

# Financial Structuring of Infrastructure Projects in Public-Private Partnerships: An Application to Water Projects

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[Revised Edition]

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## FOREWORD

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This report sets out an approach and a set of tools for the financial structuring of public-private partnership projects, with a particular application to the potable water and sanitation sector. The analytical framework developed here arose from the experience and insight of investors, lenders, governments, advisors and Inter-American Development Bank staff, in the development and financing of infrastructure projects in Latin America.

In the most widely publicized version of public-private partnerships, which originated in the United Kingdom with the Private Finance Initiative (PFI), the government contracts with a competitively selected private sector firm to deliver services on its behalf, which often involves building new infrastructure. The firm has to build, operate, maintain and finance the asset, and provide the service for the long term in exchange for recurrent payments from the public sector. At the end of the contractual period the operation of the asset reverts to the government. However, this variety of public-private partnership will only deliver under very stringent conditions: there must exist sufficient public funds for the government to comply with its payments schedule; and the judiciary system, regulatory institutions and the dispute resolution mechanisms must be solid enough to minimize the chances of *ex post* opportunistic behavior. These circumstances do not generally exist in developing countries, where contracts have been breached, changed arbitrarily or, very frequently, renegotiated. Most risks are considerably larger and the mitigation tools relatively less developed.

The Inter-American Development Bank took the lead in developing an initial analytical framework that provides an ordered protocol to examine the types of structures that may function in the context of developing countries (Benavides and Vives, 2005). PricewaterhouseCoopers was retained to further develop the framework in concert with the Bank. In this report we develop the continuum of solutions available by examining the conflicts that the private and the public sectors face under various configurations of local conditions that have a significant impact on investment decisions, and by analyzing the application of risk mitigation tools.

The approach and tools are meant to serve as a guide to assist governments and investors in evaluating different options to establish a successful public-private partnership, considering the political and economic realities of each country and the risk mitigation tools that can be implemented. The principles and analyses presented here, while comprehensive, cannot be considered to cover all possible cases. They are still being researched and refined, thus, feedback and comments are encouraged.

Even though the local conditions, case studies and examples discussed in the report originate in the water and sanitation sector, the framework is by no means restrictive in scope and could be used in other infrastructure sectors. We chose the application to the water sector because we consider it to be more complex given the wide ranging political implications of the service and the fact that many projects tend to be developed at a subnational level where complications are larger. Thus, application to energy and transportation would be simpler than the ones presented here.

The authors hope that this report will make a contribution to the development of public-private partnerships for the financing of infrastructure projects and, in turn, lead to an increase in investments in developing countries.

They would also like to thank the IDB-Netherlands Water Partnership Program for its financial contribution that made this report possible.

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## CONTENTS

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1. Introduction and Overview	3
2. A New Analytical Framework: Principles	6
3. Description of Framework Components	8
3.1. Local Conditions/Variables	8
3.2. Project Modalities	9
3.3. Tools	11
4. Creating the Project Feasibility Map: Application of the Tools and Modalities for Weak Local Conditions	12
4.1. Assess Local Conditions	12
4.2. Evaluate Which Modalities May Work	13
4.3. Assess Which Tools May Apply	16
4.4. Combine Tools and Modalities to Determine Potentially Feasible Project Structures	17
4.5. Improving Local Conditions	20
5. Closing Remarks	23
Appendix A. Local Conditions/Variables	29
Appendix B. Project Modalities	37
Appendix C. Tools	51
Appendix D. Hypothetical Examples	56
Appendix E. Case Studies in Water and Sanitation	68
Bibliography	83

## FINANCIAL STRUCTURING OF INFRASTRUCTURE PROJECTS IN PUBLIC-PRIVATE PARTNERSHIPS



## DEFINITIONS

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*Local conditions* or *variables* refer to specific components of a country's or an area's business climate that have a significant impact on the conditions for investment and investment decision making. Throughout this paper we will assume that *local conditions* are fixed in the short run, but could improve in the medium term as a result of changes in the business climate and/or the quality of institutions. *Modalities* or *project modalities* refer to the spectrum of public to private participation alternatives that could be applied to finance a given project. *Tools* refer to instruments that could be used with the *modalities* to mitigate specific risks. *Project structure* refers to the specific combination of *modalities* and *tools* (when they can be instrumentally combined) in a given project to better cope with the risks and threats posed by the *local conditions*.

## 1. INTRODUCTION AND OVERVIEW

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The link between the availability of quality infrastructure and country competitiveness has been well established. Efforts to expand investment however, have often met with significant challenges. Private sector investment, once considered a primary source of funding has diminished significantly from the peaks reached in the late 1990s. Indeed, it continues to fall substantially short of overall needs, and policymakers remain concerned about the efficiency of investments being made.

Both public and private sector participation are vital to meet the needs of the sector. Given the varied experiences of the past 15 years, however, there is a need for a better way to mobilize public and private sector investment, and to structure public-private partnerships to meet the conditions and requirements specific to each country, locality and project. Negative experiences regarding the attraction of private investment in infrastructure have tended to fall into two categories: (i) inaction (no investment) or (ii) poor choice of modalities, which left too much risk to the private parties without necessarily offering a commensurate return. In the first case, private underinvestment likely reflects the limited choice of public-private partnership modalities that were being considered (i.e., pure privatization or concession schemes that are demanding in terms of institutional and fiscal capabilities).

The consequences of choosing a poor modality, and therefore project structure, are reflected in the high renegotiation rates of infrastructure contracts during the nineties (40 percent of a sample of 796 infrastructure concessions was renegotiated in the region; and the average time to renegotiate was approximately 2.2 years). One of the major concerns expressed by investors has been the change in bargaining power from the investment stage (which favors the firm) to the operational stage (which tilts the balance toward the government because the firm is "stuck" with the investment). Under these circumstances, investors were easily expropriated where the local conditions had not been carefully evaluated and the project structure did not match the existing limitations.

The analytical framework developed in this report looks at three components that are critical to the success of projects: (i) local conditions with high impacts on investment, (ii) the modality of the project, and (iii) the tools available to mitigate the risks imposed by local conditions. The framework provides guidance and insight into how the combination of these factors can lead to additional viable project structures.

The framework is developed systematically, beginning with an identification and assessment of local conditions, followed by review and evaluation of potential modalities, and then by evaluation of risk mitigation tools and their potential impact/enhancement of feasible modalities. The modality itself, of course, is a major risk mitigation tool, aligning incentives and risk allocations between the public and private sector, and helping ensure that the project is suited to the environment in which it is conceived. Tools can make some modalities more viable by addressing residual risks, but they cannot substitute for a modality that does not address the fundamental risks faced by a project in its context.

The importance of local conditions on modality choice is shown clearly in the observations of Rodrik (2004) made with regard to the vigor of private investment in China:

Private entrepreneurs were effectively partners with the government. In a system where courts cannot be relied upon to protect property rights, letting the government hold residual rights in the enterprise may have been a second-best mechanism for avoiding expropriation. In such circumstances, the expectation of future profits can exert a stronger discipline on the public authority than fear of legal sanction. Private entrepreneurs felt secure not because the government was prevented from expropriating them, but because, sharing in the profits, it had no interest to expropriate them.

As it is clear, a financing mechanism requiring eventual recourse to the legal system (a Build-operate-transfer scheme, for example) would likely fail in this context, even in the presence of strong risk mitigation tools.

The framework presented here is designed to help investors and governments assess investment conditions and the appropriate mix of public and private sector participation in any individual infrastructure sector investment. *For policymakers*, the framework provides a guide to the issues that governments need to consider in preparing for, attracting and retaining investment into the sector. It helps identify conditions that may impede effective or greater private investment, and provides a tool for evaluating those conditions. As such, the framework can serve as guidance on measures to improve the progressive development of private participation in the sector. *For investors*, the framework serves as a guide for the identification and evaluation of possible project structures in the sector. While it does not substitute for effective due diligence, it does suggest areas of focus for that due diligence. It is intended to provide a mechanism for considering the most appropriate structures given local conditions and the risk mitigation tools available.

The framework provides guidelines for arriving at these assessments and a protocol for evaluating different structural options. It is designed to provide, as well, a means by which public and private participants may enter into an effective dialogue over project modality and risk mitigation. Each project structure ultimately must be shaped by the conditions specific to that project and locality. The framework is designed to facilitate that evaluation and help reach successful outcomes.

In order to show the application of the framework in practice, we have chosen the most complicated of the infrastructure sectors; that is, water and sanitation. In general, because of the political implications, the perceptions that these services are a right, the social consequences of deficient services, the fact that most of these services are provided at the local level, and difficulties in cutting-off service as well as other obstacles, make this sector one of the hardest to finance and one of the riskiest investments for the private sector.

This report is organized in the form of a guide, to enable the reader to quickly absorb the framework and its functions. Components of the framework are briefly described herein with further detailed information available in the appendices.

The reader is encouraged to pay particular attention to the rich material that the authors placed in the appendices. The conceptual framework of the main text can be better grasped when subject to both a desk test (via different hypothetical values of the local variables) and a validation through real cases that were carefully picked to illustrate good and bad structure choices. This is precisely what the reader will find out in the appendices. A brief description of the five sections and five appendices of this guide follows:

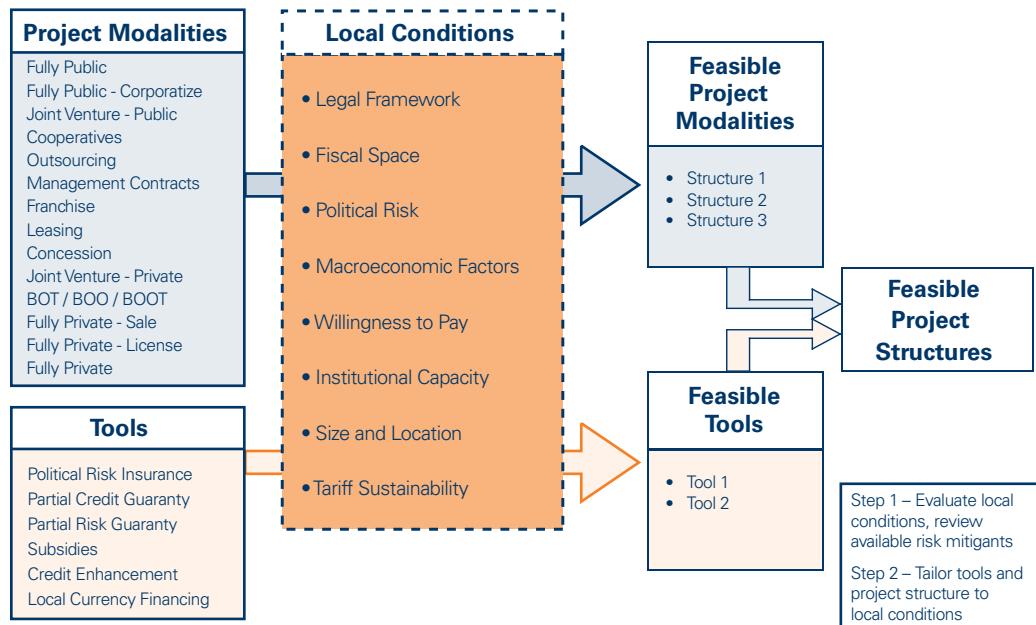
- **Section 1: Introduction and Overview**—Provides the introduction to the paper and sets the overall context for the guide
- **Section 2: A New Analytical Framework: Principles**—Introduces the analytical framework, and describes how it can assist in structuring a successful project;
- **Section 3: Description of Framework Components**—Introduces and outlines the three components of the analysis: local conditions, Public-Private Partnership (PPP) modalities and enhancement tools. Detailed descriptions of each of these are found in Appendices A, B and C respectively.
- **Section 4: Creating the Project Feasibility Map: Application of Tools and Modalities for Weak Local Conditions**—Shows how to conduct the analysis to determine most likely feasible project structures. Also introduces the use of the framework for dynamic analysis (i.e., as the sector and country conditions evolve). Appendix D provides six distinct hypothetical scenarios for further reference and understanding of the framework and its application. Appendix E uses the framework to analyze specific water and sanitation investment cases.

- Section 5: **Closing Remarks**—Provides a brief summation of the utility of the framework.
- Appendix A: **Local Condition/Variables**—Provides a working definition of the variables with a strong impact on the viability of structures, as well as discussing such impacts and suggesting some indicators to measure or assess the strength or weakness of each variable.
- Appendix B: **Project Modalities**—Discusses five major ways of structuring a project (from fully public to fully private) and some of the key variants (public corporatized, cooperatives, concessions, joint ventures, etc.), including graphic illustrations of the relationships among the regulatory function, customers, governments, shareholders and providers.
- Appendix C: **Tools**—Discusses eight tools and instruments that may be available to enhance structures, and the risks that they address.
- Appendix D: **Hypothetical Examples**—Includes six hypothetical cases of varying complexity to illustrate the application of the framework, beginning with a discussion of the given local conditions and showing how to use the feasibility map to find the most feasible structures and how adding tools on top can reduce risks.
- Appendix E: **Case Studies in Water and Sanitation**—Provides ten international case studies in the sector, aimed at illustrating (ex post) the ex ante feasibility of the applied structures, the structures and mitigation tools that were used and those which could have been deployed instead.

## 2. A NEW ANALYTICAL FRAMEWORK: PRINCIPLES

While many conditions affect an investor's willingness and ability to participate in infrastructure investments, three factors have generally had a significant impact on the success of such involvement. These are: the presence or absence of local conditions favorable to investment, the type of modality used and the application of risk mitigation instruments.

**Figure 1. Analytical Framework**



The analytical framework depicted in figure 1 shows how these three critical components can interact at a high level to shape a successful project structure. Simply put, local conditions dictate much of what can be successfully accomplished in any given country or project. The modality used to set up the project and the risk instruments available must address issues raised by the local conditions. A careful analysis of such conditions, therefore, is the starting point for determining which modalities may be successful. Risk mitigation tools may then expand the range of possible modalities by mitigating risks that are raised in the local environment.

A great number of failures in investments in infrastructure, particularly in water and sanitation, can be attributed to the application of financial structures, mostly imported from other environments, without paying due attention to the *local conditions* described in this paper, taking for granted or severely underestimating their impact on the success of the project. The analytical framework presented considers the feasibility of different *modalities*, given the prevailing, or likely to prevail, local conditions and classifies them as being feasible, non-feasible or feasible only with enhancements or risk mitigants (*available tools*).

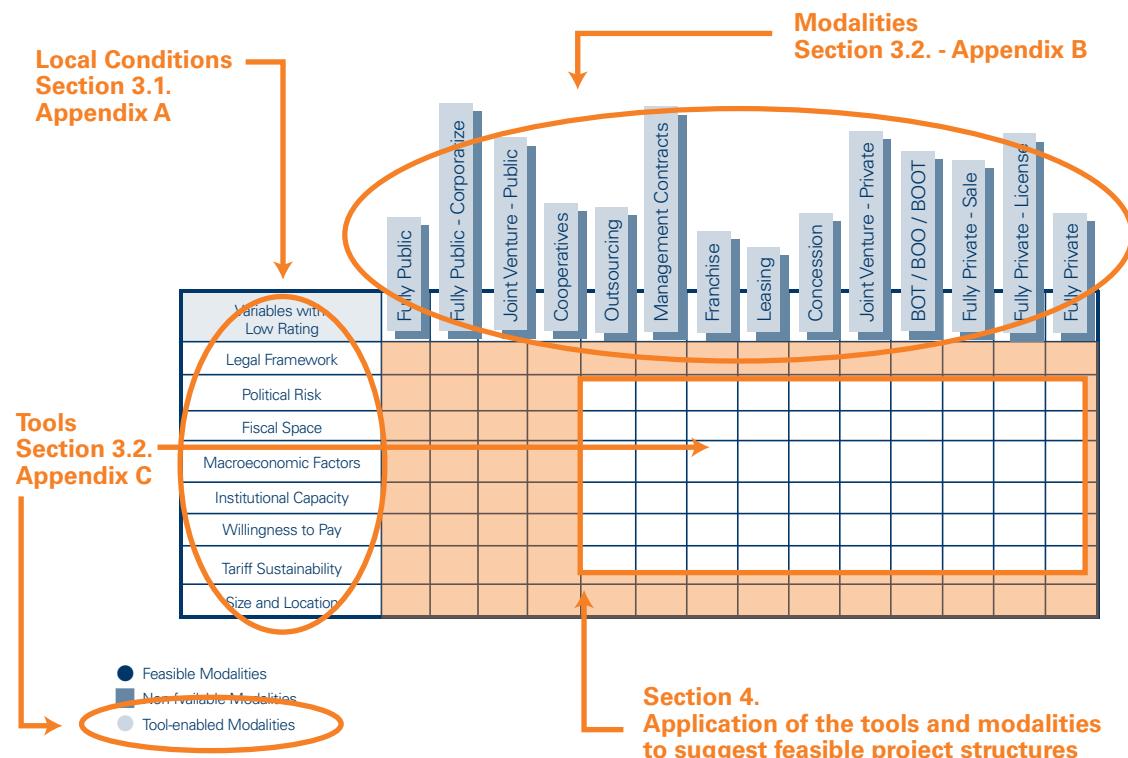
The analytical framework developed in this paper provides a tool for conducting such analysis. It encourages the reader to assess eight key local conditions (or variables) that have been proven to have a high degree of influence on the success of projects. Other significant variables may exist and each investment evaluation should consider those most relevant for the investor and the country, locality and project. This guide also reviews PPP modalities (that is the mix of public and private sector participation) and their potential application under various local conditions. It also evaluates how risk mitigation tools can enhance modalities, making additional alternatives possible.

Given the local conditions, project modalities can be selected in conjunction with available tools to identify project structures with a higher potential for success than other structures. The term *project structure* is used here to represent the final outcome of the analytical framework, that is, the project structure that is perceived to be the "most feasible" given local conditions, modalities and tools.

The analysis proceeds systematically. An assessment is made of the limitations that local conditions create for private investment in the sector. Project modalities are reviewed for fit with local conditions, and project enhancement or risk mitigation tools are assessed for application. A project feasibility map (see figure 2) is also generated. The project feasibility map relates local conditions with project modalities, incorporating available tools to assess and evaluate the most likely feasible project structures.

Figure 2 shows a blank project feasibility map and provides a guide to the sections of this paper that address each component of the map.

**Figure 2. Project Feasibility Map by Framework Component**



### 3. DESCRIPTION OF FRAMEWORK COMPONENTS

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The core framework components of local conditions, modalities, and tools are described in brief here. Detailed information on each component is found in Appendices A, B and C, respectively. The following section, Section 4, discusses how these components are combined to complete a project feasibility map for a given project.

#### 3.1. Local Conditions/Variables

Eight variables have been identified by the Inter-American Development Bank as having a significant impact on the viability of projects. These are a country's legal framework, fiscal space, political risk environment, macroeconomic conditions, institutional capacity, the willingness of users to pay for services, the sustainability of tariffs, and the size and location of the facility. Some of these variables compound (i.e., legal framework and political risk) and should be analyzed accordingly. These variables are illustrative of the most common factors that apply to all countries and all sectors, but the user is encouraged to change them or their definition to suit the case at hand.

Appendix A further defines the variables selected, provides guidance on analyzing their potential impact on private investment in the sector, and suggests indicators and approaches for determining the strength or weakness of a given variable in a local setting.

Figure 3 provides a brief definition of the variables and their areas of high impact using as an example a water supply and sanitation (WSS) project.

**Figure 3. Selected Variables**

Identified Variables	Defined in This Paper As	Area of High Impact
Legal Framework	The capacity of the courts, the body of laws, regulation and complementary institutions (including the existence of alternative resolution mechanisms) to enforce contracts	<ul style="list-style-type: none"> <li>- Conflict resolution mechanisms</li> <li>- Legal treatment of water, water infrastructure, and property rights, including collection rights and availability to enforce service suspension in the case of non-payment</li> <li>- Ability to seek recourse for breach of contract</li> <li>- Contract enforcement</li> </ul>
Political Risk	The likelihood that a project will be significantly affected by a change in the political conditions of a given country or municipality	<ul style="list-style-type: none"> <li>- Political interference with projects, including expropriation or partial expropriation breach of contract, transfer and convertibility issues</li> <li>- Collateral impacts due to civil unrest or war</li> </ul>
Fiscal Space	The financial capacity of the national and/or subnational entities to provide sustainable and credible support to a project.	<ul style="list-style-type: none"> <li>- Availability of public capital to expand service provision to new areas</li> <li>- Ability to finance ongoing maintenance of the infrastructure</li> <li>- Ability to support a project with a government funded subsidy stream</li> </ul>

**Figure 3. Selected Variables (Cont.)**

<b>Identified Variables</b>	<b>Defined in This Paper As</b>	<b>Area of High Impact</b>
Macroeconomic Factors	Economic volatility that includes the possibility of currency devaluations or high inflation as a consequence of international shocks or unsustainable macroeconomic policies.	- Devaluation and other macroeconomic events that affect the economic viability of a project as well as its value
Institutional Capacity	Institutional capacity refers to four general topics: (i) the existence of a reliable water regulator; (ii) its capacity to implement the regulatory framework; (iii) the quality of sector authorities to provide technical support to water firms; and (iv) the prevalence of corruption in the country and water and sanitation sector.	- The ability to set, enforce and monitor a rational regulatory regime, including the tariff regime - Lack of local capacity and technical knowledge that can limit the operations of the utility, or can affect how the project is implemented - Corruption levels affect accountability, transparency and trust, reducing investor confidence
Willingness to Pay	The beliefs and attitudes regarding water as a naturally free commodity; the acceptance of private services for utilities; and/or acceptance of foreign investment. This definition goes beyond the existence of an economic demand for water and sanitation.	- Ability of service provider to collect and set tariffs on a cost recovery basis
Tariff Sustainability	Consumer ability to afford the full cost recovery tariffs for water provision	- Affordability of tariffs for consumers will have an impact on the long-term sustainability of a project and the method used for structuring it (i.e., to involve shadow tariffs, subsidies, output based aid (OBA), etc.)
Size and Location	The effects of the size of a project and its location on decisions regarding asset ownership, project modality, exit strategies, and configuration of a specific project's structure	- Size can affect access to investors and to business resources provided by a sovereign or subsovereign government - Location in urban, peri-urban or rural areas, can define the type of providers that efficiently supply water

## 3.2. Project Modalities

Project modalities refer to the spectrum of public to private participation possible in a given project. Figure 4 presents this range and the allocation of responsibility between the public and private sectors under different modalities, as well as the typical duration of contractual arrangements with the private sector under that modality.

**Figure 4. Spectrum of Public to Private Options - Allocation of Responsibilities According to Modality**

	O&M	Commercial Risk	Capital Investment	Asset Ownership	Duration
<b>Fully Public</b>					
State Companies	●	●	●	●	Indefinite
Cooperatives	●	●	●	●	Indefinite
Corporatized Cooperatives and State Companies	●	●	●	●	Indefinite
<b>Management Contracts</b>					
Outsourcing	●	●	●	●	< 1 year
Generic Management	●	●	●	●	3 to 5 years
Franchising	●	●	●	●	
<b>Concession</b>					
Leasing	●	●	●	●	8 to 15 years
Typical Concession	●	●	●	●	25 to 30 years
BOT	●	●	●	●	20 to 30 years
BOO	●	●	●	●	20 to 30 years
<b>Fully Private</b>					
Divestiture by License	●	●	●	●	Indefinite
Divestiture by Sales	●	●	●	●	Indefinite
Private Supply	●	●	●	●	Indefinite

**Allocation of Responsibility** ● Private   ● Public   ● Public and Private

In general, with strong local conditions, greater private participation is possible as risks to investors and lenders tend to be lower. A strong capacity to enforce contracts, for instance, makes most of the tools for risk mitigation effective, and hence allows a broader range of project structures that can be arranged to suit the local conditions. With weak local conditions (including the ability to enforce contracts), private participation options will tend to fall into the type of self-enforcing agreements. An international WSS operator/investor may choose to pursue a management contract in one country and a concession contract in another due to very different investment conditions in each country. While they may prefer concession structures overall, they will not risk equity capital when conditions are not deemed suitable for that form of private participation.

Appendix B details the structure and risk trade-offs of the modalities listed in figure 4.

### 3.3. Tools

A number of risks can be mitigated through the use of risk mitigation instruments or tools. Figure 5 provides a list of some of the more commonly available tools and a short description of their uses.

<b>Figure 5. Selected Tools</b>	
<b>Tools</b>	<b>Brief Description and Scope</b>
Political Risk Insurance (PRI)	PRI provides coverage against risks with respect to expropriation, political violence, and currency transfer and convertibility.
Partial Credit Guarantees (PCG)	PCGs are guarantees that represent a promise of full and timely debt service payment up to a predetermined amount (usually not the full value of the debt). Useful to address macroeconomic risks or lack of an appropriate fiscal space.
Partial Risk Guarantees (PRG)	PRGs are guarantees to mitigate risks associated with specific government counter-party uncertainties. They are issued by the multilateral development banks, which are counter-guaranteed by a host-country government.
Subsidies	A transfer from a government or development community to a provider or consumer to assist the water sector in providing a public need. Subsidies vary greatly in application. Four main categories include: international grants or output-based aid (OBA), special purpose funds, government subsidies and cross-subsidies. Subsidies help to mitigate lack of affordability or willingness to pay risks.
Credit Enhancement	The strengthening of a borrower's balance sheet through insurance, guarantees, collateral and other means to facilitate financing/funding. Credit enhancement facilitates the ability of a provider to raise debt finance (reducing risks associated with the fiscal space) or raise other funds. It can also be used to increase credit capacity and improve borrowing conditions such as longer maturities that cover the life of a capital asset.
Local Currency Financing	The use of local currency to finance projects. Used to minimize the effects of currency devaluation on project sustainability by matching the borrowing currency with the revenue currency, and thus allowing for a more stable source of finance for projects that often have only local currency revenues (macroeconomic factors).
Arbitration Rules	The contract should contain various provisions for arbitration in the event of disputes between the provider and either the regulator or the corresponding government. Those rules could include the creation of an expert panel to analyze any disputes that may arise.
Off-take Contracts	Contract between the provider and the government whereby the government guarantees a minimum purchase level. The agreement is a commitment to take or pay for a specific amount of water at a specified tariff. This type of agreement is commonly used in the construction of water treatment plants. It can be used to increase tariff sustainability by giving a minimum amount of revenue to the providers.

