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## **Assessing the Outcomes of Local Private Operators' Participation in Delivering Water Services in Developing Countries through Public-Private Partnerships**

**Bushra Mohammed Bataineh, Stanford University, USA**

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Ashwin Mahalingam, IIT Madras and Tripp Shealy, Virginia Tech



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# **ASSESSING THE OUTCOMES OF LOCAL PRIVATE OPERATORS' PARTICIPATION IN DELIVERING WATER SERVICES IN DEVELOPING COUNTRIES THROUGH PUBLIC-PRIVATE PARTNERSHIPS. THE CASE OF AGUAS CORDOBESAS**

**Bushra Bataineh<sup>1</sup>**

## **ABSTRACT**

This paper uses an in-depth case analysis of the Aguas Cordobesas water concession in Cordoba, Argentina to illustrate the process of contract management and contract renegotiation under two different lead technical operators—a multinational company, and a local company. Over the last 15 years, there has been both an increase in water public-private partnerships (PPPs) in developing countries, as well as a shift to majority local ownership of the PPP concessions. This changing landscape requires reassessing the performance indicators of water concessions, because current indicators have failed to predict the outcomes of water PPPs. This paper attempts to highlight problems with the validity and relevance of current indicators in assessing the outcomes of local water concessions, and it presents and illustrates a fundamentally different causal mechanism for predicting rates of concession contract renegotiation under local water operators.

## **KEYWORDS**

Water Infrastructure Delivery, Public-Private Partnerships, Private Sector Participation, Local Operators, Project Governance, Project Finance, Relational Contracting, International Development, Water Concessions.

## **RESEARCH PROBLEM**

There exists an urgent need to improve water services and replace aging water infrastructure in developing countries<sup>1</sup>. Approximately 1.8 billion people globally use a source of drinking water

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<sup>1</sup> Stanford University, USA, bushra@stanford.edu

that suffers from microbial contamination, including piped water supplies<sup>2</sup>. Moreover, global water infrastructure needs far exceed what public funds and capacity can deliver. Globally, an estimated \$11.7 trillion are needed to meet global water infrastructure needs from 2013 to 2030, an estimate that simply cannot be met with allocated public funds alone<sup>23</sup>.

In an effort to expand access to and improve water services, governments in developing countries embarked on ambitious reforms in the 1990s, often engaging the private sector under various contractual arrangements. These efforts were promoted by development banks which, in the early 1990s, advocated for privatization and smaller government. As the largest lender for infrastructure projects in the developing world, The World Bank's support for private sector participation has had considerable influence on policy reforms of borrowing countries and other development banks and donor agencies<sup>4-6</sup>. As a result of donor policies, the number of water public-private partnerships (PPPs) in developing countries has increased threefold since 2000<sup>7</sup>. Along with this increase has been a shift towards PPPs awarded to local private water operators instead of multinational water operators like Veolia, Saur, Suez, Aguas de Barcelona, and Thames Water.

By 2015, water PPPs in developing countries that involved a local private operator accounted for 62% of active projects by value<sup>8</sup>. This is in sharp contrast to early 2000, when just five multinational companies accounted for 80% of the PPP market in developing countries by value<sup>9</sup>. This shift is driven, in part, by the decentralization of water services provision, as well as a shift in strategy for multinational operators that have begun limiting their operations in developing country markets and focusing on other regions such as Central and Eastern Europe<sup>9,10</sup>.

