Institutional capacity and performance in water utilities in the North of Mexico

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Abstract

The purpose of this study is to show the link between institutional capacity and performance in three water utilities in the north of Mexico (Hermosillo, Mexicali, and Saltillo). These utilities have similar weather, population, and economic development level, but they also have different outcome performance. These utilities also have different institutional frameworks: Hermosillo is a municipality owned utility, Mexicali is a state owned utility, and Saltillo is a public private partnership (PPP). The influence of these configurations on the institutional capacity is addressed by analyzing the political and institutional context of these utilities; their legal, technological and financial resources; and their human resources management.

Introduction

Urban water in Mexico has reached coverage levels higher than 90% in the last decades (Salazar and Lutz, 2016). However, water utilities in Mexico still have problems of high water loss levels, low cost recovery and lack of financial sustainability, which renders the operation of these utilities unsustainable in the long run. And despite of having a high percentage of urban dwellings connected to the water network, many cities cannot still provide a constant supply of water. Millions of pesos have been poured into new water infrastructure and programs directed towards improving the efficiency of water utilities, however, the average Mexican utility has a unaccounted for water of nearly 50%. These problems pose a threat to cities in the north of the country, where the arid climate constraints the supply of water and boosts the demand for it. In this study, the cases of three cities in the north of Mexico are presented: Hermosillo, Mexicali and Saltillo. These cities have similar climate, population and economic development. However, the performance of their respective water utilities differ considerably. Hermosillo's utility has high water losses, low bill collection, and its operational costs exceed its revenues. Because of its deficiencies it has applied water rationing in some years. In contrast,

Mexicali has water losses of comparable to those of developed nations and Saltillo collects almost all of its water bills.

Why do these outcomes differ so much, if these cities are similar in size, geography and economic development? According to LeMoigne (1991), many of the resources provided by the World Bank to developing nations have not been effective because of the low institutional capacity of the organizations and governments in charge of executing the funded projects. Therefore, it is not only important that there are financial resources available for the improvement of the utilities but also that these utilities are capable of using these inputs to provide a constant, clean water supply of to the population in a sustainable manner. Institutional capacity can be defined as the technical-bureaucratic abilities of utilities to transform their legal, managerial and financial resources into actions or products that allow them to improve their performance (Loera 2015). In this paper, we analyze their institutional capacity in order to evaluate how their political, legal, financial, technological and human resources affect their performance.

Performance and main characteristics of the utilities

Hermosillo, the capital of the state of Sonora, had a population of 784,342 in 2010. Rainfall precipitation is around 300 mm a year and most of its water comes from underground sources. Since 2014, around 30% of its water comes from an interbasin transfer from El Novillo dam, located 150 km east of the city. Summer temperatures usually exceed 45°C. Hermosillo's utility, Agua de Hermosillo, was created in 2003 as a substitute for a utility owned by the State of Sonora (COAPAES). It is a municipally owned utility. The highest authority is the Governing Board, presided by the Mayor of Hermosillo.

Mexicali is the capital of the state of Baja California, with a population of 936,826 and the average yearly precipitation is 132mm, which makes it one of the most arid regions in the country. The water source for the city is the Colorado River. Like in Hermosillo, temperatures during the summer usually exceed 45°C. Mexicali's Utility, Comisión Estatal de Servicios Públicos de Mexicali (CESPM) is owned by the state of Baja California, who owns the water utilities of all its municipalities. The highest authority is the Administration Board, whose chair is the state governor, who appoints the director and top management positions.

Saltillo is the capital of the state of Coahuila and in 2010 it had a population of 725,123. Temperatures in the summer go up to 38°C and all of its water comes from underground sources. Saltillo's utility, Aguas de Saltillo was created in 2001 as a substitute for a municipally owned utility. It is a PPP, with 51% public ownership[1] (the municipality of Saltillo) and 49% private ownership (Interagbar, a subsidiary company of Aguas de Barcelona (Agbar, now controlled by Suez)). Interagbar operates the utility through a 25 year contract with Aguas de Saltillo, so it is at the same time co-owner and operator of the utility. The highest authority in Aguas de Saltillo is the Executive Board, formed by the

[1] Since the creation of Aguas de Saltillo the years the municipality of Saltillo has acquired shares of the water utility and currently holds 55% of shares.

mayor of Saltillo (as honorary president), executives of the private sector appointed by the mayor, and executives of companies linked to Suez appointed by Interagbar.