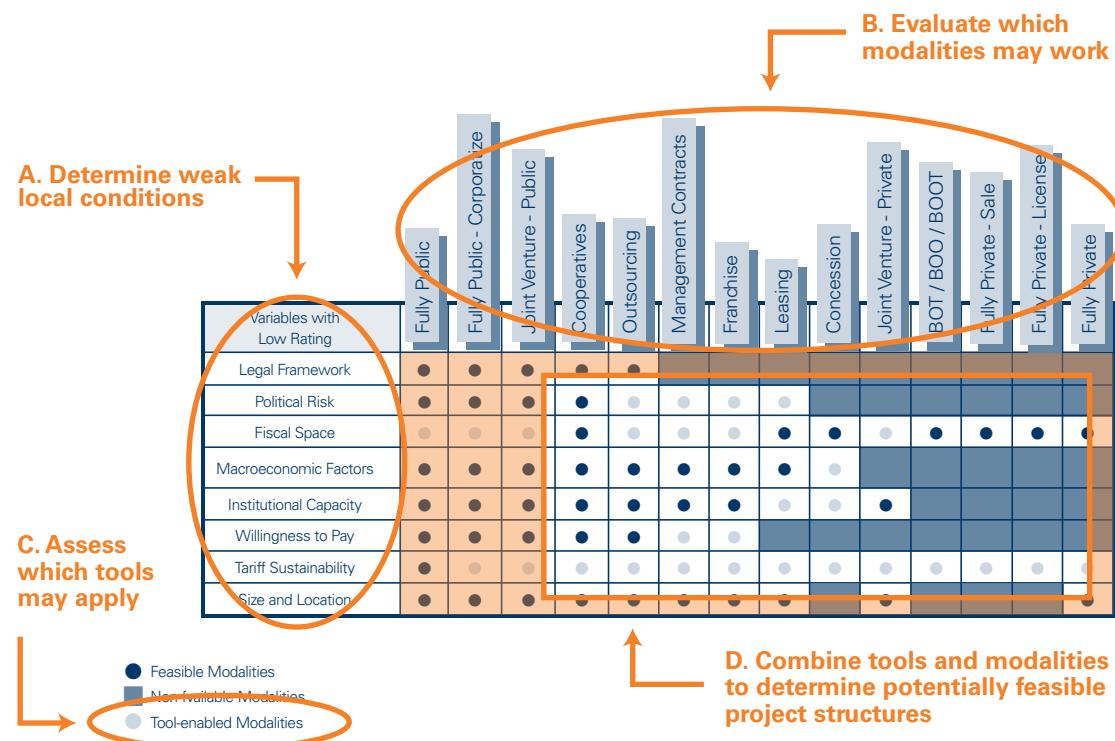
While not all these tools and instruments are available or equally applicable, their use can make a significant difference on the final risk profile of a project for a private participant. In fact, their application can enable more PPP modalities than might otherwise exist without them. This will be explained in more detail in Section 4. Appendix C further describes the tools that are available and their potential use in PPP structures.

## 4. CREATING THE PROJECT FEASIBILITY MAP: APPLICATION OF THE TOOLS AND MODALITIES FOR WEAK LOCAL CONDITIONS

This section outlines how the framework components described in Section 3 can be used to evaluate the potential viability of various project structures for a given PPP opportunity. The section introduces the project feasibility map as the synthesizing tool for this assessment.

Figure 6 shows the analytical process that should be followed.

**Figure 6. Project Feasibility Map - Analytical Process**



### 4.1. Assess Local Conditions

The analysis begins with an assessment of the local conditions/variables. (Appendix A outlines each variable and suggests some indicators which may be used to assess the strength or weakness of that variable in a given country or locality.) A variable ranked as low (or weak) indicates that there are higher risks to a project. Higher risks associated with low local conditions ratings limit the number of feasible project structures possible.

A table such as the one illustrated in figure 7 may be used to score local conditions. Using the indicators found in Appendix A or other indicators the investor feels more appropriate, establish a standard minimal acceptable criteria for the local condition ("a" in the table below) and then evaluate the local condition as either "meeting/exceeding" or "not meeting" the criteria.<sup>1</sup> A score of "not meeting" the criteria would indicate a "weak" variable.

<sup>1</sup> Some investors may prefer a scale to a binomial scoring system.

It is important to note that each investor will likely have his/her own interpretation of a minimum acceptable level, which will depend on risk appetite, country exposure and other factors. As an investor, however, the minimum level required should serve as a threshold marker for risk assessments. This may further be expanded to draw comparisons among other countries, localities or projects. For a project designer, the minimum level required could be used to select the operating profile that it would like to have for the project, trying to mimic conditions that have successfully attracted investment in other countries or regions of the same country.

**Figure 7. Rating Variables with Indicators**

Variable	Indicator(s)	Minimum Level Required (a)	Local Conditions (b)	Rating or Perception of Local Conditions (a) > (b) = low AND (a) < (b) = high
Legal Framework				
Political Risk				
Fiscal Space				
Macroeconomic Factors				
Institutional Capacity				
Willingness to Pay				
Tariff Sustainability				
Size and Location				

Each variable should be evaluated accordingly and a determination made as to which local conditions are viewed as weak and which are not.

## 4.2. Evaluate Which Modalities May Work

After the initial assessment of the variables, project modalities need to be considered. While an investor or government may have a specific project modality in mind (for example, a concession), not all modalities will work successfully where there are weak local conditions.

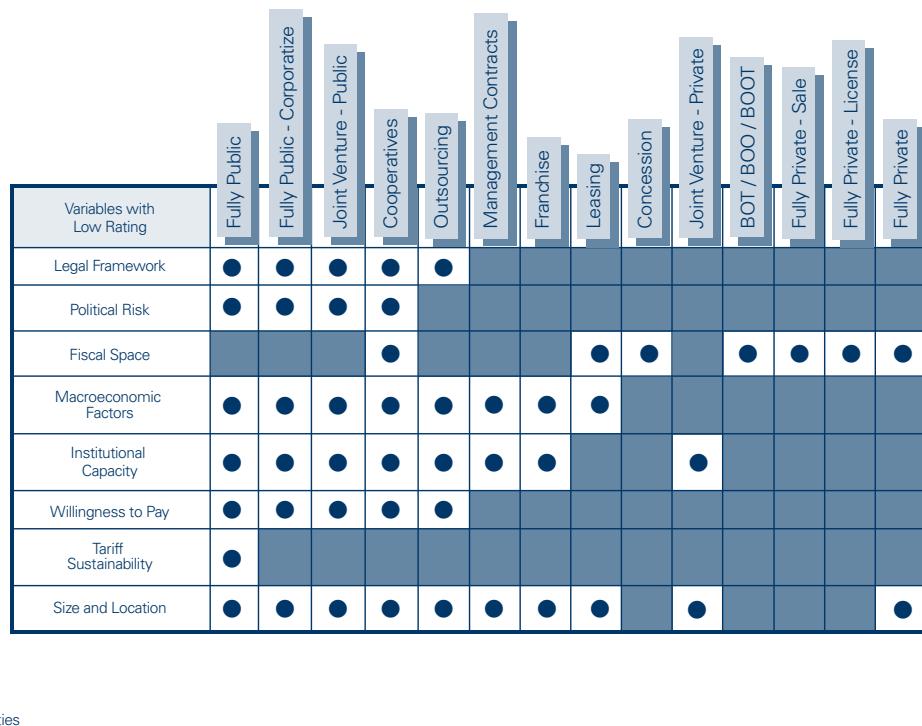
**Figure 8. Feasibility of PPP Modalities Under Weak Local Conditions**

Figure 8 shows which modalities are more likely to be successful (all other things being equal) when local conditions are considered weak. Reading vertically it can be seen that no modality, not even a fully public sector utility, is likely to succeed if all local conditions are considered weak.<sup>2</sup> But it can also be seen that there are a number of modalities that are more likely to succeed even when there are multiple weak local conditions.

For example, figure 9 shows that when both the fiscal space and macroeconomic factors are ranked low, leasing and cooperative modalities may provide the most feasible structures (both leasing and cooperative modalities have positive indicators in both fiscal space and macroeconomic factors).

Weak macroeconomic factors expose investors to potential devaluation, interest rate and inflation risks. Weak fiscal space indicates that public sector resources to support subsidy or other public funding are limited. A cooperative modality is a co-investment of users to operate and maintain a facility. In general, given that the investors are the users, they have an inherent interest in the output of the system (more so than outside investors) even under unstable macroeconomic conditions. Cooperatives may also be less sensitive to limitations on public sector resources because they often use pooled resources to invest in a facility.

Leasing limits government's capital investment and debt repayment requirements, making these modalities less sensitive to macroeconomics factors. Depending on the tariff regime and revenue requirements, leasing can include public funding streams (subsidies) or not. In principle, it does not rely on them, making fiscal space less of a limitation. Other modalities of private participation such as outsourcing, management contracts and franchising mitigate the macroeconomic risk but expose the government to potential financial

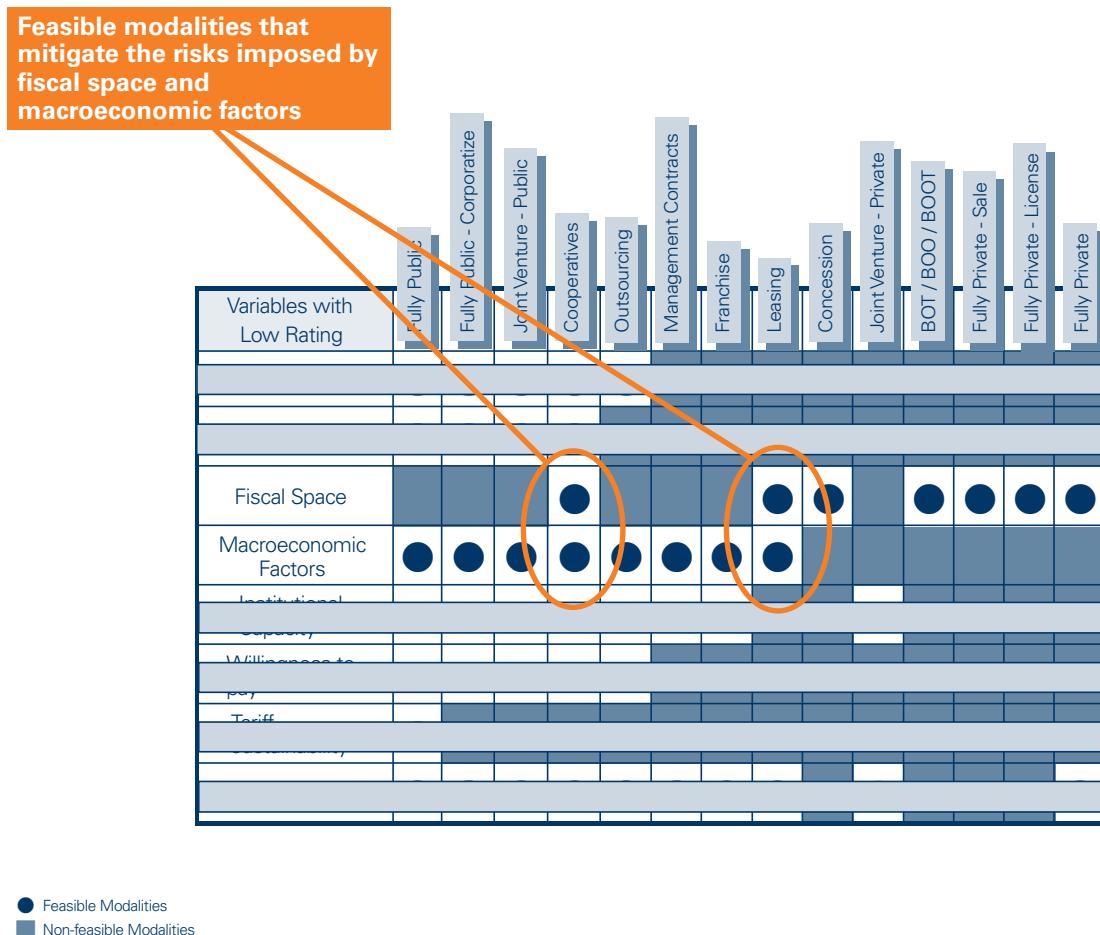
<sup>2</sup> A box with a circle indicates a potentially viable modality even if the corresponding condition is weak.

support requirements in the operation of the facility in an environment where it is not possible for the general and local budget to sustain the water utilities (low fiscal space).

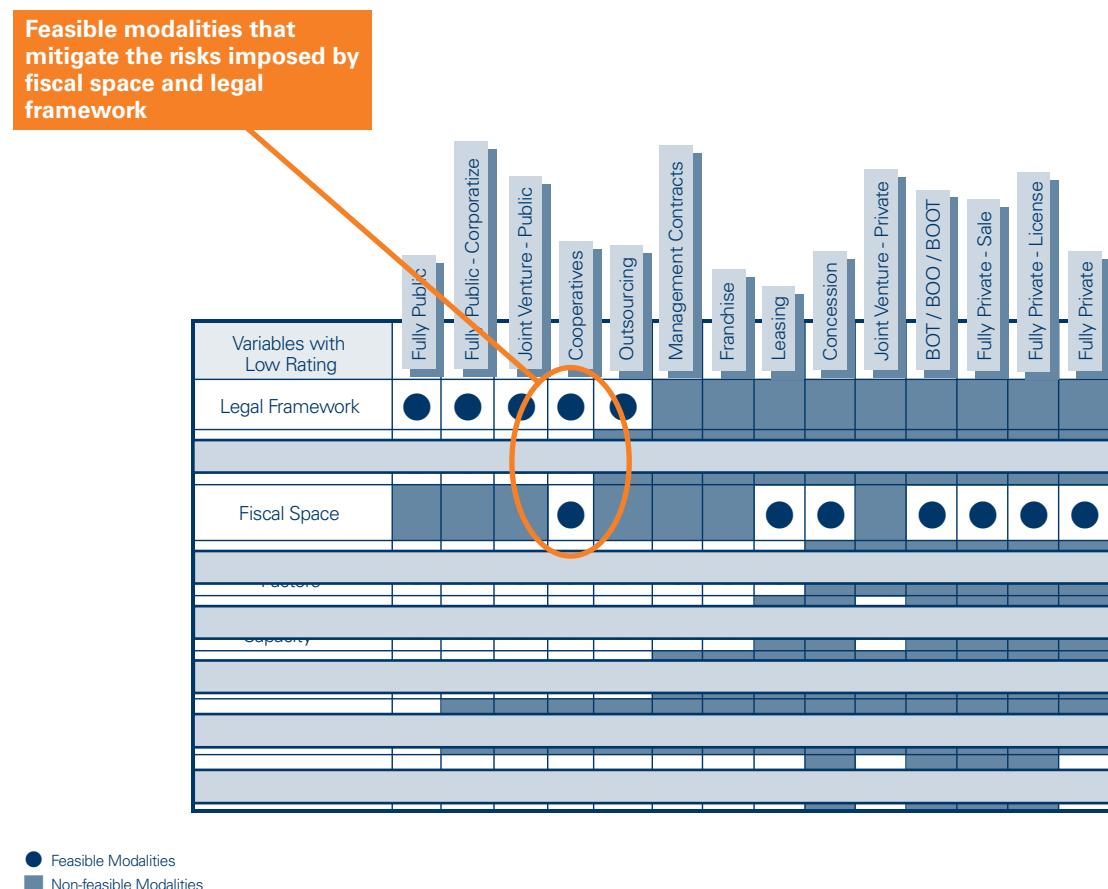
See Appendix B for more information about PPP modalities.

Figure 9 illustrates this more clearly, highlighting the two variables specifically.

**Figure 9. Feasibility of PPP Modalities Under Weak Local Conditions - Example 1**



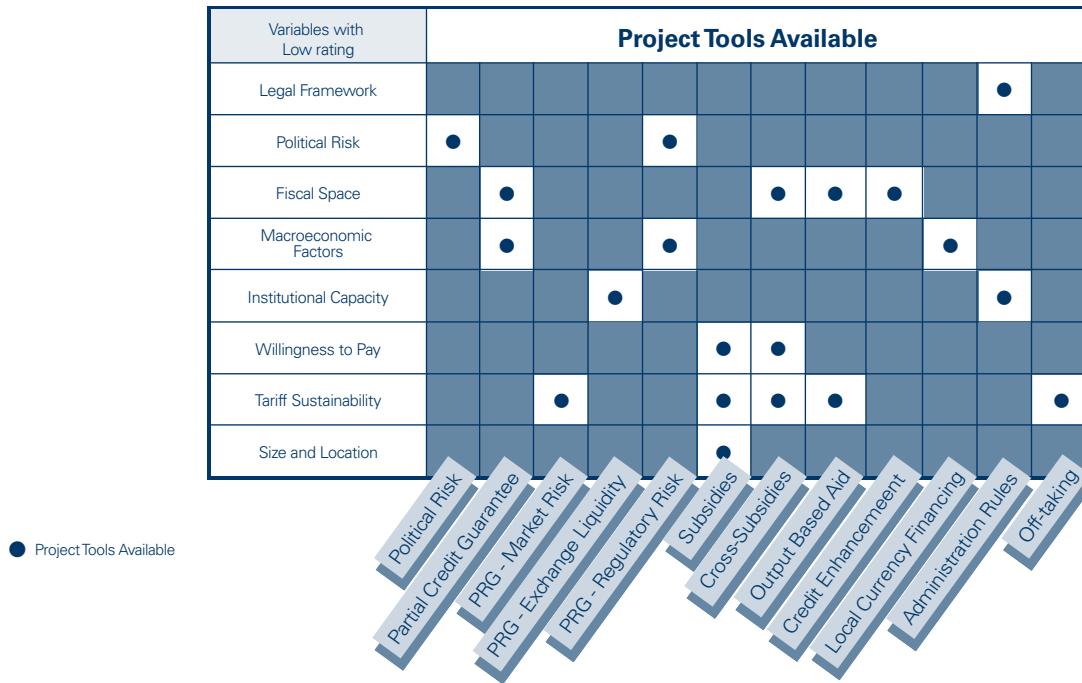
Any combination of weak variables and modalities can similarly be evaluated quickly using this chart. The case of weak legal framework and weak fiscal space is highlighted in figure 10, showing that a cooperative is the modality most likely to provide a viable project alternative.

**Figure 10. Feasibility of PPP Modalities Under Weak Local Conditions - Example 2**

### 4.3. Assess Which Tools May Apply

In the above examples, modalities involving private capital are likely to be less feasible. However, the application of risk mitigation tools may enable options for private investment that would not otherwise exist.

The range of risk mitigation tools generally available and how they enhance project feasibility is described in detail in Appendix C. Each project will require its own assessment of available tools and how they may enhance project feasibility. However, figure 11 shows, in principle, which tools and risk mitigation instruments are available and can help address identified local condition variables.

**Figure 11. Application of Project Enhancement Tools**

So, for example, where there is low fiscal space a project may be able to take advantage of a partial credit guarantee, cross subsidies, output based aid, and/or credit enhancement. However, project enhancement tools do not provide wide coverage across multiple local conditions. As a result, this may point to areas for further tool development on the part of the international community.

#### 4.4. Combine Tools and Modalities to Determine Potentially Feasible Project Structures

With the identification of weak local conditions, the evaluation of possible modalities and the review of available risk mitigation instruments, it is possible to construct the project feasibility map.

Taking the two examples from figures 9 and 10, we can see what modalities become possible when specific local conditions are weak but risk mitigation tools are available.

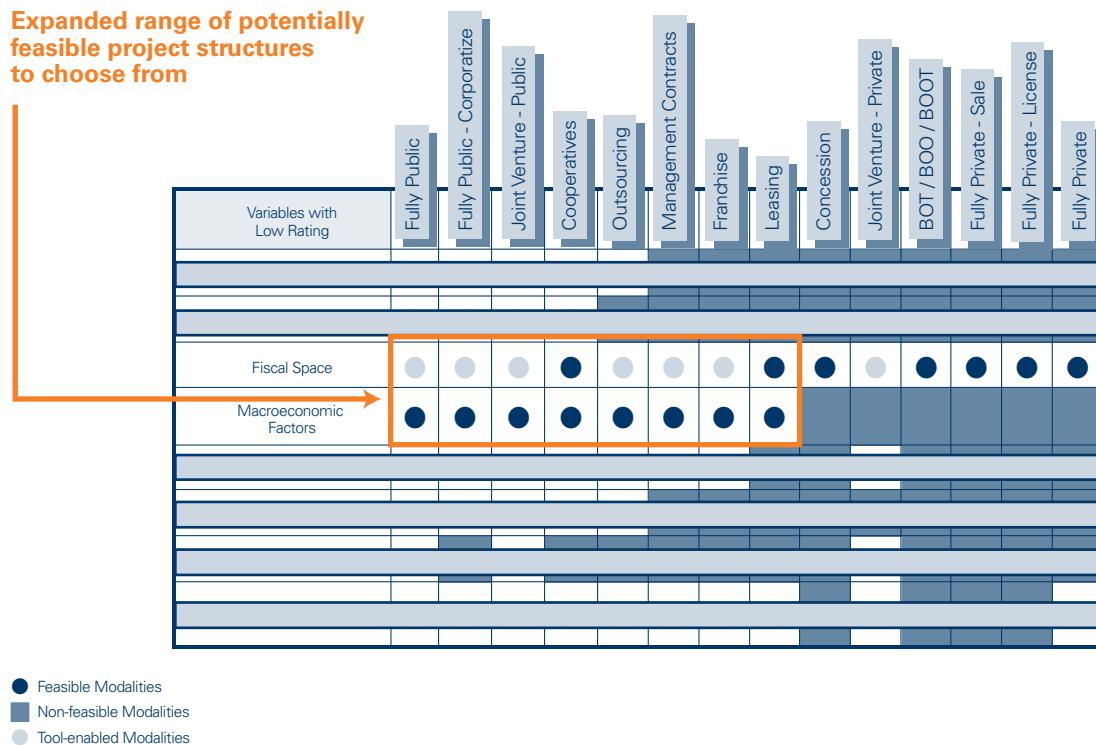
Figure 12 lists the additional available project modalities when risk mitigation tools are applied. However, it is necessary to understand that this figure assumes that all tools are available, an assumption that is not always true. The purpose of the figure is not to provide specific solutions but to suggest potential arrangements and allow for a better understanding of the relationships among the variables, tools and structures. Analyzing a specific variable in the figure, one can see the additional project modalities that are typically available for such low-rating variables. Adding the risk mitigation instruments pertaining to a specific variable, more project modalities can be considered for developing potentially feasible project structures.

**Figure 12. Increasing Access to Project Modalities Through Tool Application - Selected List of Tools and Application**

If Low Rating in	Feasible Modalities without Risk Mitigation	Apply Available Risk Mitigations Tools	Additional Feasible Modalities with Risk Mitigation Tools Applied
<b>Legal Framework</b>	Fully Public Fully Public – Corporatize Joint Venture – Public Cooperatives Outsourcing	- Arbitration rules included in the legal framework	
<b>Political Risk</b>	Fully Public Fully Public – Corporatize Joint Venture – Public Cooperatives	- Political Risk Guarantee PRG – Exchange liquidity	Outsourcing Management Contract Franchise Leasing Concession
<b>Fiscal Space</b>	Cooperatives Leasing Concession – BOT/BOO/BOOT Fully Private	- Cross-subsidies - Output Based Aid - Partial Credit Guarantee - Credit Enhancement	Fully Public Joint Venture – Public Outsourcing Management Contract Franchise Joint Venture – Private
<b>Macroeconomic Factors</b>	Fully Public Fully Public – Corporatize Joint Venture – Public Cooperatives Outsourcing Management Contract Franchise Leasing	- Partial Credit Guarantee - Credit Enhancement - Local Currency Financing	Concession
<b>Institutional Capacity</b>	Fully Public Fully Public – Corporatize Joint Venture – Public Cooperatives Outsourcing Management Contract Franchise Joint Venture – Private	- PRG – Regulatory Risk - Arbitration rules included in the legal framework - Off-take Contract	Leasing Concession
<b>Willingness to Pay</b>	Fully Public Fully Public – Corporatize Joint Venture – Public Cooperatives Outsourcing	- Government Subsidies - Cross-subsidies - Off-take contracts	Management Contracts Franchise Leasing Concession
<b>Tariff Sustainability</b>	Fully Public	- PRG – Market Risk - Government Subsidies - Cross - subsidies - Output Based Aid - Off-take Contracts	Joint Venture – Public Cooperatives Outsourcing Management Contract Franchise Leasing Concession Joint Venture – Private BOT/BOO/BOOT Fully Private
<b>Size and Location (the structure will depend on the size of the providers)</b>	Fully Public Fully public – Corporatize Joint Venture – Public Cooperatives Outsourcing Management Contract Franchise Leasing Joint Venture – Private Fully Private	Subsidies	

Figure 13, which is an extension to the example developed in figure 9, provides the project feasibility map with tools that address the variables fiscal space and macroeconomic factors. As can be seen, the addition of project enhancement tools makes more project modalities available for structuring the project. Additional examples are included in Appendix D.

**Figure 13. Project Feasibility Map - Example 1 with Tool Application**



In summary, figure 12 was used to identify available tools to mitigate risks associated with the variables identified as weak. The additional modalities that become available through the use of the identified tools were then matched with figure 8, the viability of PPP modalities under weak conditions. The combination of the two figures finally defines the project feasibility map illustrated in figure 13. With the application of the tools, the following eight project structures may now be feasible: fully public, fully public – corporatize, joint venture – public, cooperatives, outsourcing, management contracts, franchise, and leasing. The project design team could narrow down its opportunities by selecting the modality that better suits its political and business intentions. If the goal is more private involvement, then leasing would be the modality selected because it is the one with the most private responsibilities. However, if the objectives are to increase private involvement in management, then the franchise or management contracts modalities should be selected. Finally, a government that supports public corporations, would also support a fully public corporatized provider.

## 4.5. Improving Local Conditions

These examples illustrate analyses of local conditions and application of the analytical framework at one point in time. This short-run, “static analysis” is important for understanding how to incorporate the three components of the analytical framework (local conditions, tools for project enhancement and project modalities). However, it is also important to consider the dynamic evolution of local conditions as they improve (or deteriorate) in the medium term, creating evolving conditions for project success.

A dynamic analysis can illustrate the effects of changing a variable with a low rating to one with a high rating. As local conditions improve in this fashion, more tools and structures become available. This evolution of local conditions provides incentives for local regions to continue to improve conditions in order to make more options available for not only water projects, but other infrastructure and development projects also.

Anticipation of change in a sector can shape many viewpoints regarding current versus potential future options. Project designers should anticipate a “modernization” of contractual arrangements, if legally feasible, and if the benefits of the change are equitably shared between the contract parties. In addition, when those changes are expected to occur in the long run, it might be better to select a structure that keeps the option of modernization alive.

Figure 14 demonstrates the evolution of local conditions through a series of static analyses. As a local condition improves, its respective indicators will suggest a higher rating, ultimately removing it from the weak variable list as it exceeds the minimum standard set for that local condition. As a rule, the fewer weak variables that exist the greater the feasible project structure options will be as more modalities and enhancement tools are available.

Figure 14 illustrates this in the following way.

In period 1 there are five local conditions with low ratings: legal framework, political risk, fiscal space, willingness to pay and size and location. The analysis of project modalities and enhancement tools suggests the following five feasible project structures in this case: fully public, fully public corporatized, joint venture – public, cooperative, and outsourcing.

In period 2, legal framework conditions have improved and no longer have a low rating. For this reason, it is removed from the analysis, which focuses on the remaining four variables and the respective project options. Seven feasible structures are now possible in period 2. These include: fully public, fully public corporatized, joint venture – public, cooperative, outsourcing, management contracts and franchising, the latter two being the additional feasible structures in period 2.

Finally, in period 3, another improvement in the local conditions with regard to willingness to pay takes place. Removing this variable from the analysis leaves three remaining variables as low-rated. The result is that eight project modalities can now be considered for the structure of the project. These include: fully public, fully public corporatized, joint venture – public, cooperative, and outsourcing; plus the two from period 2: management contracts and franchising; plus leasing.

Overall, the dynamic analysis of the three periods highlights how improvements in local conditions can give way to further options in project structuring.

