in turn reduces service quality. This can leads to a downward spiral of service quality and the financial health of the operator. Poor service quality makes it harder to justify tariff increases, which forestalls necessary investment, and lets service quality decline further.
- **Collections are too low.** In other words, operators collect only a portion of what they bill customers. CONAGUA reports that companies charge for only 400 out of every 1000 liters produced. In a comparison of nine countries with similar levels of GDP per capita, Mexico ranked last.[5]

Most of Mexico's water and sanitation operators know what their costs are, and thanks to the benchmarking efforts of IMTA, know what level of costs is efficient or reasonable. However, operators are limited in what they can charge because of political involvement in setting tariffs.

Many of Mexico's water and sanitation systems are now operated by corporatized public entities, but have little autonomy in determining what tariffs to charge. Politicians are involved in setting operators' tariffs at several levels. Practice differs considerably from state to state but in generally, the mayor, municipal council, state parliament, or governor may all have a role in approving tariffs.

Ways to meet these challenges

Mexico's municipal water operators can improve their financial situation, and in turn, service quality, by changing the regulatory and institutional arrangements in ways that better insulate operators' technical and economic decisions from political decisions.

Our discussions with municipal operators and other sector experts indicate that, for corporatized public operators, there may not be any formal legal requirement that the mayor, state parliament or governor be involved in setting tariffs. If there is a requirement, it may only be contained in the operator's charter, and not in state law.

Where legal obstacles do exist, there may still be institutional options for de-linking management cycles from political cycles (for example, by appointing independent boards of directors with specific professional qualifications, or staggering the terms of operator management teams and municipal presidencies).

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[5] "IB-NET Database, "International Benchmarking Network (IB-NET), "IB-NET Database, "International Benchmarking Network (IB-NET), http://www.ib-net.org/ Using year 2005 and 2006 data from the International Benchmarking Network (IB-NET) for Water and Sanitation Utilities.

What is the Purpose of this Paper?

The purpose of this paper is to recommend general guidelines for improving the financial performance of water and sanitation operators in Mexico. These guidelines can be used to:

- Inform municipal governments and municipal water insanitation operators of institutional and regulatory reforms to consider as they strive to inform financial performance in water sector
- Help determine USAID's future work programs in the water sector

These recommendations come from analysis and field visits conducted by Denzel Hankinson during August 26-September 30, 2009. Abt Associates hired Mr. Hankinson as a regulatory specialist to join a team of consultants who were developing recommendations for improving the quality, efficiency and sustainability in the water sector. The Team also included a water quality engineer, and a social communication specialist. The team assessed the situation in Mexico through on site visits, secondary research and interviews with key stakeholders. Stakeholders ranged from the leaders of IMTA and the National Association of Water and Sanitation Enterprises (ANEAS) to municipal water managers to community members.

This paper presents Denzel Hankinson's findings. These findings were initially presented at a September 2-4 water congress organized by the Mexican Institute of Water Technology (Instituto Mexicano de Tecnologia de Agua or IMTA)[6]. After discussion with sector stakeholders at that conference, Mr. Hankinson refined his analysis and elaborated on certain recommendations for the annual Watergy Congress in Durango on September 23-25.

Mr. Hankinson's work focused on recommending how to set tariffs which:

- Recover reasonable and efficient service costs.
- Permit service providers to:
  - Remain financially viable.
  - Improve their efficiency.
  - Improve their service quality.
- Are affordable for customers

Meeting all of these objectives is difficult, but not impossible. Meeting them requires institutional, regulatory, and fiscal interventions.

