



WATER SUPPLY  
AND SANITATION  
IN LATIN AMERICA AND  
THE CARIBBEAN:  
**GOALS AND  
SUSTAINABLE  
SOLUTIONS**

PROPOSALS FOR THE 6TH WORLD WATER FORUM



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WATER FORUM

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## ACRONYMS

Aderasa	Asociación de Entes Reguladores de Agua Potable y Saneamiento de las Américas
Banobras	Banco Nacional de Obras y Servicios Públicos (Mexico)
Bndes	Banco Nacional de Desarrollo (Brazil)
BOT	Build, Operate and Transfer
CEF	Caja Económica Federal (Brazil)
Cepis	Centro Panamericano de Ingeniería Sanitaria y Ciencias del Ambiente, OPS/OMS
CRA	Comisión de regulación de agua potable y saneamiento básico (Colombia)
ECLAC	Economic Commission for Latin America and the Caribbean
Enohsa	Ente Nacional de Obras Públicas de Saneamiento (Argentina)
Essbio	Empresa de Servicios Sanitarios Bio Bio (Chile)
Esva	Empresa Sanitaria de Valparaíso (Chile)
Findeter	Financiera de Desarrollo Territorial (Colombia)
GDP	Gross Domestic Product
IB-NET	International Benchmarking Network
IBRD	International Bank for Reconstruction and Development. The World Bank
IDB	Inter-American Development Bank
Interagua	Empresa de Agua Potable y Saneamiento (Guayaquil)
LAC	Latin America and the Caribbean
MDG	Millennium Development Goals
NGO	Non-Governmental Organization
NRW	Non-revenue water
OSE	Obras Sanitarias del Estado (Uruguay)
Sabesp	Empresa de Agua Potable y Saneamiento del Estado de Sao Paulo (Brazil)
Saguapac	Cooperativa de Agua Potable y Alcantarillado de Santa Cruz (Bolivia)
Sanepar	Empresa de Agua Potable y Saneamiento del Estado de Paraná (Brazil)
Sedapal	Empresa de Agua Potable y Saneamiento de Lima (Peru)
Snis	Sistema Nacional de Información de Saneamiento (Brasil)
SSS	Superintendencia de Servicios Sanitarios (Chile)
Sunass	Superintendencia de Servicios de Agua Potable y Saneamiento (Perú)
WSS	Water supply and sanitation





## FOREWORD

The World Water Forum offers a unique opportunity to resume the global debate about water and update the knowledge base on performance, public policies and best practices in relation to water resources and water services. In March 2012, the 6th World Water Forum is expected to focus global attention on the discussion of goals for sustainable development of water resources and services for each of the world's regions, and to analyze policy and institutional options to achieve such goals.

At the request of the Regional Committee of the World Water Forum, CAF –development bank of Latin America– has prepared this document on goals and solutions for the water supply and sanitation sector in Latin America. The proposed goals are supported by recent estimates of the costs and investments needed to achieve them, within an integrated approach to water issues for the specific context of Latin American cities. The proposed solutions are based on lessons learned and experiences that have been implemented in several countries of Latin America. The study concludes that universal coverage—at the household level— of water supply and sanitation services in urban areas of Latin America could be achieved within the next 20 years with annual investments equivalent to about 0.3% of the regional Gross Domestic Product. However, expanding coverage alone would not be sufficient unless they are accompanied by substantial improvements in the governance of the sector, including modernization of policy, regulation and delivery functions; increased involvement by civil society in decision making and a reliable sectoral information system. These governance improvements are essential to address the main problem facing the sector represented by the low quality of water and sanitation services that are delivered to the poorest segment of the population.

CAF is supporting this two pronged approach –support to infrastructure investments while improving governance– based on the strong belief that water is not only a key infrastructure sector of the economy but also an essential component for achieving social development goals, poverty reduction and environmental stewardship. Following this vision, CAF's Integrated Water Program promotes an integrated view of water resource management, emphasizing water supply and sanitation services and the structuring and financing of investment plans, programs and projects with a high social and environmental impact. To achieve results, CAF has approved over USD 2 billion in water-related investment loans between 2007-2011.

At the same time, there is a realistic consideration to the political economy of decision making processes about policies, institutions and investments which are generally beyond the mandate and responsibilities of water agencies and ministries. As a consequence, CAF's strategic approach calls for the early involvement of key stakeholders outside the water sector; mainly, in the planning and finance ministries, legislative bodies, local governments and the organizations of the civil society. Without their participation, achieving sustainable improvement and expansion of urban water services would not be possible.

The 6th World Water Forum offers CAF a valuable opportunity to participate in the regional and global debate on water with the expectation that discussions held in Marseille in March 2012, and the regional processes that follow could make an effective contribution to mobilizing decisions and stimulating the necessary sectoral changes.

**L. Enrique García**  
Executive President of CAF

## EXECUTIVE SUMMARY

The regional context presents an unprecedented opportunity for Latin America and the Caribbean LAC to close the infrastructure and governance gap in water supply and sanitation services over the next 20 years. This opportunity is based on the sustained economic growth of recent years, projected at 4.3% of GDP for the next five years according to the Economic Commission for Latin America and the Caribbean (ECLAC); on the sound management of public finances leading to low levels of debt and inflation; stable democracies; abundant natural resources; an increasingly competitive private sector in the global market; and, on the benefits of healthy demographics in a continent free of major ethnic and religious conflicts. These factors position LAC in an optimal situation to consolidate welfare gains and meet the quality of life and expectations of the population.

The analysis builds on the understanding of the rapid urbanization over the last 50 years, when the LAC region has created a framework of sectoral institutions, and also has greatly expanded water infrastructure. During this period, the countries have followed the growth of cities, giving priority to extending water supply and sewerage networks to serve the new urban population, achieving 80% and 75% coverage respectively, in practically all countries by 2010.

However, despite the progress reflected in international statistics, an important part of the urban population is still without service or with substandard services. This situation is reflected in deficiencies in the sanitary quality of water, lack of continuity and pressure in the water distribution systems, and the low level of treatment of wastewater. In addition, most cities have significant deficiencies in terms of infrastructure for rainwater drainage, and protection of water sources.

Although this is one of the most urbanized regions on the planet, the importance of water in rural areas can not be overlooked because the serious problems of water resource management and inadequate provision of drinking water and basic sanitation services affects the poorest population (in relative terms) of the continent.

To achieve the high levels of development to which Latin America aspires, the major obstacles that characterize the region should be overcome: an unacceptably high level of social inequity, (the continent is the most unequal on the planet); weak governance, character-

ized by violence, criminality and drug trafficking; a high level of social exclusion of the poorest groups with respect to infrastructure services such as housing and basic water supply and sanitation; low institutional sustainability and absence of public policies to guarantee transparency, fight corruption, and promote effective accountability, economic efficiency and social equity; mediocre outcomes in education expressed by the low priority assigned to research and development, and the very limited production of patents, which does not prepare the region for the global competition of the 21st century.

In direct relation to the specific issues involved in sustainable water development, Latin America must deal decisively with the multifaceted challenges of growing environmental degradation, high vulnerability to natural disasters and long term impacts of climate variability and change. In relation to public services, the region needs to substantially improve their quality beyond the nominal rates of coverage. For achieving this goals, the region should reverse the low and unpredictable rates of investment in social infrastructure as a means of delivering quality services for all, while properly maintaining the water assets developed in recent decades, through sustained efforts of rehabilitation and renewal.

With an estimated investment of USD 250 billion during the period 2010-2030, the LAC region can close the investment gap of water infrastructure. This amount, about USD 12.5 billion per year, represents about 0.3% of regional aggregate GDP in 2010 (CAF, 2011). This percentage is considered within reach when compared to public allocations to water investments and tariff revenue in some countries in the region.

This level of investment is necessary to achieve 100% coverage of drinking water; 94% for sewerage; and 85% of urban areas served by rainwater drainage networks. It will also allow for renewal and rehabilitation of infrastructure assets with an average life of 40-60 years, and financing of good quality connections to water supply and sewerage networks for families in poor housing conditions. However, achieving these targets within the next 10-20 years, depending on the country, goes beyond simply financing infrastructure; and it will not be possible without a progressive transformation of the institutional governance of the sector.

In order to achieve this transformation, the region shows significant progress toward a modern approach to public service delivery, in which planning, policies, regulations and service provision recognize different actors. In this new approach, the rules are respected, and non-compliance has consequences. One component of the new approach is the establishment of regulatory frameworks for water supply and sanitation services which are almost universal in the LAC region, with acceptable formal content according to best international practices.

In terms of private participation, the lessons learned from failed concession processes in Argentina and Bolivia have been assimilated; and at this time, about 37.5 million people in various countries receive water supply and sanitation services from private providers.

Another example is the involvement of users and civil society organizations in decisions about policies, regulations and water projects. Public participation in the LAC region is channeled through various mechanisms: consumer protection ombudsmen, parliamentary commissions and directly through the judiciary. In addition, it is expected that the legal establishment of the human right to water supply and sanitation will lead to an irresistible force that strengthens the role of the natural beneficiaries of these services.

Lastly, the main recommendations emerging from this document are focused on the nexus of two themes: water governance –understood as organization, ground rules and procedures– and the water infrastructure gaps and its financing. Thus, infrastructure investments and financing subsidies will not be sustainable unless there is a sectoral governance framework that guarantees efficient service provision. Similarly, the best institutional scheme will not be effective if it does not meet the demand for services of the most disadvantaged segments of the population.



# 1

## THE INFRASTRUCTURE AND GOVERNANCE GAP

This document is intended to contribute to the analysis of investment and governance gaps in water supply and sanitation (WSS) in Latin America and the Caribbean (LAC) from an integrated social, economic and environmental perspective. The emphasis is on the identification of tools, experiences and lessons learned which lead to sustainable solutions in a region characterized by the dispersion and diversity of situations, despite the similarities of history, culture and language. The document also proposes sectoral public policies aimed at inclusion of the poorest populations and reduction of existing environmental liabilities.

Therefore, the focus of this document is rooted in the conviction that the obstacles that explain the enormous gap between the situation of services between one country to another –and even within many of them– result from the configuration of serious deficits of governance and infrastructure. These deficits admit possibilities for reversal if a series of policies and actions of proven sustainability in LAC are accepted and adapted to the local circumstances.

This document complements a recent study commissioned by CAF that made projections of investment gaps for 2015 and 2030. The report focused its analysis in urban areas, given their current size (79.5% of the total population), and projected growth by 2030 (83.6%), and the influence of cities on the overall economic and social growth of the region (CAF, 2011).

Based on these facts, this document proposes placing WSS services in the context of sustained economic growth in the region (ECLAC projects a 4.3% annual average for the next five years), so as to spread the benefits across the population through active policies - based on principles of equity and social justice largely neglected until now.

The physical gap estimated by this evaluation requires total investments of USD 250 billion for the 2010-2030 period, at USD 12.5 billion a year, to achieve universal household coverage and other related targets associated with urban water problems: wastewater treatment; provision of stormwater drainage service; expanding services to slum – which in LAC represented 27% of the urban population in 2005 (UN Habitat, 2008); expansion of water sources correlated to population growth and expansion of coverage,

*By 2030, Latin America can close the gap in water supply and basic sanitation services with annual investments of 0.3% of GDP and substantial improvements in sectoral governance.*

and renewal and rehabilitation of existing facilities and equipment. The targets are based on the integrated approach to urban water issues which is an essential guiding principle for meeting the infrastructure demand of WSS services sustainability.