The three cities have higher average incomes than the rest of the country, and they are home to an important industrial activity (Hermosillo and Saltillo have automotive factories). Hermosillo and Mexicali also have an important agricultural production in the countryside of their municipalities. Despite having similar features, the utilities in these cities have shown a differentiated outcome performance. In 2013, Mexicali's unaccounted for water level was reduced to 9% from 13.6% in 2003. In contrast, Hermosillo had 42.8% unaccounted for water in 2013, which was a significant increase from a reported level of 21.8% in 2003 (See table 1). Bill collection in 2013 was 98% in Saltillo, an increase of 5% from 93% reported in 2003. It is reported that prior to the PPP in 2001 bill collection was 64%. In contrast in Hermosillo, while bill collection in 2013 (77.9%) is higher than in 2003 (58.1%), it still falls short by 20% from the level observed in Saltillo.

Table 1. Main performance indicators

	Hermosillo		Mexicali		Saltillo	
	2003	2013	2003	2013	2003	2013
Unaccounted for water %	21.8	**42.8**	13.6	9.0	34.3	28.6
Bill collection %	58.1	77.9	85.0	81.3	93	**98**

Source: PIGOO, Conagua, Aguas de Saltillo, CESPM. Highest figures in bold.

Customers' evaluations correlate with the outcome performance indicators. According to a survey, 97% of Mexicali's customers agree that the water supply is constant, in contrast to 72% in Hermosillo. 55.7% of Saltillo's customers are satisfied or very satisfied with the service provided by the utility, while in Hermosillo only 38.7% are satisfied or very satisfied. In general, Hermosillo's customers give their water utility an overall grade lower than customer's in the other two cities (see table 2).

Table 2. Customers' evaluation

	Hermosillo	Mexicali	Saltillo
Constant supply	72.6	**97.6**	75
Customers' Satisfaction	38.7	53.4	**55.7**
Potability	27.1	7.9	**49.5**
Overall Grade of Sevice	6.8	**8.5**	7.8

Source: National Survey of Government Quality and Impact (2015). Highest figures in bold.

In order to explain these differences in output performance, in the next sections the institutional capacity of these utilities is analyzed.

Institutional Capacity Evaluation

Based on previous work by Grindle and Hildebrand (1995), and Forss and Venson (1998); Sagnestam (2002) and Rosas (2008) state that institutional capacity has three levels: the macro level, which refers to the greater political and institutional context of utilities; the meso level which refers to the legal, technological and financial resources (which allow utilities to carry out long term planning of activities, set water prices at sustainable levels, diversify financial sources, measure consumption, collect revenue, etc.); and the micro level which refers to the human resources management (hiring policies, incentives, training, etc.). In the next sub-sections, the institutional capacity of utilities in these three levels is analyzed.

Macro level

The macro level refers to the environment where utilities conduct their business and how the political setting constrains or enable the development of its activities.

Mexicali is the capital of Baja California which was the first state governed by a party different from the long time ruling party, Partido Revolucionario Institucional (PRI). In 1989 Ernesto Ruffo, of the opposition party, Partido Acción Nacional (PAN), was elected governor. Since then, the state has been governed by this party. Although the federal government was ruled by the PRI, there were no disagreements between the two levels of government that affected the management of urban water utilities, on the contrary, they established a common agenda for the negotiation of water allocations from the Colorado river with the U.S. government. Additionally, Baja California, being a border state, has arranged important agreements with the Nadbank and the EPA to obtain funds for the improvement of the water utilities. The municipality of Mexicali has been governed alternately by PRI and PAN. However, these political changes have had little impact on the management of Mexicali's utility. The state of Baja California owns all of the 5 municipalities' utilities, including Mexicali's and the State Water Commission is the agency that coordinates the water policy in the state. This prevents municipal governments from interfering with the management of the utilities.

