

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

WATER AND SANITATION SECTOR FRAMEWORK DOCUMENT

WATER AND SANITATION DIVISION

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ABBREVIATIONS

BES	Biodiversity and Ecosystem Services
CAESB	Companhia de Saneamento Ambiental do Distrito Federal
CAF	Andean Development Corporation
COPASA	Companhia de Saneamento de Minas Gerais
DEM	Development Effectiveness Matrix
ECLAC	Economic Commission for Latin America and the Caribbean
ESCI	Emerging and Sustainable Cities Initiative
ESG	Environmental Safeguards Unit
GCI-9	Ninth General Increase in the Resources of the Bank
HRWS	Human right to water and sanitation
IPCC	Intergovernmental Panel on Climate Change
IWRM	Integrated water resource management
LAC	Latin America and the Caribbean
MDG	Millennium Development Goal
NTD	Neglected Tropical Disease
O&M	Operating and maintenance
OECD	Organisation for Economic Cooperation and Development
OVE	Office of Evaluation and Oversight
PBL	Policy-based loan
PCR	Project Completion Report
PPP	Public-private partnership
SABESP	Companhia de Saneamento Básico do Estado de São Paulo S.A.
SEDAPAL	Servicio de Agua Potable y Alcantarillado de Lima
SFD	Sector Framework Document
SFW	Spanish Cooperation Fund for Water and Sanitation in Latin America and the Caribbean
UN	United Nations
UN-HABITAT	United Nations Human Settlements Programme
W&S	Water and sanitation
WOP-LAC	Water Operators Partnerships in Latin America and the Caribbean
WSA	Water and Sanitation Division
WSI	Water and Sanitation Initiative

I. THE WATER AND SANITATION SECTOR IN THE CONTEXT OF THE BANK'S SECTOR STRATEGIES

A. The Water and Sanitation Sector Framework Document¹ as part of existing regulations

- 1.1 This Sector Framework Document (SFD), prepared in accordance with the “Strategies, Policies, Sector Frameworks and Guidelines at the IDB” (document GN-2670-1), describes the Bank’s goal and provides guidance for its work in knowledge generation, country dialogue, and the design and implementation of operations (both for loans and for technical cooperation) in the water and sanitation (W&S) sector. The Water and Sanitation Sector Framework Document provides the Bank with specific guidance on its lines of work and actions in this sector, while allowing flexibility to address the diversity of challenges and the institutional, political, and economic contexts facing its 26 borrowing member countries, with guidelines for the financing of sector operations with and without sovereign guarantee. As its objective is indicative rather than normative, its application, both in the design and in the execution of operations, will take due account of each country’s particular circumstances and specific needs.
- 1.2 The Water and Sanitation Sector Framework Document covers the seven elements that are to be contained in the sector framework documents. Once it is approved, the Strategy for Integrated Water Resources Management (document GN-1908-4) will cease to have effect, as will the Basic Environmental Sanitation Policy (operational policy OP-745). The policy for Maintenance and Conservation of Physical Works and Equipment (operational policy OP-707) will cease to have effect once all the proposed SFDs have been approved (see paragraph 2.19). The nonregulatory aspects of these policies that are deemed relevant have been incorporated into this document, as indicated in document GN-2670-1. Many of their relevant regulatory aspects are reflected in the Public Utilities Policy (operational policy OP-708). The Bank will prepare an update of this SFD three years after its approval. This SFD is supplemented by the Health and Nutrition, Housing and Urban Development, and Agriculture and Natural Resources Management SFDs, which have already been approved, in aspects including water-related diseases, behavioral changes, land management, and a multisectoral approach. In addition, this SFD will be supplemented with the Gender and Diversity, Tourism, Climate Change, and Environment and Biodiversity SFDs, which have yet to be approved, in aspects such as basic services for tourism activities, a gender approach, and integrated water resource management.

B. The Water and Sanitation Sector Framework Document as part of the Bank’s Infrastructure Strategy for Competitiveness and Inclusive Growth

- 1.3 The Water and Sanitation SFD is aligned with the principles and priority areas in the Strategy for Sustainable Infrastructure for Competitiveness and Inclusive Growth (document GN-2710-5), the objective of which is to implement one of the priorities

¹ For purposes of this document, water and sanitation is understood as an economic sector comprising services for the delivery and supply of water for human consumption (catchment, conveyance, treatment, storage and distribution, including integrated water resource management), sewerage (collection, treatment, and disposal of wastewater and stormwater), and solid waste (collection, handling, and final disposal).

established in the Ninth General Increase in the Resources of the Bank (GCI-9).² This strategy establishes as a principle the promotion of infrastructure that will contribute to economic growth through universal access to services such as water and sanitation, development of innovative financing mechanisms, and promotion of private sector involvement. In addition, by treating infrastructure as a means to provide services of adequate quality, it proposes a new vision in which infrastructure is planned, built, and maintained within an environmentally and socially sustainable framework, with better governance, greater efficiency, and an emphasis on multisector programs. The Water and Sanitation SFD is also aligned with the Integrated Strategy for Climate Change Adaptation and Mitigation, and Sustainable and Renewable Energy (document GN-2609-1), as it seeks to contribute to the institutional priority of protecting the environment, adapting to climate change, and promoting food security as established in the GCI-9.

- 1.4 In line with these strategies, the Water and Sanitation SFD seeks to support countries in their efforts to: ensure universal access to sustainable, high-quality services (in terms of their efficiency of delivery and the quality of service provided); enhance water security by increasing the coverage of wastewater treatment; improve the protection of supply watersheds and reduce the risks of flooding; and strengthen the governance of the sector. Bank activities will be guided by the following principles: (i) expanding access to services for low-income and vulnerable population groups, promoting their sustainability, efficiency, and quality; (ii) promoting comprehensive solutions (going beyond the provision of infrastructure to include actions that will improve management and efficiency levels in the delivery of services, and ensure their technical, environmental, social, economic, institutional, and financial sustainability); (iii) improving coordination with other sectors (social, health, climate change, urban development, etc.) and promoting integrated interventions in those sectors in order to produce greater social and economic impacts; and (iv) incorporating the concept of water security in the W&S sector, in order to ensure that resources are available in the quality and quantity needed for all uses. These principles are aligned with the Public Utilities Policy (operational policy OP-708).
- 1.5 This document is divided into five sections. Section II presents the findings from international evidence on the effectiveness of policies and programs in the water and sanitation sector, as the basis for mapping out this SFD. Section III identifies the region's principal successes and challenges in the sector.³ Section IV presents the lessons drawn from the sector evaluations by the Office of Evaluation and Oversight (OVE), the Development Effectiveness Matrix (DEM) for recent projects, project completion reports (PCRs), and analyses performed with the Bank's Knowledge and Learning Sector on operations in execution. It also analyzes the Bank's comparative advantages for addressing countries' needs in water and sanitation. Lastly, Section V presents the dimensions of

² The objectives of the GCI-9, which are consistent with the region's long-term development needs, are to reduce poverty and inequity, to respond to climate change, and to promote integration.

³ Sections II and III are grouped around six themes that international evidence shows to be especially important for ensuring the sustainability of services: (i) access to and quality of water and sanitation services; (ii) sector governance; (iii) financial sustainability; (iv) utilities management and private participation; (v) social considerations; and (vi) environmental and climate change considerations.

success, lines of action, and concrete activities in water and sanitation that are proposed as priorities for the Bank in working with countries over the coming years.

II. INTERNATIONAL EVIDENCE ON THE EFFICACY OF POLICIES AND PROGRAMS IN THE SECTOR AND IMPLICATIONS FOR THE BANK'S WORK

- 2.1 The positive relationship between water and sanitation (W&S) availability and health is amply documented.⁴ Worldwide, 88% of infectious childhood diseases are linked to the lack of water and sanitation,⁵ and 61% of child mortality can be traced to diarrhea caused by intestinal parasites.⁶ The high incidence of diarrhea is associated with high levels of malnutrition,⁷ which can result in high levels of anemia and low levels of early cognitive and psychomotor development and physical growth in children,⁸ thus affecting their capacity to learn. Ensuring access to water and sanitation is one of the most efficient mechanisms for avoiding these effects. Better health will be reflected directly in better levels of education (reducing nonattendance and increasing the capacity to acquire knowledge) and greater productivity, which in turn will offer access to better employment opportunities, higher incomes, and a better quality of life,⁹ thereby contributing to the countries' economic growth and development.¹⁰
- 2.2 Beyond the impact on health, access to W&S services creates opportunities for the development of nonproductive (recreational) activities, especially for women and children, who are most affected by the lack of services, as well as productive activities (tourism, regional and urban competitiveness). Moreover, a lack of sanitation (treatment of wastewater and proper disposal of solid waste) can generate significant negative externalities if it has an adverse impact on biodiversity or if it reduces the availability of sufficient volumes of water that is safe for human consumption or for productive and ecological uses. In addition, given the great economies of scale in the delivery of these services in urban areas, a situation of natural monopoly can arise, leading to inefficient and inequitable service.¹¹ These sector characteristics demand proactive, continuous, and effective government intervention to correct them and to ensure maximum benefit at minimum cost for society, by taking action on the following aspects.

⁴ Galiani et al. (2005); Galdo and Briceno (2004); Arnold and Colford (2007); Waddington et al. (2009); World Bank (2013); Moraes (2003), Barreto et al. (2007).

⁵ Black et al. (2003).

⁶ Mascarini et al. (2009); Ahs et al. (2010).

⁷ World Bank (2008a).

⁸ Humphrey (2009), Fewtrell et al. (2005).

⁹ World Bank (2013).

¹⁰ Agénor (2013).

¹¹ Noll (2002).

A. Access to and quality of service

- 2.3 *Closing the coverage gap in water and sanitation services.* During the course of this century to date, countries of the region have made great efforts to expand the coverage of W&S services, in part through adoption of the Millennium Development Goals (MDGs), which call for reducing by half the water and sanitation deficit from 1990 to 2015. Relatively recent data (2011)¹² for Latin America and the Caribbean (LAC) show that overall this goal has been achieved in terms of water, with accessibility slightly higher than the 93% called for, while in sanitation the coverage rate is 82%, against the 84% target. However, those aggregates conceal enormous inequities between countries, between urban and rural areas, and with the region's poorest population (see paragraphs 3.2 to 3.7); achieving universal coverage by 2020 would require adding water services for approximately 95 million persons and sanitation services for some 170 million. Achieving universal access¹³ and, particularly, adequate standards of service and quality (potability, continuity, and adequate pressure) remains a major challenge for the region, one that has led institutions¹⁴ and academics¹⁵ to call for boosting public expenditure in W&S, and one that must be reflected as a priority in the Post-2015 Development Agenda—a new framework of priorities to be adopted by the United Nations (UN) as a replacement for the MDGs. Along the same lines it is keyed to the UN's declaration that access to water and sanitation is a human right, incorporating aspects such as actual availability of water, minimum levels of consumption, quality, continuity, proximity and affordability, and the need to incorporate segments of the urban and rural fringe population.
- 2.4 Those countries that are close to achieving universal coverage in W&S have adopted such practices as:¹⁶ (i) giving priority to investment in the sector over many years;¹⁷ (ii) formulating special programs to serve vulnerable and less accessible population

¹² For details on data relating to the MDGs for Latin America and the Caribbean, see Soulier et al., 2013. Data worldwide and by region is available in WHO-UNICEF (2014) and show in the rest of the world patterns in growth of coverage that are similar to those found in LAC.

¹³ Universal access means that 100% of the population has access to drinking water and sanitation services.

¹⁴ World Bank (2005). In particular, the low coverage and poor quality of sanitation service can have impacts on health, nutrition, and possibly child development, education, the environment and activities such as tourism, as well as increasing the likelihood that girls will drop out of school or be victims of aggression when they seek privacy. Lack of access to water is said to cause the death of 4,000 children, and losses of up to 7% of gross domestic product annually.

¹⁵ Sachs (2005) and (2008); Agénor (2013).

¹⁶ Some elements similar to these practices are seen in the experience of Africa, particularly in rural areas, even though service delivery conditions on that continent are much more precarious than in LAC. See Ghosh and Morella (2011), Chapter 9. Moreover, the experience of several regions in Asia highlights similar practices to those outlined in this document. See, for example, the case of Southeast Asia and the Pacific in Willetts et al. (2008), and for Asia overall, ADB (2013). For the challenges and practices of countries in Eastern Europe and Central Asia, essentially regarding equal access, see UN-WHO (2012), and regarding obsolete, oversized infrastructure, see OECD (2011).