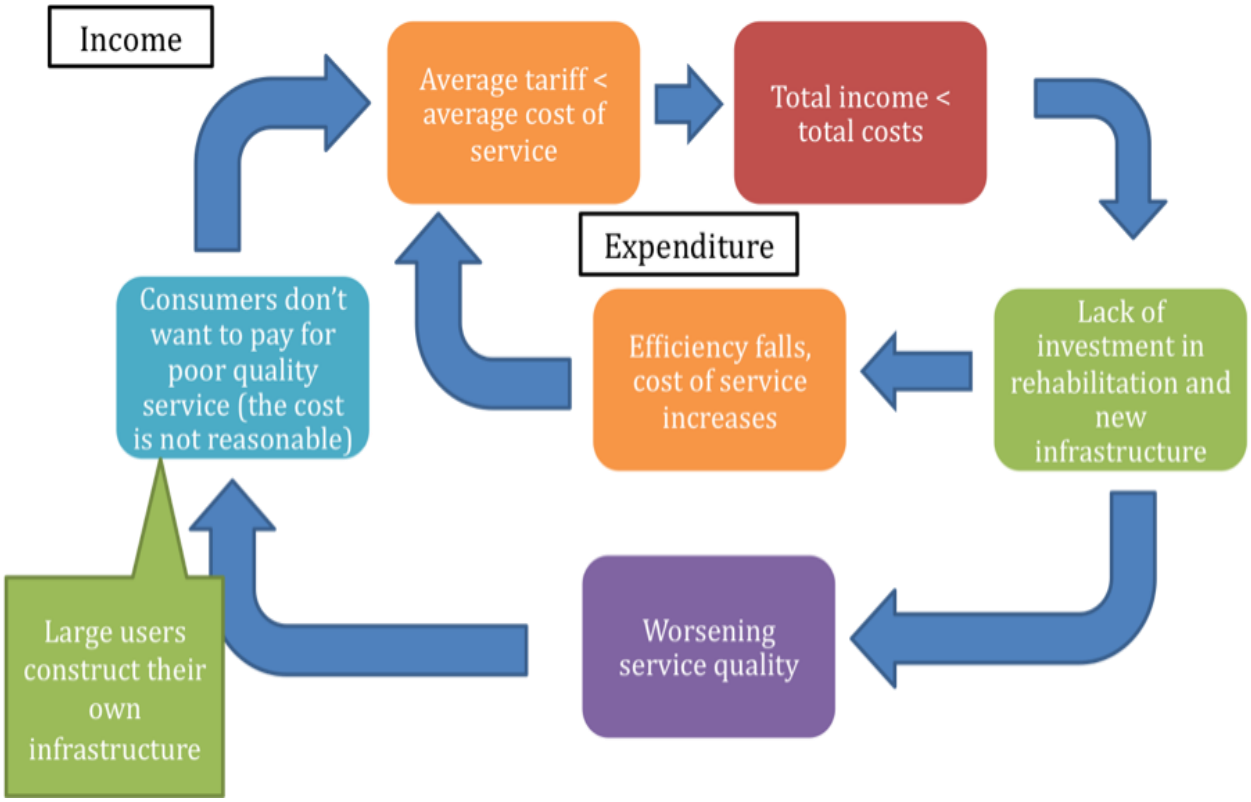
[6] 1ª Reunión Internacional de Competitividad del Sector Agua: "Los Servicios de Agua Potable y Saneamiento en Zonas Urbanas". Mr. Hankinson was asked to speak on "The importance of cost recovery, direct subsidy, and water tariff setting to achieve financial sustainability and service efficiency whilst making access affordable."

This paper describes, in Section 0 some of the major financial challenges municipal water and sanitation that operators face. Section 0 describes a number of options for meeting these challenges. Section 0 concludes with specific recommendations on what Mexico's municipalities can do to improve the financial viability of their water and sanitation operations.

What are the Major Financial Challenges?

Figure 0.1 illustrates the principal challenges facing Mexico's water operators and, indeed, many water operators in low and middle-income countries.

Figure 0.1: The Vicious Circle in the Water and Sanitation Sector



Source: DHInfrastructure

When the average tariff is set lower than the average cost of service, total income is less than total costs. This deprives water operators of the funds with which to invest in rehabilitation and system expansion. A dearth of investment has two consequences:

- **Efficiency of operations falls.** This increases the cost of service and further widens the gap between the average tariff and the average cost of service.

- **Service quality worsens.** Consumers are unwilling to pay for the poor quality service, making it politically and socially difficult to increase tariffs. In some cases, large users will construct their own infrastructure and small users will look for alternative water providers. The loss of important consumers results in an increase in the fixed cost (per customer) of providing service, and further increases the difference between average tariff and average cost of service.