Table 1 shows the size of aggregate targets for LAC and the financial costs involved. In brief, 100% coverage of drinking water, 94% in sewerage, and 85% of the urban area would be served by stormwater drainage networks. Infrastructure assets would be renovated and rehabilitated, assuming an average useful life of civil works between 40 and 60 years depending on the type of service. Investments are also included for household connections for water supply and sanitation for 20.3 million families in slum areas whose homes and urban services will be substantially improved (CAF, 2011).

**TABLE 1. COSTS AND TARGETS FOR WATER SUPPLY AND SANITATION SECTOR  
• 2010-2030**

Service	USD billions	USD billions	Target for 2030
Drinking water <sup>1</sup>	45.4	2.27	100% coverage
Sewerage <sup>1</sup>	79.4	3.97	94% coverage
Wastewater treatment <sup>1</sup>	33.2	1.66	64% coverage
Drainage <sup>1</sup>	33.6	1.68	85% urban area
Water sources <sup>2</sup>	27.1	1.35	100% incremental demand
Formalization of WSS connections	30.5	1.52	50% reduction of gap
<b>Total</b>	<b>249.2</b>	<b>12.45</b>	

1) Expansion, rehabilitation and renewal; 2) New water sources / Source: CAF 2011.

The governance gap relates to the organization, ground rules and procedures governing the administration of WSS services. The analysis takes notice of the Camdessus report, prepared for the 4th World Water Forum, which provided a useful framework of the main governance aspects of the WSS sector (Camdessus, 2003):

- Ranking of the sector in the public domain.
- Sectoral organization and roles involved.
- Independent regulation incorporating the principles of governance.
- Sectoral situation in relation to the social, environmental and economic institutional areas.
- Information systems.
- Management of services.
- Economic regulation of services.
- Community participation.
- Tariff and subsidy allocation principles.
- Political interference.
- Transparency of actions and procedures.



The relationship between infrastructure and governance gaps operates as a reciprocal link of cause and effect. As a result, the sustainability of infrastructure, resulting from the supply subsidy generated by the government, will be affected without sectoral governance to ensure efficient delivery of services. Likewise, the best institutional arrangement would not be sustainable if it did not result in achievements that make it possible to meet people's demands for adequate services, especially the most disadvantaged segments of the population.

Although in the last decade significant progress has been made in both aspects (infrastructure and governance), the effects of economic growth, climate change, environmental degradation and widespread demand for greater social inclusion, among others, have created new and renewed challenges for both fronts of sectoral public policies. The focus of this report on the urban segment does not mean neglecting the overall situation and outlook for WSS services in rural areas, whose main features are discussed in Box 1.

### **BOX 1. WATER SUPPLY AND SANITATION IN RURAL AREAS**

The rural population of Latin America is expected to fall from 122 to 109 million between 2010 and 2030. At the same time, the urban population will increase from 471 to 603 million (UN Habitat, 2008). These projections also reflect the rural-urban migration process, the growth of the informal population in cities on their periphery. Latin America is exceptionally well placed to end this social equity debt over the next 20 years.

Fortunately, despite the urban character of Latin America, the political representation of municipalities has maintained the interest of most of the governments of the region in providing water supply and sanitation services in rural areas – where in relative terms poverty rates are most acute. In fact, the region has begun to overcome a long and difficult history of failures resulting from approaches based on construction of infrastructure –generally gifts from central governments– which were technologically inappropriate, with little financial backing and limited acceptance by communities. In the past, these approaches lacked political and institutional support from governments, and did not take into account the opinions of the communities.

Since the 1970s, this supply-driven approach has been gradually replaced by one based on demand and effective participation by communities which select the most appropriate technologies, contribute to the construction and provide the finance for operating and maintenance costs. In this approach governments change their role as operators of the systems to become facilitators of the process, supported by civil society and NGOs.

In rural areas, various types of administrative committees for water supply and sanitation services are the most common management model, equivalent to public utility companies which is the predominant model in urban areas. However, not having the economic size to deal with all the operational and maintenance functions, these committees have formed larger associations. In Central America, the performance of these larger associations has been remarkable, reaching an estimated 30% of the population with a direct impact on planning, design and construction of infrastructure and, more importantly, on repair, maintenance, administration and health monitoring which guarantees their sustainability.

How will the upcoming 6th World Water Forum connect with the necessary minimum investment gaps and solving the existing organizational and institutional problems? There is no doubt that the global event has a strong political and institutional weight, which should open an opportunity to shape proposals for renewal. It is not a matter of repeating justifiable expressions of desires and aspirations, but of proposing actions and mechanisms based on the real feasibility of achieving demonstrable success through a range of experiences. In other words, identifying basic platforms to be assumed and executed in relation to the key issues which are brought out by this paper.

# 2

## BACKGROUND

Neglecting the infrastructure and governance deficits leads to unreliable drinking water services in terms of sanitary quality, and substandard continuity and pressure in the distribution systems; along with poor sanitation, comprising sewerage and wastewater treatment. The effects of this situation, either singly or in combination, constrain at various levels the aspirations for sustainable development of countries and cities, and pollution of water bodies, which affects their use and increases health risks, constraining the capacity of sources for water supply, irrigation and recreation, among others.

In practice, ignoring these deficits create two categories of citizens: those with quality services, and those with unreliable or inexistent services. It is not necessary to detail the consequences of such discrimination: health risks, overcrowding, exclusion, deepening of informality and poverty, violence, among others. In economic terms, two equally harmful universes are created: a submerged economy and a cyclical economy, which acquires overtones of «permanent.» Both have in common the fact that they require increasing resources from the government; simply for subsistence support, and to cope with the resulting consequences. Environmentally, the impact directly affects people's health, particularly that of children and the elderly, and the deterioration of the infrastructure of services and physical goods in general. This situation generates the short-term costs mentioned above, along with other impacts on the quality of life of society and the general low level of productivity of the economy.

In the urban context, in addition to the impacts caused by slums where a significant part of the population live, the rate of abnormal drainage of rainwater (which runs off through the sewerage system or natural slopes), accentuated by the excessive increase in imperviousness in cities and poor management of urban solid waste, have a negative impact on the operating conditions of sewage services. Finally, in the institutional aspect, the configuration of the deficits leads to costly distortions caused by overlapping roles, and widespread tensions within governments in pursuit of scarce resources, which are mainly allocated at the margin of any planning and strategy.

It is useful to summarize this part with a look at the economic costs of deficient provision of water supply and sanitation services. Box 2 addresses this question (see p.18).

*Ignoring the infrastructure and institutional deficits in Latin America creates two categories of citizens: those with quality services, and those with unreliable or inexistent services.*

## Box 2. COSTS ASSOCIATED WITH DEFICIENT PROVISION OF WATER SUPPLY AND SANITATION: THE CASE OF COLOMBIA <sup>1,2</sup>

Gastrointestinal diseases caused by bacteria are one of the highest costs associated with environmental degradation in Colombia, especially because of their impact on infant mortality and morbidity. Bacterial diseases are transmitted by contaminated water sources in badly operated and poorly maintained water distribution networks, along with intra-household re-contamination, resulting in chronic diarrhea, dysentery and other serious illnesses including cholera, hepatitis and typhoid. In rural areas of Colombia, where the poorest segments of the population live, gastrointestinal diseases are responsible for 7.3% of infant mortality.

Despite budget allocations for investment in water supply and sanitation, with annual values close to 1% of GDP in the last 10 years, these efforts by the Colombian government have not been sufficient to reduce the incidence of these diseases. An analysis of interventions in water supply and sanitation clearly shows the importance of hygiene-related interventions, which can reduce the incidence of diarrhea by up to 45%.

From a global perspective, the cost of ill health of millions of people is directly related to deficits in quality of access to drinking water services. Approximately 3.1% of premature deaths (1.7 million each year) and 3.7% of the cost in disability-adjusted life years (DALY) estimated at (54.2 million) are attributable to the bad quality of water supply and sanitation services.

At the regional level, the increases in coverage of water supply and sewage networks do not reflect the full extent of the deficiencies in the quality of services. In the case of Colombia, the performance indicators for the 59 largest water companies are reasonable, but intermittent services are frequent in most small towns; it is estimated that less than 50% of drinking water services, outside the large cities, have adequate treatment. Consequently, the sanitary quality of drinking water does not fully comply with drinkability standards.

Global studies indicate that the return on a dollar invested in improving water supply and sanitation services is in the range of USD 5-28, with low-tech and low cost interventions such as those related to hygiene (especially hand washing) having the highest economic returns. In these calculations, time savings and the convenience associated with access to water supply and sanitation services make the greatest contribution to the estimated benefit.

1) Mitigating Environmental Degradation to Foster Growth and Reduce Inequality. The World Bank 2006

2) Evaluation of the Cost and Benefits of Water and Sanitation Improvements at the Global Level. WHO 2004

### 2.1. SECTORAL POLICY

The state of WSS services reflect the public policies –which by action or omission– are being implemented in the region.

In this respect, without making any value judgments, two clearly divergent generic types of sectoral policies can be identified in the empirical analysis, which relate to different institutional models (Foster, 1999). At one extreme is the policy that responds to institutional arrangements where planning, policy, regulation and provision are the responsibility of different actors, although coordinated in many aspects, which we will call «modern model». In these scenarios, the rules are generally respected and non-compliance has consequences. At the other extreme is the conventional arrangement in which, regardless of the institutional and formal regulations, the actual provision of the services –in most of the basic plans– along with a wide range of sectoral functions are in the hands of providers, which respond directly to political

interests, characterizing what can be termed the «traditional model». Some systems are currently moving along –not without obstacles– the road to the first model; however, the traditional model is still the norm in most of the region.

## SECTORAL ORGANIZATION

Although the sectoral organization in the countries of the region generally distinguishes between these models, only those that demonstrate some experience of coordinated operation (Chile, Colombia, and Peru) stand out because of the real independence of their organic roles. In most cases, the provider takes the leading role, favored by the political volatility that characterizes the institutional organization of elected governments. Table 2 summarizes the distribution of sectoral public functions in various countries of the region, revealing the predominant situation –with the proviso that in every row there are exceptional cases.

**TABLE 2. DISTRIBUTION OF SECTORAL FUNCTIONS**

Country	Policies	Planning	Regulation and control	Delivery
Argentina	Governments or local providers <sup>1</sup>	Local <sup>1</sup>	Local <sup>2</sup>	Local companies
Brazil	Central and local (state and municipal)	Central/State	State or Municipal <sup>2</sup>	Municipal, but in many cases the municipalities have granted concessions to state or private companies
Bolivia	Central	Central and local <sup>1</sup>	Central <sup>2</sup>	Local companies – Cooperatives
Chile	Central	Central	Central	Regional and municipal concession holders
Colombia	Central and Provincial	Central and Provincial	Central	Municipal companies
Costa Rica	Central <sup>1</sup>	Central <sup>1</sup>	Central <sup>2</sup>	National companies
Ecuador	Provincial <sup>1</sup>	Provincial <sup>1</sup>	None (except Guayaquil)	Provincial and municipal companies
Paraguay	Central <sup>1</sup>	Central <sup>1</sup>	National Agency <sup>2</sup>	National company
Peru	Central and local	Local	National Agency	Local companies
Uruguay	Central <sup>1</sup>	Central <sup>1</sup>	National Agency <sup>2</sup>	National company
Venezuela	Central	Central	Central <sup>2</sup>	Local companies
Central America	Central <sup>1</sup>	Central <sup>1</sup>	National (not El Salvador and Honduras) <sup>2</sup>	National company and municipal companies

1) Under interference by provider 2) Limited operation / Source: prepared by the author.