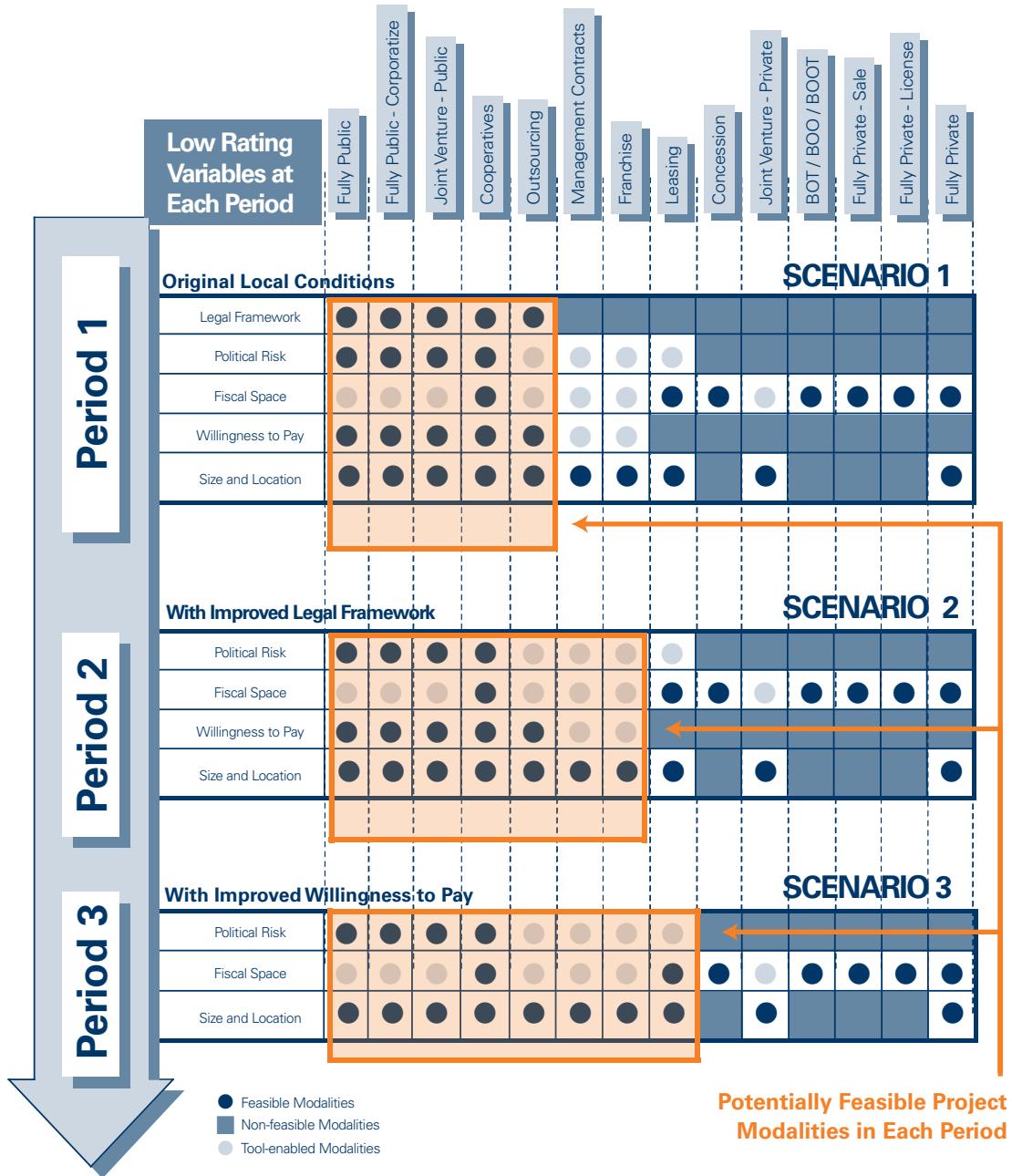
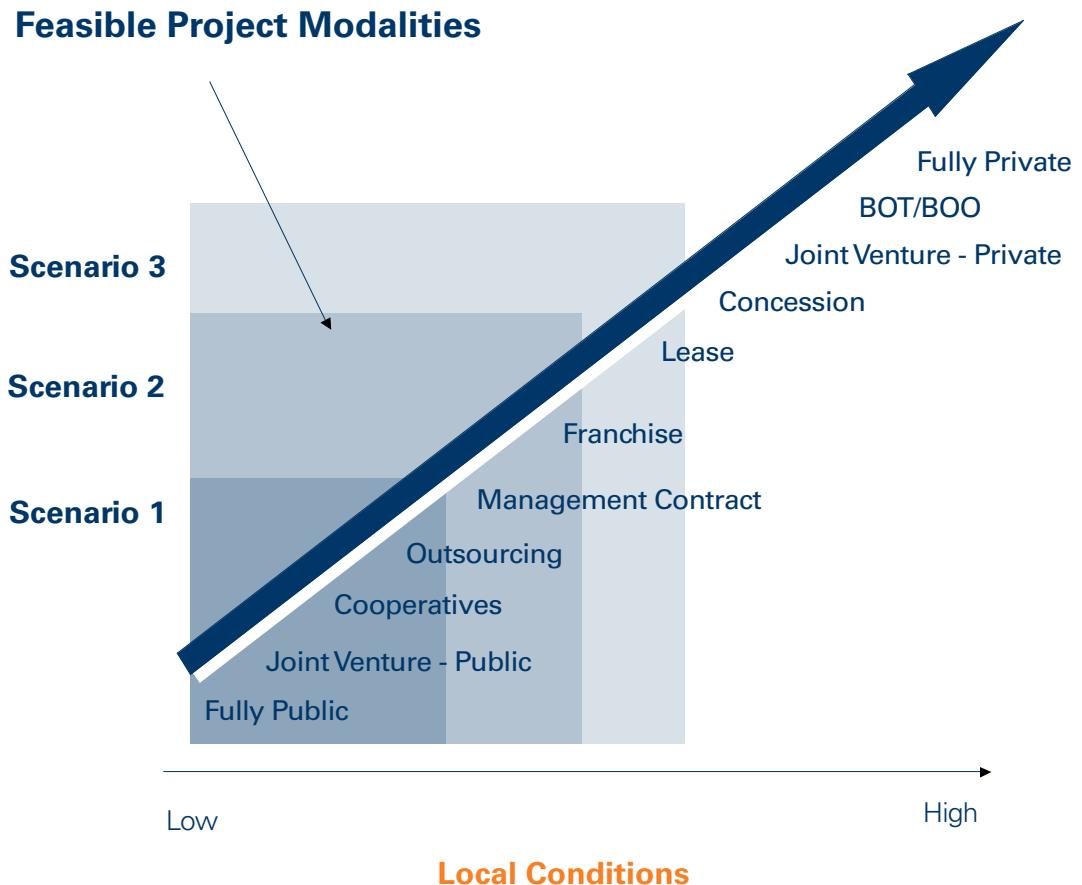
**Figure 14. Evolutionary Feasibility Map Under Weak Local Conditions**

Figure 15 shows the series of the three scenarios in the evolutionary projection described in figure 14. This figure further illustrates how the number of project modalities available for a region can increase as the state of the local variables improves.

**Figure 15. Evolution of Structures as a Consequence of the Evolution of the Variables**



Note in figure 15 how the feasible project modalities move along the private sector participation continuum. The increased feasibility of these modalities means that a region has more options to choose from to enhance investments in infrastructure.

## 5. CLOSING REMARKS

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The analytical framework presented here can be a practical tool for use by investors and governments as projects are designed, implemented and improved. The goal of this report has not been to prescribe solutions or templates for the future development of infrastructure, but rather, to provide a methodology to design successful financial structures, with public and private participation, through the interaction of local conditions, project modalities and project enhancement tools. As a framework, it can be adapted to the conditions existing for a specific country, project and investor. While, it is not meant to substitute for thorough due diligence on the part of investors or governments, it should provide useful guidelines and insight for properly conducted due diligence examinations.

## APPENDICES



## CONTENTS

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Introduction to the Appendices	28
Appendix A – Local Conditions/Variables	29
A.1. Legal Framework	30
A.2. Political Risk	31
A.3. Fiscal Space	32
A.4. Macroeconomic Factors	32
A.5. Institutional Capacity	33
A.6. Willingness to Pay/Cultural Views	34
A.7. Tariff Sustainability	35
A.8. Size and Location	36
Appendix B – Project Modalities	37
B.1. Fully Public	37
B.1.1. Public Supply and Operation by the Government	37
B.1.2. Fully Public Corporation	38
B.1.3. Public Supply by Local Cooperatives	39
B.2. Management Contracts	41
B.2.1. Outsourcing	42
B.2.2. Performance-Based Contracts (Generic Management Contracts)	42
B.2.3. Franchise	43
B.3. Concessions	43
B.3.1. Leasing Contracts	43
B.3.2. Generic Concessions	45
B.3.3. BOT/BOO	46
B.4. Joint Ventures	47
B.5. Fully Private	48
B.5.1. Fully Private - License	48
B.5.2. Fully Private - Sale	49
B.5.3. Fully Private - Private Operator	50

Appendix C – Tools	51
C.1. Political Risk Insurance	51
C.2. Partial Credit Guarantees	51
C.3. Partial Risk Guarantees	51
C.4. Subsidies	52
C.5. Credit Enhancement	53
C.6. Local Currency Financing	54
C.7. Arbitration Rules Included in the Contract	54
C.8. Off-take Contracts	54
Appendix D - Hypothetical Examples	56
D.1. Scenario 1	56
D.2. Scenario 2	58
D.3. Scenario 3	60
D.4. Scenario 4	62
D.5. Scenario 5	63
D.6. Scenario 6	65
Appendix E – Case Studies in Water and Sanitation	68
E.1. Case Studies - Variables	68
E.2. Case Studies - Modalities	78
E.3. Case Studies - Tools	81
Bibliography	83

## INTRODUCTION TO THE APPENDICES

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These appendices are meant to be used in conjunction with the main report as reference materials to facilitate its use as a guide. The materials contained herein are not exhaustive, but indicative of the local condition variables, their possible measurement, public-private partnership modalities and risk instruments or tools which investors and governments should consider in evaluating project structure options for an infrastructure project.

As noted in the report, this material was developed as a conceptual framework. It does not serve as a definitive evaluation of investment parameters. Additional research and testing of the framework will assist in refining its utility to users. Investors and governments will need to exercise proper due diligence in evaluating specific project opportunities and constraints. It is hoped this conceptual framework will better facilitate that analysis, but it is not expected to substitute for it.

## APPENDIX A – LOCAL CONDITIONS/VARIABLES

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This appendix should be used in conjunction with Section 3.1. of the main report and for guidance in completing figure 7 in the report.

Eight variables or local conditions have been identified as having a significant impact on the viability of PPP structures in the water and sanitation sector. These are a country's:

- legal framework,
- political risk environment,
- fiscal space,
- macroeconomic factors,
- institutional capacity,
- the willingness of users to pay for water and sanitation services,
- the sustainability of tariffs, and
- the size and location of the facility.

Neither the number of variables, their definitions, nor applications as used here are exhaustive. For any given country, locality or project there may be other variables than those highlighted here, or the impacts of those identified here may vary for those specific conditions. However, these eight variables have been identified from the experience of the IDB, investors, lenders and project sponsors as having potentially significant impacts on a project. In practice, some of these variables are highly correlated as a result of their coevolution and mutual reinforcement in a given country or municipality. This may lead to a compounding of problems because a poorly managed risk can easily trigger further risks (weak contract enforcement will magnify political risk, for example).

This appendix defines the variables selected, provides guidance on analyzing their potential direct impact on private investment in the sector, and suggests indicators and approaches for determining the strength or weakness of a given variable in a local setting. There exist several alternatives to rank the relative strength or weakness of each variable, depending on the availability and reliability of analytical works that provide numerical ratings or qualitative appraisals for the variables ("high", "low" in the latter case, for example). Creativity and judgment to produce practical and meaningful indicators need to be exercised by project designers. It is likely that they will exist for a subset of variables and may refer mostly to the country level.

## A.1. Legal Framework<sup>1</sup>

**Definition:** This variable refers to the existence of a legal framework supportive of private investment interests and the capacity of the courts, the body of laws, regulation and complementary institutions to enforce those laws and the contracts. The following six aspects of a country's legal framework should be considered:

- the definition and protection of private investment and property rights in the country in general, and for the infrastructure sector, in particular;
- the existence, quality and comprehensiveness of sector laws and their enforcement;
- the existence, quality and comprehensiveness of sector policies and their execution;
- available dispute resolution mechanisms;
- the capacity of the judicial system to process issues in a timely fashion (i.e. sufficient courts, etc.), and the actual rigor, fairness and capability to effectively adjudicate and enforce private sector rights; and
- the quality of contractual relationships between client, providers, government and regulatory bodies, if they exist.

Investment laws provide a framework for private participation in the country. Sector laws and regulations govern the sector and its affected players. The capacity of the judicial system provides a means by which to enforce the laws and policies. Available alternative dispute resolution mechanisms, local and international, complement the judicial system and the contractual relationships they support.

**Impact:** The quality of the legal framework can have an impact on: the legal treatment of sector and related resources, property rights, provisions for conflict resolution, provisions for accountability, the scope for private sector participation, centralization and decentralization tendencies, project selection criteria, pricing and cost recovery mechanism, interregional and/or sectoral rights and rules, user participation, private sector participation and law-policy linkages and the degree of legal integration within sector law. If the quality of the legal framework is poor, investors will not be as willing to take risks, inevitably limiting the risk appetite and the longevity of investment in a region, or shifting costs onto unprepared government or regulatory entities.

**Indicators:** Investors and policymakers can look to a number of indicators to gauge the strength of a country's legal framework. These measures include, among others, the quality of the regulatory framework, corruption indices, and government effectiveness. More specific indicators include the fairness and independence of the judicial system, the enforceability of government and private contracts, and the speediness of the judicial process. Available indicators to consider are listed below.

*Judicial/Legal Effectiveness Index (JLEI)* - The JLEI surveys firms on topics such as judicial independence, judicial bribery, the quality of the legal framework, property protection, parliament, and police effectiveness. The JLEI is developed from a question on the Executive Opinion Survey. For further information, refer to Daniel Kaufman's chapter, titled "Corruption, Governance and Security: Challenges for the Rich Countries and the World," ([http://www.worldbank.org/wbi/governance/pdf/Kaufmann\\_GCR\\_101904\\_B.pdf](http://www.worldbank.org/wbi/governance/pdf/Kaufmann_GCR_101904_B.pdf)) in the Global Competitiveness Report, an annual study available through the World Economic Forum (<http://www.weforum.org/gcr>).

*Corporate Governance Index (CGI)* - The CGI surveys firms on topics such as protection of minority shareholders, quality of training, willingness to delegate authority, nepotism and corporate governance. These indices provide an indirect support to evaluate the legal framework and also provide guidance as to how to measure the impact of this variable (ISS Proxy and FTSE have a CGI index at <http://www.issproxy.com/institutional/cgi/index.jsp>).

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<sup>1</sup> For more information about this local condition variable for the water sector, see Saleth and Dinar (2004), Guasch (2004) and OECD/EAP Task Force (2002).

Additional sources of indicators for this variable are:

- Global Insight - <http://www.globalinsight.com>
- Latinobarometro - <http://www.latinobarometro.org>
- The Economist Intelligence Unit - <http://www.eiu.com>

## A.2. Political Risk<sup>2</sup>

**Definition:** Political risk refers to the possibility of losses arising from investments in a given country and caused by changes in a country's political structure or policies, such as tax laws, tariffs,<sup>3</sup> expropriation of assets,<sup>4</sup> restriction in repatriation of profits, or any other government activity that has a significant impact on the economic viability of a project. Political risk includes outright expropriation or activities by the government that over time have the effect of reducing the financial viability of the project (partial expropriation). It also refers to restrictions on currency transfers and convertibility, and damage resulting from war or civil strife. This type of risk can be highly volatile at the sovereign, subsovereign, and local levels.

**Impact:** Political volatility can give rise to economic losses due to:

- loss of the economic benefit of a venture or specific asset without fair compensation;
- the introduction of laws, regulations or other restrictions by the host nation that impair the operations of the investment or venture;
- having to abandon the investment or venture for an extended period due to an evacuation requirement or advice from the home government;
- being unable to repatriate funds from the host nation, generally as a result of either insufficient foreign currency reserves of the host nation or having restrictions imposed by the host nation;
- physical damage to assets, or loss of ability to operate or use the assets, due to political violence or terrorism; and
- frustration of a contract either before or after the shipment or delivery of goods when the buyer or seller is a government.

**Indicators:**<sup>5</sup> Country ratings and other survey data provide indicators of political risk. The main sources of this information are institutions providing political risk coverage in developed countries, like COFACE, OPIC, EDC, EFIC, ONDD, SACE,<sup>6</sup> among others. Indicators used in country analyses are provided by groups such as the PRS Group, the EIU, and others.

*PRS Group:* Produces the International Country Risk Guide (ICRG), which provides assessments of political, economic and financial risk in a large number of developed and developing countries. The ICRG assesses three major categories of political, financial and economic risks. For more information, access: <http://www.prsgroup.com/icrg/icrg.html>

The EIU provides assessments of political volatility. For more information, please see: <http://www.eiu.com>

2 For more information about political risk in the water sector see Baietti and Raymond (2005) and Dinar, Balakrishnan and Wambia (2000).

3 A "tariff" is a tax imposed on a product when it is imported into a country (see <http://www.investorwords.com/4877/tariffs.html>).

4 An "asset" is any item of economic value owned by an individual or corporation, especially that which could be converted to cash (see <http://www.investorwords.com/273/assets.html>).

5 "To be able to assess the political risks associated with institutional reforms, it is necessary to know how the stakeholders (also called interest groups or players) are affected by the reforms, what their interests are, and their ability to impact the reforms. A quantitative evaluation of risk can be estimated once the extent of the political effects on the institutional reforms is known." (Dinar, et al., 2000, p. 4).

6 Most of the national export credit agencies publish political risk ratings.

### A.3. Fiscal Space<sup>7</sup>

**Definition:** Fiscal space is determined by the extent to which a government can provide resources to a project without adversely affecting its financial position. The fiscal space variable analyzes the capacity of the national, subnational or local government to commit the cash flow to support a project. The analysis focuses on the sources of funds for specific programs and, depending on the level of decentralization of a country, can involve multiple government entities and/or more than one government branch. It would include the financial relationships between central and local governments and the extent, reliability and capacity to allocate fiscal transfers.

**Impact:** In some infrastructure sectors, particularly water and sanitation, it is not always possible for tariffs to cover the costs of services. Grants, subsidies, inter-governmental transfers, and foreign borrowing are mechanisms by which governments can support infrastructure investments. However, the ability of governments to provide these resources is limited by their available fiscal space. A government with low fiscal space will have few resources (whether grants, loans, subsidies, financial guarantees or other) to channel or sustain to projects. A government with high fiscal space will have a greater ability to channel and sustain financial resources to public services projects.

**Indicators:** Economists have developed numerous methodologies for measuring fiscal space. The approach used and developed by the IMF relies on budget information and takes into consideration aspects such as:

- the capacity of the local and central government to impose and collect new taxes or rates and to increase the actual tax revenue;
- present and future capital investment committed by the government which could have an impact on the total fiscal position of the government;
- opportunities to reprioritize expenditures in order to increase productivity and free various funds for other purposes;
- forecasted economic growth;
- the ability to print money; and,
- the capacity to raise debt in capital markets.

For more information, see the article by Peter Heller in *Finance and Development* (Vol. 42, No. 2, June 2005; <http://www.imf.org/external/pubs/ft/fandd/2005/06/basics.htm>).

Practitioners should analyze these aspects with due diligence in order to understand the future availability of funds to support any project design that contains financial government support.

### A.4. Macroeconomic Factors

**Definition:** For the purpose of this report, macroeconomic factors include those events that affect the economic performance of a country, including financial flows, trade and economic policies influenced by a range of factors such as currency devaluations, debt default, banking liquidity crises, and the prices of import/export goods and services. These factors can change suddenly and affect financial structures supporting project sustainability. The most significant risks faced by the infrastructure sector are tied to currency convertibility, inflation, exchange rate risk, and interest rate fluctuations.

**Impact:** Macroeconomic factors like currency devaluations or high inflation rates affect the infrastructure sector significantly because of the general difficulty in finding long-term financing in local currency. Currency devaluations have a particularly damaging effect because of the mismatch between currencies of investments and

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<sup>7</sup> For more information about fiscal space, see Heller (2005), Kessides (2004) and Komives, et al. (2005).

revenues. Addressing this issue contractually by inserting pass-through provisions in the agreements has proven to be ineffective, as rate hikes are then triggered at a time when the general population is less able to pay due to the general inflationary force of devaluations. Adverse macroeconomic shocks are coupled with higher cost of capital and lower operating margins, and thus are widely associated with rising project failures.

**Indicators:** Investors have several indicators available to analyze different factors to measure macroeconomic factors and the volatility of local conditions.

Good sources of information are in the sovereign reports of credit agencies, as well as multilateral organizations such as the World Bank. Furthermore, the World Economic Forum produces a **Macroeconomic Environment Rank**, which combines aspects of the Country Credit Rating, hard data on the local economy and survey data about economic perspectives. This specific ranking is part of the Global Competitiveness Report (see: <http://www.weforum.org/gcr>).

## A.5. Institutional Capacity<sup>8</sup>

**Definition:** For the purposes of this report, institutional capacity refers to a sound institutional framework that includes clear division of responsibilities and lines of accountability among sector and central institutions that oversee the operations of companies, including the way in which policies are implemented and on how that organization functions. Given that infrastructure services can be natural monopolies and have significant externalities, some form of regulation is necessary regardless of the institutional structure of provision, and can lead to increased transparency and pressure for reform. Elements of institutional capacity include:

- the existence or not of a regulator or regulation function;
- the quality of the regulatory framework and the level of organizational development of the sector to deal with the regulatory framework requirements;
- the level and quality of capacity of the sector authorities and participants to deal with the issues of the industry (planning and technical capacities, public health awareness, governance and administrative skills, ability to provide advice to small firms, training, etc); and
- the level of corruption in the institutions.

Among the most critical tasks for policymakers in developing and transition economies is designing and implementing stable, effective infrastructure regulation. Regulations that provide a credible commitment to safeguarding the interest of both investors and customers are crucial to attracting the long-term private capital needed to secure an adequate, reliable supply of water services.

**Impact:** Lack of local capacity and technical knowledge in the infrastructure sectors, especially in the water sector, can limit the extent of project development and operations through non-enforcement of contractual obligations, poor oversight, or the imposition of unrealistic technical and quality targets for service provision, coverage targets and mandatory investment on the part of the providers. Any of these institutional failures could affect the profitability of the service provider. Corruption is in and of itself a problem that undermines development by distorting the rule of law and weakening the institutional foundation on which economic growth depends. Corruption levels affect accountability, transparency and trust, reducing investor confidence.

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<sup>8</sup> For more information about institutional capacity in the water sector, see Saleth and Dinar (2004).

**Indicators:** Institutional capacity can be analyzed by rankings, ratings and other survey data. Main sources of this information are institutions such as Transparency International, Global Insight, the World Economic Forum Institute of Management Development and Columbia University.

*Transparency International (TI)* (<http://www.transparency.org>): This is a global network including more than 90 locally established national chapters and chapters-in-formation that fight corruption by bringing together players from government, civil society, business and the media to promote transparency in elections, in public administration, in procurement and in business. TI's global network of chapters collects surveys on an annual basis to measure the level of corruption in a number of countries. The index is published annually.

*Global Insight's* (<http://www.globalinsight.com/ProductsServices/ProductDetail1027.htm>) integrated suite of country analysis products provides daily updates to country reports and country risk system. Each significant event is analyzed and reported as it occurs, while simultaneously reflected in their country reports, forecasts and risk ratings. This instant analysis is achieved through a proprietary platform that joins together a global team of political analysts, economists, and editors, producing highly specialized research and advisory services to over 120 industries and 200 countries.

*World Economic Forum* (<http://www.weforum.org/>) sponsors the Global Competitiveness Report ([www.weforum.org/gcr](http://www.weforum.org/gcr)), an annual report produced in collaboration with the Harvard Institute for International Development, which measures the perceptions of business executives about the country in which they operate. The government effectiveness sub-index, which includes such things as the competence of public sector personnel and the quality of general infrastructure, could be used as a proxy for the quality of the institutional capacity of government as a whole.

## A.6. Willingness to Pay/Cultural Views<sup>9</sup>

**Definition:** Willingness to pay does not address the economic ability of customers to pay, but rather the personal attitudes of individuals toward the provision of water and sanitation services. There are two main aspects to this variable: the beliefs and attitudes regarding the service, particularly in the case of water; and the acceptance of private operators or foreign investment in utilities.

For example, various cultures have traditional beliefs that water is a "god-given free commodity." In this cultural context it is difficult to impose a user fee for water service because local consumers are not willing to pay for this type of commodity. In Buenos Aires, before the privatization of water services, connection costs were paid through general city revenues and considered a community cost. After privatization, connection costs were passed on to customers (as opposed to the community); a segment of these customers were unwilling to pay for the water service.

In some regions, acceptance of private provision of services can be difficult because of past experiences with private concessions or simply because of the belief that a public good should be managed by a public entity. In some cases, involvement of private investors or operators entrenches this view and some infrastructure services begin to be seen of "national interest."

**Impact:** Unwillingness to pay for water can lead to civil unrest. Failure to understand the needs and demands of the local population can lead to an unfavorable resolution of the problem. This was the case of Aguas del Tunari in Bolivia where civil unrest resulted in the injury and death of protestors and, ultimately, the devolution of services to the Bolivian government.

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<sup>9</sup> For more information about willingness to pay for water services, see Kessides (2004) and Komives et al. (2005).

**Indicators/Methodology:** There are numerous methodologies for measuring willingness to pay. These methodologies fall into two broad categories: revealed preference approaches and stated preference approaches.

- Revealed preference approaches rely on existing economic behavior in other public services (electricity, telecommunication, gas, etc.) to determine the preferences of a household with regard to the particular service in question. For example, are consumers willing to pay for their energy bills?
- Stated preference approaches, like contingent valuation, rely on asking households questions about carefully constructed hypothetical scenarios. In contingent valuation surveys, households are asked how much they would be willing to pay or whether they would be willing to pay a certain amount.

These approaches only provide methodologies for estimating the willingness to pay and have several shortcomings that should be evaluated, particularly vis-à-vis the risk appetite of the investor. In addition, the development of indicators requires carrying out specific local studies. Yet, a general notion can be gained by looking at indicators such as those put together by Latinobarometro.

*The World Bank' Energy Working Notes* (No. 3, March 2005) provides further insight into these issues (see [http://lnweb18.worldbank.org/ESSD/sdvext.nsf/81ByDocName/DevidentifKlytchnikovalPaternostroSWillingnessstopayforwaterandenergyMarch2005/\\$FILE/EnergyWorkingNotes\\_Srs3\\_hires.pdf](http://lnweb18.worldbank.org/ESSD/sdvext.nsf/81ByDocName/DevidentifKlytchnikovalPaternostroSWillingnessstopayforwaterandenergyMarch2005/$FILE/EnergyWorkingNotes_Srs3_hires.pdf)).

## A.7. Tariff Sustainability<sup>10</sup>

**Definition:** Tariff sustainability deals with establishing a self-sustainable service provider that can recover full costs through tariffs. From the provider's point of view, this variable is represented by the customer's *ability* to pay the full cost recovery tariffs. From the customer's perspective, tariff sustainability is the affordability of the services provided. While a tariff can be affordable to a customer, it may still not cover the full costs of the provider. This difference in viewpoint needs to be taken into consideration for the development of feasible projects.

The customer's ability to pay the tariffs is related to income. The tariff sustainability variable takes into consideration the profile of the customers: residential, commercial, industrial, or government. On the other hand, affordability considers the recovery cost of providing service. Depending on the costs, certain affordability limits can be imposed by a regulator or community group. This variable is important to understand tariff structures and supporting subsidies to create long-term, self-sustainable projects.

**Impact:** From the service providers' perspective, the analysis of the tariff structure to achieve full cost recovery will be a key input in project planning, particularly due to the high impact that tariff sustainability has on the cash flow of the provider and his ability to pay the full investment. When the tariff is not set high enough to recover the full cost, the long-term sustainability of the provider, and more importantly, service provision and the quality of services to customers, is at risk.

**Indicators:** Three different types of methodologies could be applied.<sup>11</sup> Revealed preference approaches, stated preference approaches (as previously described in the willingness to pay section) and business standards.