¹⁷ For example, Brazil, Chile, Colombia, and Peru.

segments, such as those in rural and periurban areas;¹⁸ (iii) providing sanitation solutions in projects that involve water connections; (iv) paying special attention to these segments to ensure their connection to the systems, and as service users (for example in Medellín or Greater Buenos Aires),¹⁹ including in-house connections; (v) including W&S connection aspects in programs for neighborhood improvement or regularization of settlements (e.g. Montevideo); and (vi) revision of technical regulations governing service design and standards for periurban areas, small towns, and rural communities (Chile, Haiti).

- 2.5 **Good practices in rural areas.** Some of the policies with the greatest impact promoted on various continents by countries facing major coverage challenges have been to give priority to formulating policies, plans, and programs aimed at serving the rural population both in small towns and remote areas. In our region, the Spanish government's initiative to create the Spanish Cooperation Fund for Water and Sanitation in Latin America and the Caribbean (SFW) has revived governments' interest in addressing this segment of the population, which has been left behind in recent decades, and has been an excellent example in the community of donor countries of a large-scale cooperation program.
- 2.6 In particular, the approach to be used in rural sanitation is a question that is currently under study,²⁰ however based on international experience it involves the following main considerations: (i) the type of solution to be proposed is generally an individual one (not a networked utility), in which the user/beneficiary has a strong say in deciding on the most appropriate solution from the range of available technical solutions; (ii) only solutions actually demanded by the population, including payment capacity consideration, can be sustainable over time and effectively used by the population;²¹ and (iii) creating demand, providing education in hygiene, and promoting the local supply of solutions appear to be decisive elements of the proposed actions.
- 2.7 **Complementing the focus on access with service quality.** Beyond access, the international community is increasingly concerned with the quality of services, partly because of the pressure of demand by the growing middle class.²² In the region there are frequently problems with the potability, continuity, volume, and pressure of the water delivered, with the effective functioning of the sewerage system and wastewater treatment plants, and with improper disposal of solid waste in water bodies, sewers, or onto the ground. In addition, the standards of access to service used by the United Nations in the

¹⁸ Service quality aspects have figured prominently in the discussion of goals for the Post-2015 Development Agenda, and it is highly likely that new concepts will be incorporated for measuring access indicators. Reducing inequity in service delivery also appears to be essential. See WSSSC (2014) and WHO-UNICEF (2014).

¹⁹ See AySA, 2014 for the case of Buenos Aires, and United Nations (2012) for examples in Bangladesh, Angola, Manila, Dakar, and some cities in India.

²⁰ ECOPSIS (2014).

²¹ This is of particular importance when the beneficiaries are indigenous communities.

²² See SISS (2012).

MDGs²³ are considered too lax in the LAC context (in urban areas household connections are considered the standard, while in rural areas only, household connections, septic tanks, and some types of latrines are acceptable). As this aspect may be overestimating the real level of access to service, supplementary indicators are needed to verify that the population is actually receiving service with the expected quality. Effective practices in this regard include: (i) establishing a clear definition, in regulations and regulatory frameworks, of the expected quality standards, distinguishing as far as possible between urban, periurban, and rural areas (including small towns and remote areas);²⁴ (ii) introduction of information and monitoring systems for these indicators (as in Chile, Colombia, Peru, Brazil, and other countries);²⁵ (iii) legal and administrative tools to ensure that operators are compliant (as in Chile, Colombia, Peru, and other countries);²⁶ and (iv) shifting from an approach focused on investments in works to one focused on service delivery and quality.²⁷

- 2.8 **Coverage of wastewater treatment.** It is estimated that only around 15% of urban wastewater in the region is treated before being discharged into rivers, lakes, or the sea.²⁸ This has led to a deterioration in the quality of water bodies, limiting their sustainable use. Good practices in this area entail, first, giving priority to the issue from the viewpoint of investments, which take several years to implement.²⁹ Associated with this is the issue of financing, with reference models such as the following: (i) in Mexico, treatment coverage has risen to 48%,³⁰ with a significant direct injection of budgetary funds from the federal and state governments (a similar scheme has been used in Brazil,³¹ and in developed countries in North America and Europe); (ii) financing with rates that over the long run will cover investment costs (such a system is used in Chile, where it includes the private sector as a central player and has achieved 100% urban treatment coverage); and (iii) various

²³ The MDGs consider the following to be safe or improved sources of drinking water: piped water services and other sources protected from external contamination, such as public taps or standpipes, piped wells or boreholes, covered dug wells, and rainwater collection. Improved sanitation refers to facilities that prevent human contact with human waste, such as toilets/latrines with cisterns or siphons with a connection to a sewerage system, a septic tank, or a pit latrine; ventilated-improved pit latrine; pit latrine with slab; and compost latrine.

²⁴ In urban areas, all countries of the region have resolved this issue. In the countryside there is an important gap, and other parts of the world are experimenting with a “service ladder” as a gradual approach to improvement. WashCost (2010).

²⁵ An effort is under way in Paraguay, El Salvador, and Honduras using SIASAR for comprehensive monitoring of rural systems, as a step prior to defining policies and interventions for improvement. Smits et al. (2013).

²⁶ Statistics from the regulatory bodies in these countries show that quality indicators have improved significantly over time (see annual reports of SISS in Chile, CRA in Colombia, and SUNASS in Peru).

²⁷ Van Koppen et al., 2009 for case studies on multipurpose water services in Ethiopia, Nepal, Zimbabwe, Bolivia, India, Colombia, Thailand, and South Africa.

²⁸ Jouravlev (2004). In North America this coverage is 90% in urban areas.

²⁹ In Chile, coverage jumped from 12% in 1994 to 100% in 1998. Montevideo has since the mid-1980s been pursuing a successful program to clean up its Bay, in a series of stages as financing becomes available.

³⁰ See de la Peña et al. (2013).

³¹ See in particular the Growth Acceleration Program (PAC) <http://www.pac.gov.br/>.

forms of public-private partnership under which costs and risks are shared between the State and the private sector (Mexico, Colombia, and Brazil).³²

- 2.9 **Water security for sustainability.** In this document, water security refers to the possibility of access to sufficient quantities of water to meet the diversity of uses, preservation of quality in the face of wastewater discharges, and consideration of climate change in infrastructure planning, regulation of flows, and management of flooding and natural disaster risks. Secure access to water sources is very important for the sustainability and the expansion of W&S services. While the region is considered to have a surplus of water resources,³³ there are some countries where their level is very low, especially the islands of the Caribbean (Bahamas, Barbados, Haiti, Dominican Republic, Trinidad and Tobago, and Jamaica) as well as regions such as the Northeast of Brazil, the North of Mexico, and the Pacific coast of Peru and northern Chile. In addition, water availability is affected by its quality, which may be compromised by pollution from the dumping of urban wastewater and from manufacturing, mining, and agricultural activity. Successful practices in this area are now appearing in the region and around the world, and are generally focused on:³⁴ (i) a paradigm of integrated water resource management (IWRM); (ii) integrated planning of urban drainage works; (iii) incorporation of water bodies into the urban environment; and (iv) proper handling of solid waste which, beyond its impact on health and the environment, can often compromise the functioning of the storm water and sanitary sewerage system.
- 2.10 **Water and climate change.** Another issue related to water security is the impact that climate change may have on the continuous availability of the resource, and the risk of natural disasters such as hurricanes and flooding.³⁵ LAC, of all regions, is the most vulnerable to natural disasters,³⁶ and its poorest population segments are those most affected.³⁷ Rapid and unplanned urbanization in risk-prone areas, environmental degradation, and faulty governance are factors associated with the rising impact of natural disasters.³⁸ Part of this problem, particularly as it relates to the risk of flooding, is due to the lack of attention paid to urban drainage in the region.³⁹ Best practices in this area include: (i) conducting studies that will improve understanding of climate change and its specific impact in the region, at the territorial level and among different sectors of economic

³² An analysis of international models of public-private management in delivering water services (including wastewater treatment) is available in Marín (2009).

³³ The average per capita availability of fresh water amounts to some 63,000 m³ per year, well above the minimum level set by the United Nations as representing water stress. See data in the Food and Agriculture Organization (FAO) Aquastat database.

³⁴ For Asia's experience in this area, see ADB (2013).

³⁵ World Bank, 2011.

³⁶ IDB (2013). With the world's highest average economic losses per disaster, at 0.18% of GDP (EM-DAT Emergency Events Database, no date).

³⁷ IDB-ECLAC (2000); World Bank (2003).

³⁸ IDB (2013).

³⁹ Dourojeanni and Jouravlev (1999).

activity;⁴⁰ (ii) inclusion of climate change considerations in W&S master plans and infrastructure design standards; and (iii) studies to identify appropriate adaptation and mitigation measures.

B. Sector governance⁴¹

- 2.11 **Separation of functions.** A central paradigm in the provision of public utility services refers to the need to identify and assign to different entities the functions and powers of the State in the sector, and to keep them clearly separate. It is considered essential that operators should concentrate on delivering services, and that other entities should be responsible for supervising the sector, issuing standards and regulating services. This model has been successful in Chile and Colombia, and has made good progress in Peru and to some extent in Honduras. Its origins can be traced back to the reforms of the 1980s in England, which have also been applied successfully within the region in the energy and telecommunications fields, and other public network services.⁴² Experience indicates, however, that this concept has not necessarily been successful in all countries of the region that have attempted to apply it, and in general each country must develop a tailor-made model of organization. Although these topics are still matters of ongoing debate, the following elements can be cited as essential for considering this paradigm a good practice:⁴³ (i) the success of sector reforms will depend on the specific context, in terms of the quality of State institutions, including the legislative and judicial branches; (ii) a country's macroeconomic stability; (iii) a real political will to transfer power among State institutions; (iv) the quality of the institutional environment in terms of formulating public policies and the effectiveness with which they are carried out; (v) the degree of a country's real commitment to the new institutional framework; and (vi) the degree of interference in the management of institutions by private interests (labor unions, bureaucracies, politicians, private contracting firms, etc.).
- 2.12 **Strengthening governance in oversight.** Among the central functions of the State in W&S are establishing guidelines for development of the sector, setting policies and standards, overall planning, information and monitoring systems, allocating resources for financing investments, and decision-making on the management modality for the services. Countries that have succeeded in this area (in particular Colombia and Peru) have followed good practices in the sector and have institutions that operate under a clear legal framework and mandate, with significant budgetary resources, qualified personnel, and a senior ranking within the structure of the State—elements which determine the sector's priority on the countries' public agenda and in the allocation of resources. This contrasts with

⁴⁰ See for example the ECLAC studies (2009) in Chile.

⁴¹ In this document, "sector governance" refers to the elements associated with the definition and application of public policies, the role of institutions, and regulatory and legislative frameworks. Krause (2009).

⁴² Since the 1990s, with support from multilateral banks, a number of countries in the region (and around the world) have undertaken reforms based on the principles of subsidiarity of the State, incorporation of private operators, creation of regulatory frameworks, and separation of roles.

⁴³ See in particular Hantke-Domas and Jouravlev (2011). Regarding reforms in the countries of Eastern Europe and Central Asia, see OECD (2011).

experience in other countries that do not have an effective oversight body (Guatemala, Panama, and others).⁴⁴ It is particularly important to recognize the special requirements of the rural sector, for which specialized oversight bodies are needed.⁴⁵

- 2.13 **Strengthening governance in regulation.** A significant theme in the reforms of the 1990s was to put the economic regulation of public services in the hands of agencies that are autonomous and independent of political control. Such agencies have been established in most countries of the region, but they have been particularly successful, especially in rate-setting issues, in Colombia and Chile, and to a certain extent in Peru and Honduras. The lessons of international experience have raised questions about the design of the frameworks and institutions for regulating public utility companies, which often have multiple and conflicting objectives that are quite different from commercial goals. These analyses have raised questions that have not yet received a clear answer: Is it enough to incorporate State enterprises as companies? Are new regulatory rules needed? Is regulation necessary when the utilities are State-owned? Are there contextual elements that must be considered in the design of these institutions?⁴⁶
- 2.14 **Political economy of the sector.** The State plays a fundamental role in these services, as already explained, and it is important to ensure that public policies are aimed at maximizing the “common good”, that they have a long-term vision, i.e. that their priority extends beyond the time limits of individual government mandates, and that they are properly planned within an adequate institutional framework.⁴⁷ Using the analysis approach known as “actor-centered institutionalism,”⁴⁸ the policy-making process implemented in a country or sector should be the result of the interaction of actors (president, ministers, managers, congress, users, etc.) who have different capacities (resources, legal authority, etc.) aligned primarily with the institutional context that sets the groundrules, and with guidelines, incentives, and perceptions. The actors interact in areas where policy decisions are resolved and the nature and quality of policies are determined. The analysis formalizes modeling of decision-making under the prism of game theory. This approach is strongly centered on characterizing the way in which public policies are defined, such as their stability, adaptability, coherence and coordination, implementation quality, enforcement capacity, public orientation, and efficiency.⁴⁹ It also identifies characteristics, such as legitimacy, transparency, accountability, inclusion, equity, integration, capacities, and

⁴⁴ The exception is Chile, which has no formal oversight body, and decisions are channeled through the regulator, through SEP as a minority shareholder of several utilities, or Empresa Concesionaria de Servicios Sanitarios, S.A. (ECONSSA) which controls contracts for transfer of usage rights. In fact, 95% of the urban market in Chile is served by private operators, under concession regimes.