Hermosillo has been governed alternately by the PRI and PAN. The state of Sonora was governed by the PRI up to 2009, when the PAN candidate was elected. So there have been periods when the State and Municipality government parties do not coincide, and during these periods the political rivalry has affected the decisions made around Hermosillo's utility, since policy proposals from the state water agency are not taken into account by the utility's management during these periods and there have been disputes about the construction of new water sources. The Independencia aqueduct, built in 2012 to carry out an inter-basin water transfer from a dam located 150 km east of the city, was possible because during that period, the federal, state, and municipal government were headed by the same party (PAN), which indicates that the institutional macro arrangements allow that policy proposals work only when these political conditions are met.

Saltillo is the capital of the state of Coahuila, one of the very few states where the only governing party has been the (PRI). The municipality of Saltillo has also been governed by this party, up to 2014, when a mayor from a different party (PAN) was elected for the first time. This means that at the time of the creation of Aguas de Saltillo (2001) there was a favorable environment for the PPP agreement, and so has been since then. In 2014, there was a new governing party but the new mayor is an important local businessman, leader of Grupo Industrial Saltillo, an industrial consortium that has had representatives in the Executive Board of Aguas de Saltillo, so it has not affected the relationship between the municipality and the utility.

Meso level

In the meso level the legal, technological and financial resources are analysed. Legal resources or framework must allow utilities the autonomy to appoint managers indenpendently of political whims and based on the capacity of the apointeees. It also must allow utilities to set water prices at sustainable levels and carry out the collection of bills through effective sanctions. The technological resources must allow utilities to measure water consumption and losses so billing is based on consumption and plans for water loss management are implemented. An updated customer's database is also required to have a control of water being consumed. Finally, financial resources must be enough to properly maintain the network, carry out infrastructure projects, and must be diverse so the utility does not depend on one single source of financing, thus reducing its vulnerability to financial risk.

Appointment of Managers:

In Hermosillo the director of the utility is appointed by the city mayor, and it is required that the candidate has experience and knowledge of water utility management. However, the manager appointed from 2012 to 2015 did not have these qualifications. All other managerial positions in the utility are not legally required to have specific qualifications. From 2003 to 2015 there were 6 managers appointed, which means that they lasted 2 years on average.

In Mexicali the governor of the state of Baja California appoints the director, as well as other managerial positions. Historically, Mexicali has had some stability in the appointment of directors: Pineda and Briseño (2012) indicate an average of 4.5 years of duration. Managers are not required to have special qualifications for the job. During fieldwork by one of the authors, some managers excused themselves from being interviewed because they had just been appointed and were not well aquainted with the job.

In Saltillo the director is proposed by the operating partner (Interagbar) and appointed by the executive board. Since the only politician who is member of the board is the Saltillo Mayor, there is little room for political interference in the designation. From 2001 to 2014 there were 4 managers appointed, which means that they lasted 3.25 years on average

In Mexicali and Saltillo directors are usually longer tenured than in Hermosillo which provides a better environment for longer planning periods. In Saltillo directors are better qualified since they come from the urban water sector and have international experience. Appointments in Mexicali and Hermosillo are politically influenced, and it is not unusual for people in the managerial staff to start political careers.