Definition of Financial Viability

Clearly, a water and sanitation operator caught in this vicious circle is not "financially viable". For the remainder of this paper, we will use the term "financially viable" to mean that the operator is able to recover, through some combination of tariffs or external subsidies, its full costs of service, where the full costs of service include expenditure on:

- The costs of operation and maintenance, including expenditure on:
  - Water
  - Salaries and other employee costs
  - Electricity
  - Chemicals
  - Losses
  - Unrecoverable debt (bad debt)
- Capital costs, namely
  - Rehabilitation of existing infrastructure
  - Expansion of the system to meet demand
- Capital costs, which include:
  - The cost of servicing (paying interest on) any debt
  - The cost of any dividends paid to owners (including, possibly municipal government owners).

The vicious circle in Mexico

An international comparison shows evidence of the vicious circle in Mexico. The evidence we present relies primarily on data from the IB-Net, the international Water and Sanitation benchmarking network. We include, for comparison, countries with levels of real GDP per capita similar to Mexico's. More specifically:

- Figure 0.2 shows that Mexico's water and sanitation operators barely manage to recover their operating and maintenance expenses, leaving little additional revenue for investment in rehabilitation and system expansion.
- Figure 0.3 shows that collections are lower than in Mexico than in other comparator countries.

- Figure **0.4** shows that Mexican water and sanitation customers pay relatively less of average household income than customers in other countries. CONAGUA has estimated that companies charge for only 400 out of every 1000 liters produced.[7]
- Coverage is widespread, but not universal, and may not always be affordable. In 2006, National drinking water coverage was 89.6 percent, with coverage of 72.0 percent in rural areas. Out of 184 countries, Mexico's drinking water coverage ranking is 90th.[8] In 2007, coverage rose to 89.9 percent.[9] However, a 2006 OECD Water Management Policy Brief stated that, in Mexico City, families with no access to piped water spend between 14.5% and 28% of their income on water while families who are connected spend between 0.70 percent and 3.84 percent.[10] A more recent study found that households in Parral, Mexico were willing to pay 1.8 percent to 7.55 percent of reported household incomes above their current water bill for safer and more reliable drinking water services.[11]
- Evidence from other studies suggests that service quality is poor. The lack of continuous service is a particular problem in many areas, hence the widespread use of "tandeo" or water storage. A 2008 study by the World Bank found that more than half of households connected to the water distribution network experience interruptions in supply.[12]

[7] "IB-NET Database, "International Benchmarking Network (IB-NET), http://www.ib-net.org/

[8] Comisión Nacional de Agua, "National Water Program 2007-2012," Comisión Nacional de Agua, http://www.conagua.gob.mx/english07/publications/SGP-19_National_Water_Program2007-2012.pdf.