⁴⁵ In Chile, more than 98% of the rural drinking water systems constructed since the mid-1970s are still in operation, thanks to steady support from State policies established by the Ministry of Public Works.

⁴⁶ Hankte-Domas and Jouravlev (2011); Bonifaz (2012) and Rozas and Bonifaz (2014).

⁴⁷ In this context, “political economy” is understood as the analytic approach that uses elements of neoclassical theory on the behavior of individuals and firms, such as game theory, to model the actions of stakeholders in the political field and of related institutions. See Persson and Tabellini (2000).

⁴⁸ Scharpf (1997), IDB (2006), and others.

⁴⁹ Stein et al. (2005).

adaptability.⁵⁰ This methodological framework for analysis has been widely applied in macroeconomic policy, fiscal budgeting, and other fields and, at the IDB, has led to a series of work.⁵¹ Sector applications are, however, limited⁵² and will be considered an essential element to be developed in the Bank's knowledge agenda.

- 2.15 **The scale of services.** A common element in the W&S sector in LAC since the 1990s has been the extensive decentralization of services. In many countries national utility companies have been abolished and regional ones created (for example in Chile, Argentina, and Venezuela), or services were devolved directly to the municipalities (as in Colombia, Peru, and other countries). The great decentralization of services, especially to the municipal level, has generated another point for analysis, relating to the difficulties encountered by these entities, and the loss of economies of scale in their management. Fragmentation is evident in Colombia, Ecuador, and other countries, and seems to result in reduced effectiveness and efficiency.⁵³ Some successful experiments have integrated the municipios into associations or organizations at the departmental level to take advantage of economies of scale, although the most interesting experiments have perhaps been those carried out in England and Holland, where enterprises were created at the regional⁵⁴ rather than the municipal level.
- 2.16 **Effective integrated water resources management (IWRM).** The current paradigm in water governance is to take a holistic approach to managing the resource, meaning that all stakeholders living within a river basin or watershed should be involved in the decisions that affect them and should develop consensus-based plans that are environmentally sustainable. Successful cases are scarce, however:⁵⁵ in LAC they are exemplified by the Piracicaba, Capivari, and Jundiá River watersheds in Brazil, and the Río Negro watershed in Argentina. Numerous entities⁵⁶ have proposed tools and guidelines for IWRM in application of good practices relating to the following aspects: (i) IWRM is an evolving and gradual process; (ii) it must recognize the drivers of change and manage adaptation to changes in a watershed; (iii) it must incorporate all stakeholders, internal and external, with a proper system of information and communication; (iv) it must create watershed organizations as an institutional mechanism for moving forward with IWRM; (v) decisions must recognize the specific elements of the watershed; and (vi) water administrators must improve their information and accountability systems, among other aspects.

⁵⁰ OECD (2012), Chapter. 3.

⁵¹ Stein and Tomassi (2008); Hallerberg et al. (2009).

⁵² With the exception of Krause, Matthias (2009); Rouse, Michael (2007); World Bank (2011), Stein et al. (2005), Chapter 9.

⁵³ Hankte-Domas and Jouravlev (2011). Ferro and Lentini (2010) offer empirical evidence of economies of scale in the sector.

⁵⁴ Another interesting approach is to be found in Brazil, where since the early 1970s services have been provided in the name of the municipality by large State-owned enterprises, under a concession contract. SABESP (2011).

⁵⁵ See UNEP (2009), which presents success stories in 11 countries around the world, including the case of Río Negro in Argentina.

⁵⁶ See, *inter alia*, Akhmouch (2012), UNESCO (2011), ECLAC (2011).

- 2.17 **Integrated management of urban utilities.** The complexity of public services and goods in large and medium-sized cities⁵⁷ has revealed the need to design better approaches to planning and managing them. Of particular note are the well-known interactions between programs and projects that simultaneously address such issues as flood protection, sanitary and storm sewerage networks (when combined), and solid waste. At the same time there are interventions that can impact other activities in the city (substandard neighborhoods, management of the urban environment and water bodies, natural disaster risks, etc., and their interaction with W&S services). Examples are the use of park strips along watercourses for managing flood crests,⁵⁸ the extension of service access into periurban zones and the restoration of urban areas through decontamination of water bodies. Accordingly, integrated planning and management of these elements within a territory, with a view to overcoming weaknesses in terms of standards, allocation of responsibilities and resources, regulation and supervision, would seem a fundamental condition for the success of interventions in urban areas. Successful examples of integrated planning can be found most notably in Brazil, in cities such as Curitiba and Porto Alegre.⁵⁹ Cities such as Manaus (PROSAMIM program), Belém (PROMABEM program), São Paulo (Tietê Várzea program), and Belo Horizonte (Drenurbes program) have had good results from a long partnership with the Bank to resolve their periodic flooding problems, instituting comprehensive urban watershed programs that include drainage, urban retrofitting, resettlement of at-risk families, and delivery of basic water, sanitation, and garbage collection services. The success of such programs has prompted demand for other phases and their extension to other cities.⁶⁰
- 2.18 **Civil society participation.** Civil society plays an essential role in sector governance, either through watershed boards for the water sources that supply W&S utilities, the development and social oversight committees of household utilities—as implemented in Colombia in the 1990s—or the opening up to national and international markets, as in the case of SABESP in Brazil, for which private investors have many transparency requirements.

⁵⁷ For purposes of this document, the definitions of large and medium-sized cities and smaller towns do not refer to any specific population size range, but are relative to each country, as a means of distinguishing, in population terms, between the capital and the larger cities, the regional or departmental seats and towns of similar size, and smaller municipios or intendencias.

⁵⁸ See Mayorga (2013).

⁵⁹ See Tucci (2007).

⁶⁰ The PROSAMIM program is in its third phase and has prompted similar action in the city of Maués, in the interior of the State of Amazonas; the effort there is a pilot project to expand PROSAMIM in the interior of the state, covering, in principle, eight cities. In July 2014, the Bank approved one operation in the Río Reconquista watershed in the Province of Buenos Aires that was developed based on integrated watershed management concepts.

C. Utilities management and private participation

- 2.19 **Improving the management of State enterprises.** The management of utility services in LAC is still dominated by State enterprises,⁶¹ working through the public administration (municipal, regional, or national) or by decentralized enterprises of the responsible territorial entity (there are a few cases of modest participation by the private sector, as in Colombia, Brazil and Mexico, and other isolated cases in Argentina, Ecuador, Honduras, and Peru). These entities traditionally have multiple and contradictory objectives and principles, such as providing efficient service, serving marginal neighborhoods for social purposes, providing employment, maintaining a financial balance, or rent-seeking for special-interest groups.⁶² Given their predominance, and the slim prospects that the private sector will become a significant player in the next few years, there is once again a growing concern to understand the characteristics of public enterprises more thoroughly, as to their incentives, restrictions, capacities, orientation, and means for achieving greater service quality and efficiency. There is a consensus, based on numerous studies,⁶³ that sound management of a public enterprise depends to a great extent on the autonomy of its administration (including its financial resources), on the clarity with which its objectives are set for it (through appropriate corporate governance mechanisms), and on adequate transparency and accountability (regulatory accounting, user participation, etc.).
- 2.20 **Making service delivery more efficient.** In addition to improving the management of operating enterprises overall, it would seem important and feasible to focus efforts on improving certain critical indicators. International experience shows that significant financial improvements can be achieved through programs or projects targeted at issues such as: (i) using results-based management contracts⁶⁴ to reduce unaccounted-for water (measured as the difference between water produced and water billed to customers), arising from physical shortcomings of the system or from inefficient business management in measuring and invoicing; (ii) improving the commercial aspects relating to invoicing and collections, as these affect the operating cash flow of the service providers;⁶⁵ (iii) boosting labor productivity, recognizing that personnel costs often represent a significant percentage (around 35%)⁶⁶ of the utilities' operating costs;⁶⁷ (iv) efficient energy use, particularly in

⁶¹ In Brazil, for example, 75% of service delivery is in the hands of State-owned utilities, Ferro et al. (2014). At the extreme, in Chile only 5% of the urban market is in the hands of a public entity.

⁶² The issue of transparency and corruption is an important one for utility companies: an estimated 20% to 70% of sector resources could be saved if transparency were increased and corruption reduced. IDB (2007a), based on a study by the International Water and Sanitation Center (IRC). See also Transparency International (2008).

⁶³ Andrés, Guash and Azumendi (2011); Hankte-Domas and Jouravlev (2011); Irwin and Yamamoto (2004); Lobina and Hall (2008); Sjodin (2006) analyzes the performance of EMOS in Santiago, Chile between 1977 and 1999; Baietti, Kingdom and van Ginneken (2006); Halpern et al. (2008); Kingdom et al. (2006); Muller et al. (2008); van Ginneken and Kingdom (2008).

⁶⁴ Specific programs of this kind have been developed in Asia and are making inroads in the region. World Bank (2008b).

⁶⁵ See Jourdan (2011) for a description of a tool for this purpose.

⁶⁶ World Bank (2002).

systems that involve significant pumping of water (drinking water and wastewater) or water production and treatment, aspects that have a major impact on costs in the Caribbean region (representing on average 30% to 40% of operating costs);⁶⁸ and (v) encouraging policies for preventive maintenance of infrastructure, in order to maximize its useful life.⁶⁹

- 2.21 **Asset-management-oriented operation and maintenance.** The sustainability of investments depends largely on service providers' operation, maintenance, and rehabilitation practices. The sizeable capital investments that create economies of scale in such services demand efficient asset management. Best practices in this field are determined by elements such as the following: (i) rather than expanding investment, the utilities must adopt an asset management approach in which maintenance and rehabilitation prevail; (ii) infrastructure maintenance must be preventive, rather than remedial; and (iii) asset management must be ongoing, with adequate trained staffed and financial resources.
- 2.22 **Private sector participation.** The private sector could play a significant role in managing W&S services. Although over the past two decades private sector participation in the direct delivery of W&S services, in most cases, did not meet the initial expectation of attracting investment capital, its involvement did show positive results for improving service efficiency and quality (see the cases of Chile, Colombia, Ecuador, Mexico, Brazil, and Argentina),⁷⁰ provided there was a clear regulatory and policy framework in place, with capable supervisory institutions.⁷¹ Successful experiments in the region show that private sector participation arrangements must consider aspects such as the following: (i) heavy capital demands over short periods of time and the actual likelihood that they will be contributed either by the state or by the private sector; (ii) the monopolistic nature of these services; (iii) volatile political will, given the decentralized nature of these services; (iv) the social perception, and people's economic capacity and willingness to pay for these services, especially sewerage and wastewater treatment; and (v) the distribution of responsibilities and risks between the public and private players.⁷² Private participation is a powerful tool for achieving sector policy objectives: it is therefore important to continue supporting the development of the models of public-private partnership (PPP) that have emerged, and which are more closely adapted to the needs, expectations, and conditions of each market. These include commercial and operational management contracts (as in Mexico City and

⁶⁷ The region's leading utilities typically have one employee per 1,000 connections, and they outsource a great deal of their activities. A reasonable number of employees is considered to be 2 to 3 per 1,000 connections. In the region there are many utilities where productivity is below this figure.

⁶⁸ IDB (2011a). Many utilities can achieve energy savings of 10% to 40%. In water plants, savings of between 5% and 15% in power consumption are expected with the installation of speed regulators and high-efficiency motors, while savings of 10% to 20% are possible in treatment plants through modification of equipment.

⁶⁹ The concept of asset management is widely used in developed countries. See for example Jolicoeur and Barret (2004).

⁷⁰ Saltiel and Maywah (2007).

⁷¹ Andrés et al. (2013).

⁷² For details on the activity and exit of international operators from Latin America, see Ducci (2007).

Bogotá), operational technical assistance (Haiti, Guatemala),⁷³ and control of unaccounted-for water (The Bahamas). One field of concrete support for the Bank that has a major impact on developing sustainable PPP arrangements is providing guarantees and nonsovereign guaranteed financing for private partners in such arrangements.