## SERVICE DELIVERY ARRANGEMENTS

The arrangements for providing water and sanitation services in each different place takes the form which correlate with the political institutions of the country, although usually dominated by the configuration of dependent services or concessions granted by municipalities, while these remain the legal owners. In the cases of countries with a strong federal tradition, such as Mexico and Brazil, political and regulatory relationships may be different

(with different National/State/Municipal configurations), while other countries are usually dominated by large national utilities. In almost all cases public providers of a certain size are governed by private law regulations. This category includes providers with successful management outcomes (which still represent a minority).

The water supply and sanitation services of small and medium cities are, in many cases, managed by the municipality itself through an administrative department, except in Chile, Colombia and Peru where providers have to adopt some private law configuration. This provision is aimed at depoliticizing the management of services. Despite its slow implementation, favorable results have been achieved in a few cases. The importance of local services is growing in the political agenda of more than 18,000 municipal governments, which have been elected by popular vote in Latin America for less than 20 years –in effect forming a new matrix of public responsibilities, allocation of fiscal resources, and accountability to society.

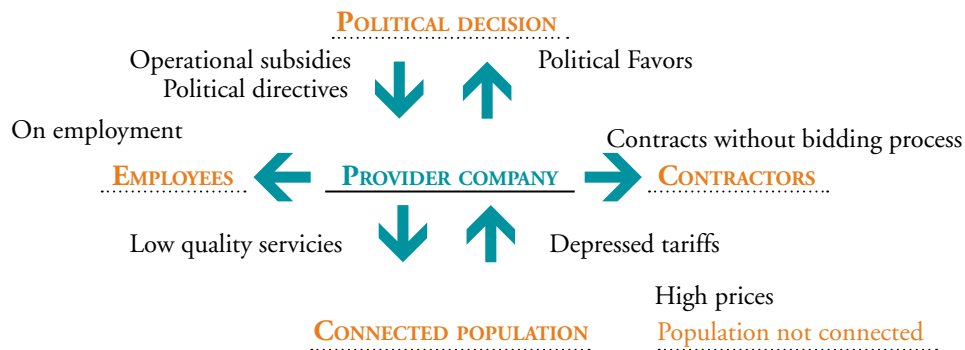
At this point, the discussion on promoting more or less decentralization does not seem to have the importance that was initially assigned to it, since it has not attracted great interest from local governments which (in many cases) are reluctant to receive the administration of local utilities with unreliable performance and heavy liabilities, especially related to labor. The positive incentives associated with decentralization of public services and the attempts to form associations of municipalities have not been in line with the political, economic and social reality of LAC. Indeed, decentralization of delivery of services requires stronger economic incentives which need to be financed by central governments. Except in Brazil, where state enterprises predominate with a strong incentive to establish concession agreements with municipalities, the issue has not been fully included in the countries' agendas.

In LAC, with the exception of large municipalities with political influence, most municipalities are economically and politically weak, highly dependent on the central organizational framework of government and, consequently, their capacity as operators of WSS services –whatever the depth of decentralization– is limited. In these cases, the following factors are present: (i) quality and coverage indicators below the national average, with a consequent increase in the respective gaps; (ii) a strong political co-optation of the services; (iii) heavy dependence on tax incentives (state, provincial or national) assigned on the basis of political alignments; (iv) disproportionate differences in quality between neighboring cities; and (v) difficult compliance with the regulations of central authority.

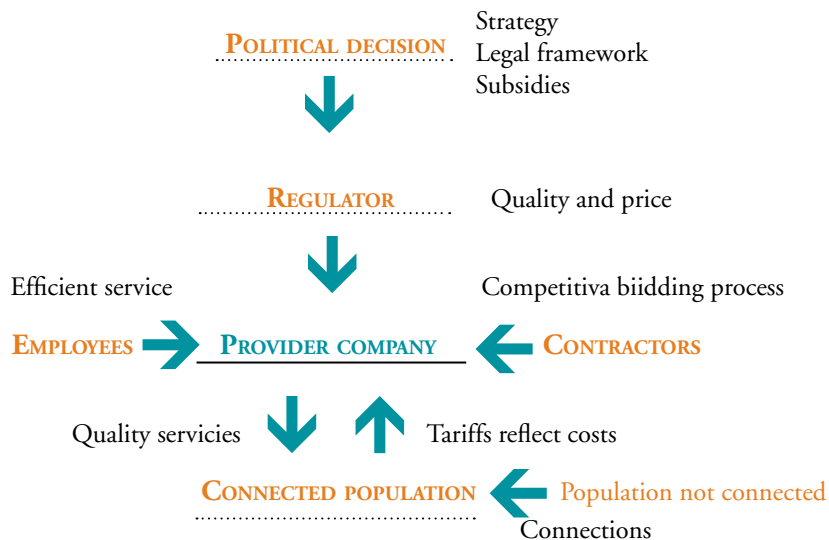
This context explains the financing problems which, in general, sub-sovereign entities suffer, even in relation to national finance development agencies, such as in Brazil, Mexico and Colombia. In most cases, the entities have to go to central authorities to obtain credits, guarantees or other financial facilities, for which the negotiations involve, above others political considerations. This situation is aggravated by the inherent requirements of annual and multi-year budget management of investments in infrastructure, especially related to projects involving water resources and water-related services whose conception, design and implementation generally require several years.

The two arrangements identify the concurrence of the two alternative models mentioned above (Figures 1 and 2).

**FIGURE 1. TRADITIONAL MODEL OF DELIVERY OF WATER SUPPLY AND SANITATION**



**FIGURE 2. MODERN MODEL OF DELIVERY OF WATER SUPPLY AND SANITATION SERVICES**



Source: adapted from Foster 1999.

**EFFICIENCY**

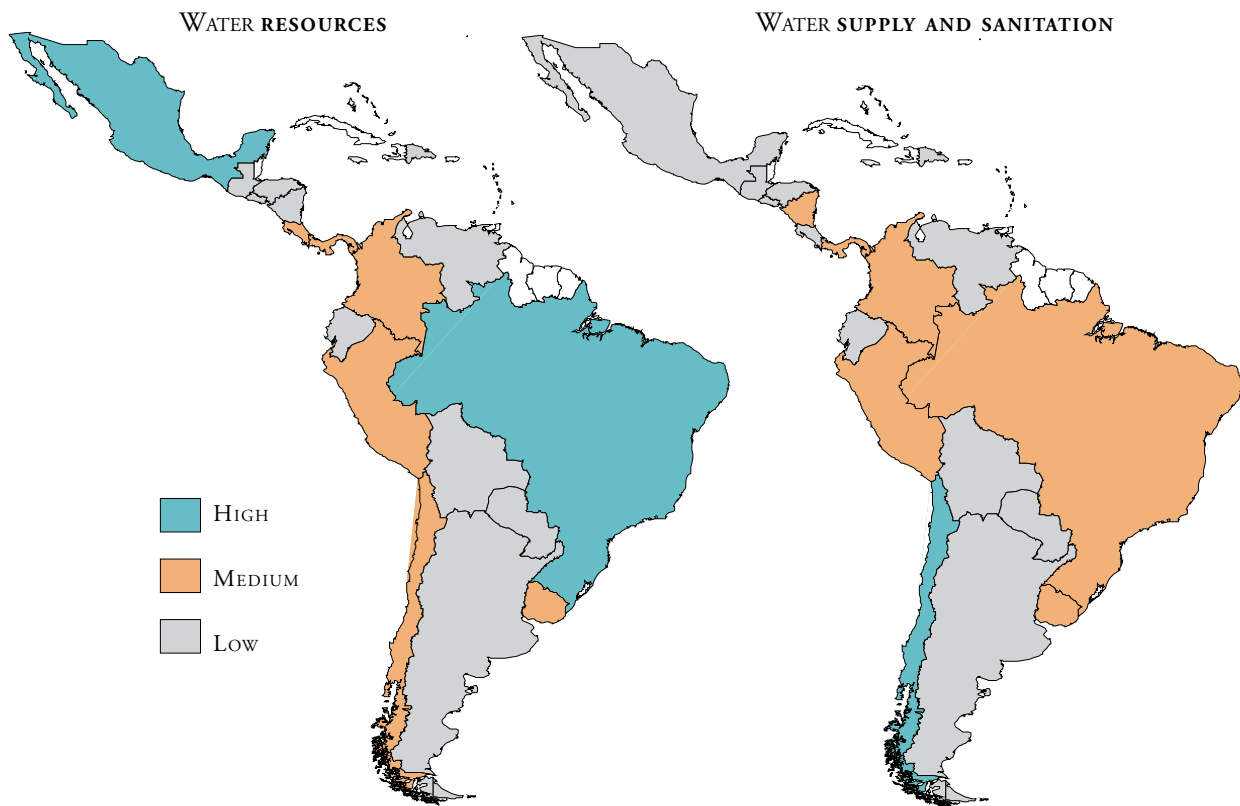
The efficiency and quality of WSS services can be measured by their operational costs. The scorecard of water utilities in the region produces conflicting conclusions: a few utilities with excellent ratings, comparable to the best in the world: Brazil (Sabesp, Sanepar and Aguas de Limeira); Colombia (Empresas Públicas de Medellín); Chile (Aguas Andinas, Esval, and Esbio); and in Bolivia (Saguapac). Other utilities are moving in that direction:

*Latin America is moving between two types of policies for the WSS sector. At one extreme is the policy that responds to a scheme where planning, policies, regulation and provision are the responsibility of different actors, although coordinated in many aspects. In this scenario, the rules are respected and non-compliance brings consequences. At the other extreme is a scheme where provision of services, and a wide range of sectoral functions, is in the hands of the providers which respond directly to political interests. Although many countries are moving toward the first, the second is still the norm in most of the region.*

Colombia (Triple A of Barranquilla, Acuar of Cartagena); Uruguay (OSE); Ecuador (Interagua); and Mexico (Aguas de Saltillo). However, there are a lot of utilities where low-quality, intermittent and /or inefficient services are common. Unfortunately this segment is still the dominant trend.

Extensive reforms aimed at reversing the situation have been under way since the 1990s. Comparing institutions with responsibility for water resources management and delivery of WSS services with international best practices , shows that despite its slow progress, in many cases the process has led to operational and commercial improvements. See Map 1.

**MAP 1. RELATIVE PROGRESS OF WATER INSTITUTIONS IN LATIN AMERICA**



Source: prepared by the author.

However, with some exceptions, structural reforms have been more declarative than effective. This appreciation is based on operational indicators that reveal deficient water quality; 40%-50% of non-revenue water (NRW); levels of non-payment over 15%; unreliable water supply in almost 30% of the systems; metering of consumption under 65%; and over-employment hidden by outsourcing of all kinds (World Bank, 2011), which in fact reaches an average level of 3.8 staff members per thousand connections (ADERASA, 2010). A scenario of efficiency, according to comparisons used for emerging countries in the Euro-



pean Union, suggests NRW rates of 20%, taking arrears to zero, and labor productivity indicators of two employees per 1,000 connections.

## EQUITY

In the provision of water supply and sanitation an arbitrary and unfair situation has been created which compels the poorest population to access unreliable services. As a result of the inadequacies and inefficiencies of the systems, the poor are de-facto second-class citizens.