Historically, water PPPs have been measured by access (coverage expansion), efficiency, service quality, product quality, tariff levels, legal and political conflict, contract renegotiation, and termination<sup>4,9,11-13</sup>. So far, the results of water PPPs in developing countries have largely been mixed, raising a number of questions about the delivery model<sup>4,14</sup>. Some of the issues include conflicts with operators in contract compliance, perceived high tariff increases, abandonment of the concession by the operator or a government takeover of the concession. A significant focus of

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<sup>2</sup> The gap is estimated at \$5 trillion under a 2% GDP government spending scenario (downside), and \$1.7 trillion gap under a 3% GDP government spending scenario (base case). Source: Standard & Poor; OECD; McKinsey & Co; Global Insight (2016)<sup>38</sup>.

the literature has been on the high incidence of renegotiation of water contracts shortly after contract award<sup>14</sup>. Extant research on water PPPs, however, has utilized the same set of indicators developed during the era of predominantly multinational concessionaires. With predominantly local ownership of newer concessions, we might expect these indicators to be less relevant in assessing the performance of water PPPs. The literature points to significant benefits of local knowledge in reducing transaction costs<sup>15,16</sup>. Orr (2005) presents evidence that foreign entrants in infrastructure projects incur unexpected costs in formal and informal relations with local host entities, including costs such as time, money, reputational damage, and relationship damage.

Focusing on renegotiation, Guasch (2004) analyzed over 1,000 long-term contracts that were awarded between the mid-1980s and 2000 in Latin America and the Caribbean. He found that 74% of all long-term water contracts were renegotiated. The renegotiations occurred 1.6 years, on average, into the contract<sup>17</sup>. The highest rate of renegotiation was in Argentina at 79%. The World Bank *Private Participation in Infrastructure (PPI)* Database showed 34% of contracts in water and sanitation in developing countries were either cancelled or in distress<sup>3</sup> between 1990 and 2008<sup>18</sup>. Guasch (2008) and (2009) analyzed the determinants of concession contracts renegotiations. Guasch looked at both renegotiations due to unanticipated events (the so-called “Pareto improving” renegotiations<sup>4</sup>) and opportunistic behavior by the firms in the absence of unanticipated events (“rent-shifting” renegotiations). His findings show that the presence of an autonomous regulator reduced the probability of renegotiations, whereas economic downturns and post-election periods increased renegotiations. Relatively more corrupt environments increased firm-led renegotiations, but decreased government-led renegotiations. Guasch explains that, in more corrupt environments, governments may have been able to strike *ex-ante* deals more easily, and were therefore less likely to renegotiate *ex-post*.

Other authors have identified additional variables associated with increased likelihood of contract

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<sup>3</sup> The PPI database considers a project to be in distress when the exit of the private sector has been formally requested or a major dispute is ongoing.

<sup>4</sup> Pareto improving renegotiations occur *ex-post* when information is revealed through the contract and are voluntary alterations of the contract<sup>39</sup>.

renegotiations. Braadbaart (2005), for example, discusses macroeconomic issues, changes in raw water supply, and asset-related uncertainties giving rise to renegotiations<sup>19</sup>. More broadly, Vernon (1971) and Woodhouse (2006) argue that, in capital-intensive sectors like water supply, investors face an “obsolescing bargain” in which governments can retreat from their original commitments once firms have invested in fixed and immovable capital assets like infrastructure<sup>20,21</sup>.

From the literature on relational contracting and renegotiations, Chan (2010) showed how strategic, cultural, and institutional factors interact to influence investors to adopt a relational renegotiation versus a legalistic response. A high level of current investment or increasing future business presence in the host country were found to be factors that favor the relational approach. National culture attributes – high collectivism, high future orientation, and high humane orientation – also promoted relational approaches, and a weak rule of law lead investors to pursue a relational response to government-led renegotiation<sup>22</sup>. Granovetter’s (1985) argues that most economic behavior is closely embedded in networks of interpersonal relations. His “embeddedness view” stresses the role of personal relations and structures (or networks) of such relations, in generating trust and discouraging malfeasance. Other literature suggests that social norms can allow for the maintenance of relational contracting. Dore (1983), for example, argues that Japanese firms maintain long-term contracts more successfully in the home market than American or European firms in their respective markets because of repeat business allied with strong cultural norms regarding reciprocity<sup>23,24</sup>.