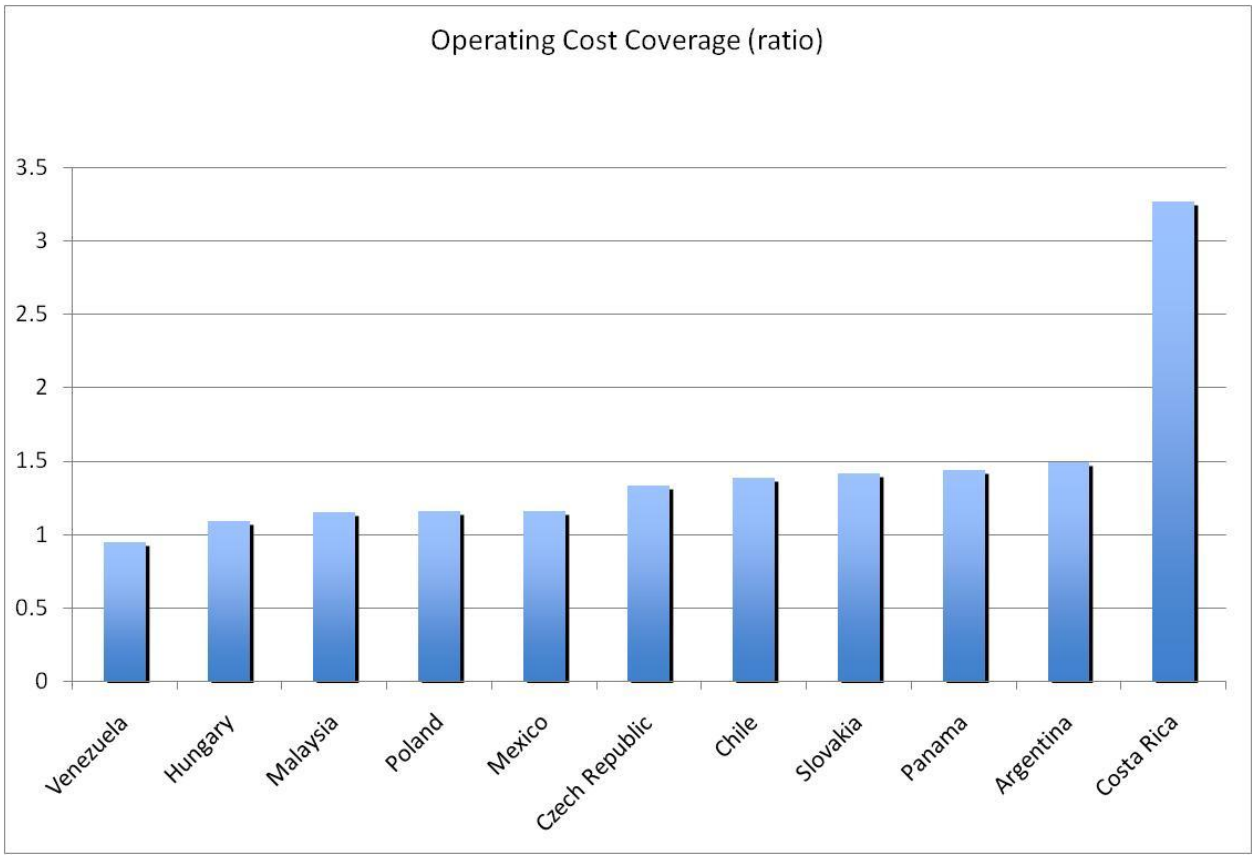
[9] Comisión Nacional de Agua, "Programa Nacional Hídrico 2007-2012: Avances 2007 y Metas 2008," Comisión Nacional de Agua, http://www.conagua.gob.mx/.

[10] OECD Environment Directorate, "Water Management Policy brief for the Mexican Project," Organisation for Economic Co-operation and Development, *www.foropoliticaspublicas.org.mx/docs/Agua.pdf.*

[11] William F. Vásquez et al., "Willingness to pay for safe drinking water: Evidence from Parral, Mexico," *Journal of Environmental Management* Volume 90, Issue 11 (2009): 3391-3400.

[12] Saltiel, Gustavo and Cledan Mandri-Perrott, "OBApproaches: Output-Based Disbursements in Mexico: Transforming the Water Sector in Guanajuato," The Global Partnership on Output-Based Aid, http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2008/11/05/000333037_20081105215954/Rendered/PDF/463170BRI0Box31roaches201Mexico1OBD.pdf.