- 2.23 **Sustainability of rural systems, community participation, and post-construction support.** The management model most commonly used internationally in rural areas makes the communities themselves responsible for operating and maintaining the service. Only in relatively small countries is it feasible to manage services centrally or from outside the community. The success of this model depends on the commitment, the training, and the post-construction support that the State provides to rural communities. Case studies suggest that the community operators model must include the following features, among others: (i) legal recognition; (ii) appropriate regulatory framework; (iii) post-construction support schemes,⁷⁴ through local or other operators; (iv) performance monitoring; (v) support programs for local governments that are responsible for providing service; and (vi) creating capacities for operating and administering the systems. Community involvement in planning prior to construction of the systems (for example, in the design of rate systems, the selection of technology, and the location of infrastructure) is key for sound management performance.⁷⁵

D. Financial sustainability

- 2.24 **Strengthening the sector's long-term financing.** To mobilize all the resources needed to ensure universal W&S service and improve its quality will require the effective channeling of contributions from the State, users, donors, multilateral and bilateral financial institutions, and the private sector. International experience shows that financial sustainability can be achieved through an appropriate combination of rate policies and subsidies (see the cases of Chile, Brazil, and Colombia). An analysis of selected W&S utilities in LAC⁷⁶ shows that the leading utilities are those that have rates adequate to cover their costs, while those that are farthest from this goal depend heavily on unstable direct transfers from central or subnational governments to cover their operating and maintenance costs. Given the volatility of such contributions, which may moreover induce undesired behavior and incentives in business decisions, and direct political interference,⁷⁷ it is important to adopt rate policies that will cover all the long-term costs of service delivery.
- 2.25 **Designing targeted subsidy schemes.** Best practices in the design of subsidy schemes suggest that:⁷⁸ (i) they should be targeted at families that would find it hard to pay their service bills; (ii) the targeting mechanisms must be transparent, objective, and defined by players other than the operator; (iii) the method for calculating the subsidy must be simple

⁷³ See the case of Haiti in Brochard (2013).

⁷⁴ Whittington et al. (2009) present evidence for Bolivia, Peru, and Ghana.

⁷⁵ Bakalian and Wakeman (2009), with cases in Peru, Bolivia, and Ghana.

⁷⁶ Ducci and García (2013).

⁷⁷ See Ducci and Krause (2013).

⁷⁸ Subsidy systems with features such as those indicated here have been in use for more than 20 years in Colombia and Chile. Lentini and Ferro (2014) and Foster (2003).

and understandable to the users; (iv) the system's costs must be kept low (for example, by basing it on information and criteria of general use for public policies); (v) financing must be sufficient and stable, and may come from users with a higher capacity to pay (cross-subsidies) or from the government budget (direct demand-side subsidy); and (vi) the mechanisms for direct financing of supply are only desirable if they can be territorially targeted (for example at rural or periurban areas), or in cases where there are externalities in the form of environmental or health problems.

- 2.26 **Potential access to credit and capital markets.** The heavy investments required in the sector call for a redoubling of efforts to give W&S utilities better access to credit and to capital markets. Numerous cases in LAC show that having appropriate and stable rates in place for the long term is a precondition for gaining such access, with interest rates, currencies, and maturities more aligned with the financial profile of the business. Utility companies in Chile are a prime example: since their privatization, they have been accessing the securities market and have been issuing medium and long-term bonds in local currency, in this way financing more than 80% of their investments.⁷⁹ This is also the case of some public utilities in Brazil and Colombia that have been able to access local and international capital markets (SABESP from São Paulo, for example, is traded on the New York Stock Exchange).⁸⁰ A great many public utilities in the region have low debt and are in a financial position to do this.⁸¹ As W&S service providers shift from an engineering vision to a corporate service and customer service vision, demand for better corporate governance, transparency, accountability, and efficiency in service delivery increases. This makes them more attractive to capital markets and nonsovereign guaranteed financing from multilaterals.⁸²
- 2.27 **Water resources and storm drainage.** When it comes to financing the costs associated with IWRM,⁸³ good practices call for mechanisms to charge users of the resource through rates or tariffs associated with extractions or discharges. For financing storm water control works there are a number of mechanisms, but the one most commonly used is the public budget.⁸⁴ The scarcity of this source of funding and the relatively low priority accorded to these activities make such financing subject to many fluctuations that impede long-term planning,⁸⁵ even for operation and preventive maintenance (for example, cleaning channels, conduits, networks etc.).⁸⁶ At the international level, a number of municipalities

⁷⁹ See Ducci and Medel (2007).

⁸⁰ There is a breakdown of the cases of Empresas Públicas de Medellín and SABESP in Cuéllar (2009).

⁸¹ See Ducci and García (2013).

⁸² See Ducci and García (2013).

⁸³ For details, see OECD (2012c).

⁸⁴ See Soluciones Integrales S.A. (2003).

⁸⁵ In some countries (e.g. Brazil and Colombia) cost recovery mechanisms are based on the increase in property values (surcharge for improvements), which has the advantage of focusing the burden on the beneficiaries of the projects. It is also common for financing of works to come from general municipal funds or from property and other taxes, with the limitations inherent to such resources.

⁸⁶ A dramatic case in point is Port-au-Prince, Haiti, where the city's major drainage works are choked by garbage, making them ineffective.

in Florida and elsewhere in the United States have developed an institutional framework for delivering “stormwater management” through specialized private firms,⁸⁷ operating under concession contracts with outcome indicators and fees based on actual runoff volumes.⁸⁸

E. Social considerations

- 2.28 **The role of community participation.** International experience suggests that interventions in rural and periurban areas will be more effective and efficient if the local community is involved throughout the project cycle, including physical location, choice of technological alternatives, professionalizing local water operators, education campaigns for payment of bills and for subsequent operation and maintenance of systems.⁸⁹ In several countries it has been found that rural systems that received post-construction support were more efficient and sustainable than those that received technical assistance only during the construction phase.⁹⁰ In flood-prone areas, involving the local populace in decision-making has minimized conflicts and mitigated the adverse impacts of the resulting resettlements.⁹¹ Similarly, IWRM policies stress the need to include users and inhabitants of the watershed in taking decisions, through effective communication strategies designed to achieve consensus,⁹² taking into account gender, ethnic, and social inclusion aspects. This will involve creating and supporting local structures at the watershed level to share responsibilities with State entities.
- 2.29 **Gender focus and indigenous communities.** International experience has shown that women⁹³ play an essential role in the sector because of their involvement in the use of water in the home, the promotion of sound hygiene practices, and the hauling of water from distant sources. It is mainly women who benefit from the savings in time and effort generated by the construction of water systems: they will have more time to devote to productive or educational activities, and consequently good practices suggest they should be included in decisions concerning projects. Various studies have also shown that giving women equitable participation in the management of water boards correlates positively with improvements in the efficiency and sustainability of the service (greater transparency and better governance).⁹⁴ Moreover, when improvements in sanitation and hygiene are not a priority for families, it is the women and girls who suffer most, as their privacy and safety depend on the degree of access to toilet facilities (for example, it has been found that in

⁸⁷ See APWA (1999). There is interest in these schemes in the region. In fact, in Chile a law to such ends progressed some way through Congress before it was suspended. The public utilities regulator in Colombia (CRA) has also expressed interest in the topic, and has conducted some specific workshops with support from the Bank.

⁸⁸ APWA (1999).

⁸⁹ IRC (2012).

⁹⁰ Smits, S. et al. (2012).

⁹¹ Van Herk (2014).

⁹² Project Management Institute (2013).

⁹³ United Nations (2012), page 25, and IDB (2014).

⁹⁴ Leino (2008) uses an experimental evaluation to measure the impact of gender on community management in Kenya.

schools that lack adequate hygiene conditions, the dropout rate is higher).⁹⁵ Another lesson from international experience is the need for a focus on serving indigenous communities or native peoples in order to properly internalize cultural aspects, reduce discrimination,⁹⁶ and guarantee the sustainability and use of solutions that will provide that guarantee. Indigenous peoples typically take steps to mitigate the effects of climate change in the areas where they live.

- 2.30 **In-house connections.** The benefits anticipated from investments in sewerage networks in the region are not being fully realized because of persistent low rates of connection. While there are no global data, connection rates of only 60% to 70% have been observed in many Bank projects. Experience shows that resolving this problem will require: (i) having standards or regulations in place for promoting connection so as not to discourage W&S firms from investing in such areas and so as to adjust the quality standards of services; (ii) making the public aware of the social and environmental benefits of connection to the network; and (iii) providing financial support to cover the costs of changes and improvements to home water and sanitation facilities.
- 2.31 **A new focus on rural sanitation.** When it comes to achieving the MDGs, this is the subsector that is lagging furthest behind in quantitative terms. The traditional approach of building conventional sewerage systems has been found unfeasible because of its high unit costs and operational problems. Existing studies⁹⁷ have shown that a key factor for increasing sustainable access to these services for rural communities is to boost demand (through awareness raising and promotion of services), and to promote sanitation marketing (using innovative community-based business models to provide individual services). As well, education campaigns to change hygiene habits are more cost-effective than interventions confined solely to infrastructure, in terms of reducing the risk of water-related diseases.⁹⁸

F. Environmental and climate change considerations

- 2.32 **Water security.** Water quality is affected and its use compromised by the increase in liquid and solid effluents that are dumped into the urban watersheds, as well as nutrients and pesticides in rural watersheds. Although there has been a reduction in the organic load of discharges thanks to wastewater treatment plants, it is hard to detect any significant improvement in the quality of water bodies.⁹⁹ The coverage of sanitary sewerage systems and wastewater treatment must be expanded in order to reduce the pollution of water resources. In addition, persons who built their homes (generally of precarious quality) in risk-prone areas will have to be relocated in order to mitigate the impacts of flooding, which can include the loss of lives, quite apart from the economic impact. The physical-chemical, biological, and hydro-morphological quality of water is also affected by climate

⁹⁵ World Bank (2010).

⁹⁶ Perafán et al. (2005).

⁹⁷ See WSP (2012) and ECOP SIS (2014).

⁹⁸ WSP (2012).

⁹⁹ OECD (2012).

change: according to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, the impacts will manifest themselves in heightened risk of natural disasters and a worsening of water pollution.

- 2.33 **Climate change.** The impact of climate change on water availability in the region is amply documented in numerous studies. The critical issues that international experience has not yet resolved relate, however, to the impact on operational and management aspects such as: (i) pricing levels and structures for W&S services; (ii) the use of water conservation mandates and other incentives, property rights over water, and the scope and restrictions for sharing water among users within or between watersheds; (iii) infrastructure investments for producing drinking water, and the operation of water infrastructure; and (iv) the allocation of water rights in cross-border watersheds.¹⁰⁰ These areas require further research and analytic work.
- 2.34 **Urban drainage and flooding.** The concept of “green infrastructure”¹⁰¹ is now being applied worldwide to reduce the costs of storm water management, by reducing runoff volumes through retention and soil infiltration, in the watershed and in the urban area, to lower the speed of the currents and protect human settlements. Permeable pavements and roof gardens, as well as wetlands, parks, and green areas are becoming an integral part of the flood control system.¹⁰² In many countries in the region, drainage master plans already incorporate solutions of this kind, as well as early warning measures.¹⁰³ Coordination with solid waste management is also essential to mitigate the problems caused by improper disposal of garbage in the drainage system and in urban waterways. The impact of flooding is magnified when surface runoff from urban areas carries pollutants such as heavy metals, organic loads, suspended solids, oils, and fats.
- 2.35 **Environmental management in utility companies.** Public pressure for a better quality of life, especially in metropolitan areas, and the heavy demand for scarce water resources are transforming the management model of W&S utilities to include environmental and social issues in decision-making processes. In addition, the impacts of climate change in some regions are prompting utilities to adopt environmental management systems to enhance their efficiency and to offset the growing shortage of water resources and the pollution of water courses.¹⁰⁴ The implementation of such systems, and the development of instruments for defining ecological flows, payments for environmental services, and users’ willingness to pay for environmental and social benefits are needed to guarantee the sustainability of modern W&S utilities in a context of climate change. Brazilian utilities such as SABESP in the State of São Paulo, CAESB in the Federal District, and COPASA in Minas Gerais, as

¹⁰⁰ Olmstead (2013).

¹⁰¹ Dourojeanni and Jouravlev (1999).

¹⁰² Sorensen et al. (1998).

¹⁰³ For example, Brazil, Bolivia, Trinidad and Tobago, Argentina, and The Bahamas. Chile recently adopted an urban drainage manual that specifies these “nonconventional” solutions. See <http://www.doh.gob.cl/manualdrenajeurbano/Paginas/default.aspx>.