Existing studies that emphasize the role of local operators, namely Marin (2009) and (2010) and Post (2008) and (2014), show that water PPPs involving a local operator have lower reported rates of renegotiation and lower contract termination compared to overall rates<sup>9,12,25,26</sup>. Many of these water PPPs have advanced in weak institutional environments with an increased reliance on relational contracting and informal contractual supports<sup>12,27</sup>. As such, the institutionalist perspective, which stresses the need for strong institutions, failed to predict the variation in outcomes of water PPPs and generally discounted the embeddedness of market interactions in social relations and a cultural context<sup>28–30</sup>.

Therefore, this study focuses on understanding why, counter to extant theoretically informed predictions, water concession renegotiations seem to be occurring at lower rates, even in weak institutional environments, where some of the claimed drivers of renegotiation are present.

## **RESEARCH METHODOLOGY**

This study presents an in-depth case analysis of a 30-year water concession in Cordoba, Argentina. I draw from 18 semi-structured interviews with key informants in 2016, and a review of secondary sources including contracts, databases, journal articles, and news coverage. The concession underwent multiple renegotiations, a contract termination, and a transfer of ownership from a multinational company to a local operator. The Cordoba concession offers an example of multinational vs. local operators, and the impact on renegotiation and project outcomes, while holding the concession and provincial factors more or less constant<sup>27</sup>.

The Cordoba Concession is a \$797 million contract to provide drinking water supply to the 1.5 million people in the City of Cordoba with an average of 320 liters per person per day from 1997 to 2027. The supply volumes are approximately 165 million cubic meters per year, with 70% of the supply coming from Suquia river basin and 30% from Los Molinos river basin. The water is treated and distributed through a network extending 3,992 kilometers with over 368,500 connections<sup>31</sup>. The concession was awarded by competitive bidding under the Provincial Government of Cordoba and included a 40 million USD loan from the European Investment Bank<sup>32,33</sup>. The original concessionaire, Aguas Cordobesas, was led by the multinational operator Suez which held 37.5% of ownership of the special purpose vehicle (SPV). The Spanish firm Aguas de Barcelona (Agbar) was the second largest owner of the SPV.

During the Argentine economic crisis of 2001-2002, Argentina abandoned its Convertibility Law which triggered a major currency devaluation. The Argentine peso went from being traded at a one-to-one ratio with the U.S. dollar to more than three pesos to the dollar<sup>17</sup>. Aguas Cordobesas stopped making contractually obligated annual payments to the provincial government. The government recognized the problem facing concessionaires but did not respond immediately due

to the political risk of a public outcry against increased tariffs. By February 2003, the issue still had not been resolved<sup>17</sup>. Suez then filed for a contract renegotiation under the French–Argentina bilateral investment treaty, attempting to settle debts, revisit the annual payments to the provincial government, and reach an agreement on a one-time, large tariff increase to increase the revenue stream by 50%<sup>23</sup>. This situation is not unique to the Cordoba concession. For most concessions, investments and obligations are in foreign currency, and revenues are in local currency. When the local economy is subject to a macroeconomic event, such as a devaluation, a concessionaire’s financial viability could suffer. Contracts often lack terms that specify the procedures in response to economic shocks<sup>17</sup>. Invoking international law raised the stakes in the renegotiation which made reaching an agreement more difficult.

Engaging in extended renegotiations, Aguas Cordobesas and the provincial government reached an agreement in 2004 to settle mutual debts and halt the canon payment<sup>23</sup>. In 2005, they reached a second agreement, which was signed into law in December, allowing the concessionaire to implement tariff increases through a new metering system. The company pushed for a one-time increase rather than staged increases. The tariff increase was between 25% and 100% and targeted mostly middle and upper class consumers. The new rates were implemented in early 2006, and resulted in a public outcry. In response to public pressure, the mayor suspended the rate increase for 90 days and reduced the increment to 15-18%<sup>23</sup>. In April 2006, Suez pulled out of the concession. The governor of Cordoba then worked on transferring the contract to Grupo Roggio, a construction firm from Cordoba that had previously owned a minority share in the concession. Grupo Roggio took on Suez and Agbar’s debt in exchange for a 61.15% stake in the SPV.