With respect to drinking water, the pressure exerted by industrial demand for water is growing rapidly, the increase in consumption by residential and commercial sectors (as a consequence of better economic conditions and misguided subsidies in some cases), combined with the limited capacity of provision, which includes a high percentage of physical losses, has opened a channel for the proliferation of self-supply systems and/or unreliable and/or informal supply by tanker trucks, public tanks or basins, illegal connections, etc. In much of Brazil, Mexico, Peru, Paraguay, Ecuador and Central America, this is a common practice. Of the 95.4% of declared drinking water coverage for LAC, not less than 25% takes place by informal, if not illegal, means (because the informal population has no other means of access). This situation can be inferred from the statistics on population living in slums (UN Habitat, 2008).

In terms of sewerage, the situation is even more serious because of health risks caused by lack of infrastructure. In predominantly peri-urban areas with increasing population density, the use of septic tanks, latrines of all types and/or rainwater drainage channels have become widespread, without any control on the quality of their construction and use. The countries, are still presenting these systems as evidence of achievement of the Millennium Development Goals.

However, in many countries (Brazil, Ecuador, Argentina, Mexico, Venezuela), though household services have been available, beneficiaries have frequently refused to connect because the incremental cost of services does not bring immediate benefits, so this becomes a significant barrier to connect, –displacing the importance of the improved sanitary conditions and possible increases in the value of the property. The fact is that of a reported regional sewerage coverage of 86.4%, about 35% relates to informal (and environmentally degrading) types of sanitation. This reference comes from the information available on compliance with the Millennium Development Goals for sanitation (World Health Organization, 2010).

In short, the use of non-household water supply and sewerage is not necessarily a second best option for the poorest sectors, because, as noted, putting informal or unreliable systems into operation requires coercive action by providers, or subsidies for the new services. Both factors have negative social impacts which are difficult to specify (cases of Guayaquil, Manaus, Paraguay).

## WASTEWATER TREATMENT

In relation to wastewater treatment services, the current coverage is estimated at 26.3% of the total population of the region (UN Statistics, 2010). Recognizing that in the last decade this indicator has grown moderately, it is noteworthy that Chile has the highest coverage because it is implementing a sustained investment plan aimed at achieving the maximum coverage technically possible by 2021. The rest of the countries are making isolated efforts, some of enormous environmental significance and large investment costs, such as: cleaning up the Tieté river in Sao Paulo; the basins of the rivers Matanza-Riachuelo and Reconquista in Buenos Aires; cleaning up of the Bogota river; trunk infrastructure in the Valley of Mexico and the Atotonilco treatment plant; the Panama City and Bay plant; and in Lima building the Taboada sea outfall. These undertakings generally respond to specific problems caused by social demands and tangentially to an integrated view of management of the water cycle in urban areas.

### 2.2. TARIFFS AND SUBSIDIES

There is a wide dispersion of tariffs and subsidies across the region. The largest companies in the region (in 15 countries) have an average price per cubic meter of drinking water and sewerage services of USD 0.622, with extremes of USD 0.04 and USD 1.84, in El Salvador and Uruguay, respectively (World Bank, 2011). Table 3 shows unit prices and annual revenue generated for various countries in the region based on average consumption:

**TABLE 3. UNIT PRICES OF SERVICES**

Country	Annual consumption m <sup>3</sup> /capita	Price of water and sewage USDm <sup>3</sup> water sold	Revenues millions USD per year
Argentina	124.1	0.24	1,102
Bolivia	30.2	0.40	80
Brazil	59.5	1.12	11,052
Chile	72.2	0.86	912
Colombia	51.8	0.81	1,539
Costa Rica	76.2	0.56	128
Ecuador	64.9	0.72	419
El Salvador	57.6	0.04	10
Mexico	75.9	0.93	5,930
Nicaragua	39.7	0.42	55
Panama	122.2	0.25	71
Paraguay	88.6	0.36	122
Peru	49.2	0.68	693
Uruguay	50.3	1.84	284
Venezuela	64.9	0.25	437

Source: International Benchmarking Network - IB-NET.

A 2009 study by ADERASA (based on 19 large operating utilities) found that the average annual bill for drinking water was USD 139.7/year, with a range between extremes of over 3,000%. At the same time, the price ratio between sewerage and water services was between 100% and 0%. Only in Chile is the wastewater treatment service paid as a separate amount. In general, there are two categories of tariffs: one associated with the costs of the service (in some cases including capital costs) and other mainly based on non-technical criteria.

The region has tariff setting mechanisms based on economic regulation models (Chile, Colombia, Peru); on administrative procedures for recovering costs (Uruguay); on cost adjusted for inflation (Brazil); or on systems that combine these components. In the case of Mexico, water and sanitation tariffs have to be approved by state legislatures every year, since they are considered municipal revenue. In other countries, the approach is based on decisions of political expediency, usually under strong influence from the utilities themselves. In this case, the criteria commonly followed for regular or special tariff adjustments and reviews have similar characteristics. The predominant practice, however, is an annual adjustment based on inflation. In this context, the case of Panama stands out where drinking water tariffs have been frozen for political reasons since 1982.

According to regional references, revenue generated by utilities can barely cover operating costs, partly because of the chronic inefficiency of the service. It has been estimated that the cost of inefficiencies represents at least 25% of the total billing of the 15 countries considered. In this regard Aderasa reports an operating cost coverage ratio for drinking water (for 18 utilities) of only 2.5%. The Brazilian Sanitation Information System (Snis) reports an operating cost coverage ratio of 8.3% for 2010. In both cases, the reported surpluses are barely sufficient to operate the system.

In terms of subsidizing demand, apart from the benchmark models (Chile and Colombia) which have been operating for over a decade, crossed subsidies of the most varied kind operate in all WSS services in the region. In a few cases they coexist with direct tax subsidies (Ecuador, originating in the telephone service, and El Salvador from electricity distribution). Again, in this area there is a wide dispersion with respect to: (i) identification of beneficiaries where, despite recognition of the need for targeting, there are cases of indiscriminate generalization (Argentina, Bolivia), and others which are unrelated to the needs that should be addressed, in situations where patronage or fraud is present. With some exceptions, there is limited coordination with other social subsidies targeting the same beneficiaries ; (ii) the size of the subsidy usually covers the first 10 cubic meters of consumption per household, unrelated to the actual consumption of the resident population.

### 2.3. INVESTMENTS

Our estimates show that average annual investment in the most recent three-year period was about USD 4.429 billion, mainly to expand water supply and sewerage networks (CAF, 2011). This annual investment represented about 0.11% of aggregated regional GDP in

*Tariff setting mechanisms respond to models of economic regulation (Chile, Colombia and Peru), administrative procedures for recovering costs (Uruguay), cost reviews, adjusted for inflation (Brazil), or systems that combine these components. In the case of Mexico, tariffs are approved every year by state legislatures. In other countries, the approach is based on decisions of political expediency, usually under the strong influence of the utilities themselves.*

2008, always in relation to the 15 countries included in the analysis. Although important, the size of the investment effort is generally insufficient to keep up with the region's economic growth and cover the existing infrastructure deficit in relation to expansion of services, and even less to finance the rehabilitation and renovation of existing facilities.

It is worth explaining that estimated investment for each country relates to increase in coverage, calculated on criteria of uniform costs per connection (because actual average construction prices are not known). Except in countries with effective regulation and sectoral planning, investment decisions are not based on integrated approaches to urban water problems. Likewise, there is limited attention to how technical designs and investments budgets respond to service demands and priorities.

Table 4 shows the most common source of investment funds for several countries (in some cases the criterion is based on the most representative utility with the largest number of clients).

**TABLE 4. HOW ARE INVESTMENTS FINANCED?**

Country	Annual investment Millions of USD*	Tariff contribution	Tax subsidy	Local financing
Brazil	1300.9	Yes	Yes (central-state)	Development bank (BNDS, CEF) w/reimbursement
Mexico	868.0	Yes	Yes	Banobras and other sources-reimbursable
Bolivia	33.8	Low	Yes	No
Colombia	435.9	Yes	Low	Findeter-Autonomous corporations. Reimbursable
Ecuador	143.0	Not	Yes (phone subsidy)	FISE**
Peru	220.2	Yes	Yes	Inversan**
Venezuela	288.6	No (frozen since 2003)	Yes	FAF**
Argentina	360.0	No (frozen since 2002)	Yes	Enohsa (non reimbursable)
Chile	151.2	Yes	No	-----
Paraguay	67.4	No (frozen since 2002)	Yes	-----
Uruguay	154.4	Yes	Not	-----
Costa Rica	34.4	Not	Yes	-----
El Salvador	61.6	No	Yes (energy allowance)	-----
Guatemala	78.1	No	Yes	-----
Honduras	32.2	No	Yes	-----
Nicaragua	39.9	No	Yes	-----
Panama	29.8	No (frozen since 1982)	Yes	-----
Dominican Republic	49.0	No	Yes	-----

\* Values referred to 2010 or most recent year available \*\* No-operating funds / Source: prepared by the author.

Fiscal resources do not exclude assistance from multilateral financial institutions that provide loans that are amortized by tax contributions or tariffs, jointly or without distinction. In this respect, approximately 37% of investments in water supply and sanitation infra-

structure in LAC are financed by CAF, the Inter-American Development Bank (IDB), and the World Bank (WB).

Another reference to consider is the efficiency of investment, where disparities between costs of contracting a connection exceed the natural technical differences that may reasonably exist between typologies, countries and cities. More explicitly, this exists in order to anticipate the configuration of surcharges, constant unforeseen expenses, deferrals or other distortions common in the execution of public works.

Table 5 shows the implementation costs of new water and sewerage connections, according to various sources (Inter-American Development Bank, 2010). For calculation purposes conservative standards were selected close to the lower limit of the ranges studied.

**TABLE 5. UNIT COSTS PER HOUSEHOLD CONNECTION**

Source	Water Supply (USD)	Sewerage (USD)
Cepis/PAHO – Brazil-Mexico – al 2000	648	840
Cepis/PAHO – Mercosur + Chile – al 2000	736	1.112
Cepis/PAHO Brazil-Mexico al 2010	789	1.023
Cepis/PAHO Mercosur + Chile al 2010	897	1.355
Brazil average – 2008	824	1.196
Authors estimate – 2011	500	1.000

Source: prepared by the author .

## 2.4. INFORMATION

The availability of reliable sectoral information depends on the existing institutional arrangements. In the systems under regulation and/or central or regional planning information is generally available, particularly from regulators. The lack of information which is found in much of the region is due to the negligible importance to allocate resources to this function, particularly where providers alone control the information. As a result, country statistics presented by international agencies on water supply and sanitation (except general censuses) are generally inconsistent and largely unreliable.

However, in the LAC region Brazil has been making a sustained effort to reverse the weakness in information by means of a centralized information system on the enormous universe of providers and the continental size of its territory.

## 2.5. USER PARTICIPATION

User's participation in the institutional context of the sector –except in the cases of Chile, Colombia and Peru– is still an objective awaiting realization. For now, participation is mostly limited to the population served, mainly to dealing with claims, and arrangements set up by providers and regulators to address such claims. In other words, users' participation is mainly reactive following specific interests, which are obviously varied and often divergent.