¹⁰⁴ In 2014, the city of São Paulo, Brazil experienced a prolonged drought that forced the utility, SABESP, to take specific measures to control water sources and ensure efficient use of existing reservoirs.

well as Empresa de Servicios Públicos (EPM) in Medellín, Colombia and EMAAP in Quito, among others, have introduced preliminary versions of environmental management systems and have taken action to obtain ISO 14001 certification. Yet the majority of utilities in the region still do not have adequate systems for handling environmental and social issues associated with the expansion and maintenance of W&S services.¹⁰⁵

III. PRINCIPAL CHALLENGES IN THE REGION

- 3.1 Despite the region's progress of recent years, particularly in ensuring access to water, there are still some major challenges relating to equity and access to W&S (for rural and periurban inhabitants and indigenous peoples), the sewerage service gap, the quality of water service (potability, continuity, and pressure), the treatment of wastewater, administrative and operational efficiency, financial sustainability, the governance framework, inter-sector coordination (territorial and land-use planning, energy, health, agriculture etc.), long-term planning to address the challenges of climate change and consideration of environmental, social and gender aspects, and water resource management.

A. Accessibility and quality of services

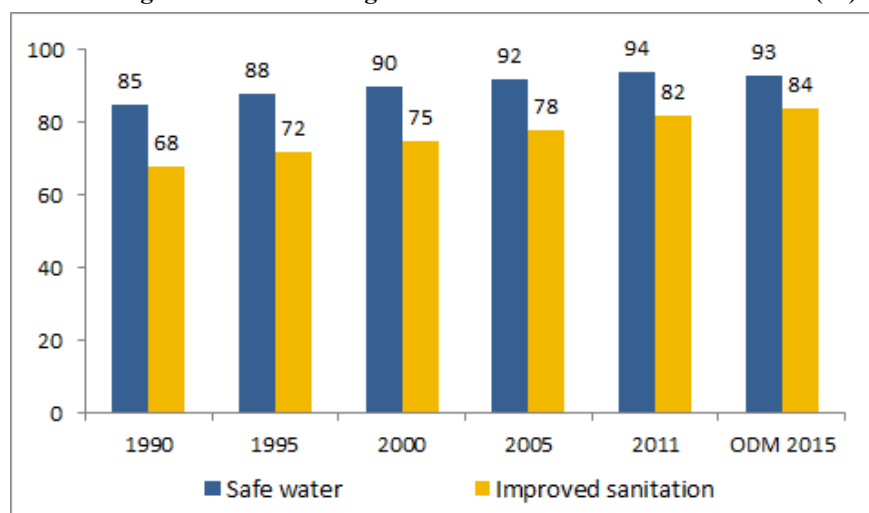
- 3.2 According to information from the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) (2011),¹⁰⁶ Latin America and the Caribbean has achieved the MDGs for access to safe drinking water, exceeding by one percentage point the expected level of 93%, but not the goal for improved sanitation coverage, where the current level is 82% versus a target of 84% (see Figure 1).¹⁰⁷ These coverage ratios mean that there are still 34 million people in the region without access to safe sources of water and nearly 110 million without access to improved sanitation. To achieve universal coverage by 2020, however, LAC will need to extend water service to another 95 million people, and sanitation service to 170 million. This poses several challenges for the region.

¹⁰⁵ Outcome from workshops conducted in Brazil, Argentina, Colombia, Mexico, and Barbados for preparing this sector framework.

¹⁰⁶ Soulier et al. (2013). Although the definition of access to services implies standards and quality levels that do not correspond to the socioeconomic situation of the region, its use is justified by the availability of information for comparing the situation across all countries.

¹⁰⁷ In developed regions, water security coverage is 99% and sanitation 96%. Joint Monitoring Program (2014).

Figure 1. W&S coverage trends in LAC versus MDGs for 2015 (%)



Source: IDB, 2013.

3.3 *Expanding access while reducing regional and socioeconomic inequity.* The coverage figures conceal disparities of access between countries, between urban, periurban and rural areas, and by level of income. It is estimated that around 70% of the families in LAC that lack water service, and 85% of those that have no sanitation, belong to the first two income quintiles.¹⁰⁸ Likewise, coverage rates in rural areas are lower than in cities: in 2011, while 82% of the rural population had safe drinking water supply and 63% had access to improved sanitation, the corresponding figures for urban areas were 97% and 87%.¹⁰⁹ The fact that the average increase in coverage indices is slowing means that this challenge, and especially its sanitation aspect, will be greater in the future. In the case of water, the rate of increase dropped from 2.33% a year in 1990-1995 to 1.56% in 2005-2011. In the case of sanitation, the average annual growth rate fell from 2.89% in 1990-1995 to 1.83% in 2005-2011. Not only are investments to expand coverage becoming ever more costly, but governments, considering that the MDGs have been achieved, may attach less importance to this objective.

¹⁰⁸ IDB (2007a).

¹⁰⁹ For water as for sanitation, countries with coverage below the average are those with the lowest per capita incomes.

Status of W&S services at the subnational level

Although overall coverage appears to be close to the MDG targets, even though universal coverage is still far off, the disparities between countries, and between regions within a country, are vast and inequitable. The following cases illustrate this situation:

- In Guyana, the capital has water and sanitation coverage of 97% and 88%, respectively, however in cities in the interior, coverage is 57% for access to water and 65% for sanitation.¹¹⁰
- In Mexico, the states of Chiapas, Guerrero, and Oaxaca have W&S coverage of around 74%, while nationwide the rate is nearly 95%.¹¹¹
- In Jamaica, coverage of access to water is 90% in urban areas, but barely 45% in rural zones.¹¹²
- In Panama, urban areas boast coverage of nearly 93% for water and 95% for sanitation, however for indigenous populations those levels are 44% and 37%, respectively.¹¹³

3.4 Enhancing the management, disposal, and treatment of wastewater. A major challenge for coming decades will be to boost the percentage of treated wastewater, which is currently less than 15% on average in the region, and varies greatly among countries. In the countries of the Southern Cone, Brazil and Uruguay are treating around 35% of their urban wastewater, but the figure is only 10% in Paraguay and Argentina, while it is close to 100% in Chile. In the Andean region, the figure is around 20% in Colombia, Peru, and Bolivia, and less than 10% in Ecuador and Venezuela. The treatment index in Central America is below 5%,¹¹⁴ with the exception of Mexico and Belize which are treating 48% and 21% of urban wastewater, respectively. In the Caribbean region, the index varies from 20% for the Dominican Republic and Trinidad and Tobago to less than 10% in the other countries.¹¹⁵ Solid waste management is another important issue, given its impact on the proper functioning of the sewerage system, including storm drainage, and on the quality of water bodies. Although the last decade has seen significant progress in trash collection (with urban coverage of 93%¹¹⁶) and street cleaning, and although the urban population with access to adequate sanitary landfills has doubled, there are still many challenges for integrated management.

3.5 New focus on sanitation solutions in rural communities. Evidence shows the drawbacks of conventional solutions (sewerage networks with treatment plants) for serving rural

¹¹⁰ Source: WHO / UNICEF JMP (2014) and 2002 Census.

¹¹¹ Source: Conagua (2013) and WHO / UNICEF JMP (2014).

¹¹² Source: Jamaica National Water Commission.

¹¹³ Source: 2010 Census.

¹¹⁴ No statistics are available for Guatemala, Nicaragua, or Panama.

¹¹⁵ Source: Diagnostic reports by countries.

¹¹⁶ Source: IDB-PAHO/WHO-AIDIS (2010).

communities, even when the population is somewhat concentrated.¹¹⁷ These solutions bring with them problems of sustainability, especially when they include wastewater treatment plants, which require technical know-how that often exceeds local capacities and which entail service costs that may cause them to be promptly abandoned.¹¹⁸ Experience has shown that the widespread and often indiscriminate use of simple individual sanitary solutions such as latrines is unlikely to be successful. The community is likely to reject solutions that are not adapted to its needs or its willingness to pay,¹¹⁹ and they will fall into disuse.

- 3.6 **Enhancing the quality of W&S services.** The fact that the water consumed is not potable is a notable problem,¹²⁰ although there are no region-wide statistics due to the lack of systems monitoring and the weakness of information systems for the sector. Generally speaking, the existing standard in the region requires that surface water uptake be disinfected: this entails an additional cost, and therefore rural communities do not always perform this treatment. In the case of groundwater, while chlorination may not be so important, there may well be elements such as nitrates, arsenic, or boron present.¹²¹ The Caribbean islands face potential saline intrusion due to overexploitation of aquifers, which can make them unusable because of the high levels of chlorides and other ions or salts. A further aspect of importance is the lack of service continuity. Some 60% of the water systems in LAC do not offer 24-hour service seven days a week,¹²² and this implicit rationing is particularly hard on periurban and rural populations. This problem also has consequences for the level of unaccounted-for water, as the seepage of air into the systems boosts the pressure and causes breaks in the mains, increasing the probability of leakage and the consequent introduction of pathogenic organisms into the water supply. With respect to the quantity of water supplied, the per capita consumption standards to which the networks are dimensioned vary from one country to the next, ranging from 80 to 250 liters per person per day – and in fact the standards are not always met.
- 3.7 **Improving coordination with other sectors.** Mention has already been made of the effects that W&S interventions can have on human health and the environment. Another

¹¹⁷ Data for Honduras show that investment costs per connection are as high as US\$2,000 (including collection and treatment, but excluding in-house connection costs); these are coupled with the costs of operation and maintenance, amounting to some US\$250 per year per connection. By contrast, the cost of individual solutions is around US\$200.

¹¹⁸ In Chile, for example, it has been documented that of the 550 wastewater treatment systems built in recent years, 80% have problems or are not operating (Saavedra, 2013). Only in Uruguay, where OSE runs the rural sanitation systems directly, has it been possible to make them function properly. This case is unique in the region, as the management of such systems is generally in the hands of the rural community itself.

¹¹⁹ Demand studies in Guatemala, Honduras, Dominican Republic, and El Salvador suggest that in many cases the willingness to pay for these facilities is less than their cost, which makes this solution inefficient due to a lack of appropriate social outreach concerning the problem.

¹²⁰ It is important to bear in mind the difference between safe water as defined by the United Nations and potable water, which implies that the water has been disinfected by some physical-chemical process such as chlorination.

¹²¹ There are documented cases of the presence of these elements in water systems in northern Chile, and in various provinces of Argentina. Galindo et al., (2005).

¹²² Jouravlev (2004).

area of great impact is that of urban planning and the contribution to the growth and competitiveness of cities and the countryside. An estimated 24% of the LAC urban population lives in precarious settlements, in areas unsuited for urbanization.¹²³ Many of the constraints on expanding access in periurban areas flow from the high costs per connection due to the relative inaccessibility of dwellings, their location in vulnerable areas, and the high rates of unplanned growth in cities. In rural areas, the constraints have to do with the relatively low density of dwellings, topographical limitations to access, low socioeconomic levels, the scarce use of nonconventional technologies, and problems in offering technical assistance and training to service providers.¹²⁴ These aspects pose the need to improve the mechanisms for coordination with other sectors in order to enhance the impact of multisector interventions and to compile and analyze information on investment costs¹²⁵ (including those associated with operation and maintenance) and the use of appropriate, low-cost technologies that will reduce the required investments.

B. Sector governance

- 3.8 **Political priority.** A first priority for proper governance in the W&S sector is to give it greater political visibility, raising its profile in the debate over national policies and levels of decision-making. In order to achieve the MDGs, as well as the goals set in the Post-2015 Development Agenda and the commitments contained in the declaration on the human right to water and sanitation (HRWS), states must move forward with structural reforms to meet these demands, without compromising the financial sustainability of the service providers. This in turn will produce the significant challenge of creating and implementing mechanisms for monitoring and control of transparency¹²⁶ in efforts to meet the service coverage and quality targets, so as to ensure full respect for the principles of equality, nondiscrimination, and participation. It seems essential to enable participation by local communities and civil society within a framework of accountability.¹²⁷
- 3.9 **Institutional framework.** It is clear that proper administration of the sector requires institutions with executive power, a clear mandate, and the resources to take the necessary decisions. Having in place a proper entity responsible for the sector is a minimum condition for making policy interventions effective. This will require a review of the institutional framework for the sector in several countries in order to establish or strengthen the national oversight entities and give them greater autonomy and political independence. At the same time support must be provided for crafting a clearer definition of the role of regulation for the delivery of urban service by public utilities or municipal services.

¹²³ United Nations Human Settlements Programme (UN-Habitat 2012).

¹²⁴ Carrasco (2011).

¹²⁵ In Caribbean countries, the impact on the costs of transporting inputs and goods must be taken into account, along with the rocky nature of the soil. In Panama, Uruguay, and less-developed countries the availability of contractors has declined due to demand from other infrastructure sectors. In other countries, macroeconomic conditions relating to the exchange rate have tended to inflate costs, with a heavy impact on investment levels.

¹²⁶ Transparency International (2013).

¹²⁷ See international practices in this regard in González de Asís, et al. (2009).