<sup>10</sup> See Nickson (2000).

<sup>11</sup> It is important to mention that different approaches have to be applied for tariff sustainability and willingness to pay. The analysis for tariff sustainability concentrates on the relationship between full cost recovery tariffs and the disposable income of the client. For willingness to pay, the information analyzed is the amount of money that the users are willing to pay. (For a more in-depth analysis, see Appendix E, SAGUAPAC Case Study (Section E.1.3).

- Revealed preference approaches rely on existing economic behavior in other services to determine the preferences of a household with regard to the particular service in question. For example, are consumers willing to pay for their energy bills?
- Stated preference approaches, such as contingent valuation, rely on asking households questions about carefully constructed hypothetical scenarios. In contingent valuation surveys, households are asked how much they would be willing to pay or whether they would be willing to pay a certain amount.
- Business standards can include metrics such as the price per cubic meter as a maximum for emerging markets and affordability limits based on the percentage of household income.

## A.8. Size and Location<sup>12</sup>

**Definition:** This variable refers to the effects of the size of a project and its location on decisions regarding asset ownership, project modality, exit strategy, and configuration of a specific project's structure.

Projects can be limited by their size and/or their location. Transaction costs for both the government and the private sector are not directly related to the size of the project, as there are significant “fixed” transaction costs. Therefore, there is often an investor and government preference for larger projects that are based in urban areas. Economies of scale, which can be found in management, material, human resources and finance (among other factors) do not favor smaller projects or remote locations. Moreover, risk mitigation tools and financing available for larger national projects are much more limited in access and application for smaller sub-sovereign projects. This variable highlights a growing trend toward risk pooling and the aggregating of assets by smaller utilities and investors to achieve economies of scale and funding objectives.<sup>13</sup>

**Impact:** Projects that are at a disadvantage because of size and/or location typically face high barriers to financing and shared liquidity. Network utilities have large economies of density and scale. Smaller providers cannot absorb the additional capacity costs that result from the need to address limited consumer density in sparsely populated areas.

Location in urban, peri-urban or rural areas can further define the type of providers able to supply the service efficiently. Peri-urban and rural areas have low consumer density, requiring unique service provision.

**Indicators:** Key indicators necessary to analyze this variable include the number of connections, the average bill, consumer density, regional population density and other location-specific considerations.

**In summary, figures 3 and 7 of the main report should be referenced in conjunction with this appendix. Figure 3 provides a brief description of each variable and figure 7 provides the framework to analyze the risk profile and local conditions for project development and associated investment.**

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12 See CIDA (2005).

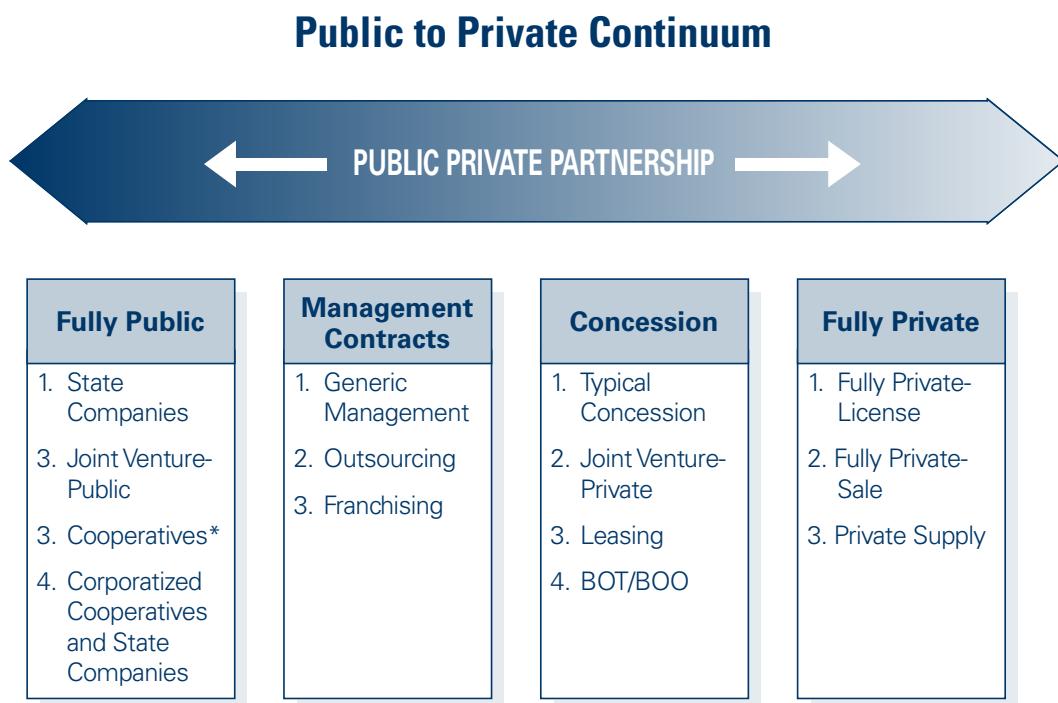
13 See Baietti and Raymond (2005). Private projects in secondary or smaller urban towns have been even fewer, despite what could be regarded as similar project risk profiles and adherence to market principles.

## APPENDIX B – PROJECT MODALITIES

This appendix highlights the range of project modalities available between a fully public sector undertaking and a fully private sector undertaking. Much has already been written on the spectrum of public to private structures. Therefore, this appendix serves only to introduce and outline the key modalities.

Figure B.1 illustrates the public to private continuum for private sector participation in infrastructure development.

**Figure B.1. Generic Modalities that Can Be Used to Implement Projects**



\*As defined by the International Cooperative Alliance in 1995, a cooperative is an autonomous association of persons united voluntarily to meet their common - economic, social, and cultural needs and aspirations through a jointly owned and democratically - controlled enterprise.

### B.1. Fully Public

Modalities defined as fully public are either owned, operated and maintained by national, regional or local governments or by a group of citizens in common interest, as in a cooperative.

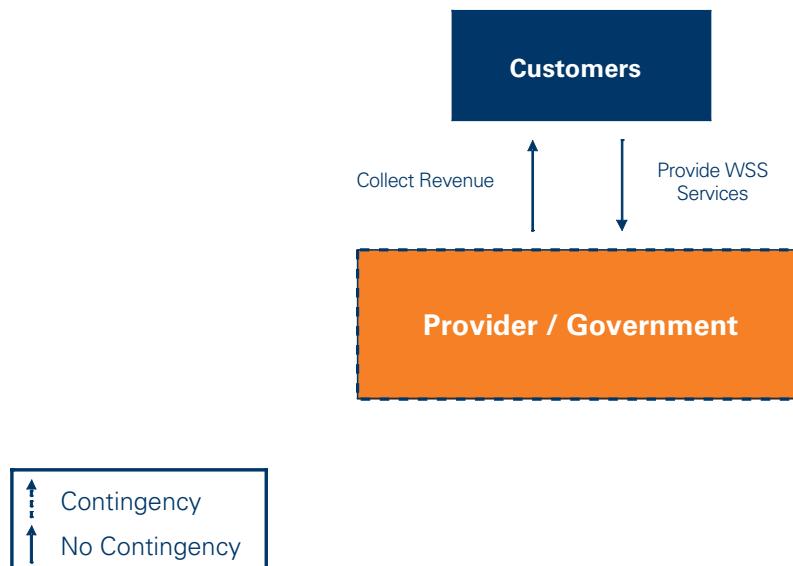
#### B.1.1. Public Supply and Operation by the Government

Public utilities own, operate and maintain public infrastructure services in a defined area. The utility can operate as a self-supporting enterprise fund whereby the operations and capital expenditures are funded with

revenues generated from customer user fees and one-time fees paid for capacity at the time of connection to the system or in some cases with some support of the government budget.

The utility is part of a national, subnational, or state operation, and the adoption of business policies linked to efficiency and performance is a matter of the current administration rather than a long-term decision about public policy in the sector.

**Figure B.1.1. Fully Public - Public Supply and Operation**



### B.1.2. Fully Public Corporation

*Fully public or state-owned enterprises (SOE):* SOEs are defined as directly or indirectly state-owned or controlled economic entities that generate the bulk of their revenues from selling goods and services. This definition limits the SOE set to commercial activities in which the state is able to control management decisions by virtue of its ownership or voting rights alone. This definition includes those societies where the private sector shares management responsibilities with the government and the government has veto power over its decision.

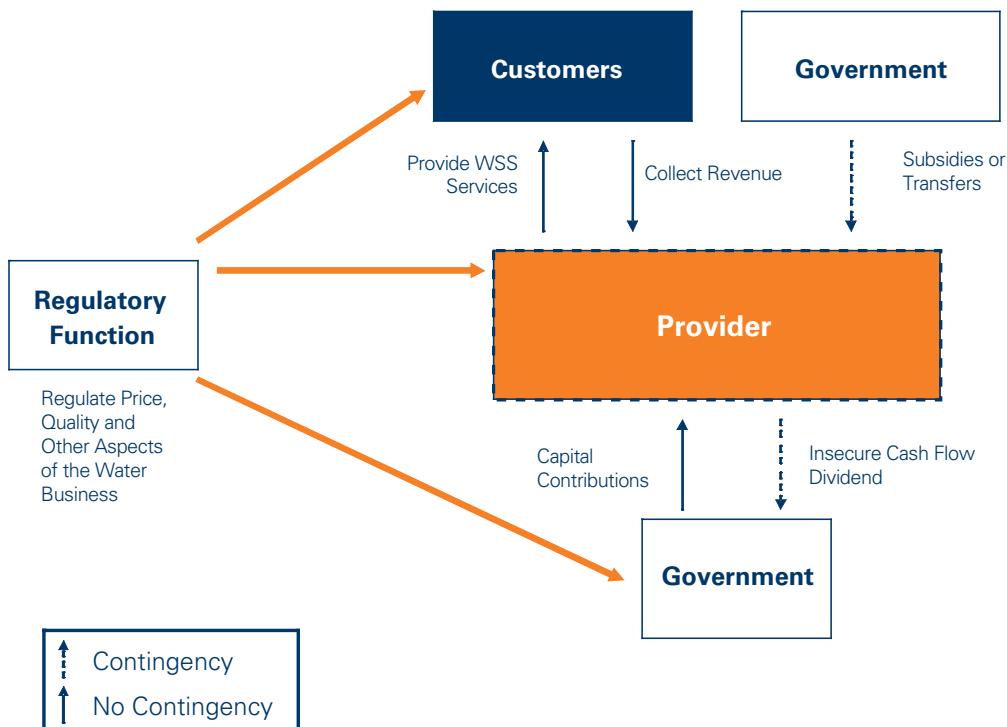
Corporatization is an administrative means of introducing the discipline of market forces to publicly owned and operated utilities. Corporatization introduces a new relationship between the government and the management-operators of the utility. After corporatization, the relationship is governed by legislation specifying the powers and responsibilities of the parties. The relationship mimics the private sector, with the utility operating under a board of management with the government acting as the shareholder.

Corporatization involves the introduction of the following four principles, which change the relationship between the government and the utility: clarity of objectives, management autonomy and authority, strict accountability for performance and a level playing field with private sector operators.

Although the government's relationship with the water utility changes, it continues to control areas such as water resource allocation and management, and environmental quality, as well as safeguards on monopolistic

behavior. Indeed, the shift to a corporate model means that the regulations over such issues should be well specified and transparent in their operation.

**Figure B.1.2. Fully Public - Corporatized**



### B.1.3. Public Supply by Local Cooperatives

Cooperatives<sup>14</sup> are a hybrid form somewhere between a regulated public utility and a self-governing users' "club." Legally, cooperatives maintain an independent status and make their own investment decisions without a government mandate of universal service, and without an exclusive right to serve the areas where they operate or restrictions in expanding this area. However, they are recognized and endorsed by law, and their rates and service standards are regulated by a formula. The most established cooperatives have become quasi-official over the years.

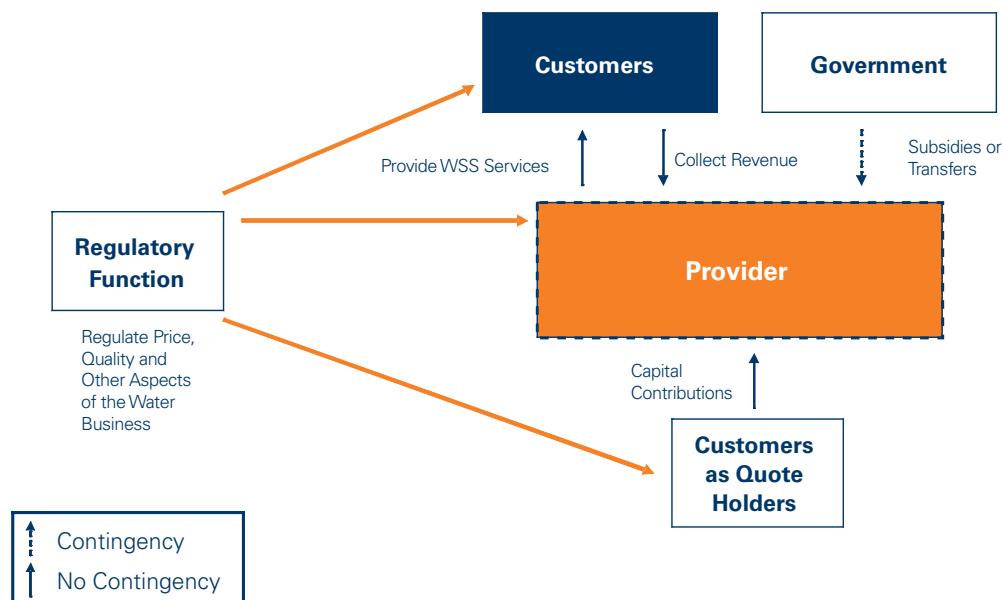
Even though cooperatives are privately owned, there are important differences compared with private (investor-owned) utilities. In investor-owned utilities, investors share proportional ownership rights in to the organization. Few investors, if any, have a commercial relationship with the organization beyond their equity investment. The organization's objective is to maximize profits and distribute them based on equity rights. Equity rights are fully transferable, allowing investors to adjust their participation to meet their investment objectives and capture fully the capitalized value of their investment.

<sup>14</sup> The Statement of Cooperative Identity, adopted by the ICA in 1995, defines a cooperative as an autonomous association of persons united voluntarily to meet their common economic, social, and cultural needs and aspirations through a jointly-owned and democratically controlled enterprise.

In contrast, in the case of a cooperative, ownership of the organization takes a very different meaning. Profits are not pursued and if obtained, are generally reinvested in the cooperative. Because members cannot withdraw and reallocate their investments, the only way they can capture the value of the cooperative's activities is through the use of the service. Generally obligated to meet performance standards and to pay corporate and extraction taxes, cooperatives can raise investment capital by selling shares to their customers, in a way that private for-profit operators cannot.

Thus, in their dual role as owners and users, it is in the members' interest to have the utility deliver good service at low cost. An obvious difference between cooperatives and public utilities is that of ownership rights.

**Figure B.1.3. Fully Public - Public Supply by Local Cooperatives**



At the same time, cooperatives and public utilities share a mission: to provide good service rather than realize profits. It should be noted, however, that in practice, public utilities often deviate from the objective of providing good service due to political interference or lack of accountability.

In consumer cooperatives, the fact that owners and customers are one and the same helps align objectives. In Bolivia and Argentina the larger cooperatives have become established and can even get national government grants or guarantees for multilateral loans. Today, Argentina's cooperatives have a difficult time competing with concessions, since their tariff regulations generally do not provide for recovery of investment costs.

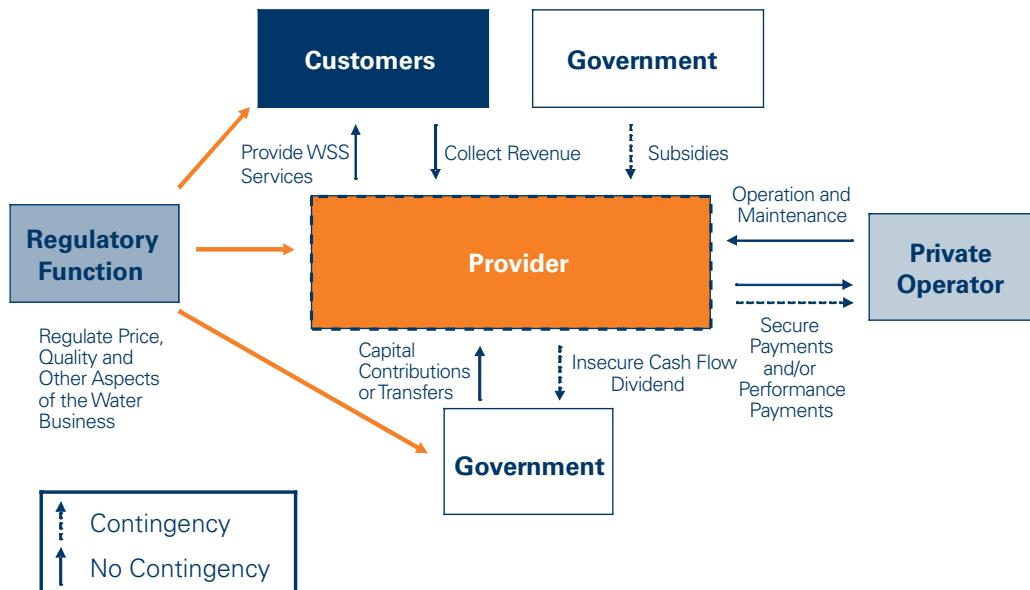
In Bolivia, where cooperatives are the sole supplier for several major cities, cooperatives compete for new markets. New cooperatives in peri-urban areas are particularly entrepreneurial, and compete actively with each other to recruit members at the boundary of their service areas.

## B.2. Management Contracts

Management contracts transfer responsibility for the operation and maintenance of government-owned businesses to the private sector. The government is responsible for the commercial management and the expansion of the network, and is the owner of the assets.

The management contracts are a continuum in themselves: they range between outsourcing on one end of the spectrum to franchises on the other. Under outsourcing, the payment of the operator has no link with the performance of the work and the utilities. In the latter contract, the remuneration of the private operator is totally linked to their performance and that of the utilities. In the middle area of the continuum, more responsibilities can be delegated to the private operator and there are more links between the compensation of the private operator and the results achieved.

**Figure B.2. Management Contract - Outsourcing, Franchise and Performance-Based Contracts**



The management contract (in all of its forms, outsourcing, franchise and performance-based) can be viewed as different links in the value chain of the service. There is usually a focus on the operation and maintenance (O&M) link but in some cases also a commercial link in the value chain, such as meter reading and billing and in some cases, collection.

These contracts are useful if the core objective is to increase a utility's technical efficiency for the performance of specific tasks, but complete privatization is not considered feasible due to the very low qualification in the variables described in Section 3 and Appendix A. Management contracts are a short-term solution for some infrastructure projects, particularly for water and sanitation projects, because these mechanisms create an incentive problem that results from the trade-off between the O&M cost, the responsibility of the private operator, and capital investment, and, by the responsibility of the owner (public, private or cooperative) which is partially substituted by the production function of the water utility. *In other words, an investment, or lack thereof, made by the owner of the assets, can affect the profit and loss of the private operator.*

Moreover, management contracts are not an appropriate public-private partnership option if a government's main objective is accessing private finance for new investment, as management contracts typically leave all responsibility for investment with the government. On the other hand, because they do not necessarily transfer any of the commercial risks to the management contractor, they draw little on private sector incentives to reduce costs and improve the quality of services.

### **B.2.1. Outsourcing**

Outsourcing, considered a first step towards private sector involvement, is a well-established mechanism in the water supply and sanitation industry. Outsourcing refers to contracts between water and wastewater service providers and firms with the following characteristics:

- a contract period, commonly, renewed annually;
- a contract budget that specifies a fee that bears no direct relationship to utility performance, so the private service provider does not share any of the risk related to the utility's water business; and
- the contract gives the private provider no say over the utility's internal resources.

Services commonly outsourced include equipment maintenance, building maintenance, pipe-laying and repair work, meter reading and billing and collection of customers, cleaning, and similar services.

In cases where private operators or cooperatives are available to provide the services, outsourcing is often considered more cost-effective because private providers can take full advantage of economies of scale, and competitive tendering will tender the job to the most efficient providers. In addition, this kind of private participation improves quality because private providers enjoy advantages of specialization.

However, it should be noted that outsourcing may drive up prices because private firms may add profit margins to service delivery costs, which may invite collusion and corruption and requires expensive monitoring. Outsourcing may be an appropriate option for introducing private sector participation in the water utilities of small and medium towns. Since they are characterized by diseconomies of scale, lower per capita incomes, and lower population density, private firms may be unwilling to engage in concession contracts.

### **B.2.2. Performance-Based Contracts (Generic Management Contracts)**

Management contracts transfer responsibility for the operation and maintenance of government-owned businesses to the private sector. They have the characteristics detailed below.

- Contracts are generally for three to five years.
- Simplest contracts involve paying a private firm a fixed fee for performing managerial tasks. More sophisticated management contracts can introduce greater incentives for efficiency, by defining performance targets and basing remuneration at least in part on their fulfillment. To be worthwhile, these more complex management contracts must produce efficiency gains large enough to offset the regulatory costs of establishing targets and monitoring performance against them.
- In some cases, the private provider can be involved as an advisor to the utility's internal resources.

### B.2.3. Franchise<sup>15</sup>

The franchise concept applied to the water and sanitation sector means that a water operator acting as a franchisor would provide its technical know-how regarding the operation of a water utility to other water operators (franchisees). The franchise contract has the characteristics detailed below.

- Contracts are generally for five or more years.
- Contract budget specifies a fee that is linked to the performance of the utility; thus, the private service provider shares the risk related to the utility's water business, and a franchisee buys support from a franchisor for a royalty fee. This typically includes an initial up-front fee (a lump sum on signing the franchise contract) and an ongoing royalty fee (a percentage of the franchisee's gross sales, calculated on a periodic basis and paid throughout the entire duration of the contract).
- The private provider has some advisory role with respect to the internal resources of the utility.

Franchisors can provide franchisees with support in all areas of professional expertise needed to run a utility, including: asset management, billing and collection, engineering (construction, operation and maintenance), human resources management and procurement.

Franchising offers a business model for international operators to enter higher risk markets, as well as in-country markets. As franchising does not involve capital investments, international operators might use this business model to enter into more risky markets that they would not consider entering through traditional contracting options. However, the franchisor could face other risks such as intellectual property issues, difficulties in monitoring quality standards, difficulties in servicing the franchisees, rise in local competition, and inadequate local legal and regulatory framework.

## B.3. Concessions

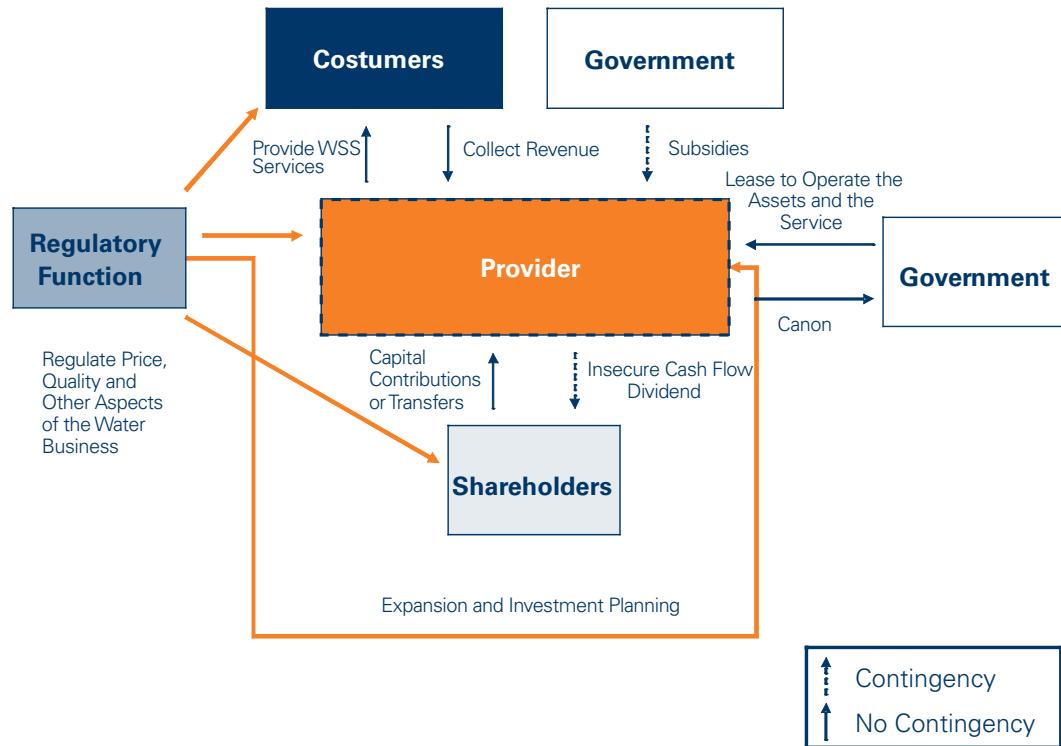
### B.3.1. Leasing Contracts

Under a lease arrangement a private firm leases the assets of a utility from the government and takes on the responsibility for operating and maintaining them for a period of time. Because the lessor effectively buys the rights to the income stream from the utility's operations (minus the lease payment), it assumes much of the commercial risk of the operation.

The leasing is governed by a contract that sets out such conditions as the main performance targets (coverage, quality), performance standards, mechanism of coordination for capital investment, mechanisms for adjusting tariffs and in some cases arrangements for arbitrating disputes.

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<sup>15</sup> Franchising is a method of distribution of a product or service, whereby the developer of a business concept (the franchisor) licenses an individual or enterprise (the franchisee) to operate that business concept, using the franchisor's system and brand name, over a contractually defined period of time, and within a specific geographic territory.

**Figure B.3.1. Concessions - Leasing or “Affermage”**

Leasing is often bid by price: the bidder that proposes to operate the utility and meet the investment targets for the lowest tariff or, offering a set of tariffs, the highest lease payment ("canon") for the government wins the concession.

Under a well-structured contract, the lessor's profitability will depend on how much it can reduce costs (while still meeting the quality standards in the lease contract), so it has incentives to improve operating efficiency.

If a government's main or sole concern is to improve efficiency and there is little need for new investment, it might choose a management contract or a lease contract. A lease can yield better results than a management contract because it exposes the private sector to commercial risks, encouraging it to increase sales and reduce costs. But a lease will work well only if the government can establish an environment in which the private sector feels confident about taking commercial risks; that is, if it believes that tariffs will be maintained at a level that yields a reasonable return.

The main difference between leasing (*affermage*) and concessions is that the regulatory body, sometimes the government, reserves the right to oversee the planning of the infrastructure expansion and the structure of the network. As was mentioned in the section on management contract above, there is a trade-off between the responsibilities over the investment and the O&M cost; nevertheless, the involvement in the design of the network allows pass-through tariffs of the agreed investment and impacts on the O&M.