*Participation of the civil society in decisions on policies, regulations and water projects is expressed through various mechanisms: consumer protection, ombudsman, parliamentary commissions and directly through the legal system. It is expected that the legal consecration of the human right to water supply and sanitation will strengthen the role of users of water supply and sanitation services.*

Moreover, there is considerable confusion about community participation as seen by the proliferation of public agencies with overlapping responsibilities: consumer protection, ombudsman, parliamentary committees, offices of the provider and the regulator. These agencies are generally acting simultaneously with non-governmental organizations (NGOs) of the civil society with specific economic and political interests. Institutions that respond to the needs of users –real and potential– still needs a more precise regulation on the area and scope of intervention, representation, and independence, among others. But above all, the political will to implement it.

Clearly, the general population of LAC has not been able to create and internalize a culture of civil society and organize for a common purpose in relation to the objectives of social equity, transparency and efficiency of WSS services. Moreover, it seems that deliberated actions to create capacities and educate the general public are limited.

In Venezuela, there is an interesting regulation in this area with quasi-binding systematic mechanisms of consultation and control on management and decisions relating to services. It is known, however, that the scheme is not fully operational and has no transcendental results so far. In fact, tariffs have been frozen in Venezuela for almost a decade.

Another interesting reference is the legal protection of the environmental interests of the civil society. In Argentina, for example, the Supreme Court has intervened in the promotion and control of an important environmental project (cleanup of the Matanza-Riachuelo basin in Buenos Aires). In many other places (Brazil, Mexico, Colombia and in Guayaquil, Ecuador) environmental inspectors act under the public prosecutor, which, at the request of NGOs or even any citizen, oblige providers –and their delegates– to take concrete action to preserve the environment. In the case of Manaus, the utility has changed its investment plans to expand the sewerage system because it has been forced to provide treatment for 100% of collected wastewater. This legal protection administered by the judiciary brings a new actor into the institutions of the sector, which in many cases substitutes the participation of the users.

## 2.6. THE HUMAN RIGHT TO WATER AND SANITATION (HRWS)

The formal ratification of the human right to water and sanitation by the United Nations on July 28, 2010 is a new development not only because of the power of the mandate but also because it compels countries to adapt their legal and regulatory frameworks, which will facilitate application of sectoral strategies to respect the mandate. Although LAC citizens have always had –as diffuse rights– the right which is now explicitly recognized. Its inclusion in positive legislation will oblige states to adopt the regulations contained in General Comment N° 15 of the United Nations, which will significantly facilitate the exercise of these basic rights. The regulation of the human right to water and sanitation categorizes them as rights with deferred effect, which of course depends on the efficiency and speed with which the obliged States act.

The legal adoption of the right to WSS as a human right has a strong binding power which reinforces the role of existing and potential recipients of services. However, the challenges ahead have to do with how to prepare and educate people to exercise these rights, how to meet the obligations inherent to the conservation of water resources, how to assign responsibilities to those who have to guarantee compliance, and how those who have jurisdictional authority are accountable. At this time, the concerns of countries mainly relate to incorporating these rights into their laws. However, this formal activity does not preclude designing and taking specific actions in favor of the full exercise of these new human rights, which is now just beginning.

## 2.7. ENVIRONMENTAL ISSUES AND CLIMATE CHANGE

Up to now, most environmental concerns associated with WSS services have been linked to sanitation services - institutional and/or informal - and to the consequences of degradation of soil, water and ecosystems in general. In this respect, the areas of public health, environment, and management of urban services and water resources of most countries, states and municipalities have been acting without coordination by the agencies that are responsible for such functions.

However, in favor of environmental protection in LAC, the coverage of sewerage and wastewater treatment has increased in the last decade. Although there is an explicit attempt to close the water “cycle” by investing in wastewater treatment, there is no clear integrated view to promote the safe use of wastewater, reuse of treated wastewater and improved water conservation. So the results are poor and even counterproductive. For example, in the case of Manaus, when connection to sewage networks is prevented due to the temporary absence of treatment, the incremental benefits which improve the quality of life of the population are frequently delayed.

In addition to the environmental issues, the effects of climate change result in damage and risks closely linked to the provision of WSS services. The population which has not suffered from the phenomenon is generally unaware of the association and of the difficult situation which exists. In this respect, awareness initiatives need to be undertaken. There is strong empirical evidence that several Andean countries are already experiencing difficulties traceable to climate change. Specifically the high Andean cities of La Paz, Arequipa, Quito and Bogota, and others supplied by sources in the Cordillera are reporting a significant reduction of their supply glaciers and the drying of wetlands in the high mountains, which has led to development of new sources of supply and build alternative forms of multi-year seasonal storage and river diversions.

Therefore, climate change simply magnifies the basic challenges that all WSS services have in relation to a series of issues, including reducing the vulnerability of infrastructure to natural disasters. This also applies to a number of other actions like: reducing water losses,

*Coverage of sewerage systems and wastewater treatment in LAC has increased in the last decade in an attempt to meet the Millennium Goals with the objective of closing the water “cycle” with investments in wastewater treatment to improve environmental management. However, these investments take place in the absence of an integrated view that emphasizes human health as the overriding objective, while fostering the safe use of wastewater, including reuse, conservation of water resources, and management of ecosystems.*



improving the quality of water and sanitation for those most at risk (usually the poorest segment of the population), and systematically renewing and rehabilitating infrastructure. It is known that many utilities are already adopting preventive measures to adapt their systems to emerging climatic conditions.

Assessing the vulnerability of water supply sources, treatment plants and pipe networks are of particular interest because they are directly impacted by droughts and floods. In general, droughts reduce the available capacity of water sources and the volume accumulated in dams; increase competition among users for the same resources; and concentrate pollutants due to lower flow rates. Floods also affect water infrastructure by collapsing aqueducts, sewerage systems and by damaging water treatment plants. The fact is that LAC is already suffering from and adapting to the recurrent effects of cyclical climate phenomena such as El Niño (ENSO) and La Niña, which affect countries in different ways.

In addition, the effects of extreme events on water infrastructure have a disproportionate impact on the most vulnerable segments of the population, further deteriorating their situation of poverty and deprivation. Fortunately, vulnerability of water infrastructure and services to climate change is being increasingly recognized, and is expected to lead to greater cooperation between public agencies and other social sectors, such as the private sector and research institutions under a coordinated and integrated approach to the solution of urban water management issues.



# 3

## GOOD PRACTICES IN THE WATER SUPPLY AND SANITATION SECTOR

Following on from the substantive content already discussed, which sets out the institutional and infrastructure gaps faced by the WSS services sector, this section presents experiences in each category which can be classified as “good practices” because they contribute, in their respective fields, to closing some of the most pressing governance and infrastructure gaps.

### 3.1. GOVERNANCE

Identifying the institutional issues of the WSS sector involve identifying, in each place, whoever actually exercises power in the sector, and how the scope of responsibility are distributed to prevent overlapping, invasions or postponements of mandates. Any recommendation for change should be based on this knowledge, and in the careful consideration of its political feasibility. In terms of governance, the functioning of a democratic institutional order is generally a prerequisite. Where institutions are weak, good sectoral governance is not possible.

Some commonalities are described next as a way of defining good practice in governance of the WSS sector in LAC. The main consideration leads to discussing a set of guiding principles (which most countries have) or what has been called the sectoral Regulatory Framework (RF). It includes the Sanitation Services Law of Chile; Law 14445/2007 of Brazil; the Household Services Law N° 142 of Colombia. The arguments that a benchmark RF distorts the federal nature of political organization of the State, or would invade the areas reserved to states or municipalities are weak, because the creation of a regulatory framework usually involves environmental, health and preservation of natural resources; which are a primary responsibility of central governments.

Practical observation suggests that where there has been no central control, services have become chaotic and deeply unequal. Consequently, the highest legislative instrument should include the basic principles of sectoral organization, demarcation of functions and responsibilities for delivery of WSS services; principally, separation of policy and regulatory functions, definitions of delivery, and creation of a body to control all aspects of provi-

sion. With their particular characteristics, this is what has been achieved in Colombia, Chile, Peru, and to some extent in Brazil.

The construction of such a division of responsibilities does not require many bureaucratic levels, or advisory or consultative bodies; simply a government department - a secretariat or ministry - responsible for formulating policies and validating planning, and an independent body to deal with regulation and control. In most countries this exists, but it is immersed in an administrative tangle which hinders and limits the operation of the system and, above all, setting goals.

The institutional example of Brazil, implemented since the Constitutional Reform of 1989, of including WSS issues in the context of an integrated approach to water management, coordinated with urban development and housing, is a transformative precedent which is making sustained achievements. For example, targeting the fight against poverty represented by people living in slums around (and within) large and medium cities; strengthening watershed and sub-watershed organizations and their influence on preventing the effects of change climate; adopting a framework law on sanitation services, which is beginning to be implemented; setting up a comprehensive information system; along with a massive increase in public financing –reimbursable and non-reimbursable– for programs created by the new institutional setting.

The Ministry of Cities as guiding entity of sectoral policy has under its mandate the Urban Programs, National Environmental Sanitation, and Housing departments. The first deals with urban planning, regularization of land tenure, risk prevention, rehabilitation of urban areas and conflict mediation, all in direct coordination with the Housing and Sanitation departments. Sanitation is responsible for the general planning of water and sewerage services, urban and rural, revitalization of watershed committees, solid waste policy, urban development, and storm water drainage, among others.

An example that the integrated concept of urban water problems is feasible is the successful integrated sanitation program in Manaus (Amazonas state) financed by IDB, where a series of actions coexist: eradication of invaded areas, housing and sewage works in adjacent areas, strengthening community action, creation of green spaces and recreational facilities, adaptation of public health services, and urban regeneration works, among others.

Other examples of investment projects aimed at incorporating the water-health-environment nexus can be found in Venezuela and Argentina. In the case of Venezuela, in 2011 CAF approved finance for the first phase of an investment program of over USD 500 million to improve the quality of health and improve operational reliability of the seven major water treatment plants in the country. The expected impact of this program is to improve the quality of health of 9.2 million people, one third of the country's population. The Program also supports conservation and management of river basins that supply water treatment plants.

In Argentina, the Aguas y Saneamientos Argentinos (AySA), under the national government, is responsible for delivering water supply and sanitation services in the Autonomous City of Buenos Aires and in 17 municipalities of Greater Buenos Aires, with a population of 9.5 million. Since 2010, CAF has supported WSS by financing projects to expand water and sanitation services in six specific areas of the poorest municipalities, aiming at integrating isolated systems (which currently cannot guarantee water quality) into the metropolitan system which has high standards of service.

The situation of WSS service providers in intermediate and small localities are generally dependent on support from higher levels of government. This is the case of Ecuador where CAF has been supporting the Environmental Sanitation Program –PROMADEC– since 2007. This program is being implemented under the leadership of the national development bank (Banco del Estado), and finances investments for USD 600 million, of which USD 500 million are from a CAF loan. PROMADEC finances WSS investments in 150 intermediate and small municipalities with the highest rates of poverty, benefiting about four million people through over 400 projects. Ninety-five percent of such projects benefit localities under 50,000 inhabitants. Support of Banco del Estado guarantees the sustainability of the WSS services by providing integrated assistance composed of investments in WSS, support for operational management and small service providers, and strengthening the financial capacity and commercial performance of municipalities.

The social configuration of private law established in Peru, Chile and Colombia contributes to the solution, but cannot by itself solve performance problems in small municipalities with low per capita revenue. Brazil's Federal Sanitation Law introduces regulatory elements to encourage the associations of municipalities through the allocation of grants. Although it is premature to draw conclusions, Brazil has achieved positive results by aggregating medium- and long-term concession agreements between municipalities and large public state companies with commitments on performance and investment, as well as for a canon payment to the municipality.