- 3.10 **Transparency.** Together with institutional arrangements for improving governance in the sector, another priority is to promote its transparency and accountability. This line of action must be focused on improving the quantity and quality of information for all stakeholders, for use in citizen control and participation, so as to strengthen users' rights. This will require real efforts to publish strategies, master plans, projects, annual reports, audited financial statements, management indicators, job openings, and contracts for goods, works and services.¹²⁸
- 3.11 **Grouping markets.** To take advantage of economies of scale in the delivery of W&S services and in the management of solid waste, mechanisms for coordination and decision-making between municipal agencies, water management boards, and other local entities will have to be strengthened. The concept of *mancomunidad* ("leagues") as practiced in Bolivia¹²⁹ and the creation of types of associations (integrated rural sanitation system or SISAR in Brazil)¹³⁰ exemplify ways of addressing this challenge. Similarly, managing water resources, organizing and strengthening users, and coordinating State institutions are essential to ensure safe, efficient, and equitable water use.
- 3.12 **Coordination and information.** Improving the institutions responsible for planning and coordinating policies, plans, and programs in urban and rural areas in areas such as health, education, gender perspective, agriculture, etc.(see paragraph 3.7) is a critical challenge for improving infrastructure interventions and managing service delivery. An essential tool for the governance of the sector, the design of public policies, and control over the management of the service providers is the availability of timely, reliable information that will allow all agents to take appropriate decisions. The region must make great efforts to address the shortcomings in this area.
- 3.13 **Integrated water resource management.** From the viewpoint of IWRM—the international paradigm for water management—governance can be seen as one of the principal problems in the region.¹³¹ Institutional mapping reveals a great heterogeneity of approaches among ministries and levels of government: (i) functions such as the delivery of W&S services have been decentralized in several countries, and responsibility for IWRM is retained at the senior levels of government; (ii) many countries have established watershed agencies¹³² whose capacity to contribute to IWRM depends on their powers of regulation, planning, and financing; (iii) there are functional overlaps and gaps;¹³³ and (iv) user organizations and civil society are very weak. An appropriate legal framework and an institutional approach that embraces all levels of government with civic participation are necessary for progress with IWRM and for guaranteeing water security.¹³⁴

¹²⁸ These practices are suggested by Andrés et al. (2013).

¹²⁹ Smits et al. (2012).

¹³⁰ Rocha (2014).

¹³¹ OECD (2012b).

¹³² OECD (2012b).

¹³³ World Bank (2011), Andrés et al. (2011).

¹³⁴ Akhmouch, A. (2012).

C. Utilities management and private participation

- 3.14 **The operators are still inefficient in their management.** A diagnostic assessment¹³⁵ of service providers reveals a broad range of situations. There are some firms with strong management capacity and sound indicators in various countries and in the larger cities of the region, but there are still many utilities whose performance is deficient.¹³⁶ There is less information available on small and medium-sized enterprises, but they may well fall within this latter category. In many cases there are high levels of unaccounted-for water (between 40% and 50% in most utilities), the service is not metered and water is consequently wasted (the average metering rate is around 70%), existing infrastructure is not properly maintained and is deteriorating for lack of timely replacement, there are excessive expenditures on some items, and there is a shortage of equipment for proper service management. Another common indicator of efficiency is the number of employees per 1,000 drinking water connections, with three considered as the ideal maximum, and many operators are far in excess of that benchmark. This is coupled with problems of high turnover among management personnel and the shortage of qualified professional staff, low salaries, and inadequate training and motivation. One aspect to note is the precarious nature of preventive maintenance for infrastructure: here, the region needs to move on from the concept of investments for replacement to that of asset management, by adopting management schemes, practices, and monitoring systems to ensure proper and timely maintenance of infrastructure. Lessons learned from experience show the need for appropriate practices in corporate governance, with the adoption of autonomous business schemes, whether public, private, or mixed.
- 3.15 **Management capacities of rural operators.** Rural systems are frequently run by community organizations (boards, committees, cooperatives, etc.) which are responsible for administrative management and for operation and maintenance. However, most boards have no formal legal status and are therefore not recognized by the State and by other institutions, banks in particular, a situation that impedes their work and heightens the risk of loss of resources (a source of social problems when management is not sufficiently transparent). With no operational training, with high turnover among members of the committee, and without any State backup structure, service quality drops and users stop paying their bills. The dearth of revenue and capacity leads to lack of maintenance and misuse of water in the community, and speeds deterioration of the infrastructure. The main challenge in this area, then, is to improve, sustain, and professionalize the actions of the operating entities, and to create post-construction support schemes for the communities.
- 3.16 **Private sector participation.** The role of the private sector in W&S remains relevant as a tool for achieving various sector policy objectives, such as improving efficiency and providing funding. Although many attempts at private participation in the region were terminated early, and despite the decreased emphasis on its role as a major service provider,

¹³⁵ See IDB (2007).

¹³⁶ Service delivery indicators for a broad (although not representative) sampling of utilities can be found in ADERASA (2007). The figures shown there are those observed in large-scale utilities (serving more than 500,000 residents), and they are heavily skewed by the utilities in Chile and Colombia, which are generally considered good or very good.

it is still possible to promote innovative approaches, either through management contracts, technical assistance to public operators, or the delivery of specific services under results-based contracts. There are lessons to be learned from experience on issues such as greater availability of information (groundrules, contracting process, etc.), multiple bidders, design of contracts and the rate system, the impact on low-income users, the definition of flexible mechanisms for settlement of disputes, information and support studies, regulatory schemes, and political support.

D. Financial sustainability

- 3.17 **Availability of government funds.** There is an enormous need for investment funds in Latin America and the Caribbean. To achieve universal coverage by 2020 will require some US\$22 billion to be invested in safe drinking water and some US\$43 billion in improved sanitation.¹³⁷ If these sums are coupled with the requirements for solid waste management, wastewater treatment and storm drainage, the financing needs double, not counting investments in quality improvement. An initial challenge is to increase the availability of funding from the government budget, primarily for investment in rehabilitating and expanding systems. The real possibility of increasing this source of financing will depend on such factors as: (i) the priority accorded to the sector within government policies; (ii) the country's macroeconomic situation; (iii) the capacity of the entities responsible for service to plan investments and to carry out programs and projects efficiently; (iv) the capacity to spend funds effectively; and (v) the inclusion of measures for transparency in the handling of funds.
- 3.18 **Making W&S operators financially self-sustaining.** The shortage of funds places great constraints on efficient service delivery to users.¹³⁸ Rates must be set using technical criteria and a long-term horizon, and must not be subject to political interference. The shortage of investment funding in the region typically means that utilities cannot expand their services into low-income neighborhoods, nor can they improve facilities so as to optimize service quality, reduce leakage, and replace physical assets (including wastewater treatment) as needed. Measures are needed to reduce the perception of risk in infrastructure projects (through better design, improved corporate governance, and greater efficiency in service delivery).
- 3.19 **Financing rural W&S to achieve universal service.** The focus of government attention in rural areas has typically been on social programs, in which the investments will not be recovered. While most countries have created mechanisms for routine O&M cost recovery through the rates that users pay (and which in rural areas are collected by the communities themselves), these revenues have generally been insufficient, and have clearly fallen short of the amounts needed to finance major repairs or expansion of service. The challenge is to

¹³⁷ Soulier, Martin et al. (2013).

¹³⁸ The most severe constraints relate to situations where there are insufficient funds to acquire chemical products, to pay electricity bills, to purchase materials and tools for day-to-day use, etc., all of which has a heavy impact on the quality of service to customers, on the quality of drinking water delivered, on the quality of effluents and treated water discharged, on the timely handling of complaints, on locating and repairing leaks, on preventive maintenance of infrastructure, etc.

design financing mechanisms that will be sufficient and stable over the long term and that will take into account the total cost of service throughout the project lifecycle.

- 3.20 **A key issue is how to finance the management of water resources.**¹³⁹ In general, the government institutions responsible for administration do not have sufficient stable resources to perform their work, and they are moreover constrained by the operating rules inherent to the public sector. At the local level there are no funds for financing user associations or to allow civil society to participate in the watershed planning process, and this despite the fact that many countries have implemented, to a greater or lesser degree, user charges for water extraction or the discharge of effluents. These resources are normally precarious and inadequate to cover the needs of management. Moreover, user charges are not always linked to the value of water, considering its different uses, and they are not employed as a means for rationalizing water use.

E. Social considerations

- 3.21 **The need for a gender focus and differentiated treatment for indigenous peoples, Afro-descendants, and other minorities.** The region needs to include the gender focus in its policies and projects, particularly in rural areas where the W&S coverage gap is greatest and where women spend much of the day collecting water, losing productive time that they could devote to other activities. In these areas, most of the systems are run by community boards that do not always include women. There is evidence to show that projects that promote equal participation by women produce better results in terms of service management, efficient resource use, and sustainability of built infrastructure.¹⁴⁰ Another challenge is to provide adequate toilet facilities, particularly in schools where this can reduce the dropout rate among girls. Moreover, in LAC women represent the majority of informal recyclers, and they are marginalized even more than this group as a whole. According to the IDB (2011), there are gender disparities in access and in control over the benefits from resources, opportunities, products, and services. Promoting gender equality in recycling projects can have a great impact.¹⁴¹ Similarly, the region needs to take a differentiated approach for indigenous peoples and Afro-descendants.
- 3.22 **Community participation.** Governments and executing agencies in the region still face the challenge of involving the community in planning, design, execution, and maintenance. This is particularly important in rural areas where many systems fall into disuse as soon as they are built because of the lack of participation by beneficiaries. Beneficiaries must be trained before a project is launched in order to make them aware of the benefits of access to drinking water and of adequate sanitation, and thereby create demand for the services. Communities are not consulted on the design and the technology selected, and their preferences and their willingness to pay for these services are not ascertained. In addition, training is needed for operation and maintenance, for creating a culture of paying water tariffs, and for fostering rational use of water. Similarly, countries generally do not adopt a differentiated approach to policies, programs, and projects in indigenous communities,

¹³⁹ See details in OECD (2012c).

¹⁴⁰ See Gross et al. (2001); Fong et al. (1996); Kudat et al. (1991); WASH (2006), among others.

¹⁴¹ IDB (2011), page 5.

failing to take into account their particular cultural, social, and economic circumstances, and as a result the solutions instituted are not sustainable.

F. Environmental considerations and climate change

- 3.23 **Water stress.** The diversification of economic activity and food pressure are generating externalities that are harming the environment, and water resources in particular. Over the period 2000-2050, the Organisation for Economic Cooperation and Development (OECD) (2012a) foresees an increase of 55% in the demand for water and estimates that 40% of the population will be living in watersheds with severe water stress, while 20% will be living in flood-prone areas. The impact of climate change may generate greater demand for water, with the projected rise in temperatures, and could aggravate existing water stress, particularly in those regions of LAC where water is less available¹⁴² (Bates et al., 2008): water resources are likely to shrink in the Caribbean, Central America, and southwestern South America.
- 3.24 **IWRM governance.** The principal challenges for managing environmental issues relating to the delivery of W&S services can be traced to inefficient governance and management.¹⁴³ Climate change, which is exacerbating the existing problems and posing new ones, demands greater coordination among institutions, better knowledge of the availability and quality of water resources, infrastructure planning that considers future changes in water availability, better conservation mechanisms, greater understanding of the resilience of water-producing ecosystems, and more contact with users.
- 3.25 **Water security.** The issues that the sector has not yet resolved relate to the impact on operational and management aspects, the use of water conservation mandates and other incentives. These include compensation for environmental services, the establishment of ecological flows, water property right regimes, the scope and restrictions for sharing water among users within or between watersheds, infrastructure investments for producing drinking water, taking the impacts of climate change into account in the design and operation of water infrastructure, the allocation of water rights in crossborder watersheds, the economic assessment of ecosystem services in relation to the availability and regulation of water resources, the assessment of their vulnerability to the effects of climate change, and variability in the quality and availability of water. These areas require more information gathering, research, and analytic work.
- 3.26 **Using the resource efficiently.** Recent droughts¹⁴⁴ have drawn attention to this resource and to the need to make rational and efficient use of it. Nevertheless, many countries still harbor the idea that the sources of water for human consumption can be expanded beyond their efficiency level. Various W&S utilities in LAC, primarily the smaller ones, report

¹⁴² Water availability measured in l/s/km² or m³/capita. For example, Peru has a water surplus, but 65% of the population lives on the Pacific coast, which has only 1.8% of the country's water availability, a typical situation of relative scarcity of water.

¹⁴³ OECD (2012b).