Tariffs and collection

In Saltillo, the water law of the State of Coahuila provides the municipalities with autonomy to approve water tariffs set by the utility. In contrast, Hermosillo and Mexicali do not have this possibility, since the state legislature must approve the water tariffs. Collection capabilities are backed by the state water law in Saltillo, which allows the restriction of water effluent to debtors and the cancelation of service after 3 months of payment overdue. In Hermosillo the law allows the utility to cancel the connection to debtors of more than 6 months. Billing error complaints are usual, and the staff of Hermosillo's utility usually are not capable of solving the problem, so many customers prefer to stop paying and wait for programs of debt and fines cancellation. Some users also join a the Union de Usuarios (Customers Union) which is a clientelistic organization that lobbies discounts and exemptions in exchange for political engagement or money contributions of lesser amount than the usual water consumption bill. In Mexicali only water effluent restrictions are applied to debtors. In addition, the state governor occasionally carries out a pardon of debts, which creates a perverse incentive to avoid paying for the service.

Customer database

Mexicali and Saltillo reports a 100% reliability which means that all existing connections are properly registered, whereas Hermosillo reported a 96%. However, an executive of Hermosillo estimated that around 20% of connections are not in the list. Thus a large volume of water is neither being measured, billed nor collected.

Micro measurement:

Micro measurement coverage is the percentage of customers that have a meter installed. Mexicali and Saltillo have 100% of connections metered. In Saltillo, the meter is responsibility of the customer, and in case of theft or malfunction, the replacement of the device is done with charge to the customer, so the utility offers the customers the option of buying an insurance for these events. This responsibility is indicated in the state water law (article 58).

In Hermosillo, from 2009 to 2012 thousands of meters were bought but were not installed. At the time of writing this paper there is not notice of where those meters are and there is no registry of their existence. The meters were bought above the market price which suggests a corrupt acquisition process.

Macro measurement:

Macro measurement refers to the percentage of water sources with a meter installed. Mexicali has a macro measurement coverage of 100% and so has been since at least 2002 (PIGOO). Saltillo has increased its coverage from 6.7% in 2003 to 100% in 2013. In contrast, Hermosillo went from 97% in 2004 to 8.5 in 2013. Measurement in Hermosillo both micro and macro are low, therefore the water utility has little control on the measurement of water losses, both physical and commercial.

Financial resources

Mexicali has obtained financing from external sources such as the Japan Development Bank (credit) and the Environmental Protection Agency of the USA (donation). The creditors and donors supervised that the resources were properly applied to the goals for which the credit was granted. These credits were obtained thanks to the mediation of the government of the state of Baja California. However, the utility has had operation deficit for years, as a result of low bill collection. Fitch rates the utility as A−.

Saltillo obtained in 2014 45% of its resources for investment from its own revenue. 33% were from federal subsidies and 22% from a state-federal program. Saltillo's revenues exceed its operational cost, and in 2014 obtained a profit of MXN 64'400,137. Fitch Ratings does not evaluate Saltillo's water utility but it does rate the municipality of Saltillo, which has an AA rating. Fitch indicates the surplus in the management of the water utility as a factor for the positive rating of the municipality.

Hermosillo's financial resources for investment are mainly the Federal and State governments. Fitch indicates that the municipality has financed the constant operational deficits of the utility, although in 2014 and 2015, it has had an operation surplus due to the tariff increases approved after the completion of the Independencia aqueduct. Fitch gives Hermosillo a BBB rating.

Micro level (Human Resources Management)

Staff in Mexican utilities can be classified in two broad categories: unionized workers (operations staff) and non-unionized (managerial positions). In 2013 Saltillo had a total staff of 405 employees, (127 unionized) which amounts to 1.7 employees per thousand connections (ETC). Hermosillo had a staff of 921 (708 unionized) which is equivalent to 3.4 ETC and Mexicali had a staff of 1271 (572 unionized) 3.97 ETC. In 2012 the average Mexican utility had 4.9 staff per thousand connections (Salazar and Lutz, 2016). Although all three utilities analyzed are below this figure, Saltillo is more efficient in its use of labor. The performance and productivity of the labor force is influenced by the training and the incentives provided by the hiring and promotion policies, on the one hand, and the salaries paid by the company on the other. These factors are reviewed in the next subsections.