### 3.2. REGULATION

The regulation of WSS services, on condition that they work effectively with all their attributes, is one of the key factors for achieving the goals of equality and social inclusion, quality and environmental protection in the area of WSS services, and, indeed, to close the existing gaps. It seems that the regulations –and its institutions– are a fundamental component of the modernization and reform of the sector.

The sectoral regulatory process began in Chile and Colombia 30 years ago, with the pioneering creation of a tariff superintendency to apply marginal costs pricing to tariffs, set up a system of cross subsidies, and establish criteria to define socioeconomic strata to implement the cross subsidy policy. With a few conceptual modifications this system persists to date. By the late 1980s the preparatory phase to privatize (and regulate) WSS companies

*Regulation of water supply and sanitation services is one of the transcendent objectives for achieving the goals of equity and social inclusion, quality and environmental protection and it is a basic and overriding component in the transformation of the sector.*

in Chile began. Argentina followed in the early 90's by creating regulators prior to the award of a few concessions. The trend continued in Bolivia, Guayaquil (Ecuador), Paraguay, Brazil, and other countries or municipalities, which have issued comprehensive regulatory instruments for WSS services.

At present, there are 28 regulatory agencies in 16 LAC countries and 23% of the population in the region has regulated their water services. In fact, there are even more regulators if the 17 multi-service regulatory agencies (which include basic sanitation), along with 21 other municipal regulators that have been created in Brazil. These numbers show that there are national regulators, as well as state or provincial, and in some cases municipal (Guayaquil and Puerto Cortés in Honduras), plus various in Brazil. In some countries with federal political organization, the debate on which level or levels should exercise that role is not yet over (Brazil and, especially, Mexico).

The regulatory agencies established Aderasa nine years ago as a second-floor entity to promote dissemination, training and horizontal transfer of experiences and knowledge. Aderasa groups 15 organizations with different profiles; some are central offices of local regulators (Argentina, Brazil, and Mexico), while others are independent agencies or government bodies responsible for issuing certain regulations. Aderasa maintains active regional working groups engaged in the participation of civil society in regulation; benchmarking; tariffs; subsidies; regulatory accounting; and small operators and in distance training programs. The existence of regulatory frameworks in LAC is almost universal (only Ecuador, El Salvador, Honduras –with the exception of Puerto Cortés– do not have them), and their technical components are broadly acceptable. The establishment of specific entities, some with limited powers (cases of Uruguay, Nicaragua and Mexico), reflects the importance that has been assigned in LAC to the regulation of natural monopolies like the provision of water supply and sanitation services. Colombia is the only case where the economic and control functions of regulation are in the hands of separate entities, although the law provides for means of coordinating procedures between them.

Regulatory agencies have made an impact on improving the capacity of technical staff and specialists to regulate utilities at levels of international standards. However, the most remarkable impact about this trend is the emerging conviction of the need for regulation has been spreading throughout Latin America. The regulatory action is in progress, not without some recurring conflicts against certain providers used to accumulating all the sectoral competences. The process is in its infancy, and in many cases requires external support to effectively exercise the authority conferred by regulation.

The agencies that have accumulated most experience and capacity should be a benchmark to assess progress of regulatory systems in the region. Specifically, the most sophisticated and experienced regulators –Chile (SSS), Colombia (CRA) and Peru (Sunass)– have accumulated valuable experience on: (i) maximizing knowledge of efficient costs of the sector, both investment and operational; (ii) improving the control function by continuous updating of meth-

odologies, systems and actions; (iii) reducing information asymmetries in relation to providers; (iv) increasing capacity for discussing the rationale of investments; and, (v) reducing conflicts between users and providers. There are no doubts about the legal or practical feasibility for establishing water and sewerage service regulators for public providers, although this is not the same as stating that there is widespread acceptance, let alone guaranteeing efficient regulatory function in such cases. The capacity to enforce decisions is still difficult (except in Chile, in large utilities in Colombia, and in the water company of Lima).

These regulatory agencies have several elements in common. The most important is their effective administrative and decision-making autonomy. Although coordinated by the executive branch of their countries, this does not imply necessarily a functional dependency. This is the opposite of what happens in other institutions subject to regulatory controls and restrictions on competence from other sections of the public administration. The best regulatory agencies have internal organizations modeled on their technical activities. They are headed by a single person, or in the case of the CRA of Colombia a governing body composed of the minister of the area or his delegate, the national planning secretary or his delegate and the executive director of the entity, who is in charge of operational management.

The powers exercised by the agencies, with some particularities in each country, are of the following nature:

- (i) Policy, usually interpreting or regulating the sectoral Regulatory Framework (RF). In Chile, also the capacity to determine certain professional competences, and regulation (and control) of liquid industrial waste.
- (ii) Regulatory, setting prices and tariffs, and recognizing investment plans under the regulatory regime and existing sectoral planning.
- (iii) Adjudication, only in the case of Chile where the SSS formalizes awards for WSS service concessions.
- (iv) Audit, monitoring compliance with regulations and pricing decisions, expansion and quality which providers have to comply with.
- (v) Sanctions, in relation to infractions detected in audits.
- (vi) Jurisdictional, acting as an appellate body in disputes between users and providers. In the case of Peru, this is part of the work of the regulator (Sunass), an independent administrative tribunal which hears these disputes (the Trass).
- (vii) Promoters, when they have to intervene in the establishment and actions of user committees and their representatives.
- (viii) Mediators, acting as a coordinating agency with other institutional actors with legislative, oversight and disciplinary powers in related matters (offices of health, environment, consumer protection, municipalities, etc.)
- (ix) Advisors, making recommendations to political decision makers (executive and legislative) on policies and sectoral planning.

The financing of regulatory agencies is not uniform. While the Chilean agency is funded only through the general state budget; in Colombia the regulated utilities must pay an

amount to CRA (in charge of economic regulation) and another to the Superintendent (responsible for service quality). Under these limits the quotas are determined according to the size of the providers. In Peru, however, the financial support of the regulator is established as an amount not exceeding 1% of the revenue of each utility. In general, regulators do not have a large staff, given the national scope of these entities (which in most cases there is a need of small offices in several cities): 195 people in Chile, 161 in Peru, and a smaller number in the CRA of Colombia. Seventy percent of staff are professional from various disciplines. Regulatory budgets are austere compared with the importance of their functions. According to their own reporting, in Chile USD 15.5 million, Peru USD 7.0 million, and Colombia USD 8.8 million (only for CRA)

Another important feature relates to the policy of subsidies and municipal participation. While in Chile municipalities identify the beneficiaries in their jurisdictions, based on a matrix of weighted factors, and pay the utilities from national budgetary resources; in Colombia municipalities classify the properties in their area into the strata used for the crossed subsidies scheme. In both cases the regulatory agencies have no control over municipal decisions.

Appropriate regulation requires some essential attributes: independent decision-making; administrative, budgetary and financial autonomy; technical expertise; transparency and accountability. When the agency cannot perform any of its competences (for example, sanctions cannot be applied) or failure or absence of any of the conditions mentioned, regulation, no matter how good the legislative base on which it operates, cannot function. This is the case with many of these entities in LAC.

The problems currently faced by regulators, even in the models presented, include: (i) extension of regulation to providers in small and medium cities; (ii) harmonization of the regulatory system in WSS services with other regulatory and control bodies working in related areas; and (iii) dissociation between the roles of regulatory agencies in relation to the participation of civil society.

### 3.3. PRIVATE PARTICIPATION

Since the early 1990, the invitation to the private sector (PP) to operate WSS services (under various contractual forms) has produced mixed results. PP appeared as a policy response to improve the low-quality services provided by public utilities, with no prospect of sustainability, and an almost total lack of investment. With this backdrop, privatization transactions were designed and executed with an inadequate information base, unrealistic expectations, excessive investment requirements, unclear regulatory rules and procedures, excessive politicization, and the irresponsibility of private businesses which took on unrealistic investment and service obligations, particularly in low-income areas.

Following the early termination of the concession contracts in Bolivia and Argentina (especially in the Buenos Aires metropolitan area) a highly polarized ideological debate took the

center stage of the policy discussion contrasting the advantages and shortcomings of public and private providers. Unfortunately, it called into question the viability of various forms of partnership between the public and private sectors. An assessment by the World Bank concluded that services under private management, including contracts that were forced into an early termination, had achieved a good performance in terms of quality and efficiency, without necessarily leading to higher tariffs (World Bank, 2009). The weakness of the PP program is on the investment side where, except in the case of Chile, commitments were not fulfilled.

The successful experiences include those of Chile, a few cities of Colombia (Barranquilla, Cartagena, Montería, and Santa Marta), Guayaquil, Cuba (in the tourist corridor), Brazil (Limeira, Manaus and a number of medium and small cities), Cordoba (Argentina), and Saltillo (Mexico). By the end of 2011, private participation in LAC's water supply and sanitation sector (excluding mixed capital participation in Sabesp) covers approximately 37.5 million people (8% of the urban population of LAC).

In many cases, the private sector is comprised by local companies engaged in financing, construction, solid waste collection, and technical consulting among others, while the large European companies which pioneered the PP processes in LAC have kept a partial participation in a few concessions: Santiago, Valparaiso, Guayaquil, Saltillo, Montería and Cartagena. In short, private participation, particularly of local entrepreneurs, has shown an added value by improving the quality and security of service. However, in most cases the PP transactions have been designed with mixed financing (public subsidies and revenue generated by tariffs) which have allowed for a gradual and realistic expansion of coverage, especially for the poorest populations.

The positive incentives of private management of public utilities and the lessons learned from the frustrating experiences of the past few years have prompted the search for new organizational arrangements for managing and financing the sector. These arrangements are generally aimed at incentivizing joint ventures with majority state ownership, not excluding the alternative of equity integration. In all cases the operation of the services as a commercial business and stable institutional rules are essential prerequisites. The traditional concession model appears relegated as a feasible scenario for this type of partnership, given the private sector's well known aversion to risk.

Similarly, the risk guarantees designed by multilateral banks have not been appropriate or attractive, given the political constraints related to the public policy decision about contingent liabilities linked to central governments' counter-guarantees, the risks and the long period of maturity that characterizes these transactions. In the case of large infrastructure projects under buy operate and transfer (BOT) arrangements, risk guarantees are more favorable. It should be highlighted, however, that these guarantees have hardly been used in the region.

Recent experiences of new PP transactions include the growing interest of local companies in managing public utility services in medium and small municipalities (between 20,000



and 100,000 inhabitants) in Brazil, supported by soft loans from the country's development banks. Another remarkable model has been the minority incorporation of private equity in Sabesp through flotation of shares on the San Paulo stock market, which other Brazilian state companies are trying to replicate. The experiences of large joint ventures in Colombia (Cartagena, Barranquilla, and Montería) are demonstrating other PP mechanisms which are evolving reasonably well.

### 3.4. CIVIL SOCIETY PARTICIPATION

There is no doubt that community participation has a positive impact on the provision of WSS services because it reduces information asymmetries, limits technical and financial discretionary actions, prevents corruption, helps the social responsiveness to decisions, channels people's concerns and mobilizes conflict resolution. However, for public participation to be effective it must be established through regulatory mechanisms, procedures and institutional measures in order to guarantee public participation in decision making on issues that affect many of their basic rights, starting with the right to life.