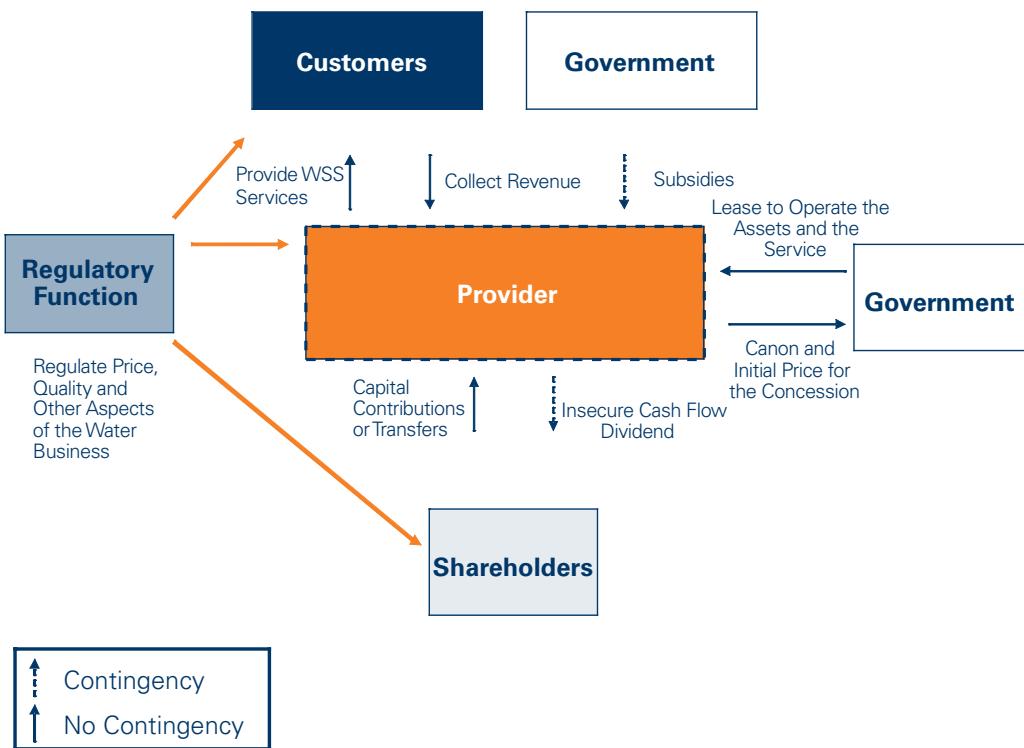
This structure requires that the regulatory body have significant institutional capacity for (i) planning the investment, (ii) the economic expertise to estimate the tariffs and (iii) transparency to avoid capture from the provider.

### B.3.2. Generic Concessions

Under concession contracts, a private operator is given a contractual right to use existing infrastructure assets to supply customers. Asset ownership remains with the government; however, the full rights to all the assets, including those created by the private partner, revert to the government when the contract ends—usually after 25 to 30 years.

The concession contract also includes obligations to finance extensions and upgrades to the existing infrastructure. This tends to result in concession contracts that are of longer duration than lease contracts to enable the operator to recover its capital and financing costs.

**Figure B.3.2. Concessions - Generic Concessions**



The concession is governed by a contract that sets out such conditions as the main performance targets (coverage, quality), performance standards, arrangements for capital investment, mechanisms for adjusting tariffs and, in some cases, arrangements for arbitrating disputes.

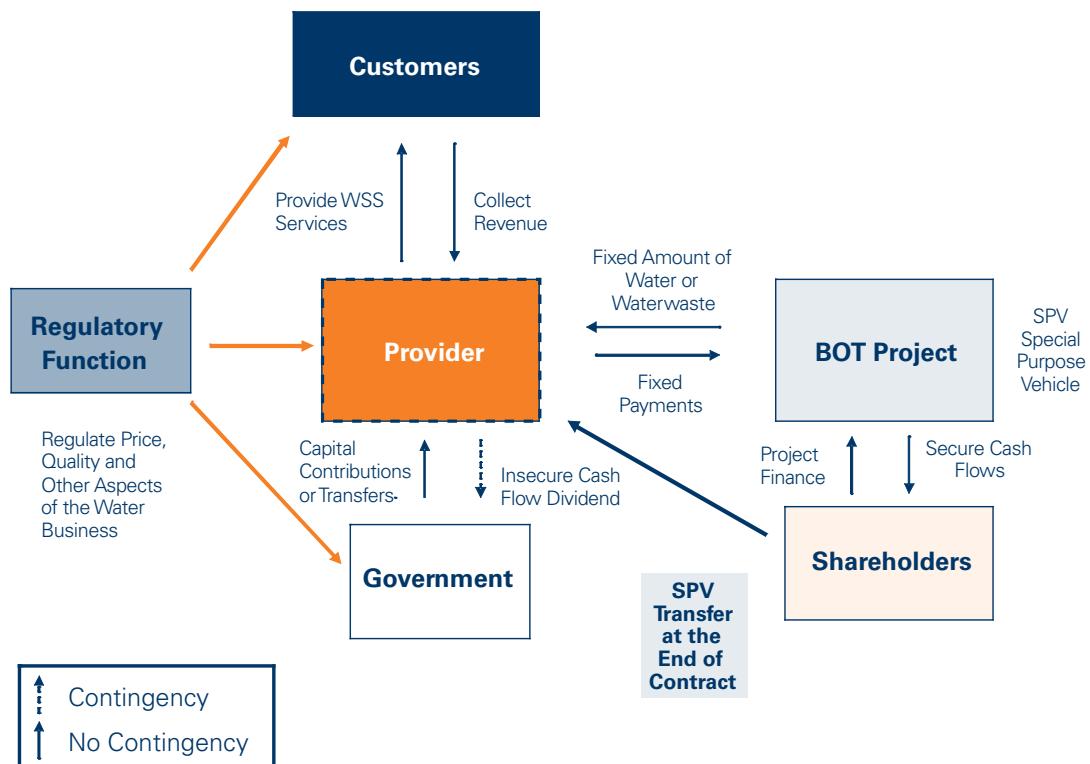
The main advantage of a concession is that it passes full responsibility for operations and investment to the private sector and so brings to bear incentives for efficiency in all the utility's activities. Therefore, the concession is an attractive option where large investments are needed to expand the coverage or improve the quality of services.

However, administering a concession is a complex business because it confers a long-term monopoly to the concessionaire. This means that the quality of regulation is important in determining the success of the concession, particularly the distribution of its benefits between the concessionaire (in profits) and consumers (in lower prices and better service).

### B.3.3. BOT/BOO

Build-operate-transfer (BOT) arrangements resemble concessions for providing bulk services but are normally used for green-field projects, such as a water or wastewater treatment plants.

**Figure B.3.3. Concessions - BOT**



The build-operate-transfer (BOT) or design-build-operate-maintain (DBOM) model is an integrated partnership that combines the design and construction responsibilities of design-build procurements with operations and maintenance. These integrated contracts transfer design, construction, and operation of a single facility or group of assets to a private sector partner.

These business models are usually set up as a single design-build-operate contract for the entire project with financing secured by a public agency in an off-take contract, under which the contractor provides long-term operation and/or maintenance services, with the public sector sponsor retaining the operating revenue risk and any surplus operating revenue. The contract between the BOT concessionaire and the utility is usually on a take-or-

pay basis, obligating the utility to pay for a specified quantity of water whether or not that quantity is consumed. The nature of these contracts makes them particularly amenable for new dams and water treatment plants.

BOTs tend to work well when the goal is the expansion of the system, but if the main problem is operative, the BOT will aggravate the difficulties faced by the utility because it increases the size of the operation.

#### *Reverse BOT*

A reverse BOT is a contract in which the government buys or builds the facility and hires a private firm to operate it. If desired, over a period of time, the firm may purchase the facility in installments covering the government's debt service and management expenses. By taking on much of the initial risk, governments can encourage more private sector participation and lower the cost of such participation. This can be an attractive PPP option in countries where economic or political risks are high.

#### *Build-Own-Operate*

Under a build-own-operate (BOO) contract, a private company is responsible for financing and carrying out the investments required to meet the obligations specified in its license or by the regulator. The main difference between a build-own-operate and with the BOT arrangement is that under a BOO arrangement the assets remain indefinitely with the private partner.

In build-own-operate-transfer agreements (BOOTs), private firms are responsible for the construction of the plants, as well as their ownership and operation for a fixed time period, after which they revert to the government, which can then, if it so desires, contract out the operation for another term.

## **B.4. Joint Ventures**

Joint ventures (JV) between the public and the private sectors make it possible to introduce private capital into an endeavor while reducing the expropriation risk that could otherwise occur if conventional concession schemes were used in very weak institutional environments. Joint ventures are ideal modalities permitting firms to enter new markets they could not reach via direct investment or privatization. By sharing ownership with the private sector, governments become residual claimers that are interested in preserving the performance gains that the private partner could introduce. For this modality to function the private sector must hold a majority of shares to control managerial decisions.

The joint venture is governed by a set of contracts between the government and the private operator that may resemble those that can be normally found in affermage, BOT or BOO arrangements. The key difference stems from the fact that joint venture arrangements are self-enforcing, while arrangements without joint property require solid third-party enforcement (courts, dispute resolution mechanisms), which may be lacking or costly. In any case, the legal context will determine the legal vehicle that can be set up. In certain countries the constitution rules out the possibility of private majority in shares.

Many varieties of joint ventures have been developed to supplement the lack of explicit or implicit property rights. In China, for example, cooperative joint ventures (CJV) are almost always used for infrastructure investments because other financial arrangements cannot effectively address the financial risk to foreign investors that contribute a large amount of cash.<sup>16</sup> Normally, the foreign party owns the majority of share capital. A cooperative joint venture may enable these investors to recoup their investment more quickly than other structures, since the parties can negotiate how and when profits are ultimately divided. For example, a foreign

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16 See The China Business Review: <http://www.chinabusinessreview.com/public/0501/folta.html>

investor could negotiate to receive up to 100 percent of the available cash for an initial period (perhaps the first 5 to 15 years). In the next 5 to 10 years, available cash could be split to match the parties' shareholding. In a final period, perhaps the last 5 to 10 years, the foreign party could receive a share of the available cash that is less than proportionate to its shareholding.

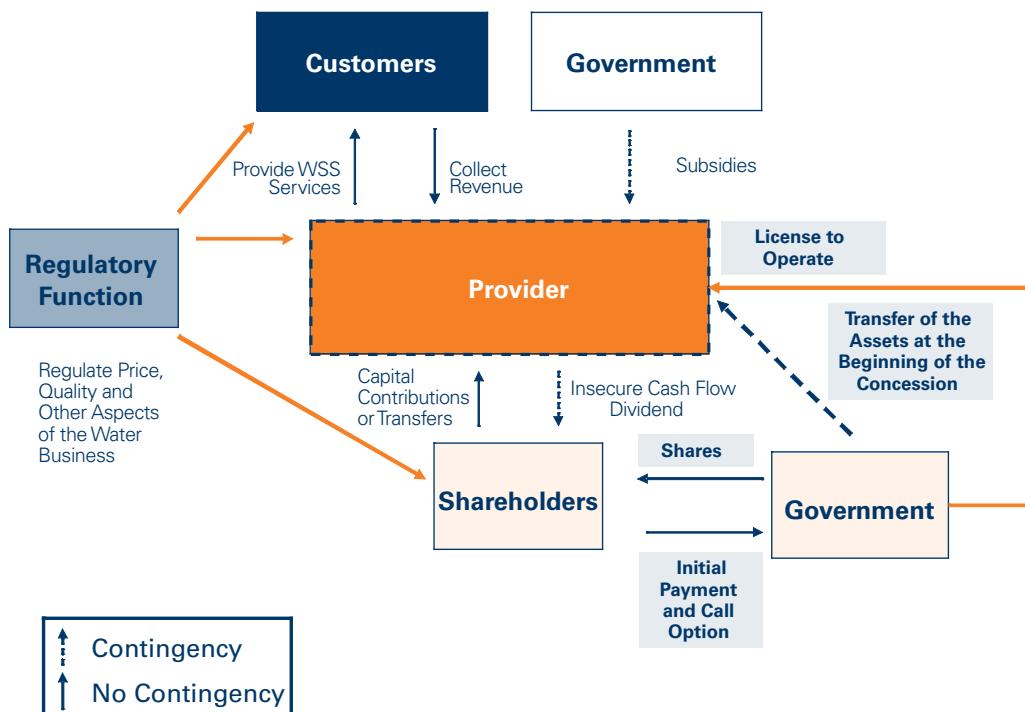
All agreements and definitions of rights should be carefully spelled out in the detailed joint venture contract. Both the government and the operator have a fiduciary responsibility and the duty to act in good faith in matters that concern the common interest or the firm.<sup>17</sup>

## B.5. Fully Private

Fully private are those utilities managed and owned in majority or in totality by private interests.

### B.5.1. Fully Private - License

**Figure B.5.1. Fully Private - License**



Divestiture of water and sewerage assets (through a sale of assets or shares) can be partial or complete. Under a license agreement, the government sells the assets and gives to the company a license to operate in a region. While divestiture by license is widespread in the telecommunication sector and, more recently, in the

17 “Fiduciary responsibility” refers to holding something in trust for someone. “Acting in good faith” means to behave in compliance with standards of decency and honesty.

energy sector, it is not common in water and sanitation. The main rationale for this modality is that an increase in the technology of the sector will change the way the businesses perform. In this case, the government will reserve the right to open the market to competition giving new licenses to other private companies.

From the operational perspective the license gives the private provider full responsibility for operation, maintenance and investment. In contrast to a concession, these arrangements transfer assets to, or permit, the private licensee to provide green-field supply investments.

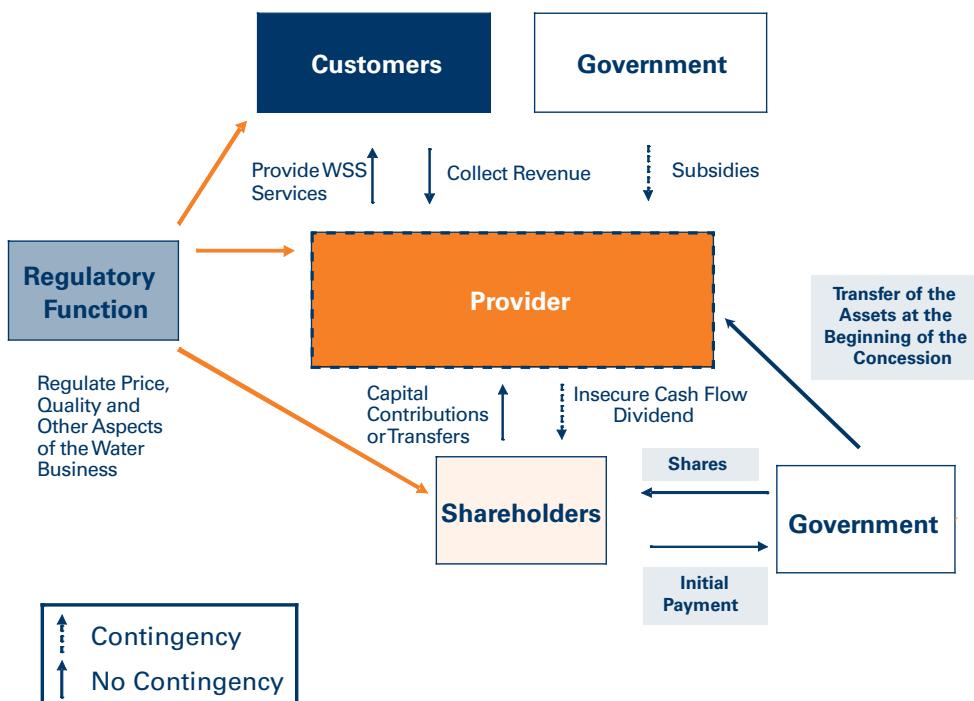
This modality leaves the government with the task of regulation, and in the future, the deregulation of competition.

It is important to indicate that this type of contract gives the buyer the right to provide the service without competition during a specified period of time. If the contract is correctly designed, it creates procedures that all parties, including the licensee, the government and the regulators, will have to follow in order to allow new competition.

### B.5.2. Fully Private - Sale

Divestiture of water and sewerage assets (through a sale of assets or shares) can be partial or complete. A complete divestiture, like a concession, gives the private sector full responsibility for operations, maintenance, and investment. In contrast to a concession, these arrangements transfer assets to the private sector or permit green-field service supply investments.

**Figure B.5.2. Fully Private - Sale**

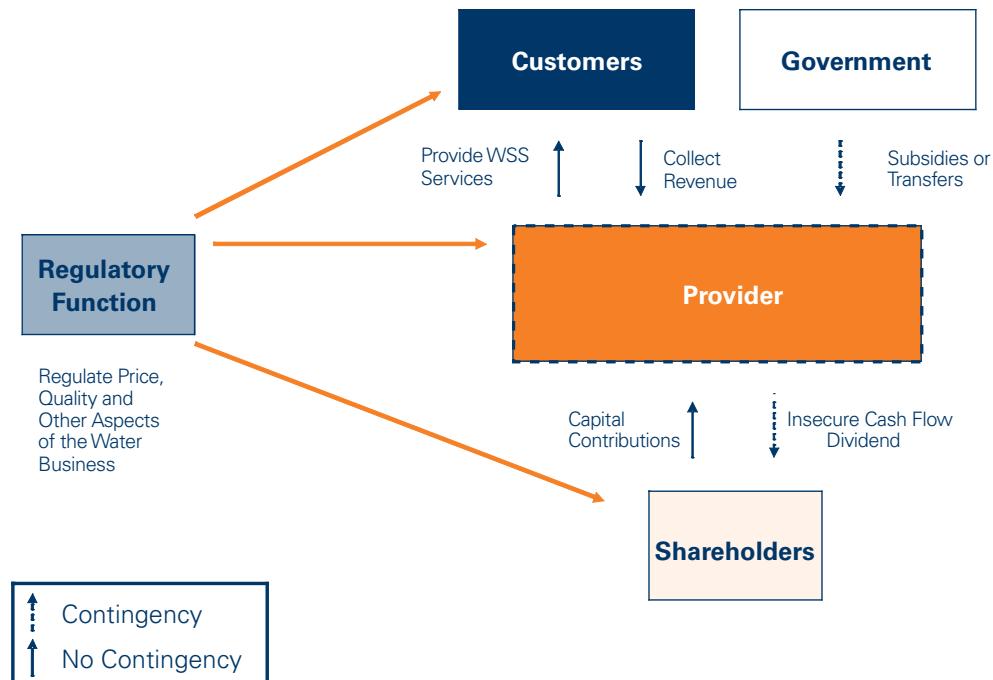


In this context, divestiture leaves the government only the task of regulation, since, in theory, the private company should be concerned about maintaining its asset base.

### B.5.3. Fully Private - Private Operator

A private utility is a regulated company that operates and maintains water and wastewater systems in a defined area. Moreover, the company was built and developed by a private owner. The provider would operate as a self-supporting enterprise whereby the operations and capital expenditures are funded with revenues generated from customer user fees and one-time fees paid for capacity at the time of connection to the system or, in some cases, with some government support.

**Figure B.5.3. Fully Private - Private Operator**



Although widely used in other infrastructure sectors, divestitures in the water and sanitation sector have been limited to England, Wales and Chile.

**In summary, there are various types of project modalities that make up the PPP continuum and involve different responsibilities between the public and private sectors. Figure 4 of the report presents a spectrum of public to private options as well as the allocation of responsibilities and risks assumed.**

## APPENDIX C – TOOLS

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This appendix reviews the tools and instruments commonly available and the risks that they typically address.

### C.1. Political Risk Insurance

The standard forms of political risk insurance (PRI)<sup>18</sup> provide coverage against risks with respect to expropriation, political violence, and currency transfer and convertibility. On a negotiated basis, many providers of PRI will also provide coverage against breach of contract. Rating agencies view political risk insurance as an effective means to enable a transaction's rating to breach the sovereign ceiling and to permit the transaction's local currency rating (which is usually higher in the absence of PRI) to become its foreign currency rating. However, as is true also of co-financing, PRI does not provide protection against devaluation and, normally, does not afford coverage against regulatory risk. Although political risk insurance can include breach of contract coverage to mitigate the risk that a host government might break its commitments, this coverage typically requires that the government discriminate against foreign investors; however, the most serious forms of regulatory intervention are those that affect an entire sector and apply with equal force to domestic and foreign investors.

### C.2. Partial Credit Guarantees

Partial credit guarantees (PCGs) are provided by official agencies to cover a portion of the debt used to finance an infrastructure project. For example, a PCG might apply to all scheduled debt service payments during the final five years of a 15-year loan. Alternatively, the partial credit guarantee could be structured to apply to the next scheduled payment (or payments). This was the case of the World Bank's rolling partial guarantee program (which required a counter-guarantee from the sovereign). With this structure, the guarantee would continue to remain available so long as the borrower continued to make its scheduled debt service payments. If the borrower were to default, the guarantee would be called upon to make the payment, and, if the borrower (or the sovereign) were to reimburse the issuing agency within the required period, the guarantee would be reinstated.

The availability of long-term financing (in local currency or US dollars) is often an issue in many countries. A partial credit guarantee that covers longer tenor debt service payments can solve this problem by permitting private sector lenders to provide financing only for a tenor with which they are comfortable. Similarly, rolling partial credit guarantees can be used to raise the transaction's rating above the sovereign ceiling and to improve the pricing and tenor of available financing.

By virtue of the fact that they guarantee a portion of an issuer's debt, PCGs are exposed to all of the risks to which the issuer is exposed. As in the case of co-financing, they increase lenders' and investors' comfort with a transaction, but more importantly, provide a direct claim against the guarantor, up to the amount of the guarantee.

### C.3. Partial Risk Guarantees

Partial risk guarantees (PRGs) differ from partial credit guarantees in that they are exposed only to a carefully defined segment of the total set of risks that face any project. PRGs can be tailored to cover any specific risk for which the host-country government is prepared to provide a counter-guarantee. In the context of financing

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<sup>18</sup> PRI is offered by the Multilateral Investment Guarantee Agency, the US Government's Overseas Private Investment Corporation, private insurers, and export credit agencies. In addition, some Multilateral Development Banks (MDBs) offer guarantees that are the functional equivalent of PRI.

water and sanitation projects in low- and middle-income countries, three forms of partial risk guarantees are most likely to address the major concerns of equity investors and project lenders.

*PRGs to Mitigate Market Risk:* As previously noted, most water and sanitation projects offer their services to a market consisting of businesses and/or the general public. Uncertainty about the long-run level of demand for a project is greatest for green-field projects, but it can also be significant for newly privatized ones. Alternatively, users can be required to pay for service and the government can provide a revenue guarantee to the project covering the aggregate amount of revenues received from all users. This tool can help prevent the cases where there is a low score in the willingness to pay variable. These types of guarantees can be structured in various ways, but in general, this structure provides a minimum revenue amount, and thus, effectively mitigates market risk.

*Regulatory Risk PRGs:* Water and sanitation projects are monopolistic and are often under the supervision and regulation of the government. Regulation can prevent the abuse of this market power, but regulation can also adversely affect the equity returns that were expected by the project's sponsor(s) at the time that a decision was made to invest in the project. The fact that most of the assets used in a project cannot readily be employed in a new location exposes those projects to opportunistic behavior, as well as to well-intentioned but mistaken regulatory decisions (lack of institutional capacity). By specifying the essential elements of the regulatory regime governing a specific sector, governments can assure potential equity investors that their expectations will not be frustrated by opportunistic or ill-informed regulatory decisions. A PRG that guarantees the host government's commitments with respect to these issues can be the decisive element in a project's risk mitigation structure that enables the project to go forward.

*Foreign Exchange Liquidity Facility PRGs:* A foreign exchange liquidity facility is a contingent credit facility that can be drawn upon by a project to enable the project to meet its scheduled US-dollar debt service when it would otherwise not be able to do so as a result of devaluation of the host country's currency. Foreign exchange liquidity facilities represent a partial risk approach because they are structured to cover currency risk, not project operational risks.

A foreign exchange liquidity facility was provided by OPIC for a US\$300 million Brazilian transaction in 2001, and its use was recommended in March 2003 by the report of the World Panel on Financing Water Infrastructure (the Camdessus' Report). Although the foreign exchange liquidity facility provided by OPIC was structured as a contingent credit facility rather than as a guarantee, PRGs could be structured to apply to a foreign exchange liquidity facility provided for water and sanitation projects by a host-country financial institution with a counter-guarantee from the host-country government.

## C.4. Subsidies

Subsidies to utility customers are a salient feature of water services worldwide. In some cases, subsidized service is made possible by transfers that cover the cost of providing water to a general or specific group of consumers.

Subsidies have two main objectives: the first is to make a project sustainable that would otherwise be unsustainable by providing the financing required to bring water to poor areas and normalizing the relationship between the utilities and the consumers. The second is to make the services affordable for some groups of consumers in the utility area.

A project can have different types of subsidies, such as: utility vs. consumer focus, consumption base vs. connection base subsidies, targeted vs. untargeted, implicit vs. explicit, and others.

There are different sources of funding for these subsidies, including: (i) international grants, (ii) special purpose cross-subsidies, (iii) fiscal transfers between different branches of government or directly from local government general budget, and (iv) tariff systems, cross-subsidies between different categories of customers. Listed below are some of the different sources of funding being used by successful projects in the water and sanitation sector around the world.

- International grants or output-based aid (OBA), a strategy for using explicit performance-based subsidies to deliver water services where policy concerns justify IDA grants to complement user fees.
- Special purpose funds that collect funds from special taxes or tariffs imposed to a group of customers or taxpayers to cover the expansion of the water sector. In Ecuador, for example, a surcharge on telecommunications is used to finance water.
- Government subsidies can take the form of large transfers from general tax revenues, which can be in the form of either capital projects or regular transfers to cover revenue shortfalls, related to service consumption (like a shadow transportation toll per vehicle, or based on water served) or of a general nature. The source of the funding can be the local government or the national government and the risks faced in each case is different according to the fiscal space that each branch of government has available.
- Cross-subsidies: excess revenues from some customers or in one part of the utility's business are used to offset losses created by the subsidy programs. Cross-subsidies are popular because they appear to permit utilities to achieve cost recovery without relying on central government transfers.

Project designers must have a clear understanding of the transient or permanent nature of these subsidies, provide a credible time schedule of how subsidies are going to decrease or fully disappear, according to the cost-recovery strategy of the firm; and evaluate how much fiscal space would be available to cover these subsidies vis-à-vis the need of funding merit goods. A major source of financial and political troubles for water firms stems from implementing tariff and subsidies that are unsustainable.

## C.5. Credit Enhancement

Credit enhancement is the process of reducing credit risk by requiring collateral, insurance, or other agreements to provide the lender with reassurance that it will be compensated if the borrower defaults. Credit enhancement in the water sector can be provided through the use of trust funds or special purpose vehicles by leveraging low risk assets as collateral for enhancing debt financing.

Covering assets with debt is ideal for infrastructure projects; however, many face short maturity periods matched with long-term assets. This mismatch creates a risk for the longevity of large-scale infrastructure improvements. A city operating a balanced budget may be prepared to match long-term assets with the issuance of municipal bonds. Where acceptable market pricing may only allow for short-term maturity bonds, a special purpose vehicle can assist with revolving funds from revenues, allowing for the extension of bond maturities. Such credit enhancement can yield precedent-setting standards for investment within a local financial market.

The Indian state of Tamil Nadu has pursued credit enhancement to connect with the financial markets and institutions while providing the funding for local development of projects aimed towards poverty eradication. The asset management company for the Tamil Nadu Urban Development Fund (TNUDF) issues bonds to fund the purchase of municipal bonds. Pooled financing is then achieved through a project-specific pool where projects are grouped together into one bond issuance. This grouping thus reduces transaction costs and improves the bond pricing for investors. The TNUDF will also bundle grants and loans in order to reduce inter-

est costs for smaller governments. These bundled arrangements are ideal for the poverty eradication efforts of low-income communities. The fund has been able to finance over 500 projects covering water supply and sanitation and other urban local projects.

## C.6. Local Currency Financing

Where local currency financing is available with the maturity and the cost required by water sector projects, it can be used to mitigate risks inherent in the macroeconomic factors variable. For example, local currency financing could further be used to minimize the effects of currency devaluation on project sustainability. Local financing works as a hedging contract matching the currency of debt with the currency of the revenue stream.