Adopting a different bargaining strategy, Grupo Roggio engaged in multiple informal negotiations with the provincial government. The firm would no longer need to make the annual payment to the provincial government. The tariff increases were delayed and made more gradual. The provincial government allowed an increase of 15% in 2006, after which the next tariff increase would begin in 2008<sup>23</sup>. The tariff rates then increased incrementally every 6 months or when inflation was over 8%. Grupo Roggio now only had to invest in the operations and maintenance of the system using the tariffs collected. Investments in the treatment plant and network expansions, which had previously been required of Aguas Cordobesas, were now the responsibility

of the provincial government. In addition, the provincial government agreed to support a “social tariff” for low income consumers. Consumers could apply to receive the social tariff, which currently applies to 12,000 users<sup>34</sup>.

Under Suez, the drivers of renegotiation and eventual contract termination are consistent with the literature. Under Grupo Roggio, however, we would hypothesize that the concession would undergo additional renegotiations between 2006 and the present, based on the literature. For example if we look at economic drivers, the economic downturn in 2008 led Argentina’s GDP to drop from an increase of over 8% throughout 2004 to 2007 to a decrease of 6% in 2009<sup>35</sup>. Furthermore, the political shift from the Peronist government under Cristina Fernandez de Kirchner starting in 2007 to the conservative Mayor of Buenos Aires, Mauricio Macri, in 2015, and the contentious provincial elections in 2007 with allegations of election fraud, would have hypothetically driven contract renegotiations. There were however no formal renegotiations recorded between 2006 to 2016.

While no formal renegotiations were recorded under Grupo Roggio, during the period 2006 to 2016, our interviews showed that there were substantive changes to the contract. If we use Guasch (2004)’s definition of renegotiation as “a significant change in the original contract and the financial impact of a contract that were not the result of contingencies spelled out in the contract”<sup>17</sup>. Our findings show that contract changes occurred and involved key clauses<sup>34</sup>. These include investment obligations on the operator’s side as well as changes to the project works program. Adopting a different negotiation strategy, Grupo Roggio engaged in multiple informal negotiations with the provincial government. This is in contrast to the negotiation methods drawn upon under Suez with the use of the bilateral treaty. However, it is difficult for us to determine whether informal contractual supports were also drawn upon under Suez. Furthermore, the interviews with the local operator took place in 2016, and covered issues since the operator took over the contract in 2006, the responses are susceptible to recall bias.

In the case of Aguas Cordobesas, the underlying process of renegotiation was fundamentally



different under the local operator, and resulted in the lower reported contract renegotiation rates. Instead, the informal, relational and reciprocal renegotiation processes served as a way to address uncertainty and incomplete contracts, exchanging lower investment obligations on the operator's side for gradually increasing water tariffs vs. large, one-time tariff increases that had caused consumer outcries in the past. Furthermore, the local operator seemed to demonstrate more patience in negotiations, had longer planning horizons, and maintained longer term relationships<sup>27</sup>. Chan (2010) showed that negotiators with a high degree of *future orientation* favor integrative longer-term negotiating strategies as opposed to competitive strategies. This matches well established economic game theory findings about participant behavior in repeated games vs. one time games<sup>36</sup>. Similarly, Post (2008) and (2014) showed that developing country firms tend to hold a range of businesses in their contract jurisdiction, and will hence exhibit greater patience, entertain a wider range of negotiation outcomes, and have better access to informal contractual supports than foreign firms'. While investors without these characteristics may invest heavily in the short term, particularly in stable periods, their relationships can be compromised during periods of political shifts or increased state leverage<sup>25</sup>.