¹⁴⁴ For example, in the Caribbean in 2009-2010, Argentina in 2011, Mexico in 2011-2012.

losses in excess of 50% of the volume produced,¹⁴⁵ and many countries exhibit excessive consumption. Yet there are some countries where per capita consumption has been declining through a combination of metering policies, rate increases, and awareness raising campaigns. The real availability of water depends primarily on its quality. Most urban rivers^{146,147} that serve as water sources are polluted by domestic and industrial wastes, and in some cases by mining and agricultural runoff, which in many cases limits their use. Rural areas are more sensitive to changes in the availability and quality of the source, as small systems will be dependent on a single source and consequently fluctuations in the flow will have a sharp impact on supply. In the case of prolonged droughts, water sources can simply disappear.¹⁴⁸

- 3.27 **Environmental and social management in W&S utilities.** Environmental and social management in the region's W&S utilities exhibits different levels of development, with great variations within and between countries. The larger-scale utilities generally tend to employ environmental management systems for various reasons (because of pressure from environmental control agencies, or at their own initiative as a way of improving their management systems, or in an effort to be in the vanguard of the sector, etc.). Firms such as EPM, SABESP, CAESB, and EMAAP-Q have begun to institute environmental management systems based on ISO 14001,¹⁴⁹ but they have no system for monitoring environmental and social issues once works are built. Smaller firms are focused on providing and expanding W&S services, and they address environmental and social issues only when there is a pro-active environmental agency or when they receive financing from international organizations. It is important, as part of project preparation, to allocate funding to help firms implement environmental management systems in a manner consistent with their level of business development. With projects, it is important to consider issues relating to water conservation (payment for environmental services), preservation of downstream ecosystems (ecological flows), and gender and ethnic issues. In designing projects, particularly in rural areas or small municipios, safeguards need to be included to deal with potential environmental and social problems. Drinking water projects must provide for the mitigation or appropriate handling of "gray water".¹⁵⁰ Individual sanitation systems need to consider the proper management and disposal of the sludge that accumulates in septic tanks or latrines. In some countries, technical or environmental regulations may require that these systems comply with effluent quality standards that will require the construction of conventional sewerage and treatment networks. In such cases it

¹⁴⁵ IDB (2007).

¹⁴⁶ Río Tietê in São Paulo, Río das Velhas in Belo Horizonte, Río Bogotá in Bogotá, Río Rimac in Lima, Río Reconquista and Río Matanza-Riachuelo in Buenos Aires, among others.

¹⁴⁷ Mahlnecht and Pastén (2013).

¹⁴⁸ This has been the case in many localities in north-central Chile in recent years, which have experienced five years of drought.

¹⁴⁹ Titan Engineering (2014).

¹⁵⁰ "Gray water" refers to water used in the kitchen or for personal hygiene and similar uses, but not polluted with excreta.

would be advisable to revise the regulation in question and adapt it to the characteristics of these small systems.

IV. LESSONS FROM THE BANK'S EXPERIENCE IN THE SECTOR

- 4.1 The Bank has had a close historical involvement in development of the W&S sector in LAC. Over the years 1980-1995, W&S was one of Bank's most active sectors, accounting for more than 10% of all loan approvals. Between 1996 and 2005, however, loan approvals in the sector declined to less than 5% of total lending (and in 2001 it fell to only 1%), partly as a result of the Public Utilities Policy adopted in 1996, which established common rules for network services (such as electricity and telecommunications) and which led the Bank to prepare a manual for its application in W&S projects (see paragraph 4.28). Under these circumstances, and in response to the United Nations' warning that the MDG targets for access to W&S were unlikely to be met, the Bank launched the Water and Sanitation Initiative (WSI) in 2007, summarized in the section on comparative advantages of the Bank for positioning itself in the sector in recent years.
- A. Lessons learned from Project Completion Reports**
- 4.2 In order to draw lessons from the execution of Bank-financed projects in the sector, 35 projects were analyzed¹⁵¹ with support from the Knowledge and Learning Sector, in an exercise that included documentary reviews and interviews with Bank specialists and executing agencies. The study was supplemented with information extracted from knowledge products developed by the Water and Sanitation Division (WSA) in recent years. The principal findings can be grouped under the following aspects:
- 4.3 **Attention to the rural sector.** The resurgence of numerous projects in the rural sector in recent years highlighted its abandonment in countries' policies and interventions in recent decades. Efforts must now be made to close the urban-rural coverage gap, bearing in mind the specific features of the communities concerned.
- 4.4 **Comprehensive approach.** Projects must offer integrated solutions that address jointly the aspects of W&S, health education, and environmental and social issues. This has been very evident in projects for restoring the quality of water bodies, which cannot be improved without actions to address topics such as sanitary sewerage, storm drainage, and solid waste. Nevertheless, in many cases the resources have been inadequate to support the required interventions, which have therefore had to be undertaken in stages, with the result that the expected outcomes will take longer to materialize than those from a particular intervention program.
- 4.5 **Quality and efficiency of service.** Project design must include a focus on quality, asset management, and service delivery efficiency. This focus has led to the incorporation of components for rehabilitation, expansion and technological updating of infrastructure, the supply of equipment and tools, improvements to O&M practices and business structure, the inclusion of good corporate governance practices in the utilities, personnel training, and

¹⁵¹ A list of the 35 projects analyzed as input for the lessons learned is found at (link).

institutional strengthening for the service providers. A recurrent problem in the region, especially in the Caribbean and in smaller cities, is the high cost of energy. The Bank has funded various projects that include energy efficiency measures, and these have produced a high financial return. Investments in energy cost savings paid for themselves in 1.5 to 3 years. Moreover, it was found that gains in terms of the skills of personnel yielded great improvements in the system's labor efficiency, thus producing savings in operating costs. Lastly, experience shows the need to have a professional group dedicated to asset management issues in order to ensure the sustainability of infrastructure.

- 4.6 **Flexibility.** There is no single solution that is ideal for all cases. Projects must offer appropriate solutions taking into account the specific socioeconomic and cultural features of the beneficiaries, within a national regulatory framework for service quality. In sanitation projects it is especially important to consider and select strategic intervention options that will maximize the effectiveness, efficiency, and sustainability of these solutions. This is critical in rural areas, but also in urban and periurban projects, or alternative solutions, such as the use of condominial sanitation systems.
- 4.7 **Management weaknesses of small operators.** In smaller urban areas, experience has shown that the operators frequently do not have the technical and human resources needed to manage services efficiently, due to a shortage of financial resources, lack of scale, heavy political interference, inappropriate management systems, and the absence of appropriate and comprehensive regulatory policies. Strengthening these operators and governance of the sector is essential to guarantee the sustainability of investments. The Bank has financed various capacity-building programs including the provision of equipment (IT systems, operating and maintenance (O&M) equipment, vehicles etc.), the installation of modern control and management systems, training for key personnel, formulation of master plans for the systems, incorporation of project evaluation methodologies, rate studies, etc. However, the overall conclusion is that these programs have had a limited or temporary impact because of frequent personnel turnover, among other factors.
- 4.8 **Cost recovery/payment for service.** In several countries of the region micrometering is little used, user charges are based on the characteristics of the property or the geographic area, much water is consumed free, and there is room to improve the rate-setting systems, but above all there are no explicit mechanisms for subsidizing low-income families. An important lesson is that when there is a clear commitment on the part of the operator to provide quality service, users are much more likely to accept higher service charges. Moreover, while rate adjustments are a necessary condition for escaping from the vicious circle in which many utilities are trapped, the timing of such adjustments is critical. One approach that has proven successful in several countries is to make gradual rate adjustments, linking them to a serious commercial and information policy that will explain the benefits of the investment programs or other actions, while ensuring that the rate system makes provision to subsidize families that do not have the capacity to pay. Successful examples show that political support for these measures has been very important.
- 4.9 **Transparency.** This is a fundamental factor for gaining the trust of users, and of other authorities, and for making them aware that their contribution –i.e. timely payment of their bills – is essential for proper delivery of service over the short, medium, and long terms.

The public can be informed via Internet about the administrative, financial, operating, and technical situation of the operators, for example through the publication of financial statements or management indicators. Similarly, the process for tendering works, equipment and services, especially in the case of public operators, must be seen as transparent.

- 4.10 **Public-private partnerships (PPPs).** A number of lessons can be drawn from the Bank's experience in supporting arrangements of this type. First, without strong incentives neither the private nor the public sector will make its best efforts. Aligning incentives and control with expected outcomes is essential in any PPP contract. Without effective social outreach, the public counterparty will not support the contract. Active and effective consultation with the people who will be affected by the contract, and especially the utility's employees, is essential. Although this consultation can hold up implementation of the contract, the cost of such delay will be less than the cost that would be entailed if the contract failed to meet its objectives.
- 4.11 **Gender focus.** Bank experience has also shown that promoting women's participation is well-received and has a positive effect, both on its positioning within the community and on the outcomes of projects. Thanks to the gender focus included in programs, women have more input into decision-making at higher levels, such as when it comes to the construction of water and sanitation systems. Furthermore, because women are often key in shaping family hygiene and health habits, they will have an essential influence on the impact of programs (IFPRI, 2012 and 2013).
- 4.12 **Resettlement.** Works that involve resettlement require a careful definition of the area of activity and sufficient time to design appropriate solutions, with a solid physical and socioenvironmental diagnosis. Experience shows that complex projects involving human resettlement need more preparation time in order to avoid subsequent delays and cost overruns during execution. Preparation and updating of a resettlement plan is very important, particularly when it comes to defining the beneficiaries and the eligibility criteria, as is the planning of responses to potentially anomalous situations in the resettlement phase, above all from the legal viewpoint.
- 4.13 **Demand-based approach.** In rural projects, experience indicates the need for a demand-based approach. The diagnosis for establishing the project baseline must include surveys to analyze local socioeconomic conditions, education levels, housing conditions, the origin and uses of water, water-related diseases, family incomes, and a preliminary mapping of stakeholders and interest groups. Moreover, it must consider local knowledge, practices, opinions, and expectations relating to W&S services, potential executing agencies, their participation as the process proceeds, effective communication mechanisms, etc. Lastly, it is essential to assess the willingness to pay for service.
- 4.14 **Incentives for users to connect to sewerage systems.** A recurrent problem in the region is the low rate of user connections to new sanitary sewerage networks. A number of Bank projects failed to take this element into account in the design, and the expected benefits were thus not fully achieved. Based on that experience, a number of tools have been used to resolve the problem: (i) strategies for changing behavior, using the mass media to help

users recognize the problem and understand the importance of connecting (especially in light of the health benefits involved); and (ii) providing technical and financial assistance to users for connection to the sewerage system (some programs targeted their support at families in real need of economic assistance, using the eligibility criteria for the social assistance programs run by various government bodies at the municipal, subnational, or national level).

- 4.15 **Communication.** Experience shows that a sound social outreach strategy is essential for reform programs and processes, and that keeping the community informed is a key factor in achieving greater legitimacy. Users are less likely to oppose the reform process if they understand why, where, and how it will affect their situation (for example through higher rates). However, adapting communication and community work in zones of cultural conflict (especially indigenous) remains a major challenge, one that has significantly delayed or even blocked the completion of works.
- 4.16 **Climate change.** Incorporating climate change into W&S projects has become a fundamental factor. Bank experience has shown that this aspect is critical when designing water reservoirs to deal with the accelerated melting of tropical glaciers, providing water under conditions of increasing drought, adapting urban storm drainage to changes in precipitation patterns, regulating dams to prevent flooding, constructing berms to protect wetlands, and ensuring rational exploitation of groundwater wells to prevent salinization.

Lessons from Project Execution	
Executing agencies	
• The capacity analysis conducted as part of the project must be more comprehensive and must consider the realities of the country and the sector, and the executing agency's capacity. • Having executing agencies with prior experience in implementing projects financed by international agencies, and by the IDB in particular, has been found critical for the implementation of such projects. When such experience is missing, an important factor for success will be to have persons with high technical capacity, suitable prior training in project management and, if possible, initial support from specialized firms or consultants.	
Institutional leadership	
• The lack of leadership from the highest level of the institutional structure is one of the fundamental factors conditioning the success of an operation. The person who exercises institutional leadership must be identified from the outset in order to forge the alliances and the consensus that will ensure the ongoing support needed for smooth execution.	
Training	
• Training, both for the entities involved and for the executing units, must be ongoing in order to cope with the high mobility of qualified personnel due to changes in the political or administrative leadership of localities and institutions. • Bank procurement policies are an area where the required training and appropriation can be a time-consuming and often complex process, given the differences with country systems. It is important that the project schedule and the associated programming instruments should allow the time needed to strengthen the executing agencies' understanding of Bank policies for the procurement of goods and services.	