## C.7. Arbitration Rules Included in the Contract

To foster regulatory and judiciary effectiveness, policymakers and regulators in some countries have contracted regulatory functions and dispute arbitration to third parties; for example, arbitration panels for dispute resolution or technical expert panels for regulatory effectiveness. Such mechanisms should always aim at resolving any conflict quickly, efficiently and impartially so as to create minimal interference with the operations of the utility, which needs to carry on ensuring the provision of water supply to the population.

Disputes between the operator, regulator and government are standard and bound to arise under any contractual agreement. To reduce the regulatory risk resulting from uncertainty about the resolution of disputes, an arbitration mechanism that all parties perceive to be neutral and independent should be used. The contract should contain various provisions for arbitration in the event of disputes between the concessionaire and either the regulator or the corresponding government. It should also require that the rulings of arbitration be implemented on a provisional basis, with interim remedies in place even when they are appealed in the courts (because the appeal process can be significantly lengthy).

The inclusion of these arbitration rules in the contract would help to mitigate the risk imposed by weak local conditions in the institutional capacity and, partially, in the legal framework variable.

Regardless of the mechanism chosen by the parties or the project designer to resolve potential conflicts, the arbitration rules should: (i) establish the method for resolving disputes (arbitration, court proceedings, appointment of experts, or alternative dispute resolution); (ii) indicate the dispute settlement –(judicial, quasi-judicial or administrative and arbitral); (iii) specify the degree of commitment with the judgment of the arbitration panel (binding or nonbinding); (iv) point out the mechanism with which to enforce the decision, if necessary; and (v) consider the international rules that may apply in the cases of international arbitration or expert panels.

In the special case of the regulatory panels, the rules for this panel ought to consider the scope of the work to be performed –(monitor the fulfillment of contractual conditions, review tariffs or even settle technical disputes) and the degree of commitment from the ruling of the expert panel.

## C.8. Off-take Contracts

In project structuring, off-take contracts are a form of guarantee on the volume of the revenue for the project.

Frequently, off-take agreements are structured on a “take-or-pay” basis, which means that the off-taker is obligated to pay for a product on a regular basis whether or not the off-taker actually takes the product; unless, of course, the product is unavailable due to a default by the project company. These agreements frequently are on a fixed or scheduled price basis during the term of the project debt financing.

Off-take agreements can be for a portion or all of a utility's output, but, provided they are executed with creditworthy counter-parties, they provide an excellent risk mitigant to market and revenue risks.

Those agreements are useful to mitigate market risk and will have an important impact in the mitigation of macroeconomic factors and fiscal space risk as long as the legal framework local condition is strong enough to enforce the contracts.

**In summary, there are tools that can be leveraged to enhance the availability of certain project modalities. Figure 12 of the report provides a snapshot of these tools and the additional project modalities that become available with their use.**

## APPENDIX D - HYPOTHETICAL EXAMPLES

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The analyses that follow include six hypothetical examples, highlighting progressively more complex structures of water sector projects. Each scenario begins with given local conditions, followed by an analysis of available tools and modalities. The project feasibility mapping provides a user-friendly illustration of where feasible project structures may be implemented based on the local conditions receiving a low rating. Suggested project structures are those whose vertically aligned boxes all include circles. This reading of the map is important for understanding the discussion in Section 4.5 Improving Local Conditions.

The analysis indicates the most feasible project structures given specific weak local conditions. In each sample Project Feasibility Map, feasible modalities have a white background and a dark shade circle and those considered less feasible have a solid blue background. Less feasible structures, however, can be made feasible with tools that facilitate financing and risk mitigation. In the scenarios that follow, all variables that have project enhancing tools will be identified with a white background and a lighter shade circle. To determine what types of tools are available for a particular variable, refer to figures 11 and 12 in the main report.

Although this analysis highlights modalities available for feasible project structures, it does not imply that other modalities cannot be used. Companies that can diversify risks in other ways may consider project modalities outside of those highlighted here as feasible. As such, these examples should serve as guides, not templates, for developing and implementing a project.

### D.1. Scenario 1

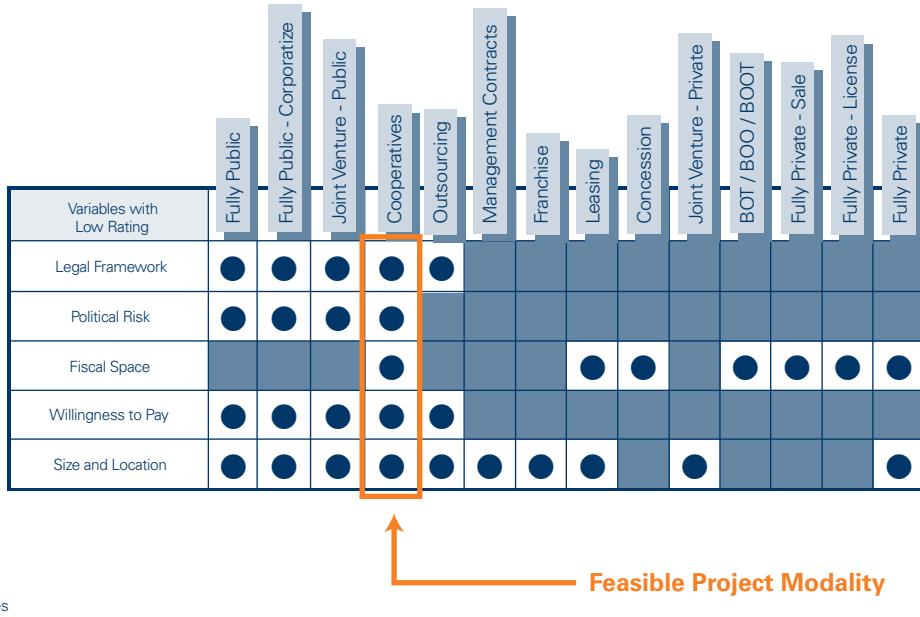
#### Variable Rating

Low	High
<ul style="list-style-type: none"> <li>• Legal Framework</li> <li>• Political Risk</li> <li>• Fiscal Space</li> <li>• Willingness to Pay</li> <li>• Size and Location</li> </ul>	<ul style="list-style-type: none"> <li>• Institutional Capacity</li> <li>• Macroeconomic Factors</li> <li>• Tariff Sustainability</li> </ul>

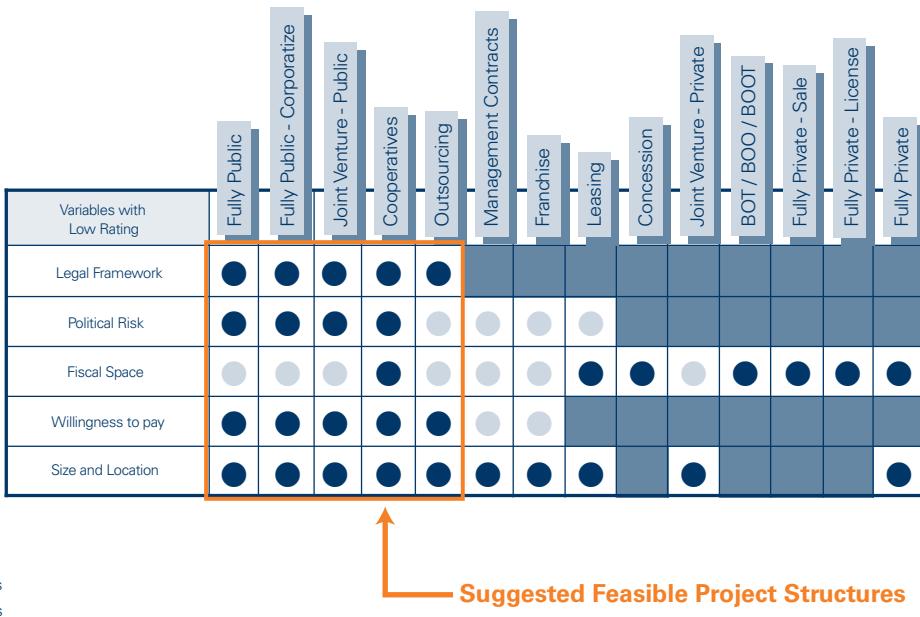
#### Scenario Description and Project Feasibility Analysis

The project faces low ratings in legal framework, political risk, fiscal space, willingness to pay, and size and location.

The low rating in fiscal space requires that the project seek private investment, but the low acceptance of private investment and low ratings in the political risk and legal framework deter such financing. Private investors in this scenario would be exposed to an environment where their property rights are subject to a high risk of possible involuntary or voluntary expropriation. In this business climate, the most feasible solution will be a cooperative modality (See figure D.1.1.).

**Figure D.1.1. Feasibility of PPP Modalities Under Weak Local Conditions - Scenario 1**

Applying project enhancement tools such as cross-subsidies and output-based aid can make available three additional modalities: fully public, fully public–corporatized, and joint venture–public. Additionally, if the project receives a political risk guarantee to cover the political risk, the outsourcing modality can then become feasible (additional four options with lighter blue circles, as shown in figure D.1.2).

**Figure D.1.2. Project Feasibility Map - Scenario 1**

Five modalities (one of which was already available) become available for project structuring when using these tools in scenario 1. The modalities are: fully public, fully public–corporatized, joint venture–public, cooperatives and outsourcing. It is important to note that there is no enhancement tool to mitigate risk associated with a low rating of the legal framework variable.

## D.2. Scenario 2

### Variable Rating

Low	High
<ul style="list-style-type: none"> <li>• Political Risk</li> <li>• Fiscal Space</li> <li>• Willingness to Pay</li> <li>• Size and Locations</li> </ul>	<ul style="list-style-type: none"> <li>• Legal Framework</li> <li>• Institutional Capacity</li> <li>• Macroeconomic Factors</li> <li>• Tariff Sustainability</li> </ul>

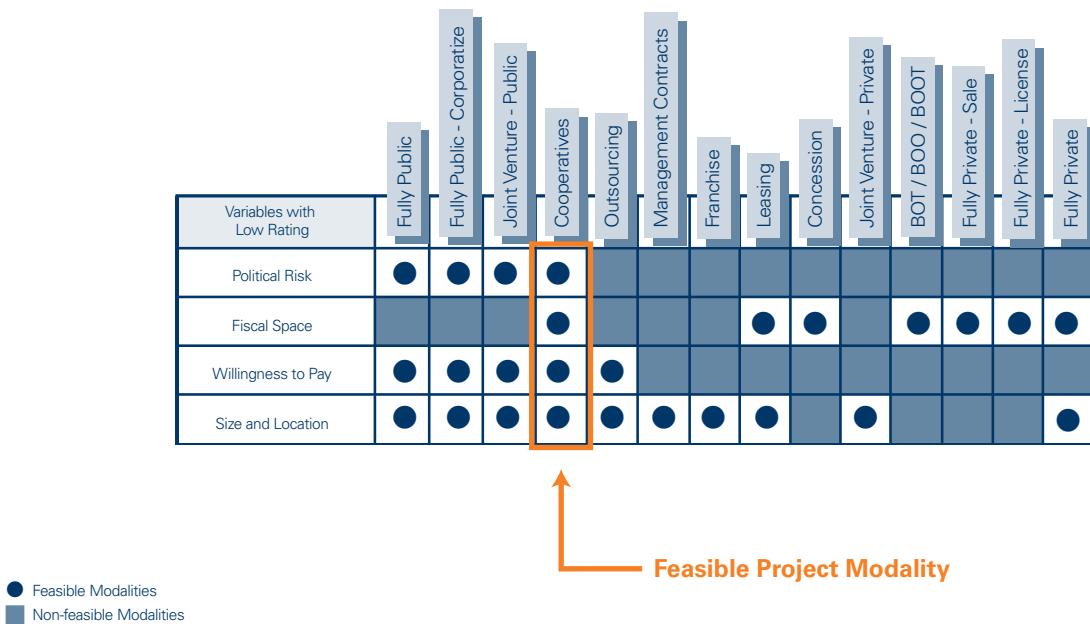
### Scenario Description and Project Feasibility Analysis

The project faces low ratings in political risk, fiscal space, willingness to pay and size and location.

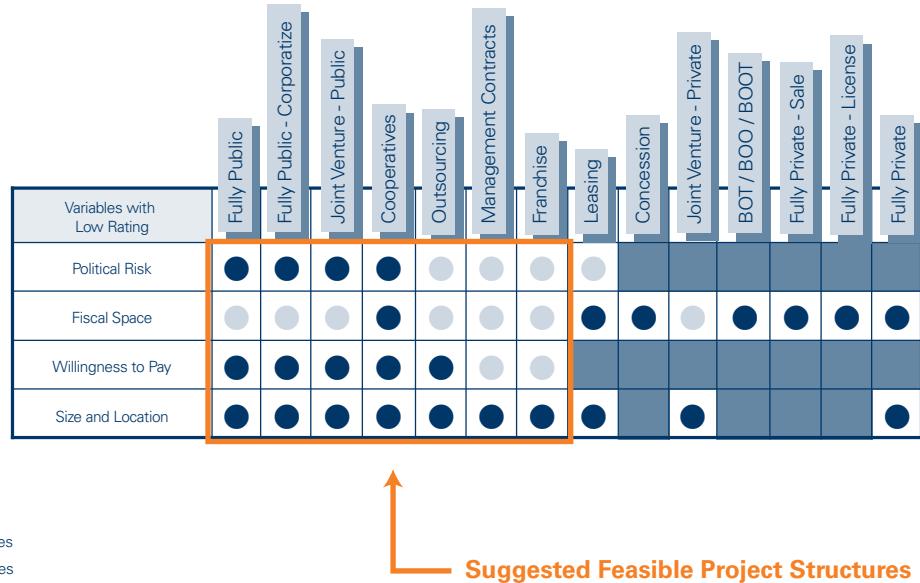
This scenario is an evolution of the previous one, where the legal framework local conditions are better as a consequence of strengthened public policy. Private investors in this scenario would no longer be exposed to an environment where their property rights are subject to a high risk of possible involuntary or voluntary expropriation.

As noted in scenario 1, the low rating in fiscal space implies that the project seeks private investment, but the low acceptance of private investment and a low rating in political risk deters such financing.

The willingness to pay variable also imposes an interesting restriction in that there are no well-defined risk mitigants to address this risk under more private modalities such as concessions, BOT/BOO/BOOTs, fully private sales and licenses, short of a subsidy. Weak fiscal space in this scenario would suggest that output-based aid or a similar donor directed subsidy is likely to be the best mechanism to address this risk. A consolidation of small providers might provide economies of scale in revenue generation, but if willingness to pay is below the cost recovery threshold, then the only option is a subsidy stream. There are limited means to address cultural acceptance risks for private investment. In this environment, without the use of tools, the most feasible solution is a cooperative company (see figure D.2.1.).

**Figure D.2.1. Feasibility of PPP Modalities Under Weak Local Conditions - Scenario 2**

Six additional project modalities become available when project tools, such as cross-subsidies and political risk guarantees are applied. To further expand on the variables, low willingness to pay and low fiscal space demand some sort of subsidy, possibly a cross-subsidy to address the willingness to pay condition. Given that the tariffs are affordable (that is, there is no weak tariff sustainability condition), the international community providing output-based aid may want to consider gradually reducing the subsidy as the users become accustomed to paying the service fee and realize they have the funds for doing so. This hypothetical example would further require a strong institutional framework to enforce the tariffs.

**Figure D.2.2. Project Feasibility Map - Scenario 2**

\* Refer to Figures 11 and 12 for the specific tools corresponding to the local conditions identified

Using the tools in scenario 2, seven modalities result as options for project structuring: fully public, fully public-corporatized, joint venture-public, cooperatives, outsourcing, management contracts and franchises. Additionally, this business environment has two more feasible project structures than in scenario 1.

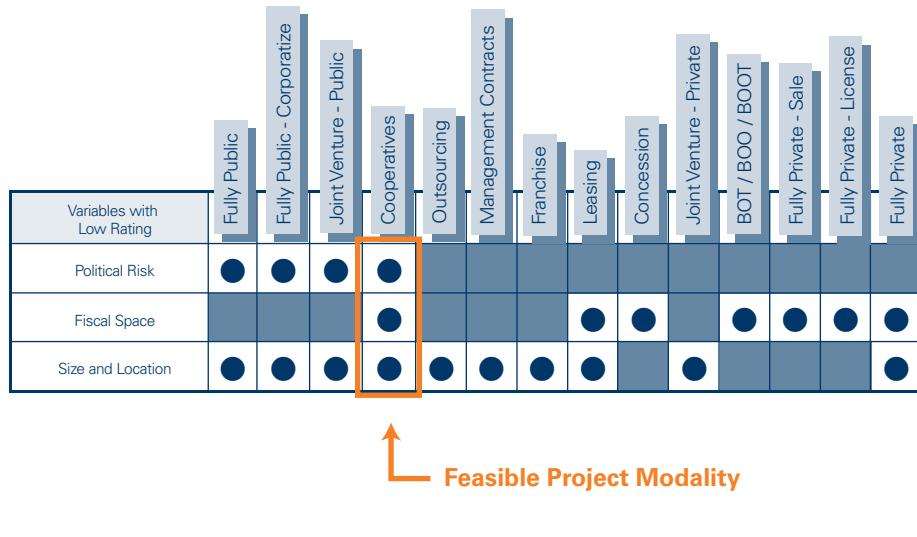
### D.3. Scenario 3

#### Variable Rating

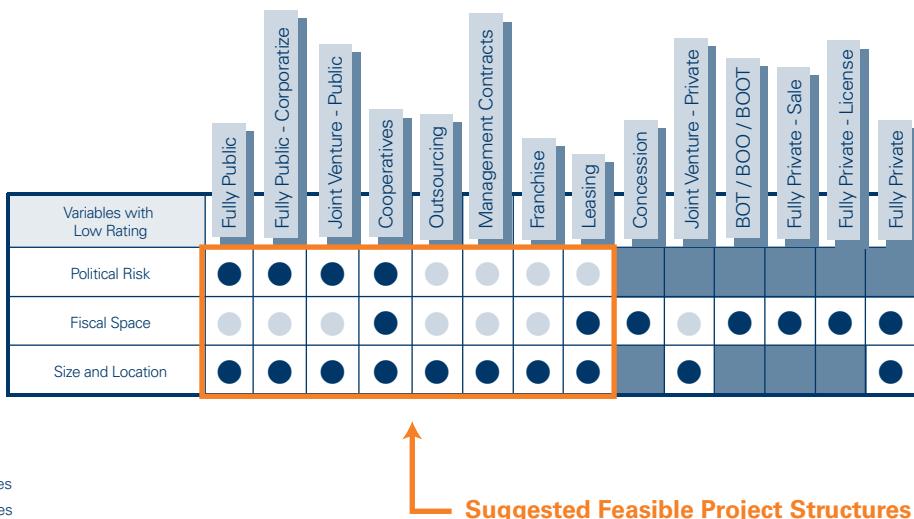
Low	High
<ul style="list-style-type: none"> <li>• Political Risk</li> <li>• Fiscal Space</li> <li>• Size and Location</li> </ul>	<ul style="list-style-type: none"> <li>• Legal Framework</li> <li>• Institutional Capacity</li> <li>• Macroeconomic Factors</li> <li>• Tariff Sustainability</li> <li>• Willingness to Pay</li> </ul>

#### Scenario Description and Project Feasibility Analysis

The project faces low ratings in political risk, fiscal space and size and location. This scenario is an evolution from scenario 2, with an improvement in willingness to pay. The strength of the legal framework can lead to improved enforcement capacity, which can gradually improve the willingness to pay as the tariff steadily increases until full cost recovery is reached.

**Figure D.3.1. Feasibility of PPP Modalities Under Weak Local Conditions - Scenario 3**

Political risk can be mitigated with political risk insurance, which deserves some discussion. Although political risk insurance is an applicable tool for a low condition in political risk, it becomes less effective in long-term contracts, such as lengthy concessions. For this reason, it is not considered as a potentially viable modality in those that generally extend into the long term.

**Figure D.3.2. Project Feasibility Map - Scenario 3**

\*Refer to Figures 11 and 12 for the specific tools corresponding to the local conditions identified

Using the tools such as political risk insurance and cross subsidies, eight modalities result as options for project structuring: fully public, fully public–corporatized, joint venture–public, cooperatives, outsourcing, management contracts, franchises and leasing. Where only four feasible project modalities resulted in scenario 1, eight feasible project modalities now result due to the improvements in legal framework and willingness to pay now seen in scenario 3.

#### D.4. Scenario 4

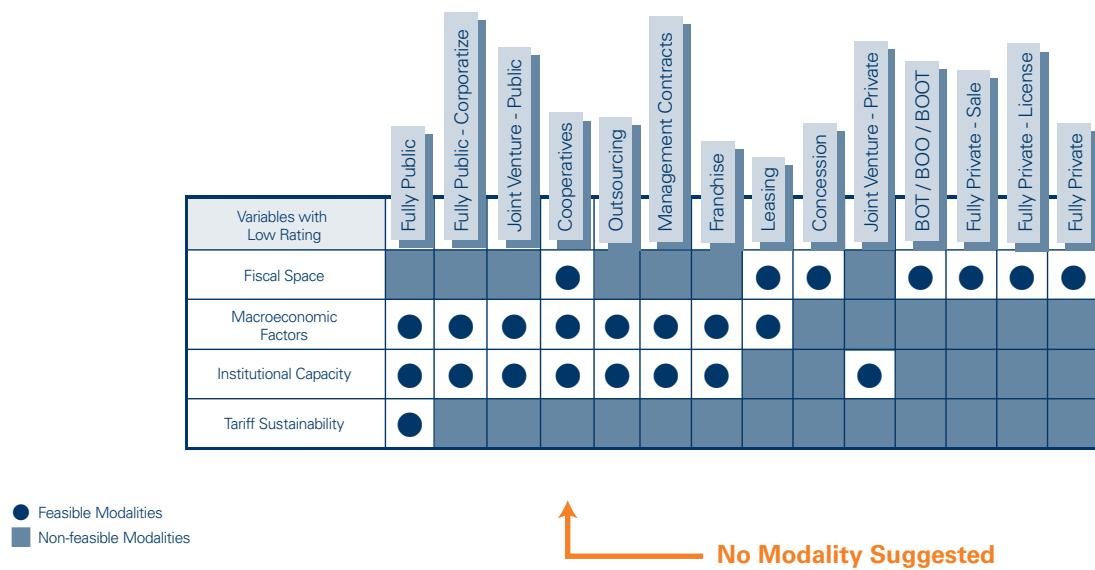
##### Variable Rating

Low	High
<ul style="list-style-type: none"> <li>Fiscal Space</li> <li>Macroeconomic Factors</li> <li>Institutional Capacity</li> <li>Tariff Sustainability</li> </ul>	<ul style="list-style-type: none"> <li>Legal Framework</li> <li>Political Risk</li> <li>Willingness to Pay</li> <li>Size and Location</li> </ul>

##### Scenario Description and Project Feasibility Analysis

The project faces low ratings in fiscal space, macroeconomic factors, institutional capacity and tariff sustainability.

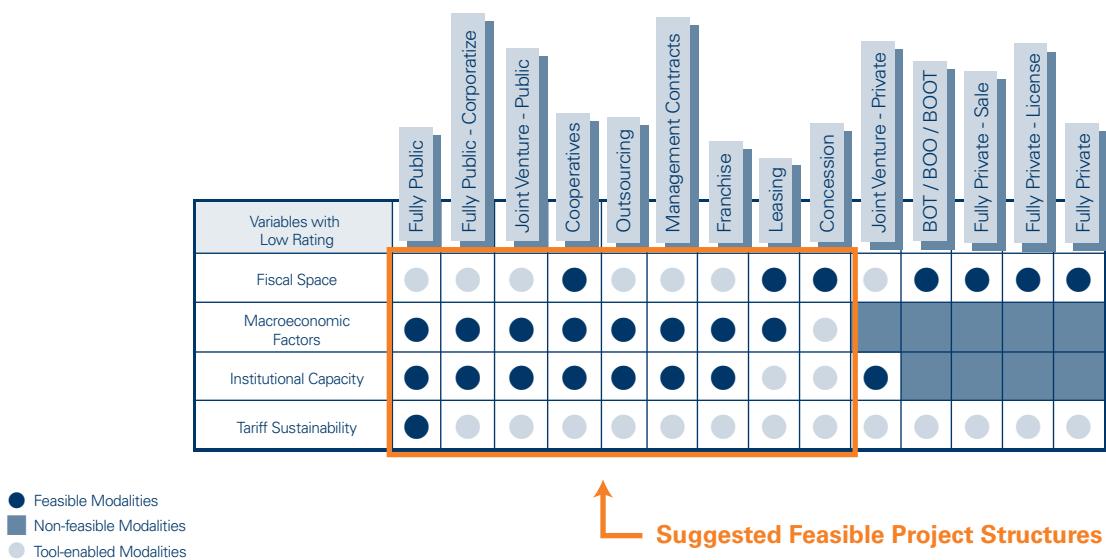
**Figure D.4.1. Feasibility of PPP Modalities Under Weak Local Conditions - Scenario 4**



The low rating in fiscal space reflects the fact that the government's budget resources are limited, thus making it unlikely for the government to provide funds for projects. Therefore, seeking private investment is important for developing and implementing feasible project modalities.

The variables can affect the feasibility of projects in various ways. Fiscal space recommends the use of the private sector, but institutional capacity, macroeconomics factors and tariff sustainability indicate the need for government intervention. Not all project modalities are available, but more can become available through the use of project enhancement tools, including: (i) cross-subsidies or output-based aid to mitigate the tariff sustainability issues and the fiscal space constraints, (ii) partial risk guarantees to mitigate the risks that institutional capacity can impose on effective regulation and (iii) partial risk guarantee–liquidity facility to improve some of the restrictions imposed by macroeconomic factors.

**Figure D.4.2. Project Feasibility Map - Scenario 4**



\* Refer to Figures 11 and 12 for the specific tools corresponding to the local conditions identified

Using the tools in scenario 4, nine modalities result as options for project structuring: fully public, fully pub-lic-corporatized, joint venture-public, cooperatives, outsourcing, management contracts, franchises, leasing and concessions.