## **LIMITATIONS**

We assume here that relational contracting and informal contractual supports were not as available to or as utilized by the multinational company. These factors have gone largely unmeasured in water concessions, so an embedded assumption was that these tools were not utilized under Suez. The case also involved a transfer from the multinational operator to a local operator. The extent to which the management of the contract was influenced by the antecedent experience with the multinational is not addressed in this study. The categorization of local is also not dichotomous. Grupo Roggio was a family company established in Cordoba, with various assets across diverse sectors within the same province as the water concessions. The company seemed to be heavily embedded at a very local level with the relationships they possessed and maintained. An area of further study would be to measure the degree of "local-ness" that a private operator holds. Our case study and review of the literature point towards constructs such as ownership and location of diverse assets by the operator, and networks of interpersonal relations and connections.

## **KEY FINDINGS AND IMPLICATIONS**

In the case of Aguas Cordobesas, there was an increased reliance on relational contracting and cross-sector diversification to deal with uncertainty in managing contract renegotiations<sup>13,27,37</sup>. For upheld contracts, there is evidence of a lowering of investment obligations, vs. those set out in the original documents, on the operator's side. So the actual rate of renegotiation is likely to be higher than the formal renegotiation rates previously reported, and this probably accounts for the lower reported contract termination rates and longer contract persistence of locally owned water PPP concessions even in weak institutional environments like that of Argentina in the early 2000s.

This research highlights the need for improved indicators to assess the performance of the growing number of locally owned and operated water PPPs and the need to develop more reliable indicators to predict the outcomes of local water PPPs in Latin America. Future research that develops additional in-depth case studies of locally owned and operated water concessions is needed to allow us to understand the real drivers of renegotiation of water PPP concessions and the impacts of this on their performance thereafter.

## REFERENCES

1. Unicef & World Health Organization. *Progress on Sanitation and Drinking Water – 2015 Update and Millenium Development Goals Assessment*. (2015).
2. Bain, R. *et al.* Global assessment of exposure to faecal contamination through drinking water based on a systematic review. *Trop. Med. Int. Health* **19**, 917–27 (2014).
3. Standard and Poor. Global Infrastructure: How To Fill A \$500 Billion Hole. *RatingsDirect* 1–15 (2014).
4. Davis, J. Private-Sector Participation in the Water and Sanitation Sector. *Annu. Rev. Environ. Resour.* **30**, 145–183 (2005).
5. Finger, M. & Allouche, J. *Globalisation and the state’s changing role in infrastructure development. In Water Privatisation: Trans-National Corporations and the Re-Regulation of the Water Industry*. (2002).
6. Haughton, G. Market making: internationalization and global water markets. *Environ. Plan. A* **34**, 791–807 (2002).
7. World Bank Group. 2013 Water Sector Private Participation in Infrastructure Update. *World Bank Gr. Public-Private Partnerships* 1–7 (2013).
8. World Bank. *Private Participation in Infrastructure (PPI) Project Database*. (2015).
9. Marin, P. *Public-Private Partnerships for Urban Water Utilities. Trends and Policy Options* (2009). at <<http://elibrary.worldbank.org/doi/book/10.1596/978-0-8213-7956-1>>
10. Izaguirre, a. K. & Hunt, C. Private water projects. *World Bank Gr. Public Policy J.* **297**, (2005).
11. Boudet, H. S., Jayasundera, D. C. & Davis, J. Drivers of Conflict in Developing Country Infrastructure Projects: Experience from the Water and Pipeline Sectors. *J. Constr. Eng. Manag.* **137**, 498–511 (2011).
12. Marin, P., Izaguirre, A. K. & Danilenko, A. Water Operators from Emerging Markets. *Gridlines. Public-Private Infrastruct. Advis. Facil. World Bank. Note No. 5*, 1–4 (2010).
13. Post, A. E. & Murillo, M. V. How Investor Portfolios Shape Regulatory Outcomes: Privatized Infrastructure After Crises. *World Dev.* **77**, 328–345 (2016).
14. Guasch, J. L., Laffont, J.-J. & Straub, S. Renegotiation of concession contracts in Latin America. *Int. J. Ind. Organ.* **26**, 421–442 (2008).
15. Hayek, F. A. The Use of Knowledge in Society. *he Am. Econ. Rev.* **35**, 519–530 (1945).
16. Orr, R. J. Unforeseen Conditions and Costs on Global Projects: Learning to Cope with Unfamiliar Institutions, Embeddedness and Emergent Uncertainty. 219 (2005).
17. Guasch, J. L. Granting and Renegotiating Infrastructure Concessions: Doing It Right. **Developmen**, (2004).
18. World Bank. *Private Participation in Infrastructure (PPI) Project Database*. (2015).