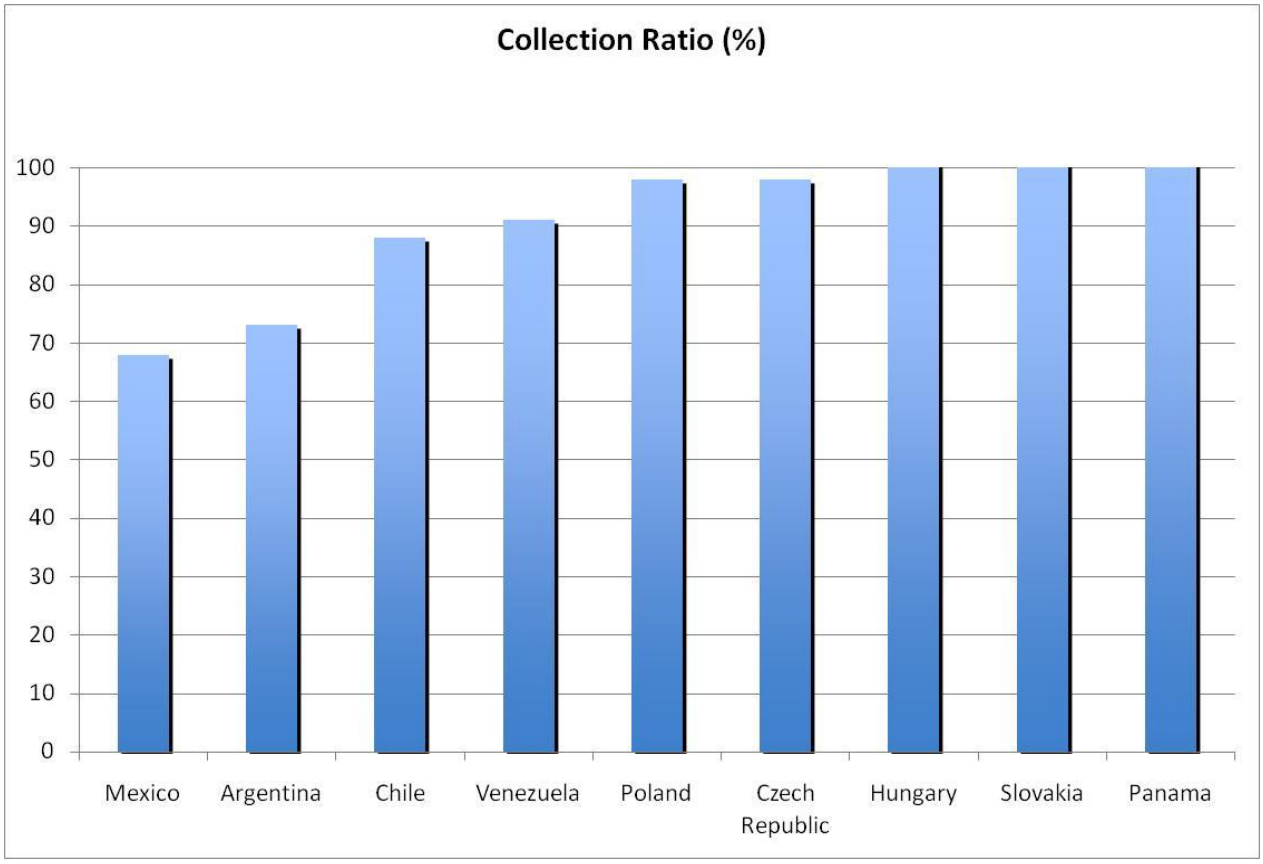
Figure 0.2: Operating Cost Coverage (ratio)



Source: www.ib-net.org[13]

[13] "IB-NET Database, "International Benchmarking Network (IB-NET), http://www.ib-net.org/

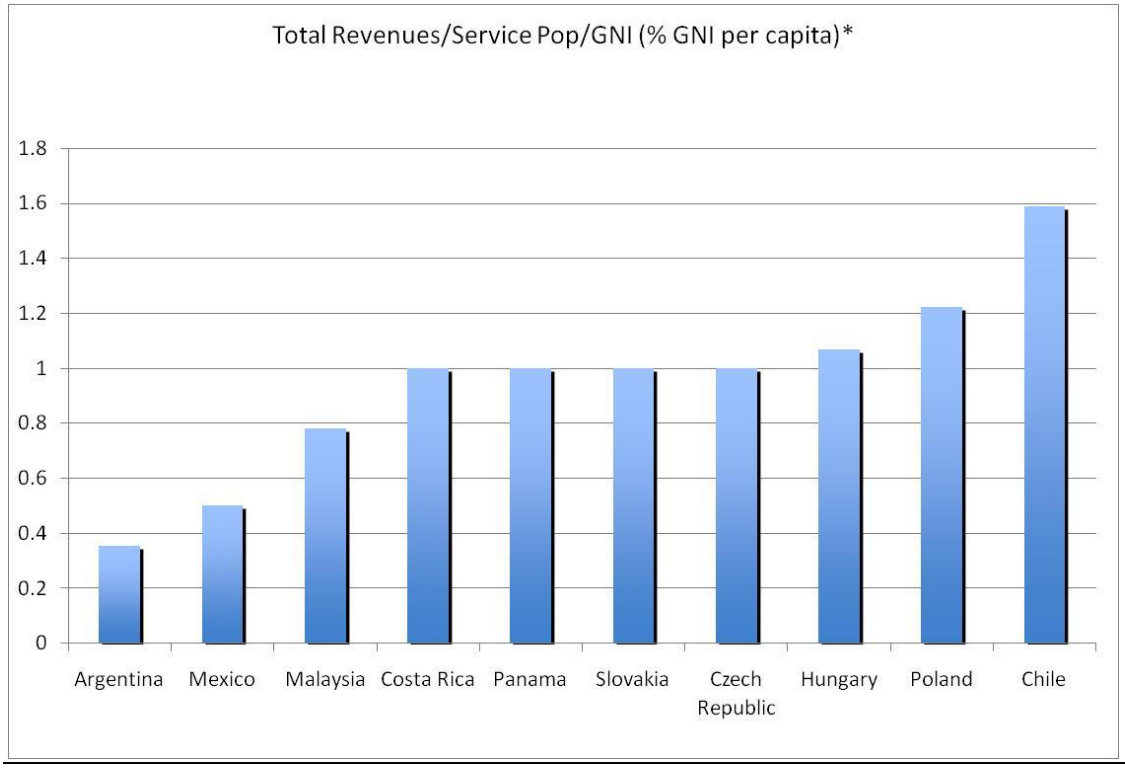
Figure 0.3: Collection Ratio (%)