Leaving aside operational aspects of the services (claims, information, etc.), the positive legislation in all the region generally contains devices with differing characteristics, which enable the action of civil society and/or individual users of public WSS services. However, as discussed earlier in this paper, effective implementation of the right has so far produced meager results.

The references to the countries with the most efficient regulatory systems identify the main features of the organization and operation of public participation in WSS services (Table 6). A remarkably common note is that in three countries (Chile, Peru and Colombia) user representation requires the strictest political independence, as well as restrictions on any intervention by persons or entities which may have conflicts of interest in relation to the service and its providers.

The characteristics of the schemes described are associated with the general organization and level of administrative and political decentralization of the States, but also with the existing "culture" of social participation. In many countries, public policies in this area neglect the responsibilities reserved for public participation which are: (i) empowering people, users or not, through knowledge, involvement and the exercise of their rights and obligations; (ii) strengthening the negotiation capacity of civil institutions; (iii) promoting universal access and provision of quality services; (iv) disseminating information on operational, economic, financial, environmental and health services; and, (v) participating in decision making on planning, investment, operation and control of services. In the context of these policy objectives of public participation, the Colombian experience offers the most structured approach.

Without doubt, the global recognition of the human right to water and sanitation requires a significant institutional support which recognizes that possibly the most important objective will become the control and monitoring needed to guarantee that these rights are



**TABLE 6. PARTICIPATION OF CIVIL SOCIETY**

<b>Participation civil society</b>	<b>Chile</b>	<b>Peru</b>	<b>Colombia</b>
Nature of participation	Advisory role in the tariff fixing process. Exercise authority over particular, general and diffuse claims	Advice on all matters affecting users (collectively or individually)	Compulsory intervention in control and discussion of tariffs and planning of service providers
Who has the representation	Consumer associations with legal personality. Several may act simultaneously. The same association can act in various public services	Local user councils, territorial and corporate. User councils propose a coordinator to represent them with the regulator. The councils are related to providers through the regulator, subject to consultation or other minor actions	Development and social control committees at level of each provider company
Who are the members of the user body	Natural persons or legal entities members of a consumer association	Only organizations and entities set out in the law participate in the user councils, which must have certain period of existence and legal status	The number of members on each committee is proportional to the population of the area served by the company (real and potential users). The committee elects a representative known as the control member who becomes member of the company board
Governing law	General Consumer Protection Law	Framework Law of the regulatory organization of the State. Organic WSS Service Law	National users' statute. National Law No. 142 of household public services
Organizational list of user representation with the regulator	None	Total dependence. The regulator executes the election process, appoints and removes the coordinator and user councils	The superintendence of sanitation services supervises and assists the committees. The superintendence has the protective and sanctioning authority over those involved in the performance of committees
Organization of user representation	Composition according to the statute of the respective consumer association	Local user councils (3 to 10 members) who work by sector of activity. A coordinator to represent users before the CD of the Controller	The committees are governed by regulations that they themselves approve, noting the organization and internal decision-making mechanism, including appointment and removal of the control member
Financing	Public budget of national consumer service	Budget of regulator. Also with a percentage of the fines applied by the regulator	The budget of the Superintendence of public services partially finances the action of the committees

enforced. To that end, organizations representing users have sufficient legal capacity to represent people without these rights, even before the courts.

### 3.5. INFORMATION SYSTEMS

In the few LAC countries where information plays a basic role in formulating public policies and actions, data is collected from many sources: national and local statistics agencies, WSS service regulators and providers, and other related public sources (watershed bodies, and environmental, health, economy and finance departments, being among the most important).

Although Chile and Colombia have fairly sophisticated information systems, the best model in this area is Brazil's National Sanitation Information (Snis). In operation since 1995, the Snis was initially supported by a WSS sector modernization program financed by the World Bank. The program, which continues to evolve, required an exhaustive effort to design indicators, methodologies, processing systems and other instruments suitable to various categories of providers, along with intensive training (Box 3).

#### **Box 3. NATIONAL SANITATION INFORMATION SYSTEM—BRAZIL**

The SNIS collects material from 97% of the Brazilian delivery system, comprising a 1,730 entities of various social types (public and private providers, joint ventures, micro-regional, municipal and regional state providers) serving universes of very varied sizes.

The Brazilian Federal Sanitation Law (No.11445/2007) devotes a chapter to the National Information System (to be renamed Sinisa), incorporating new tasks, especially description of the facilities available in each location, in relation to projections of demand. The Law requires states and municipalities legal owners or concession holders or delegates of WSS services to supply information and other related actions, with penalties for failure to comply; the most important being to lose contributions from the central authorities.

The SNIS, in addition to national consolidation, generates the following products by provider and by sub-regional sets: (i) separate statistical information on drinking water and sanitation, updated annually. The information includes the following aspects: institutional, administrative, financial, accounting, quality and planning operations, determining benchmark indicators for each category. (ii) General annual sectoral diagnosis, as well as unitary by provider and region. (iii) Water and sanitation and watershed maps.

Information generated by the SNIS is used at central level, state and municipal levels for: (a) public policy planning in the sector; (b) guide for application of fiscal revenue; (c) performance evaluation and monitoring; (d) improvement of management, especially regarding required corrective actions; (e) orientation of regulatory and oversight activity of the owners; (f) contribution for social control; and (g) comparison and measurement of the global and regional performance of the sector.

# 4

## RECOMMENDATIONS

The recommendations emerging from this study relate to two interconnected themes: water service institutions, understood as organization, ground rules and procedures; and the gap in water infrastructure and its financing. However, it should be clarified that lessons learned from institutional arrangements and country cases are in general applicable to LAC. The task of each country is to adapt such lessons to their specific situation recognizing the political, cultural, social and economic characteristics which must be considered.

### 4.1. PRIORITIES FOR INSTITUTIONAL ACTION

Except for Chile, all countries in the region need to make significant adjustments in the areas mentioned. But no country is starting from zero, including Haiti (perhaps the most backward) where there are aspects of organization, delivery of services and financing which could be beneficial. In other words, this document is written in the hope that its recommendations can be transformed into incremental efforts that decisions makers can take to overcome the existing situation.

Each of the policy priorities for key aspects of WSS services is directly and immediately linked to the core issues of institutional organization and financing for the infrastructure required, as outlined in Table 7.

**TABLE 7. PRIORITIES FOR INSTITUTIONAL ACTION**

<b>Public policy priorities</b>	<b>Institutional Impact</b>	<b>Impact on investment and financing</b>
Framework or legislation of institutional organization and regulatory principles of the services. Assigning roles and institutional coordination	This is the instrument that sets the guidelines for organization and provision	The guidelines for sectoral public policies include rules on the tariffs needed to cover all or part of the gap
Regulation of services, as a set of rules based on the principles of economic regulation, quality and expansion	When regulation is applied with reasonable independence in decision making, it is the key to the institutional regime	The regulation must include public policies for recovery of costs and subsidies which help to gradually close the gap
Investments, setting minimum ranges related to national GDP or average income per head	The investments result from institutional rules and the goals they are designed to achieve	The gap is closed with investments that provide integrated solutions for urban water problems

continues

Public policy priorities	Institutional Impact	Impact on investment and financing
Social control, preferably through a participatory decision-making scheme emanating from the regulatory system	Social participation, organized in the aspects of representation, nature and support, is a fundamental part of the institutional scheme of the sector	Community involvement in investment decisions and control of execution contribute to efficient allocation and costs which improve coverage of the gap
Tariffs and subsidies, as expression of sectoral strategies and public policies	Institutions are strengthened by depoliticized tariffs and subsidies resulting from sectoral strategies and targets and technical processes of evaluation of costs and efficiencies, where the provider has a proactive role	Tariffs and subsidies are directly involved in the formation of investment resources
Modern technologies, such as public policy to raise standards of quality and cost efficiency	The incorporation of new technologies, duly evaluated, as a component of economic regulation and quality is the result of a coordinated institutional regime.	Reduce the costs of the gap, and/or times for achieving the goals.
Climate change and environmental issues. Public policy must address institutional coordination in this area and on the actions and goals related to WSS services	Apart from specific regulations emerging from existing institutions, an interactive scheme between sectoral actors and other public agencies involved is essential	The investments related to both questions necessarily integrate the sectoral financial gap
The human right to water and sanitation. Public policy needs to adapt sectoral planning setting new targets for inclusion, especially for the informal population	An additional task for institutional activity, with assignment of specific roles to all actors	To the extent that the exercise of rights favors investment destinations, it reformulates the quantum of the gap, and therefore requires identifying additional sources of financing
Rural water and sanitation. Public policy makes it part of the global situation, always under specific principles. The general principles need to be included in regulations and specific goals	The institutional framework for delivering services to the rural population, based on community involvement, needs regulations that promote and assist such activity, reducing the welfare concept prevalent in most countries	The demands from the rural area create a special gap, whose financing depends on the institutional framework that is established
Information system as part of the institutional regime. All public policies must establish principles to guide their organization and operation	The information level is part of the service institutionality	The gap can only be addressed on the basis of adequate information through integrated and lower cost responses
Functional Responsibility. The State must establish institutional responses to the endemic problem of the region, which is revealed through failure to execute the regulations, and the decisions of existing institutions. As a result, public policy needs to include a chapter on the functional responsibility of institutional actors	The institutional framework does not generate results when actors do not meet their responsibilities	Functional irresponsibility promotes: inefficiencies, delays, waste, incorrect designs, corruption and low productivity

Priorities related to public policies that appear in each section of the first column can be seen as a baseline of reference for structuring a process of sector reform. The legislation to be prepared is a necessary condition, in specific aspects, but is not in itself a sufficient condition. Only political will can transform the advances conceived on paper into reality.

Starting from the baseline, the process would involve carrying out a logical sequence of actions, namely: (i) inventory of the situation, with reference to the areas mentioned, highlighting the cases of existence, confusion, overlap, lack of competence, actions, and other institutional characteristics of the current situation; (ii) design of sectoral reorganization scenarios and assignment of roles; (iii) creation of instruments; (iv) setting sectoral targets; (v) setting goals for delivery of services; and (vi) establishing a timetable for implementation.

Other considerations relate to management of infrastructure projects: who authorizes, who executes and who audits? In practice there are a variety of alternatives on offer, and others not yet explored in the public works area – such as trusts/mandates. However, monitoring and control of execution should be the task of the regulatory body, provided it has sufficient capacity to enforce its decisions.

#### 4.2. THE URBAN INFRASTRUCTURE DEFICIT AND ITS FINANCING

The financial gap to close the deficit of water infrastructure has been estimated at USD 250 billion, equivalent to USD 12.5 billion in water investments per year (CAF, 2011). Closing such investment gap would translate into universal coverage of water and sewerage services by 2030, as well as reaching other goals related to wastewater treatment, increase of storm water drainage services, increase capacity of water sources to supply incremental population, adequate provision of water and sewerage in slum areas, and renovation and rehabilitation of existing infrastructure.

Annual water investments of USD 12.5 billion seems unattainable when compared with the current annual average volume of investment of about USD 4.4 billion, which are dedicated almost exclusively to expanding coverage of water and sewerage networks. In general, current investment programs are not including the development of sources, pollution control, and infrastructure renovation and rehabilitation. Moreover, some of the largest investment deficit relates to fixing water and sewerage connections in slums, and expanding trunk infrastructure and collectors for stormwater, while implementing non-structural measures.