19. Braadbaart, O. Privatizing Water and Wastewater in Developing Countries: Assessing the 1990s Experiments. *7*, 329–344 (2005).
20. Woodhouse, E. J. The Obsolescing Bargain Redux? **364**, (2006).
21. Vernon, R. *Sovereignty at Bay; the Multinational Spread of US Enterprises*. (1971).
22. Chan, C. ‘Henry’ F. To talk or to fight? collective effects of strategic, cultural, and institutional factors on investors’ renegotiation approach in public- private concessions. 167 (2010). doi:10.1017/CBO9780511792533.011
23. Post, A. E. Liquid Assets and Fluid Contracts: Explaining the Uneven Effects of Water and Sanitation Privatization. (2008).
24. Dore, R. Goodwill and the Spirit of Market Capitalism. *Br. J. Sociol.* **34**, 459–482 (1983).
25. Post, A. E. Foreign and Domestic Investment in Argentina: The Politics of Privatized Infrastructure. 1–36 (2014). doi:10.1017/CBO9781107256569
26. Post, A. E. & Murillo, M. V. How Investor Portfolios Shape Regulatory Outcomes: Privatized Infrastructure After Crises. *World Dev.* **77**, 328–345 (2016).
27. Post, A. E. Home Court Advantage: Investor Type and Contractual Resilience in the Argentine Water Sector. *Polit. Soc.* **42**, 107–132 (2014).
28. Tan, J. *et al.* Local Institutions and Participation for Sustainable Development. *World Dev.* **26**, 1–12 (2010).
29. Boulding, K. E. Toward the Development of a Cultural Economics. *Quarterly, Soc. Sci.* **53**, 267–284 (1972).
30. Granovetter, M. Economic Action and Social Structure: The Problem of Embeddedness. *Am. J. Sociol.* **91**, 481–510 (1985).
31. Cordobesas, A. *Sustainability Report*. (2014).
32. Nickson, A. *The Córdoba Water Concession in Argentina. DFID Knowledge and Research Project R7398* (2001).
33. PPIAF – World Bank. Private Participation in Infrastructure (PPIAF) Database.
34. Bataineh, B. *Agua Cordobesas Interview*. (2016).
35. The World Bank. *World Development Indicators*.
36. Axelrod, R. Effective Choice in the Prisoner’s Dilemma. *J. Conflict Resolut.* **24**, 379–403 (1980).
37. Chan, H., Levitt, R. E. & Garvin, M. J. Collectives effect of strategic, cultural, and institutional factors on concession renegotiations. in *Proceedings of the Engineering Projects Conference (EPOS)* (2010).
38. Woetzel, J., Garemo, N., Mischke, J., Hjerpe, M. & Palter, R. Bridging global infrastructure gaps. *McKinsey Glob. Inst.* **60** (2016).
39. Dewatripont, M. Renegotiation and Information Revelation over Time: The Case of Optimal Labor Contracts. *Q. J. Econ.* **104(3)**, 589–619 (1989).