Source: www.ib-net.org[14]

[14] "IB-NET Database, "International Benchmarking Network (IB-NET), http://www.ib-net.org/

Figure 0.4: Total Revenues/Service pop/GNI (%GNI per capita)



Source: www.ib-net.org[15]

[15] "IB-NET Database, "International Benchmarking Network (IB-NET), http://www.ib-net.org/

The source of the challenges

The institutional framework for water and sanitation is a principal cause of the challenges operators face.

Most of Mexico's water and sanitation operators know what their costs are, and thanks to the benchmarking efforts of IMTA, many know what level of costs is efficient or reasonable. However, operators are limited in what they can charge because of political involvement in setting tariffs.

Mexico's largest water and sanitation systems are operated by corporatized public entities (approximately 400 of the largest of roughly 2100 operators), but have little autonomy in determining what tariffs to charge. Politicians are involved in setting operators' tariffs at several levels. Practice differs considerably from state to state but in generally, the mayor, municipal council, state parliament, or governor may all have a role in approving tariffs.

What Are the Options for Meeting these Challenges?

Generally speaking, the only way to meet these challenges is for operators to:

- Increase income through some combination by:
  - Increasing tariffs
  - Improving financial efficiency by:
    - Billing customers for all water sold
    - Collecting from customers for all water billed
- Lower expenditure by:
  - Improving the efficiency of operations
  - Discontinuing service to customers who do not pay
- Receive subsidies for difference between income and expenditure.

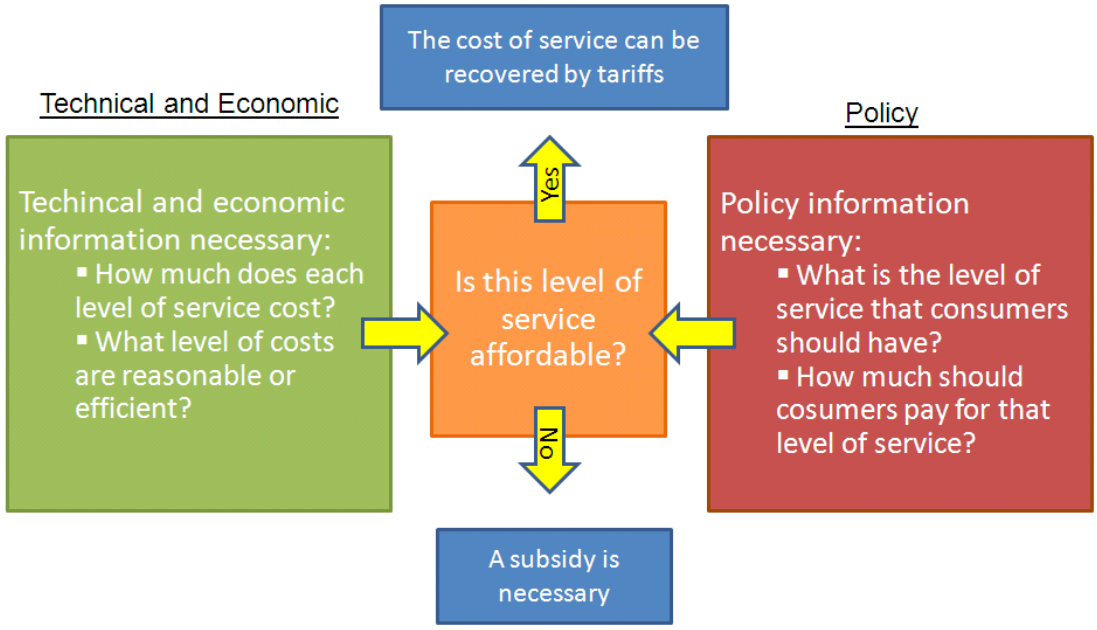
Some combination of these measures is required **before** operators can improve their efficiency and improve the quality of service. Operators who cannot even cover their costs of operation and maintenance will find it very difficult to improve efficiency or service quality.