## D.5. Scenario 5

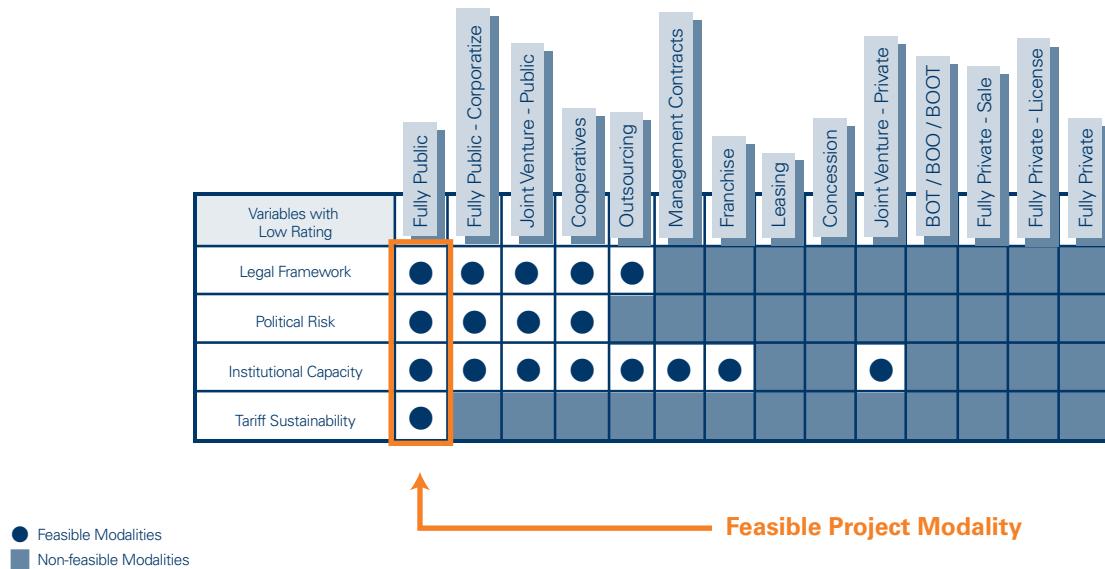
### Variable Rating

Low	High
<ul style="list-style-type: none"> <li>• Legal Framework</li> <li>• Political Risk</li> <li>• Institutional Capacity</li> <li>• Tariff Sustainability</li> </ul>	<ul style="list-style-type: none"> <li>• Fiscal Space</li> <li>• Macroeconomic Factors</li> <li>• Willingness to Pay</li> <li>• Size and Location</li> </ul>

## Scenario Description and Project Feasibility Analysis

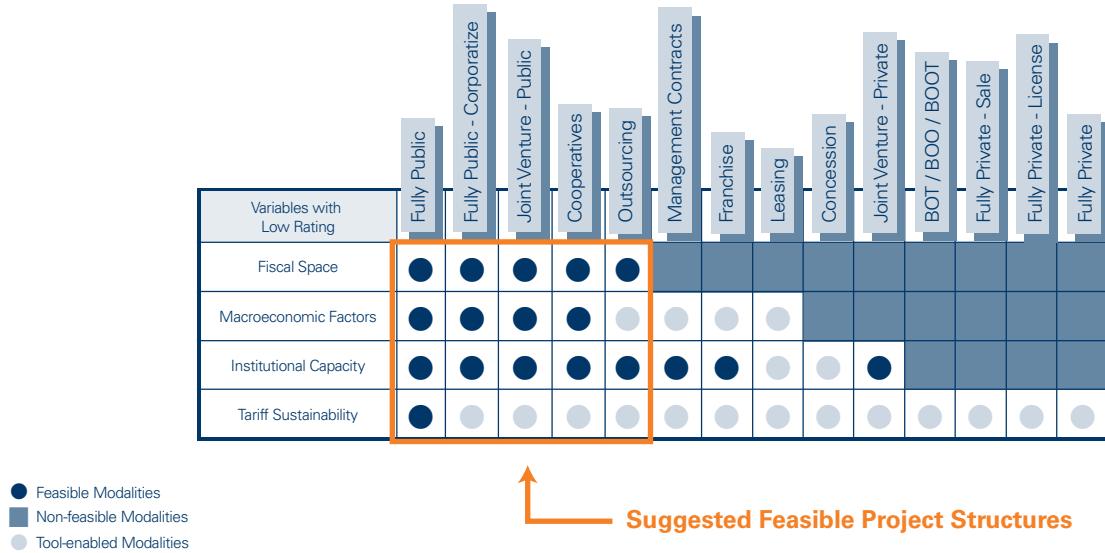
The project faces low ratings in legal framework, political risk, institutional capacity and tariff sustainability.

**Figura D.5.1. Feasibility of PPP Modalities Under Weak Local Conditions - Scenario 5**



This project is most feasible as a fully public project where the government is subsidizing the users through the general budget. Legal framework does not have an enabling tool, and therefore, limits the outcome of additional available modalities. Using tools such as cross-subsidies and output-based aid to improve tariff sustainability, and the political risk guarantee to mitigate political risks, the project feasibility map can suggest five potential project modalities for successful project implementation: fully public, fully public-corporatized, joint venture-public, cooperatives and outsourcing.

Finally, it is important to mention that an improvement in the legal framework would strongly increase the availability of feasible project modalities, assuming the availability of tools.

**Figure D.5.2. Project Feasibility Map - Scenario 5**

\*Refer to Figures 11 and 12 for the specific tools corresponding to the local conditions identified

Using the tools in scenario 5, five modalities result as options for project structuring: fully public, fully public-corporatized, joint venture-public, cooperatives and outsourcing.

## D.6. Scenario 6

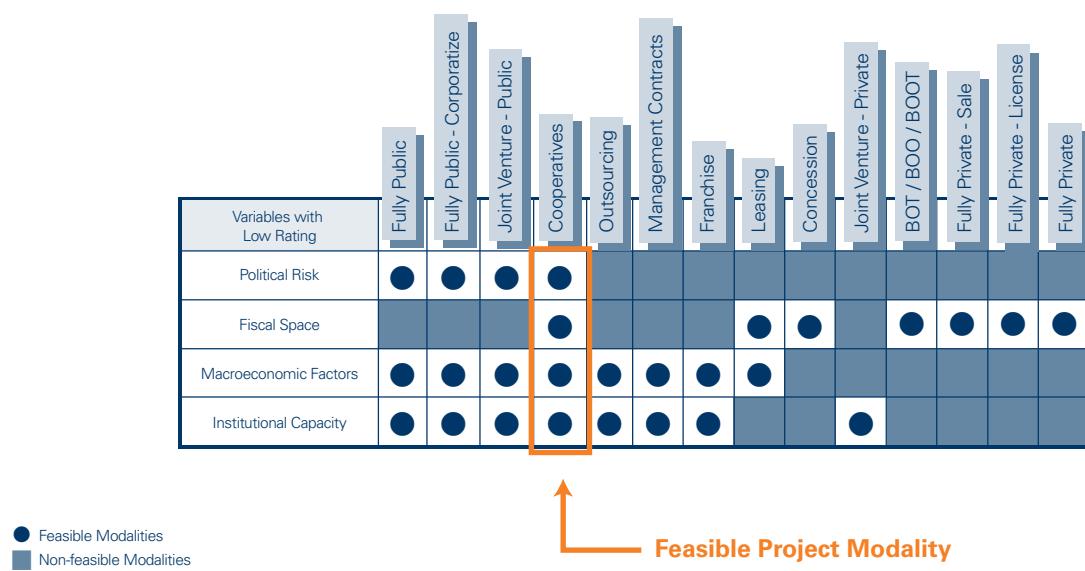
### Variable Rating

Low	High
<ul style="list-style-type: none"> <li>• Macroeconomic Factors</li> <li>• Political Risk</li> <li>• Fiscal Space</li> <li>• Institutional Capacity</li> </ul>	<ul style="list-style-type: none"> <li>• Legal Framework</li> <li>• Tariff Sustainability</li> <li>• Willingness to Pay</li> <li>• Size and Location</li> </ul>

## Scenario Description and Project Feasibility Analysis

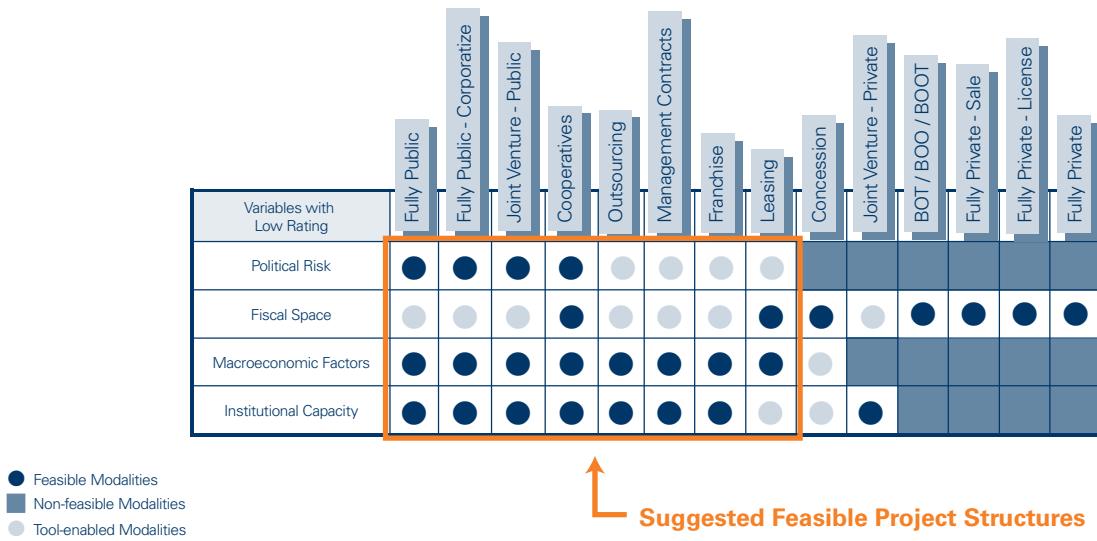
The project faces low ratings in macroeconomic factors, political risk, fiscal space and institutional capacity.

**Figure D.6.1. Feasibility of PPP Modalities Under Weak Local Conditions - Scenario 6**



This project can be feasible for a cooperative modality without the use of tools. However, the use of a combination of tools can yield additional modalities as feasible project structures, including tools like: PRG, to cover the regulatory risk innate in institutional capacity; partial risk insurance, to cover political risk; and, output-based assistance to address the fiscal space needs. Seven additional modalities can be added for this scenario.

As noted in scenario 1, the low rating in fiscal space suggests that the project should seek private investment, but the low rating in institutional capacity deters investors from pursuing the opportunity. It is clear that an improvement in one of these two variables will have a strong impact in the project feasibility map, yielding an additional available project modality, the concessions modality, with considerable private participation.

**Figure D.6.2. Project Feasibility Map - Scenario 6**

\*Refer to figures 11 and 12 for the specific tools corresponding to the local conditions identified

Using the tools in scenario 6, eight modalities result as options for project structuring: fully public, fully public-corporatized, joint venture-public, cooperatives, outsourcing, management contracts, franchises and leasing. Compare to figure D.6.2

## APPENDIX E – CASE STUDIES IN WATER AND SANITATION

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The analyses in this appendix were undertaken using the framework proposed to evaluate real case studies in the water and sanitation sector. It is based on published case study information for specific projects and not on first hand details. However, the analysis suggests that the framework has utility in evaluating both previous experiences in the sector and future projects. A further step in the development of the guide and this conceptual framework is to move beyond desk analysis and apply it to current projects under investment consideration.

This appendix contains three sections:

- a) Case Studies – Variables: Applies the project feasibility map to actual cases.
- b) Case Studies – Modalities: Demonstrates how several non-standard modalities have been applied with success in the water sector.
- c) Case Studies – Tools: Introduces some examples of uses of nonstandard tools.

### E.1. Case Studies - Variables

#### **Case Study E.1.1. Guinea - Société de Exploitation des Eaux de Guinée**

**Source:** Bayliss (2001).

#### **Local Conditions—Weak Legal Framework and Institutional Capacity**

*Local Conditions Prior to the Reform of the Water and Sanitation Sector in Guinea:* Before the reform in 1989 the performance of the water sector in Guinea was very poor. There was low access to water and a high incidence of water-borne diseases. The World Bank had sponsored the first Water Supply and Sanitation Project for Conakry from 1977 to 1985, but results were disappointing.

Political interference and an unfavorable economic climate resulted in poor financial performance and *weak institutional development in the water sector (weak institutional capacity)*. Fewer than 40 percent of the urban population of Guinea had access to piped water. Tariffs bore little relation to supply costs and irregular flow and poor water quality were commonplace.

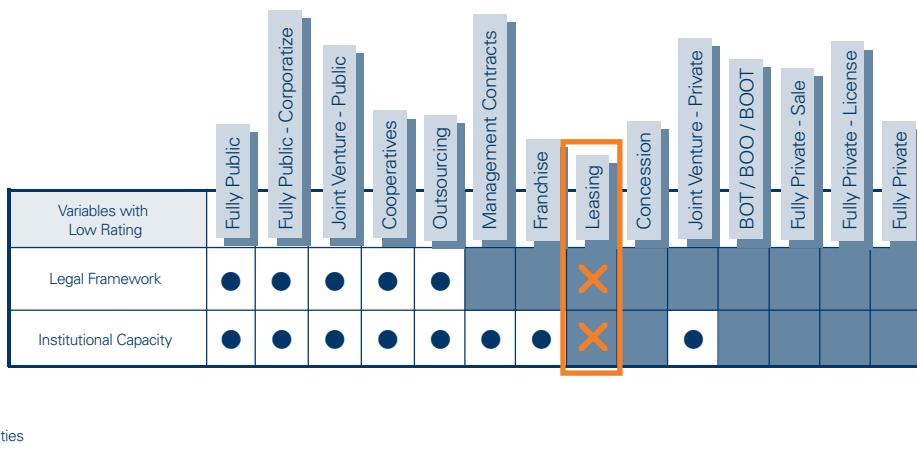
According to the case study material available, at the time, Guinea was potentially unstable having recently been through a military coup. Judiciary and regulatory capacities were dependent on the government, which had a *poor record of enforcing private contracts (weak legal framework)*. As a result, government authorities and advisors considered that it was too risky for private/foreign firms to invest in long-lived and non-transferable assets.

*Project Structure:* The government opted for a lease contract as the means for bringing in private sector participation. Under this arrangement, the private operator was not responsible for the assets because these were owned by the government. The private firm would pay a lease fee for the infrastructure assets and also be responsible for operating and maintaining the system, billing, and collecting revenue. The government would be responsible for the capital investment.

The leasing contract was awarded to SAUR and Vivendi (France), under a special purpose vehicle called Société de Exploitation des Eaux de Guinée (SEEG). The donor community provided US\$102.6 million in investments in the expansion of the network and therefore this lease contract.

The advantage of this structure is that private investors do not have to commit funds to long-term investment projects. Nevertheless, the chosen project modality required the support of the legal framework to collect payments. Figure E.1.1 shows that “leasing” would not be the suggested feasible project structure to mitigate local condition risks because of the weak legal framework and institutional capacity. The weak legal framework led to renegotiation of the contract, which changed the responsibilities and risks taken by SEEG from a lease to a contract that resembled an outsourcing modality, which is more viable in this business environment. However, the contract restructuring shifted payment risk onto a government with little capacity to enforce collection, with the result that the government incurred significant financial costs. Earlier identification of a more appropriate project structure could have avoided some of these challenges.

**Figure E.1.1. Project Feasibility Map - Case Study - Guinea**



*Outcome Following the Reform of the Water and Sanitation Sector:* After the lease contract was executed, service improved, connection rates rose from 38 percent in 1989 to 47 percent in 1996, and labor productivity also rose. Water quality increased, consumer service improved and metering levels rose dramatically. There was substantial investment due to the funds provided by donors at the start of the project. According to the research, these improvements were mostly due to the strong financial support from the donor community.

However, collection rates were substantially below initial expectations. Sustainable revenue generation was affected in part by the weakness of the judicial system, which was unable to enforce contracts for payment. Obtaining payment from non-payers was particularly difficult when it included government departments. SEEG proposed and SONEG, the regulator, complied with a modified cost-plus-tariff setting scheme, passing through the cost of uncollected bills to the national water authority, SONEG. This, in effect, changed the project structure from a lease contract (with payment risk held by the lessee, SEEG, to an outsourcing contract for the management of the utility (with payment risk held by the government regulator, SONEG).

Under this structure, collections improved substantially and significant increases in tariffs were approved. SEEG quickly became profitable, making profits of US\$3.2 million in 1996. SONEG, on the other hand, was experiencing losses as a result of the tariff pass-through and its inability to collect payments, a decrease in the rental fee it received under the original lease contract, and the end of the government subsidy. In 1996, SONEG's losses were US\$4.1 million.

*Analysis:* The adoption of a leasing contract with weak legal framework and institutional capacity provided an unsustainable structure in the water sector. The weak legal framework is reflected by the inability to collect unpaid bills either by SEEG or SONEG, thus creating a financial liability. Weak institutional capacity had an impact on the contractual relationship by allowing the regulatory body and the company to agree on a structural tariff change that effectively shifted onto SONEG risk that was originally to be borne by SEEG. The information available suggests that the resulting arrangement did not take this risk transfer fully into account in the tariff structure, with the result that SEEG became quickly profitable but SONEG's losses mounted.

While the private participant effectively mitigated its payment risks with a contractual change, the public sector participants took on this risk without apparent off-setting adjustments.

*The new contractual relationship reflected more of a "management," outsourcing structure as opposed to a leasing structure,* and as noted, this is what the proposed framework would have suggested over a lease structure given the local condition variables. However, an outsourcing structure, negotiated at the outset, could have resulted in different financial arrangements and tariff structures than those that arose from the renegotiation.

### **Case Study E.1.2. Bolivia, Aguas del Tunari**

**Sources:** Public Citizen (2001) and Nickson and Vargas (2002).

#### **Local Conditions—Weak Political Risk, Fiscal Space, Tariff Sustainability, and Willingness to Pay Conditions**

*Local Conditions Prior to the Reform of the Water and Sanitation Sector in –Cochabamba, Bolivia:* The Bolivian government had privatized several public entities, including the national airline, the electric utilities, the national train service, and in 1999, the water service of Cochabamba. According to the case study, the political environment during this time was under considerable pressure as a consequence of various local and regional economic difficulties. This resulted in a *weak condition in political risk*.

Forty percent of Cochabamba's population lacks piped water or effective sanitation services. Government officials considered various options for improving water provision and services, including transporting water to Cochabamba from the Corani reservoir and the development of the Misicuni project (which entailed building a dam, a tunnel and an aqueduct). According to the case study, these options would require financial resources that local governments did not have and the national government was not willing to provide. This suggests a potential *weak local condition in fiscal space* to earmark government funds for infrastructure development.

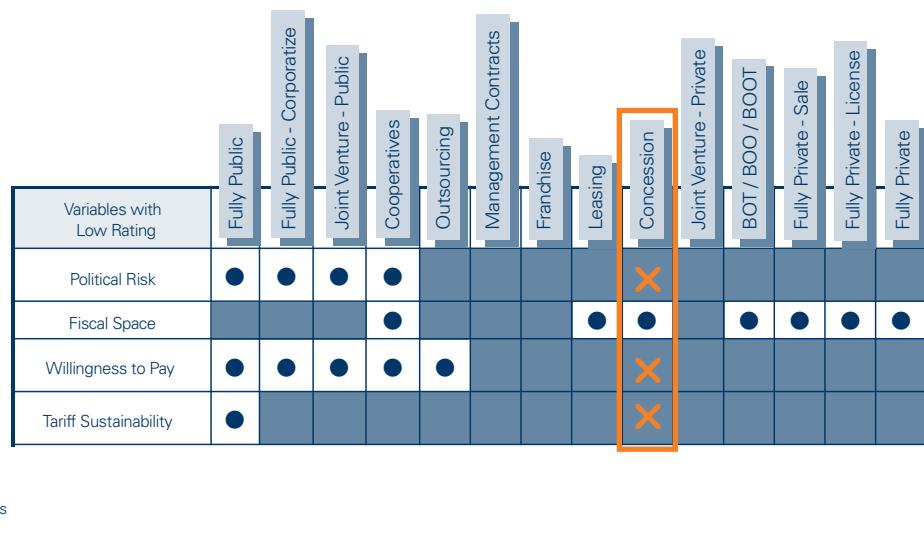
New laws regarding water property rights and privatization of water services were being issued. The local water-rights leaders were opposed to the privatization of water services and to new laws that supported the privatization and the transfer of the underground water property rights to the government. Local farmers and landlords were opposed to this because they rejected the new laws and changes in water provision, which ultimately created the environment for a *weak willingness to pay*.

*Outcome Following the Reform of the Sector:* Due to the unavailability of local funds, and an agreement between the national government and the local municipality that private management would improve the water system, the federal government pursued a public-private partnership in the form of a concession. The project design attracted only one bidder, Aguas del Tunari, a joint venture formed by International Water, Abengoa of Spain, and four Bolivian companies. Aguas del Tunari proposed the deferral of the Misicuni project, a capital intensive and long-term project, to instead focus on repairing the existing network, which at the time, was losing 60 percent of the water pumped into the network through leaks and other causes.

During the negotiations for the final agreement for the concession, the government and the company agreed to include as a cost of the concession the debts incurred by the company being privatized. This agreement could only be met by raising tariffs. Ultimately, the tariffs charged by Aguas del Tunari had to reflect a package of costs in addition to full cost recovery. This had never before been included in the tariff. Moreover, *local conditions for tariff sustainability were low*. According to the case study information available, in some cases, consumers found themselves paying up to half of their monthly income for the water service.

With weak local conditions in political risk, fiscal space, willingness to pay and tariff sustainability, figure E.2 shows that a “concession” would not be a suggested feasible project structure to mitigate existing local risks.

**Figure E.1.2. Project Feasibility Map - Case Study - Aguas del Tunari**



**Outcome:** Various factors led to the failure of the concession soon after water service management was privatized. In an area where two-thirds of the population live below the poverty line, tariff increases led to extraordinarily high and unaffordable water prices and clashes with the community, including street protests. The protests grew so violent that President Banzer placed Bolivia under martial law for 90 days. The contract was ultimately terminated and responsibility for water services was turned over to a coalition of protesters, which also took over SEMAPA's US\$35 million debt. The goal of the coalition has been to avoid government and transnational corporate influence in water provision. Aguas del Tunari filed a request for arbitration through the International Centre for Settlement of Investment Disputes (ICSID) to determine whether expropriation fees need to be paid by the Bolivian government.

**Analysis:** Private investment seeks projects that can be self-financing in the long term, however, project feasibility is primarily dependent on local conditions and political risks. Figure E.1.2 clearly shows that concessions are not a suggested feasible project structure. We cannot propose alternative project structures because the project enhancement tools that may be available in Cochabamba are not known. Theoretically, with the support of output-based aid<sup>1</sup> to mitigate tariff sustainability and fiscal space risks, cooperatives and fully public project modalities could have provided alternatives for project structuring.

<sup>1</sup> Output-based aid is currently available in the telecommunication and electricity sectors of Bolivia.

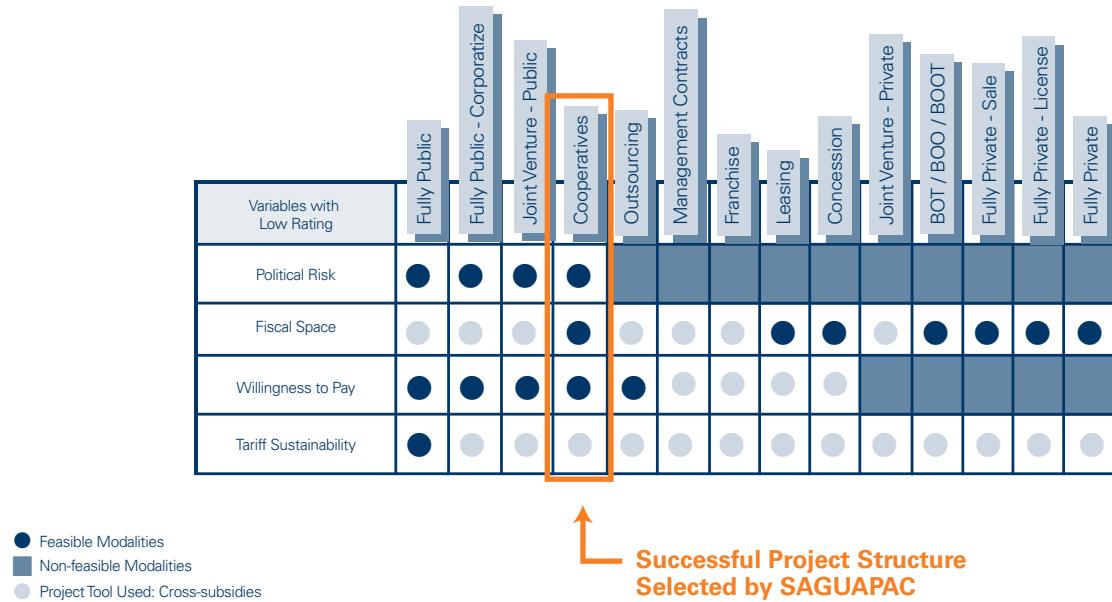
### Case Study E.1.3. Santa Cruz, Bolivia, SAGUAPAC

Source: Nickson (2000).

#### Local Conditions—Weak Tariff Sustainability, Willingness to Pay, Fiscal Space, and Political Risk Conditions

*Local Conditions of the Water and Sanitation Sector in Santa Cruz, Bolivia:* The SAGUAPAC cooperative of Santa Cruz, Bolivia, highlights the advantages of autonomy in the region. The unique cooperative structure is an alternative to privatization and an example of a successful water utility company providing twenty-four hour service to a population of one million. This case illustrates how a project structure appropriately met the needs of a locality, mitigating the same risks found in the case of Aguas del Tunari.

**Figure E.1.3. Project Feasibility Map - Case Study - SAGUAPAC**



*Project Structure:* According to the case study, the organizational structure of SAGUAPAC is based on a classical cooperative arrangement. Decision-making is decentralized to its 96 000 customers through the nine water districts (*distríitos de agua*) into which the municipality is divided. A district assembly is held in each water district every two years. The assembly has two principal functions. First, it elects one-third of a six-member district council (*consejo de distrito*) for a six-year term of office. Second, it elects three delegates to a biennial citywide general assembly. SAGUAPAC itself organizes the election arrangements, through its own District Unit, and the elections are supervised by the state regulatory agency for cooperatives (Instituto Nacional de Cooperativas, INALCO). In order to vote, customers must produce a water bill and identity card.

The administrative board meets twice a month. It elects a leadership (president, vice-president, treasurer and secretary) that may serve a maximum of three consecutive two-year terms in office. The administrative

board appoints the general manager of SAGUAPAC, who retains overall responsibility for personnel appointments. Four managers –(responsible for commercial, administration and finance, engineering and planning matters) report directly to the general manager. The main tasks of the administrative board are to approve tariff increases, investment plans and staff salary scales.

**Outcome:** The tariff pricing structure incorporates three forms of progressive cross-subsidization to deal with the demographics of the area covered by the utility. The first includes a low-cost tariff for residential consumers with a cap on water output. The second form differentiates between industrial/commercial users and residential users. The difference in user fees is 45 percent less for the residential user. Finally, the third includes an increasing block tariff structure that is adjusted based on development of the region.

The revenue stream of the Santa Cruz cooperative, SAGUAPAC, has embraced the consumer affordability limit of 5 percent of household income. At 4.5 percent of household income, willingness to pay has been high. SAGUAPAC also provides low-interest credit for two year financing for installations and connections (\$100). The increasing challenge, however, is extending the service to the growing population that resides outside of the city's inner five rings. Additional cooperatives have been considered due to the successful nature of the cooperative management structure of SAGUAPAC in the central part of the city.

Furthermore, this level of tariffs includes a financial subsidy in the form of loans from the central government at subsidized interest rates that the central government obtains from soft loans of multilateral development institutions. The low fiscal space is minimally expanded with the pass through of international development aid.

**Analysis:** As discussed in the Aguas del Tunari case, the cooperative can be a feasible project structure given the application of some sort of project enhancement tools when weak conditions arise in political risk, fiscal space, tariff sustainability, and willingness to pay. In the case of SAGUAPAC, the use of cross-subsidies provides the necessary risk mitigation for a low condition in tariff sustainability. This cross subsidy was developed taking into consideration one of the methodologies suggested in Appendix A, the affordability limit, to assess the appropriate level of tariff setting.

#### **Case Study E.1.4. Argentina, Aguas Argentinas - Pre-2002 Crisis**

**Sources:** Zerah, Graham and Brockelhurst (2001).

#### **Local Conditions—Weak Willingness to Pay, Institutional Capacity, and Tariff Sustainability Conditions**

*Local Conditions Prior to Reform of the Water and Sanitation Sector in Argentina:* In May 1993, a 30-year concession contract was awarded to a private company to operate the water and sewerage services in Buenos Aires. At the time, tariffs barely covered the variable costs of the very inefficient utility running the system, and water had been made artificially scarce by poor management, despite an abundant and easily tapped source. The concession attracted three bidders who offered lower tariffs and annual investments of US\$240 million over the first five years; annual investment over the previous decade had been only US\$10 million.