In contrast, an annual water investment requirement of USD 12.5 billion appears to be feasible with the combination of the following policy decisions: (i) government assigns a high priority to fiscal budget allocations to sanitation linked to the social and economic impact on poverty ; (ii) strengthening the institutional framework within an integrated approach to urban water problems to facilitate the interactions needed to achieve the desired level of investment; (iii) existence of tariffs and subsidies which guarantee margins of revenue to cover the infrastructure gap; and (iv) size and efficient implementation of projects.

The distributive allocation that is recommended for different sources of financing is presented in Table 8. Tax revenue source would not allocate more to the WSS sector, in aggregated terms, than the actual amount. A look at the annual figures that governments spent in the sector leads to believe that higher nominal amounts would not be required. With respect to transfers of public funds, emphasis should be put on finding the right balance between development objectives of efficiency, equity and transparency.

**TABLE 8. FINANCING OF INVESTMENTS IN RELATION TO GDP**

<b>Item</b>	<b>% 2010 GDP</b>	<b>Comment</b>
Operational cost	0.5	Based on data from Chile, Colombia and Brazil
Investment in WSS and wastewater treatment	0.2	Includes expansion, renovation and rehabilitation
Other investments in water	0.07	Includes urban drainage and expansion of drinking water sources
Formalization of household connections	0.04	Reduce deficit by 50%

Source: Prepared by the author.

With respect to tariffs, it has already been explained that part of the investment needs should be financed by the revenue generated by utilities. In general, when a system recognizes a difference of around 30% between operating costs and revenue, there is a margin to support a reasonable capital investment program. Except for Chile, in a few cities of Colombia and in a few other cities in the region such a margin is not reached. Moreover, without proposing major changes in the structure of tariffs, which are resisted when not accompanied by significant improvements in the quality and extent of services, the search for financial margins should be clearly directed to: (i) recovering basic management efficiencies; (ii) reviewing the subsidy policy; and (iii) correcting perverse tariff distortions. There is, however, room for improvement on all these fronts.

The margins of inefficiency are large. Reducing inefficiencies in collecting revenue, improving labor productivity and reducing non-revenue water through gradual improvements would provide an extra annual sum of USD 5.8 billion, as shown in Table 9. Efficiency-target indicators are widely used for similar estimates in many countries, allowing comparisons based on standardized definitions. Benchmarks such as collections under 100%, economic losses associated with a range of NRW between 20-30%, and lower labor productivity, may be useful tools for quantifying intermediate targets and goals in a realistic way, including financial resources and periods needed to achieve them.

**TABLE 9. ANNUAL COST OF INEFFICIENCY**

<b>Hidden cost</b>	<b>USD billions</b>	<b>Benchmark</b>
Over staffing	1.82	1 employee per 500 connections
Non-revenue water	1.91	NRW = 20%
Arrears	2.05	Collection 100%
Cost of inefficiency	5.78	

Source: prepared by the author.

With respect to subsidies, the normal standards should be used to define the capacity to pay of low-income households. Many countries show in their tariff structure sufficient margins to increase revenue, given the presence of indiscriminate subsidies. Others have kept their tariffs frozen at nominal prices for many years, as if an adjustment for inflation was a real increase.

Increased revenue must also come from implementing of a subsidy system targeting demand with a more equitable relation to users in the lower income brackets. Excluding the subsidy systems of Chile and Colombia which require municipal cooperation almost impossible to achieve elsewhere, the cross-subsidies that apply in almost all countries, as well as general subsidies (political tariffs) require revision. The cross-subsidy system –of different nature and magnitude– is a second best for economic orthodoxy, but it is part of the culture and the financial reality of the region. While it is true that the socioeconomic profile of LAC places a majority of the population in the lower quintiles, it is clear that the distribution of the increased in GDP in the countries has privileged the most favored social sectors, widening the gap between rich and poor. The tariff system, in particular the tariff that governs cross-subsidization of WSS services, has not yet incorporated this reality. There is therefore an intrinsic need for social justice in favor of subsidies to adjust the targeting criteria, eliminating the existing distortions of inclusion and exclusion, while restricting the benefits enjoyed by many users who do not need them.

A gradual review of the current subsidy structure would generate additional revenue of over 20% of the current figure (approximately USD 4.2 billion). In this case, greater efficiencies coupled with correction of the subsidy system would make it possible, with no major constraints, to achieve the financial resources required to cover the gap whose financing should be borne by the services themselves.

### 4.3. FINANCING FROM MULTILATERAL SOURCES

Multilateral banks (CAF, IDB, and IBRD) have been steadily increasing the financing granted to the region. The loans approved in the last six years average about USD 2.047 billion per year for projects whose execution is over four or five years. In the case of CAF, average annual approvals for WSS projects is USD 350 million; a figure which increased from USD 158 million to USD 720 million between 2006 and 2010. By comparison the aggregate commitments of international financial institutions in 2000 were about USD 950 million.

When these figures are added to the financing granted by Brazil's development finance institutions (BNDES/CEF) and Mexico's (Banobras), it could be argued that sufficient funds are available for a large portion of the aggregated regional needs estimated in this document, taking into account that water investments outside the WSS sector will be directly financed through fiscal allocations.

The IDB structures its assistance under a programmatic scheme which includes: (a) the situation of the poorest cities, larger than 50,000 inhabitants; (b) sanitation in rural areas and small towns; (c) environmental protection (pollution management, treatment, etc.); (d) promotion of efficiency and transparency, including institutional aspects; and (e) climate change. This arrangement is appropriate provided that each area plays its part under an all-embracing and integrated approach to address water issues.

CAF proposes an integrated approach to conservation, use and disposal of water, so that each component of the water cycle becomes part of a process that incorporates planning, management, regulation, treatment and conservation of water resources under a watershed approach, with the aim of maximizing the social, economic and environmental benefits in an equitable and sustainable way.

In more specific terms, the components of this process include evaluation of water sources, protection of aquifers, adequate consideration to environmental services of aquatic ecosystems; productive use of water and soil resources, including irrigation, industrial uses and human consumption; construction, expansion or rehabilitation of WSS systems in terms of equity, quality and administrative and operational efficiency; collection and disposal of rainwater, and wastewater collection and treatment systems.

Within this framework, CAF promotes and supports its shareholder countries in financing and preparing studies, projects and investment programs to improve the quality of life of the population, through four lines of action: a) watershed management and protection; b) irrigation and agricultural development; c) drainage and flood control: climate change; and d) water supply and sanitation.

In light of the diagnosis and priorities highlighted in this document, multilateral banks face renewed challenges in relation to the focus and priorities of their assistance. These challenges can be grouped into several categories: (i) Distribution of loans - at present in each operation 45% usually goes to infrastructure investments, and the rest to “modernization”, “planning” and other related items of technical assistance whose results need to be optimized, based on the required institutional priorities. Projects should never be satisfied with adjustments to formalities, but with actions in favor of the designed institutional improvements; (ii) Identification of priorities, adding essential demands related to climate change, the integration of water solutions in slums, and addressing the specifics of rural areas, respectively; (iii) The type and size of infrastructure projects and also operational management to break rigidities which close the way to incorporation of new technologies; and (iv) The overall value allocated to the sector, which needs to be strengthened in parallel with promotion of essential institutional adaptations to allow the effective participation of WSS services in the fight against poverty and environmental degradation.

Likewise, these same challenges require some adaptation of capacities at the level of specialized national and international agencies, as well as finance institutions, so that together they can make an effective contribution to the debate on public policies and sectoral strate-



gies, broadening the dialogue to a varied audience of actors, including civil society, private sector and other levels of the public sector. These capacities are coupled with a renewed emphasis on the need for information as the basis for decision making, support for medium - and long-term planning, assistance to promote the design and efficient implementation of projects and the effective safeguarding of the environment by internalization of the social and environmental impacts of investment projects.



## CONCLUSIONS

Latin America is in a privileged position to substantially raise the quality of life of its low income population and reduce environmental degradation over the next two decades. This optimistic view is solidly grounded on the main advantages and opportunities of the region: strong economic growth (ECLAC projects GDP growth of 4.3% per year for the next few years); sound economies with low inflation, monetary stability, and manageable public debt; healthy demographics in terms of growth rates and age distribution; a continent with no major ethnic or religious conflicts and minimal territorial disputes; and an increasingly competitive private sector both regionally and globally. In addition the continent has abundant natural resources: forests, soil, water, mining; all with increasing added value on the international market for raw materials and agricultural products as well as fossil fuel (gas and oil) and renewable energy resources.

To achieve and sustain high levels of development, Latin America must overcome major obstacles, including: the enormous and inexcludable level of inequity and social exclusion; weak governance characterized by violence, high crime rates and drug trafficking; institutional weakness and lack of public policies that guarantee transparency, reduce corruption, promote effective accountability, economic efficiency and social equity; and the poor quality of education at all levels, reflected in low results in international comparisons, and finally the negligible level of research and a low number of patents, all of which ill prepare the region to compete effectively in the 21st century.

In relation to the link between water supply, basic sanitation, and sustainable water development, Latin America needs to make a commitment to a strategy for the integrated development of water to deal successfully with large imbalances between demand and availability of water, reverse acute environmental degradation, and reduce vulnerability to natural disasters, while effectively adapting to climate change.

These challenges are particularly urgent for a region with 8.5% of the world population and 33% of global water resources (FAO, 2009). At the same time in spite of the relative abundance of water, it is not only asymmetrically located in space and time but also in relation to the availability of water resources as regards the location of population and economic activity.

In terms of collective and household services of water supply and sanitation, apart from declarative coverage rates, all countries in the region must substantially improve the qual-

- *There is a reasonable understanding of the problems that afflict the water sector, the best policies and successful practices in Latin America.*
- *With annual investments equivalent to 0.3% of GDP and substantial improvements in sectoral governance; Latin America can close the coverage gap of water supply and basic sanitation services in the next 10-20 years*

- *Improved governance of water is essential if investments are to have the desired impact and cover existing infrastructure deficits*
- *These actions should be framed by an integrated (and inclusive) approach comprising water resources and all water services, urban development, care for the environment and internalization of climate change.*

ity of delivery of such services because they disproportionately affects the poorest and most vulnerable population. Lastly, the public policy practice of low and unpredictable rates of investment in infrastructure must be reversed, so that quality services can be delivered to all while maintaining major infrastructure assets with sustained programs of rehabilitation and renewal.

To achieve the development goals of the water sector in the LAC region, governments must take decisions on policies, institutions and investments at various levels which generally go beyond the mandate and responsibilities of water management agencies. Commitments are particularly needed from planning and finance ministries, legislative bodies, and local governments; with the effective participation of civil society. Without these commitments, sustainable improvement and expansion of urban water services including: water supply, sewerage, wastewater treatment, urban drainage and protection of sources of supply will not be possible

CAF is aware that policy, institutional and investment decisions about water are largely in the hands of decision makers outside the water community. Consequently, the dialogue at the level of politicians and lawmakers to be held in Marseille in March 2012, apart from the technical discussions, of primary importance to reaffirm commitments that are essential to achieve the ambitious goals that have been set for the water sector at the global and country levels.

CAF offers a realistic proposal for sectoral goals the period 2010-2030, supported by an estimate of the associated costs, the public policy framework and the governance needed to make them sustainable, based on the experience and good practices of the region. Achievement of these goals would take Latin America to levels of WSS service comparable to those of developed countries.

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