As noted above, the root cause of the financial challenges in Mexico's water sector are institutional. This section will therefore focus on possible institutional solutions for raising tariffs to cost recovery levels.

Separating Technical and Economic Decisions from Political

Figure 0.1 illustrates a framework for thinking about how to improve cost recovery of tariffs. The framework emphasizes the importance of separating technical and economic decision-making from political decision-making.

Figure 0.1: A Framework for Institutional Solutions



Source: DHInfrastructure

The policy decisions associated with running a water and sanitation system are:

- What level of service customers (for example, number of hours of service and quality of water) customers should have
- How much consumers should pay for the level of service they desire

The technical and economic decisions are:

- How much do different levels of service cost, and more specifically,
- What are "reasonable" costs, service given the experience of other, similar utilities elsewhere (typically established by some sort of formal or informal comparisons or benchmarking)

If policy decision-makers decide that the cost of the service and the level of service desired is beyond what is socially or politically acceptable, then some sort of subsidy is needed.

How to separate technical and economic decisions from political decisions

There are, in general, two arrangements used internationally to separate technical and economic decision-making from political decision-making. These are:

- **The creation of an independent sector regulator.** Independent regulators exist at the regional (state or province) or national level in many countries. These bodies typically have 3-7 commissioners responsible for licensing sector operators, and setting tariffs and service quality standards. Commissioners typically serve for 3-5 years, are appointed by the executive branch (the president or prime minister), and approved by the legislative branch (congress or parliament). A number of mechanisms are used to provide the commissioners with some independence from the political process. These include, for example:
    - Clear professional requirements (for example, number of years of experience in a certain discipline or position)
    - Rules prohibiting conflict of interests (for example, rules prohibiting ownership of a large water vendor or large water customers)
    - Staggered terms of appointment to office (in other words, commissioners enter and leave at different times)
    - Terms of office which do not coincide with political cycles (for
- **Regulation through performance contracts.** Long-term performance contracts are used at the national and local level in many countries between the government owner and an operator. In many cases (as in many municipalities in France), the operator is a private company. In concession and lease contract models, the tariff and service quality standards are typically fixed in the contract. These contracts range in duration from 7-20 years. A base tariff is specified in the contract, with annual escalation (or de-escalation) to reflect changes in costs that are beyond the control of the operator, for example:
    - Electricity costs
    - Foreign exchange costs (if the operator must make investments or pay debt service on investments in another currency)
    - Inflation.

    An important part of any performance contract is a clear and reliable mechanism for resolving disputes, short of arbitration or termination of the contract.

Hybrids of each of these institutional options also exist. In Uganda, for example, the National Water and Sewerage Corporation (NWSC) has a series of performance contracts between the Managing Director and senior managers, between senior managers and system area managers, and between system area managers and their staff. These performance contracts specify performance targets, and compensation tied to these targets.

Another example of a hybrid arrangement can be seen in some municipalities in the United States. In Northampton, Massachusetts, for example an independent board of directors sets

tariff, service quality standards, and policies of the Department of Public Works. Box 3.1 describes in more detail how the responsibilities and organization of the Board of Public works.