Training

One of the keys to being able to provide water with a smaller workforce is training. The differences in hours of training in the three utilities are striking. In Hermosillo, from 2011 to 2013 the total hours of training were 311 (103.7 per year). These are equivalent to 0.11 hours per employee per year, whereas in Mexicali there were 1,964.50 hours (654.8 per year), equivalent to 0.52 hours per employee per year. In contrast, in Saltillo, there were 7,938 hours of staff training only in 2013, which is equivalent to 19.6 hours per employee. There are also differences in the type of training each utility. Many of the training sessions in Hermosillo had little impact on the development of abilities, since most of the hours where allocated to personal development courses instead of technical abilities training. In contrast, training courses in Mexicali and Saltillo were focused on increasing the technical and managerial capacity of the workers.

Hiring practices

Hiring of operating staff practices are similar in the three utilities. In order to fill a new position or vacancy, only unionized workers apply, but, if there is no worker within the union with the capacity or adequate profile to fill the vacancy, the utility can hire a nonunionized worker but must join the union when hired. The employee is assigned temporarily to the new position for 30 days. After this period, the worker is evaluated by the company to determine if the worker is definitely assigned to the new position.

In Saltillo in order to fill a new position or vacancy, seniority of the applicants is prioritized. In case of equal seniority, the criterion is worker's capacity. Saltillo's collective contract of 2016 indicates that the utility is currently working with the union on a scheme of promotion with the worker's capacity (instead of seniority) as the main promotion criterion. In Hermosillo, in case of equal qualification of two candidates to fill a position, close relatives of current members of the union are given preference.

Salaries and incentives

Saltillo's contract includes a yearly payment of 6 days of salary as productivity bonus, however the collective contract does not specify how it is linked to productivity. In Hermosillo and Mexicali, there are no incentives explicitly linked to performance. In 2016 the salary of the director in Hermosillo was MXN 75,617. In contrast, the salary of the director in Saltillo was MXN 126,427 (almost twice as in Hermosillo). Other managerial positions in Hermosillo have also lesser salaries than similar positions in Saltillo. Salaries of operational unionized workers, on the other hand, are lower in Saltillo. According to the salary scale, Mexicali's salary monthly salary ranged from MXN 7,350 to 11,940 in 2011. In Hermosillo, monthly salary range from MXN 6,727 to 15,143 in 2016. In Saltillo, salaries ranged from MXN 3,622 to 10,032 in 2016. Total salaries plus benefits expenditure in Mexicali in 2014 was MXN 507million, while in Hermosillo it was MXN 230 million din that same year. In contrast, in Saltillo total salaries plus benefits expenditure in 2016 MXN amounted only100 million. Operational employees have better economic incentives in

Mexicali and Hermosillo than in Saltillo, however, the sums destined to cover these incentives are affecting noticeably the operational costs of the former two utilities.

Conclusions

Results show that utilities with a better performance (Mexicali and Saltillo) have greater institutional capacity. Mexicali and Saltillo have longer tenure of directors and planning horizons than Hermosillo as well as greater measurement of water consumption. They also have more hours of training and Saltillo's managers have better incentives. Saltillo has also less staff per thousand connections, and being a PPP, is not affected by political discretion in staff hiring. Mexicali has diversified its sources for financing infrastructure, unlike Hermosillo which depends greatly on the support from the municipal government. An additional feature that improves the capacity of Mexicali in this area, is that the application of these resources are supervised by lenders and donors, reducing the margin for discretion and corruption in its use. Although Hermosillo has reduced its operational deficit in recent years, it has been done through a steep increase in tariffs which are currently higher than Saltillo's. In general, results suggest that the institutional configuration of utilities can affect their institutional capacity and thus performance, with training, measurement and financial diversification as key elements of institutional capacity. So far, policies in Mexico have been oriented towards providing more resources for new water sources and infrastructure, but these resources are not used efficiently because of the low capacity of utilities. Thus, policies should address the issue of institutional capacity in urban water utilities in Mexico. By subdividing of institutional capacity in three levels, the approach used in this study allows policy makers to identify opportunity areas in the institutional capacity of utilities so that policies can be oriented to the improvement of the most deficient levels

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