An independent regulatory agency ETOSS (Ente Tripartito de Obras y Servicios de Saneamiento) was created in May 1993 to enforce compliance with the terms of the concession contract, monitor the concessionaire's five-year investment plans, determine tariff provisions and investigate customer complaints. Since the contract became operative in May 1993, several major changes have been implemented and some of the terms of the concession have been renegotiated. Under the terms of the original contract, expansion of the secondary network in Buenos Aires was to be financed through a connection fee on new consumers.

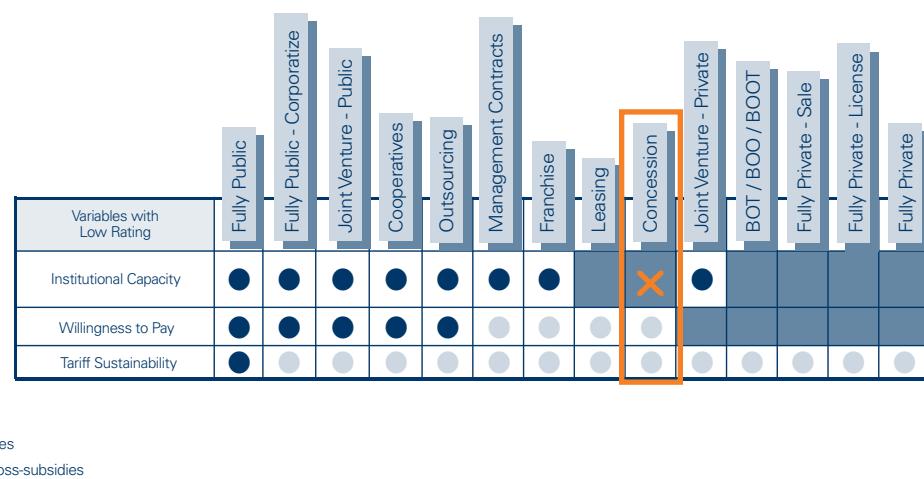
This charge affected mainly low-income households living in poor suburban areas and was created social resentment. On the other hand, those consumers who were already connected to the system initially benefited from a significant drop in tariffs and an improvement in the quality and reliability of service. However, *affordability for the poor has been a serious concern*, and it appears that the benefits have accrued largely to middle-class consumers who were already connected to the system at the time that the contract was awarded. The middle-class consumers who remained unconnected, but could afford the increased tariff, were not willing to pay for the connection because there was no connection fee charged before privatization. The unpopular decision to pass the cost of system expansion on to new consumers in the form of a hefty infrastructure charge was one of the issues leading to early contract renegotiations.

Aguas Argentinas and the regulatory agency began negotiations in February 1997, but the process quickly bogged down. Problems were due in part to political pressure brought to bear on members of the ETOSS board, many of whom were political appointees. The regulator was bypassed and two federal agencies, the Public Works Secretariat and the Natural Resources and Human Development Secretariat, reached an agreement directly with the concessionaire.

With regards to institutional capacity, *regulation has been weak and ineffective*, and this has led to some erosion of public confidence in the process. The Buenos Aires concession demonstrates the importance of effective regulation in maintaining transparency and public trust, and in an understanding of the impact of concession design, pricing policy and regulatory decisions on the poor.

*Project Structure:* Preference was given to a concession format over a management or lease contract because the government wanted a private investor to take responsibility for the massive investments needed to expand the system. Selling the assets could have posed legal problems and the concession arrangement has the advantage of keeping ownership of fixed assets in the public domain.

**Figure E.1.4. Project Feasibility Map - Case Study - Aguas Argentinas Pre 2002 Crisis**



*Outcome:* Although these changes cut the average water bill by three-quarters per household in poor neighborhoods, affordability remains a problem in the poorest areas. It is important to mention that the project has not experienced tariff sustainability issues as cross-subsidies originated from the project itself. This self-enhancing subsidy has allowed the project to mitigate the risks of the tariff sustainability variable in some areas.

According to the case studies, privatization without reform can have only limited benefits for poor consumers. If the tariff structure is fundamentally flawed then adjustments in tariff rates, however well intentioned, will also be flawed. If the tariff and incentive structure is transferred from public to private management without any modifications it can be difficult to provide services effectively, particularly to the poor; reform in institutional arrangements must precede private sector participation.

**Analysis:** The concessionaire partly mitigated the willingness to pay and tariff sustainability risks by applying implicit tariff cross-subsidies.<sup>2</sup> Also, it mitigated the institutional capacity risk through its political connections and ability to bypass the regulator. This situation can further expose the water service provider to political risks associated with negotiating directly with government officials.

In this first part of the case, political risk and macroeconomic factors have not been considered as weak variables because they were not emphasized in the original case presented by Zérah. Nevertheless, political risk was inherent in the renegotiation of the contract in 1997, as the second part of the analysis illustrates.

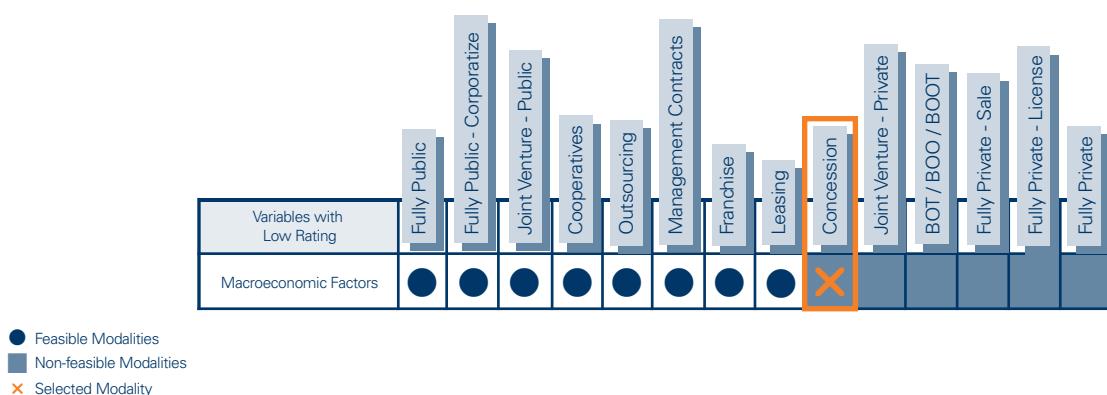
### Case Study E.1.5. Aguas Argentinas and the Tariff Pesofication in Argentina – Post 2002 Crisis

**Source:** Case study prepared by authors based on a review of documents regarding these renegotiations

#### Local Conditions—Weak Macroeconomics Factors

**National Context:** In 2001-02, Argentina experienced one of the worst economic crises in its history. Output fell by about 20 percent over 3 years, inflation was reignited, the government defaulted on its debt, the banking system was largely paralyzed, and the Argentine peso, which until then was pegged to the U.S. dollar, reached lows of Arg\$3.90 per U.S. dollar (in June 2002), a devaluation of 300 percent over a period of six months. In January 2002, Congress passed the Emergency Law, which converted the tariff, denominated in dollars to pesos at a rate of one-to-one and prohibited indexation to foreign inflation.

**Figure E.1.5. Project Feasibility Map - Case Study - Aguas Argentinas Post 2002 Crisis**



**Project Structure:** In 1993, the water and sanitation system for the city of Buenos Aires was awarded to the consortium including Suez, Vivendi, Aguas de Barcelona and Anglian Water through a 30-year concession contract. The consortium offered a reduction of 27 percent of the current tariff structure in order to gain the conces-

<sup>2</sup> The demographics of consumers in Buenos Aires allow the cross-subsidy to be used in more modalities than the standard shown in the section titled "Mapping Sector Evolution"

sion award. The contract established that the *tariffs were to be denominated in US dollars*, expecting that this would mitigate the extensive foreign exchange risk incurred by the firm through its international borrowings from commercial banks, the International Finance Corporation and the Inter-American Development Bank.

*Outcome:* The legislation described above and the unwillingness of the government to allow for tariff increases left without any effect the presumed foreign exchange risk and inflation risk mitigant that the project thought it had when it included tariffs denominated in US dollars. This had a significant impact on the concessionaire's shareholders. The Suez water business has written off €500 million in its financial statements and, in a note to the 2001 accounts (footnote: Note 24 to Suez Annual Report and Accounts 2001), Suez spelled out its belief that it would be able to claim compensation under contract clauses "guaranteeing a fair remuneration on capital employed (U.S. dollar equivalent) and entitling the concession holder, in the event of contract termination, to compensation calculated based on the net book value of assets, plus a premium in the event of fault by the concession grantor" and also a right to international arbitration. In September 2005, Suez announced its intention to sell the concession and leave the country.

*Analysis:* The €500 million investment was to finance the capital investments necessary to improve and expand the operations of Aguas Argentinas. In an economic environment where devaluation may occur, it is critical to reduce exposure to currency risk by applying project modalities that properly address them. In this case, the mitigant of denomination of tariffs in US dollars was overcome by the macroeconomic crash and was rendered useless by the unwillingness of the government to accept tariff increases in local currency (political risk and institutional weakness)

The framework shows that the selection of a concession modality was not recommended under weak macroeconomic factors because of the financial risks that a crisis imposes on the investment made by the private operator. The challenge is to identify these conditions sufficiently in advance to negotiate the appropriate project structure. This is not always possible as this case very clearly shows.

Under weak macroeconomic conditions, the framework recommends the selection of a leasing contract or any management contract, if private participation is desired. Because the main assets were owned by the government, these modalities would have been more appropriate under the risks created by the financial crisis of 2002.

### **Case Study E.1.6. STPP – Peru – Small Town Pilot Project in Peru**

**Source:** Drees-Gross, Andrade, Schippner (2005).

#### **Local Conditions—Weak Size and Location Conditions**

*Local Conditions of the Water and Sanitation Sector in Peru:* In Peru's small towns, municipalities have traditionally provided water and sanitation services, making all decisions with respect to service characteristics and fees. Of the 650 small towns in the country, approximately 150 have water and sanitation services administered by municipally owned water and sanitation enterprises, whereas provincial or district municipalities deliver water and sanitation services in the remainder. Water and sanitation services managed by the local government (regardless of whether it is a provincial, district or town municipality) are characterized by insufficient coverage rates, fees that do not recover costs, municipal subsidies, inadequate system operation and maintenance, deficient management, political interference, high turnover of service personnel, delays in fee payments and the unwillingness of community members to pay fees due to poor service quality.

*Project Structure:* In response to this situation and in the context of the decentralization process currently underway in the country, the Vice Ministry for Construction and Sanitation launched the Small Town Pilot Project

(STPP). The STPP tests new water and sanitation service management models in which civil society organizations, the community, local small-scale providers and the municipality work in partnership. The community makes the decision to change the management model after learning about the advantages and disadvantages of the different options. The project has financial support from the Canadian International Development Agency (CIDA) and technical assistance from the World Bank's Water and Sanitation Program for Latin America.

*Outcome:* Municipalities interested in changing their water and sanitation service management were invited to participate in the project. Fifty-six municipalities responded and 10 were selected for participation based on their geographic location, population size and inadequate service quality and coverage. These municipalities signed a city council agreement committing them to empower the community to change the water and sanitation service management model.

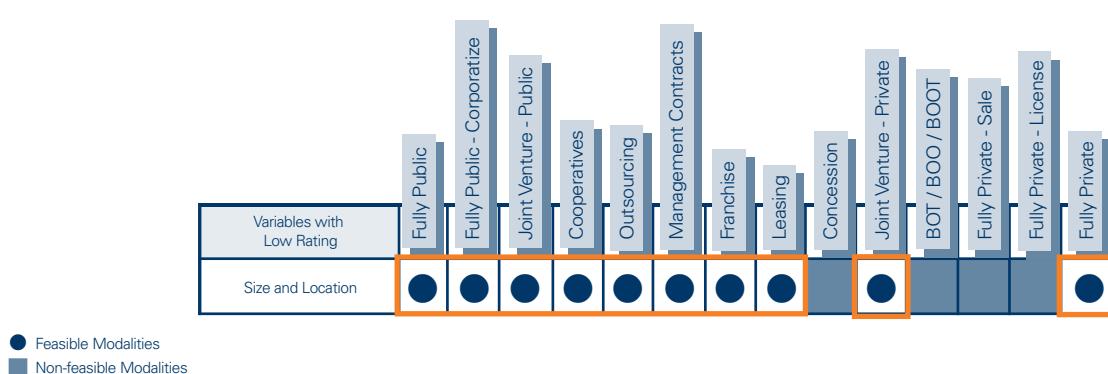
Within the STPP, the management model is defined as the established institutional arrangement to deliver water and sanitation services based on four key elements: quality and price determination, service operation, supervision of the operator and authorization to operate.

Specialized operators in the Small Town Pilot Project are small- or medium-sized enterprises created for the purpose of delivering quality water and sanitation services. They may be fully private or mixed economy entities such as fully public-corporatized, depending on the preferences of the community and the institutional capacity of the municipality.

If the community chooses a private operator, the municipality will pre-qualify entrepreneurs and/or firms to determine their technical and financial status. The STPP will encourage the participation of local entrepreneurs, merchants and technicians in service delivery. Specialized operators will require capital of approximately US\$5,000 and a financial capability of US\$30,000 for loans to be paid through user fees.

In the case of mixed-economy operators, the municipality will determine its percentage of participation in the enterprise and define the economic terms of the contract (payment for management, payment for lease of facilities or participation in benefits) as well as other selection mechanisms.

**Figure E.1.6. Project Feasibility Map - Case Study - Peru STPP**



*Analysis:* The Small Town Pilot Project framework offers solutions to the size and location restriction in line with the analytical framework. The selected project modalities are geared to provide small scale providers

with options for project structuring. These particular project structures would generally avoid the high transaction costs of project development and regulation that are often incurred in large-scale concessions.

Transaction, regulatory and control costs in a concession, BOT and fully private license modality are often very similar regardless of the size of the project. This kind of private participation requires a complex system of oversight of the private participant given the monopolistic position of the operator. For example, the lack of strong regulation could allow a private operator to concentrate efforts in the region or on the customers with the highest profit potential, to the exclusion of less profitable customers or regions. A strong regulatory body or function is needed to help ensure enforcement of obligations and appropriate oversight of the utility.

In the other modalities (except for the fully private option) the government (or the community in the case of cooperatives) is in charge of the expansion of the water network. In these circumstances, network investment decisions are often shaped as much or more by efforts to maximize the wellbeing rather than the profit potential of the utility. This reduces the cost of regulatory oversight of the utility albeit at the potential cost of efficiency of the utility.

## **E.2. Case Studies - Modalities**

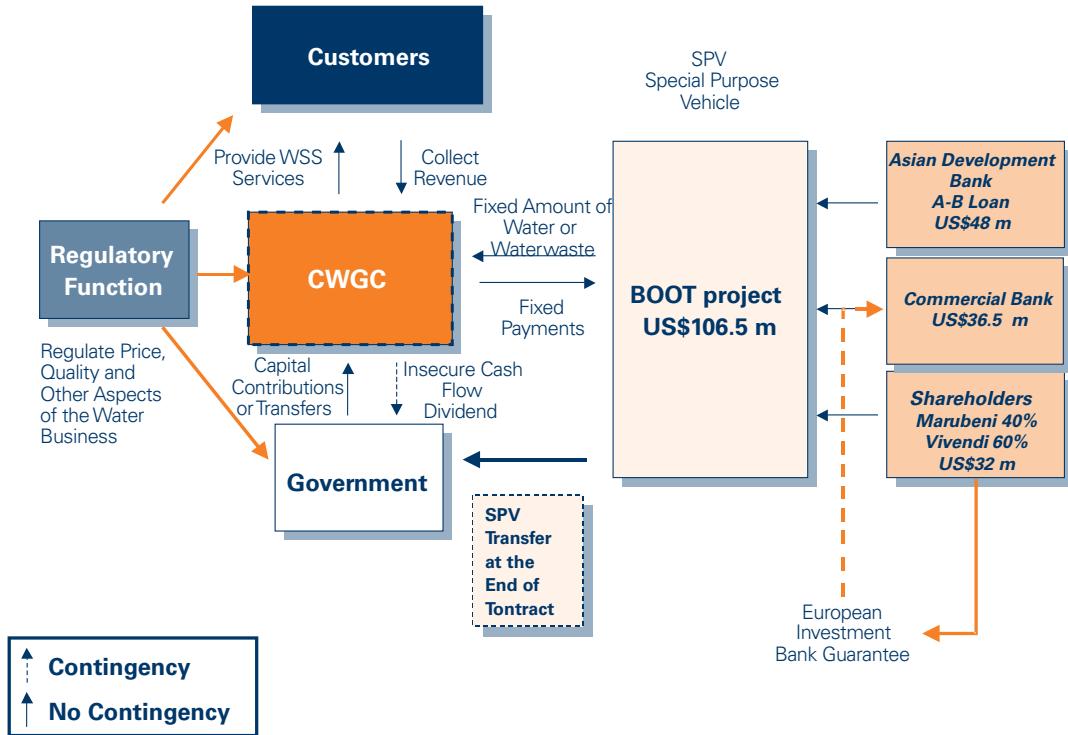
### **Case Study E.2.1. Chengdu, China**

**Source:** Case study prepared by authors based on a review of several documents.

#### **BOOT**

**Context:** In the framework of a BOOT project, Chengdu Générale des Eaux-Marubeni Waterworks Company (CGEM), a joint venture which is 60 percent owned by France's Vivendi Water (now Veolia) and 40 percent owned by Marubeni Corporation, started in 1999 the construction of the works related to the Chengdu N° 6 Water Treatment Plant.

This BOOT project, the first one in China, involved a US\$106.5 million investment that was financed 30 percent with equity funded by the two joint venture partners; and the remaining 70 percent with a debt of US\$74.5 million. Lenders included the Asian Development Bank with A/B loans, the A tranche of US\$26.5 million and the B tranche of US\$21.5 million, from an international bank syndication and the European Investment Bank.

**Figure E.2.1. Chengdu, China**

The project contract states that the consortium will operate the water treatment plant for 18 years after completion of the work. In order to mitigate market risk to the sponsor, the pricing mechanism included an off-take agreement signed with Chengdu Municipal Waterworks General Company (CWGC) that commits to take or pay a minimum of 400,000 m<sup>3</sup> per day based on the operating tariff specified in their bid.

*Analysis:* The project modality BOT/BOOT was enhanced with the use of three tools. The first is a *credit enhancement tool* that includes the A/B loans issue by the Asian Development Bank, which gave the owner of tranche B the same *preferred credit status* that it holds. The second is a *partial credit guarantee* issued by the European Investment Bank. The third is an *off-take* contract issued by the Chengdu Municipal Waterworks General Company.

The BOT contract required strong local conditions in all the variables except fiscal space. Together, the tools (A/B loans, off-take contract and the partial credit guarantee) mitigate different risks uncovered by the developers. The off-take contract mitigated the revenue risk, off-setting weak conditions in tariff sustainability, if any. The partial credit guarantee and the A/B loans partially mitigated convertibility and liquidity issues off-setting potentially weak conditions in political risk.

This project does not face the same risks that are associated with variables normally found in other water sector projects, such as institutional capacity, willingness to pay and size and location. Because the contract is between the Municipal Waterworks General Company and Chengdu Générale des Eaux-Marubeni Waterworks it is not under the supervision of the regulator and, therefore, does not have a direct relationship with the user.

### **Case Study E.2.2. Cartagena, Colombia**

**Sources:** Nickson (2001), Beato and Díaz (2003), APEIS (2003).

#### **Joint Venture — Public**

*Context:* Cartagena is a large seaport on the Caribbean with a population of about one million residents in 2006 (850,000 in 1995). The municipality has had a long tradition of political favoritism and tight fiscal resources, which only totaled about US\$208 per capita in 2000. These institutional and fiscal problems were compounded by high levels of poverty and inequality (the Gini coefficient in Cartagena in 1996 was 0.44, while the national one was 0.57). At the beginning of the 1990s, the Cartagena's water and sanitation system (which was owned by the municipality) was about to collapse following decades of poor technical, commercial and financial management. Sixty percent of the water was not accounted for in 1994. Tariffs have been historically set at a low level. Cost recovery was about 45 percent, most of it due to inadequate billing (due to a lack of metering), as well as poor collection practices. Between 1990 and 1994 water coverage remained flat at 68 percent, and sanitation coverage decreased from 61 to 56 percent. Both percentages were well below the national average (90 percent in water and 80 percent in sanitation for urban centers). Both the water and the sanitation systems were in a state of disrepair. Privatization of service was not an option since the utility has a history of operating losses and underinvestment

*Project Modality:* Cartagena was the first city in Colombia to introduce a joint venture (JV) in the water and sanitation sector, which is made up of the municipality (through AGUACAR) and the private sector (Aguas de Barcelona (AGBAR) and private Colombian investors). The municipality holds 50 percent of the shares, AGBAR holds 45.9 percent and other private investors about 4 percent. A 26-year concession contract was signed between AGUACAR and AGBAR to operate and maintain the assets. The short-term objective of the municipality was to improve its financial position and efficiency by securing financing from international financial institutions to upgrade and expand the deteriorating systems. This included improving the quality of drinking water, reducing leakages and introducing higher environmental conservation standards.

The 1995 contract between AGUACAR and AGBAR specified that the latter was only responsible for management. In 1998, the municipality awarded AGBAR a separate contract to manage a US\$220 million investment program to be carried out between 1998 and 2002 that was to be largely financed by the World Bank and the IDB. In this contract, the private sector partner performs functions normally found in French-like concession models (so-called “*affermage*” contracts, which grant private operators a greater degree of freedom than is possible with normal management contracts; operators receive all the revenues and bear all the costs of the concession). Tariffs were increased in real terms (following a decreasing rate schedule) in both water and sanitation.

*Outcomes:* The key performance indicators displayed quite satisfactory recovery measured between 2002 and 2004. For example, by 2004 coverage had reached 95 percent in water and 74 percent in sanitation; production capacity rose from 1.6 cubic meters per second to 3.1 million cubic meters per second; the number of employees decreased from 1300 to 272; the share of metered connections went from 30 to 99 percent; and water is now available 24 hours a day compared to only 7 hours a day in 1994. However, unpaid bills remain a problem. The tariff structure is still based on a cross-subsidization scheme that can be easily manipulated by high- and the middle-income residents. As mentioned in section 4.1. of the report, many contracts may evolve in response to improvements in the local conditions. In this particular case, the current contract could change to a normal concession contract with more powerful incentives for efficiency than the *affermage*-like contract currently in place (which works well when the aim is to increase revenues but is weaker in its ability to encourage cost reductions) once the central issue of cost recovery shows clear sign of improvement.

## E.3. Case Studies - Tools

### Case Study E. 3.1. Tamil Nadu, India, Pooled Financing

Sources: The Hindu Business Line (2002) and Pradhan (2004).

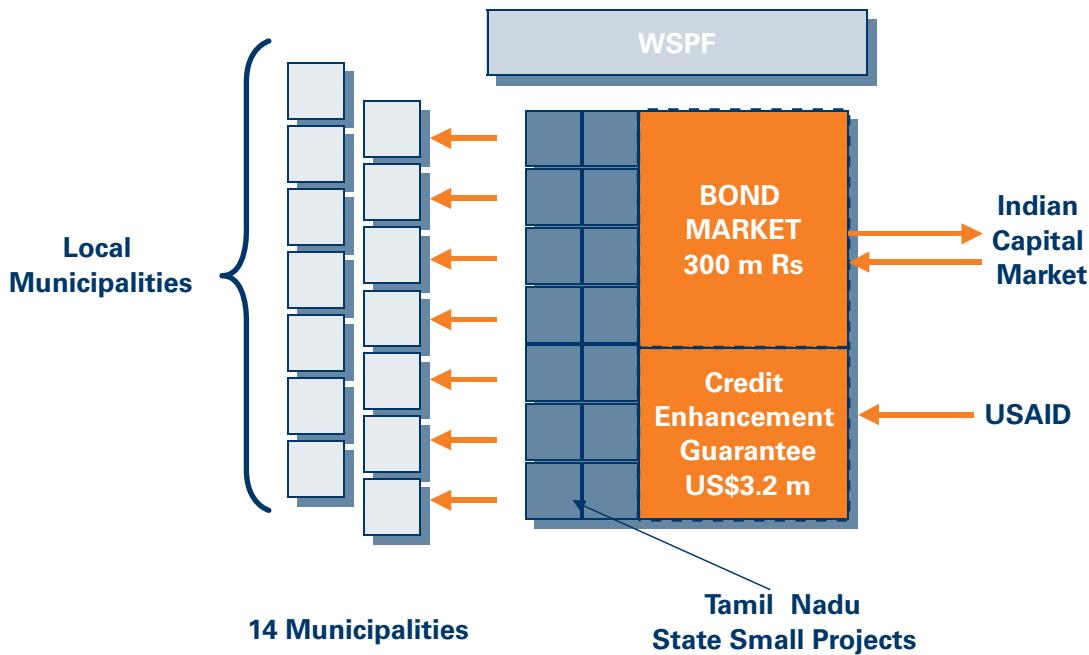
#### Credit Enhancement

**Context:** Small and medium urban local bodies in Tamil Nadu, India, lacked the necessary credit for attracting capital investment. Needed funds for development of the local water sector were difficult to obtain individually.

**Outcome:** Through the pooling of projects in water and sanitation, 14 local urban bodies were incorporated into a special purpose vehicle named the Water and Sanitation Pooled Fund (WSPF). The Fund was set up as a project-specific pool supporting small municipalities. It issues bonds to finance municipal environmental infrastructure projects for these small utilities, which have a limited individual borrowing capacity.

The Fund raised Rs 300 million from the bond market at an interest of 9.2 percent in 2002. The bonds were issued with a credit enhancement guarantee from USAID of US\$3.2 million. The pooled financing attracted investors into the Fund and supported the development of the 14 local urban bodies.

**Figure E.3.1. Tamil Nadu, Water and Sanitation Pooled Fund - Credit Enhancement**



**Analysis:** Two different tools were used to increase the capacity of the municipal operators to raise money. The special purpose vehicle create the *required business scale to cover the cost of issuing the bonds* in the local market and provided a bond offering of sufficient size to interest the market, while the guarantee issued by USAID increased the collateral of the bonds and reduced the cost of financing. Both tools, the pooled financing structure and the USAID guarantee, are credit enhancement tools that helped to address the size and location challenge of each of the smaller utilities.

### **Case Study E.3.2. Output-based Aid in Water - 2005 - Paraguay**

**Source:** Drees, Schwartz and Bakalian (2004).

#### **Output-based Aid**

*Context:* Paraguay's *aguateros* (small private water companies) are an important part of the water sector, serving about 9 percent of the total population (or about 17 percent of residents with piped water supply). But until recently, they operated only in urban areas, where water resources are abundant and they could choose customers based on their ability to pay the full costs of providing the service.

The government of Paraguay was dealing with fiscal space restrictions required by the IMF. The low coverage of water supply in the country required the commitment of a substantial amount of the budget to increase water coverage.

The main constraint creating tariff sustainability risk had been the connection cost. A new initiative funded by the World Bank seeks to attract *aguateros* and construction firms active in the water sector to underserved rural areas and small towns by providing an output-based aid subsidy that is awarded through competitive bidding. The private operators recover the rest of their costs through user tariffs. To minimize costs, the government uses competitive bidding based on the minimum subsidy offered. The initiative was the first attempt anywhere to apply this approach to investments in the water sector in rural areas and small towns.

*Outcome:* The response from the communities that have received service has been overwhelmingly positive thanks to the rapid progress from concept to construction, all without up-front cash contributions from the communities.

*Analysis:* This case shows how output-based aid tools became a solution in an environment of weak fiscal space and tariff sustainability. The output-based aid approach has helped to overcome the affordability problem in Paraguay, helping the poor gain access to water without paying the full recovery cost of a water connection. World Bank financing removed the fiscal pressure.

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