Box 3.1: Northampton Board of Public Works

- It was created by the Acts of 1961 and updated in 2002.
- The board has seven members, including a director.
- Their responsibilities include:
  - Setting water and sewer rates.
  - Establishing an annual plan and a five-year investment plan.
  - Responding to citizen inquiries and holding public hearings.
  - Overseeing the Water and Sewer Enterprise Fund.
  - Creating rules, regulations and policies of the department.
  - Issuing permits and setting fees for all permits.
  - Signing and approving all contracts and change orders.
  - Serving in an advisor capacity to the mayor and city council.
- The mayor names the members and the director. They are approved by the city council.
- The members must be registered voters of the city.
- The members serve three-year terms and receive no compensation. They have a degree of independence because the mayor serves a two-year term.
- To remove members of the board, there must be:
  - The presentation of written charges by the mayor or two members of the city council; and
  - A majority vote by the city council.

Source: "Board of Public Works Charter," Northampton Board of Public Works, http://www.northamptonma.gov/gsuniverse/httpRoot/bpw/Documents/.

Table 0.1 summarizes the advantages and disadvantages of independent regulation, performance contracts, and a hybrid option which would give existing public operators more autonomy.

Table 0.1: Institutional Options

Option	Advantages	Disadvantages
Independent regulator	▪ Economies of scale ▪ Able to have highly skilled staff (at the national and regional level)	▪ Less representative because it the regulator is more distant from the consumer ▪ It can be expensive and difficult to implement ▪ It may not be as efficient if the regulating body is public
Board with more autonomy	▪ More representative (because it is closer to users) ▪ Consistent with the policy of decentralization	▪ Less access to highly skilled staff (at the national or regional level)
Contracts	▪ Increases confidence in tariff stability.	▪ Development of a high-quality contract costs time and resources.

Source: DHInfrastructure

How do we recommend Mexico Meet these Challenges?

We recommend the following guidelines for improving the financial sustainability of Mexico's water and sanitation operators:

- I**mplement other institutional models at the state or municipal level.** The changes necessary will vary from state-to-state. This may be as simple as changing the charters for water and sanitation operators, or as complicated as changing state water laws. Our discussions with municipal operators and other sector experts indicate that, for corporatized public operators, there may not be any formal legal requirement that the mayor, state parliament or governor be involved in setting tariffs. If there is a requirement, it may only be contained in the operator's charter, and not in state law.

  Where legal obstacles do exist, there may still be institutional options for de-linking management cycles from political cycles (for example, by appointing independent boards of directors with specific professional qualifications, or staggering the terms of operator management teams and municipal presidencies).

- **Understand what customers can pay.** Evidence suggests that tariffs are also well below what customers are able to pay. Families without service, or with unreliable service, spend much more money on water from "piperos" (water vendors) than they would from a piped network. A 2006 OECD Water Management Policy Brief stated that, in Mexico City, families with no access to piped water spend between 14.5% and 28% of their income on water while families who are connected spend between 0.70 percent and 3.84 percent.[16] A more recent study found that households in Parral, Mexico were willing to pay 1.8 percent to 7.55 percent of reported household incomes above their current water bill for safe and reliable drinking water services.[17]
- **Look for municipal leaders with the political courage and clout to change the institutions.** More than anything, the change requires political will. The institutional changes recommended above cannot happen without it. Much rhetoric is heard from politicians about the need to change the "culture of water", but change needs to begin from above. If politicians find the courage to raise tariffs to levels that recover costs but are still affordable, support disconnection of non-paying customers. Operators can initiate the change with Municipal Presidents who have the courage to pursue reforms in pursuit of improved service quality and sustainability.

Conclusion

Our recommendations for this project have been directed principally at municipal operators. However, the funding institutions at the state and federal levels can also have in impact. We recommend, for example, that institutions like CONAGUA or APAZU, which provide capital for rehabilitation and investment, make such funding conditional upon institutional and tariff reforms.

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[17] William F. Vásquez et al., "Willingness to pay for safe drinking water: Evidence from Parral, Mexico," *Journal of Environmental Management* Volume 90, Issue 11 (2009): 3391-3400.

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from Parral, Mexico,” *Journal of Environmental Management* Volume 90, Issue 11: 3391-3400.