Design of the execution and disbursement arrangements
When loans are approved without first defining key issues such as the conditions and method for transferring credit to subregional levels, or without a precise designation of the executing agency, the availability of lands etc., and spelling these out as conditions precedent to disbursement, there are likely to be significant delays in project execution. Better-defined projects can minimize the contractual conditions for beginning disbursements and can reduce delays in execution.
Institutional strengthening
Most operations include a component or a series of activities for strengthening the executing agency. These measures are often aimed at the executing unit, without covering the agency as a whole. For every operation it is important to analyze and differentiate between activities geared to execution and activities to strengthen the executing agency more generally. Actions to improve the performance of the executing agency should not, as a rule, be conditions for the execution of works.
Policy-based loans
- Policy-based loans have proven themselves to be a suitable mechanism for inducing regulatory and institutional changes that will strengthen the sector and generate appropriate conditions for the implementation of programs and investment projects. In many cases this alternative has proven more effective than the inclusion of regulatory or institutional reforms in multiphase projects (investment projects) as triggers for subsequent phases, because the executing agencies for these operations do not control the adoption of these measures, which moreover need time for design, consensus, approval, and implementation which may exceed the execution cycle of an investment project. - Multiphase projects have proven very effective in supporting executing agencies in investment projects which, even if they do not involve policy reforms, will require continuity over long periods of time (covering successive governments or administrations) in order to maintain a long-term vision (examples of this long-term impetus are common in urban sanitation programs).

B. Reports from the Office of Evaluation and Oversight

- 4.17 In recent years, the Office of Evaluation and Oversight (OVE) has produced evaluations covering various aspects of W&S. The most relevant was the “Evaluation of the Public Utilities Policy (OP-708) for water and sanitation services,” dating from 2002, which analyzed the Bank’s application of the policy from 1996 to 2001. Specifically, it found that economic and financial sustainability was not a sufficient condition to ensure increases in coverage for poor population groups or for protection of the environment, and it recommended placing the access objective at the same level as that of economic and financial sustainability. As well, it recommended that specific criteria and strategies be defined for rural and periurban areas. These recommendations were initially taken up in the manual for application of OP-708 in W&S projects (IDB, 2002) and were fully addressed in the Bank’s Water and Sanitation Initiative. As explained in section D of this chapter (see paragraphs 4.32 to 4.26) that Initiative gave top priority to extending coverage to the poorest people of the region, it placed serving rural and periurban populations at the center of the region’s political and technical agenda, and it aligned proposed interventions in countries with their particular situation (social and political reality, priorities, institutional capacity, and degree of development in the sector).
- 4.18 Another pertinent OVE document is “The Challenge of Integrated Watershed Management: Analysis of the Bank’s Action in Watershed Management Programs

1989-2010,” from October 2012. That evaluation identified the Bank’s structural difficulties in implementing the mandates of the strategy and highlighted the absence of a clear definition of the concept of “integrated watershed management” in the development of operations which, while they took the watershed as the physical framework for execution of activities, did not address the issue in a comprehensive way, responding only to the specific needs of subsectors such as agriculture, irrigation, drainage, or sanitation. In response to that analysis, in 2011 WSA prepared a manual with outcome and output indicators for use in projects involving water resources and watershed management. However, a remaining task, addressed in this SFD, is to take a more comprehensive approach, following experience with the program for modernizing water resources in Peru, which the Bank implemented in 2011.

- 4.19 A third relevant OVE evaluation was on the “Integrated Strategy for Climate Change Mitigation and Adaptation and Sustainable and Renewable Energy,” published in 2013, which examines the Bank’s progress with its implementation. The analysis concludes that the conceptual aspects are the primary concern and that although the importance of this area at the institutional level is confirmed, its operational aspects are not considered in depth, thus highlighting the need to incorporate them into ongoing policies in the country strategies and in the programming dialogues. The Water and Sanitation Division (WSA) has applied the strategy in its operations of recent years in specific aspects such as energy efficiency in water utilities in various countries.¹⁵² It has also encouraged the incorporation of climate change adaptation considerations in the sector through the water and adaptation to climate change initiative prepared in 2010, which proposes three basic lines of action: (i) promotion of regional dialogue on water and adaptation policies; (ii) support for innovation through the development of decision-making tools and applied knowledge products; and (iii) development of a portfolio of case studies. As outputs from this initiative, WSA has a catalogue of case studies dealing with the major challenges associated with climate change (extreme events, floods, droughts, rising sea levels, melting of glaciers, degradation of ecosystem services, etc.) throughout the region.¹⁵³ Some of these pilot cases have allowed elements of adaptation to be incorporated into the design of Bank operations.

C. Results from the Development Effectiveness Matrix

- 4.20 The scores obtained in the Development Effectiveness Matrix (DEM) in the various dimensions for projects in the sector have improved significantly since 2009. Since 2011, all sector projects have qualified as highly evaluable (see Table 1).

¹⁵² Nicaragua, Dominican Republic, Jamaica, The Bahamas, Guyana, Barbados, and Suriname.

¹⁵³ Ecuador, Uruguay, Argentina, Peru, Trinidad and Tobago, Haiti, Honduras, Nicaragua, Mexico, and Brazil.

Table 1
Summary of the DEM results for WSA operations

	2009		2010		2011		2012		2013	
	Sector	Bank	Sector	Bank	Sector	Bank	Sector	Bank	Sector	Bank
Number of projects approved	16	114	24	135	16	122	15	125	7	110
% of highly evaluable projects	31	22	33	41	100	86	100	99	100	100
1. Evaluability based on assessments and solutions	5.9	6.7	7.1	7.6	8.0	7.9	8.0	8.3	8.7	8.8
2. Monitoring and evaluation	4.3	5.0	5.3	5.9	6.8	6.9	6.8	7.5	7.6	7.8
3. Ex ante economic analysis	5.8	3.9	6.8	6.0	9.6	8.9	9.9	9.4	10.0	9.6
4. Risk management	7.3	7.3	7.1	7.7	9.5	9.2	9.8	9.8	N/A	N/A
Average evaluability	5.8	5.7	6.6	6.8	8.5	8.2	8.6	8.7	8.8	

Source: IDB.

4.21 The most relevant aspects from the DEM analysis for the sector are the following:

- a. **Ex ante economic evaluations.** The Bank has a high level of expertise in conducting project economic evaluations. As a general rule, a rigorous cost-benefit analysis is performed for all projects, and this is reflected in the DEM score for this category, which was consistently above the Bank average.
- b. **Impact evaluations.** To measure the effect of W&S interventions on health variables (for children under 5) and the impact of economic incentives and education and awareness raising campaigns concerning sewerage connectivity, since 2010 the Bank has been conducting three impact evaluations using an experimental design. Although that number, as a percentage of operations approved, is below the Bank average (because of the wealth of evidence on the positive impacts of W&S on people's health, the high costs of conducting those assessments, and the complexities of randomization), in the coming years WSA will define an evaluations agenda that seeks to generate greater knowledge of the sector.

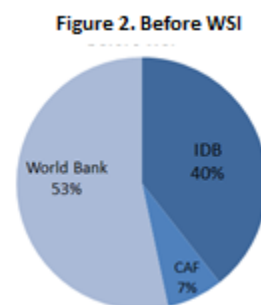
D. Comparative advantages of the Bank in the region

4.22 The Bank is seen as having great experience in the region. In recent years, it has been renewing and decentralizing its specialist staff in order to meet countries' demands more effectively, and the executing agencies in fact place great value on the support provided by those specialists in project development and execution. In many cases the executing agencies consider that the Bank should reinforce its role as a collaborator with other entities (donors, government agencies) and with the executing agencies themselves in the development of projects.

4.23 Implementation of the WSI positioned the Bank as a lead entity in the sector, by proposing a series of strategic guidelines and a set of special targets and financial and nonfinancial products to support solutions tailored to the needs of each country. The WSI responded to a pressing need in the region in terms of knowledge, technical assistance, and project financing. The results

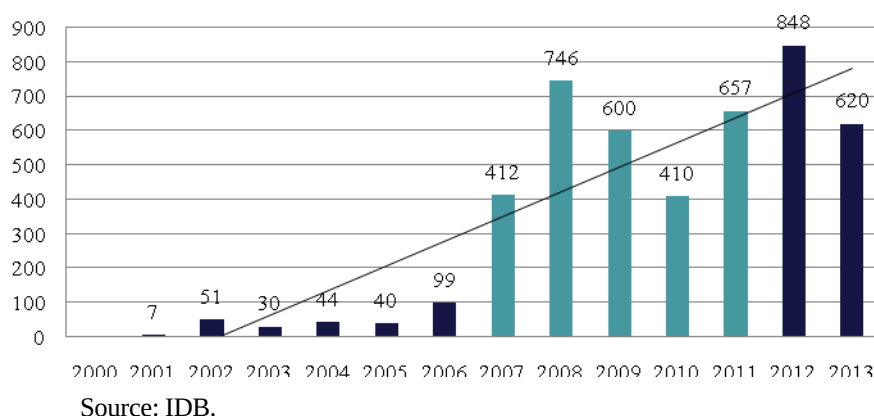


obtained through its finalization in 2012 indicate that it has placed the Bank as a benchmark and a strategic partner in the region. With the WSI, projects approved by the Bank increased from an average of five per year between 2000 and 2006 to an average of 15 between 2008 and 2012, with the total amount involved rising from US\$200 million per year to an annual average of US\$1.4 billion.



4.24 The absolute amounts disbursed have increased significantly since 2007.

Figure 4. Disbursements by year (US\$ millions)



4.25 As a strategic part of the WSI, the Bank launched the AquaFund in 2008, a multidonor fund for nonreimbursable technical cooperation designed to finance the preparation of projects, institutional strengthening activities and innovative pilot projects (water in schools, recycling with the participation of recyclers, low-density rural areas, etc.). To date 104 technical cooperation projects have been approved for a total of US\$54.3 million, benefiting 24 countries of the region.

4.26 The AquaFund has been key to positioning the Bank as the sector's main partner in LAC, generating benefits in terms of: (i) developing an active knowledge and public policy

agenda;¹⁵⁴ (ii) increasing the loan portfolio;¹⁵⁵ (iii) improving portfolio performance and disbursements, and reducing the risk of cost increases by having projects that are ready from a technical standpoint;¹⁵⁶ (v) strengthening sector institutions;¹⁵⁷ (vi) supporting knowledge sharing;¹⁵⁸ and (vii) developing innovative intervention models.¹⁵⁹ In addition, the AquaFund has leveraged significant public and private capital (over US\$50 million in cofinancing, and more than US\$30 million to finance technical cooperation from other donors).

- 4.27 Given the AquaFund's impact in the region, it will continue to play an essential role in implementing this SFD. It is the main Bank tool available for incorporating considerations on gender, ethnic minorities, and climate change, as well as for supporting the generation of knowledge, public policies, and the preparation and execution of loans on priority topics such as access for periurban and rural populations, wastewater treatment, solid waste management, risk management, urban drainage, business management of the operators, sector governance, and financial sustainability.
- 4.28 The WSI also facilitated the establishment of strategic partnerships that have augmented the Bank's presence in the sector. Of particular note is the Bank's partnership with the Government of Spain, established in 2008 to administer the Spanish Cooperation Fund for Water and Sanitation in Latin America and the Caribbean (SFW), a nonreimbursable investment fund for financing W&S projects, with priority to rural and periurban zones, which has served to multiply the impacts of Bank activities in the region. For 2013, the SFW had a portfolio of US\$1.105 billion under administration (US\$560 million in grants,

¹⁵⁴ In Uruguay, financing was provided for preparing the first Integrated Water Resources Management Plan and training specialists at the National Water Office. In Peru, partnering with government and regulatory institutions, the AquaFund financed nine activities that provided the inputs needed for sector reforms to be implemented with a US\$50 million programmatic PBL. These reforms focused on the regulatory system and updating the National Sanitation Plan and developing a financial model to guarantee long-term sector sustainability.

¹⁵⁵ In Panama, five technical-cooperation operations: (i) made a significant contribution to formulating new operations and ultimately increasing the WSA portfolio, which rose from 5% in 2009 to 27% in 2013; and (ii) built project management capacity in executing units: in 2013 disbursements were triple their level in 2012.

¹⁵⁶ In the Dominican Republic, thanks to a technical cooperation operation financed by the AquaFund to support a loan, two years after the project achieved eligibility, 30% of the operation's resources had been committed—a substantial improvement over the previous operation in the sector, in which the designs were going to be prepared as part of the loan operation and two years after eligibility just 1% of the approved amount had been committed.

¹⁵⁷ The AquaFund makes it possible to develop and apply capacity-building tools that go beyond what can be achieved in the time and with the budget available for preparing a loan. These tools help to identify institutional weaknesses in the service providers and to design customized improvement and strengthening strategies. Examples include AquaRating, HydroBID, corporate governance, and others.

¹⁵⁸ Knowledge has been shared among countries. For example, financing was provided for 21 exchanges of operators in the region from 2010 to 2012. In addition, roughly 16 training workshops were funded for operators on unaccounted-for water, energy efficiency, and other topics. In Brazil, it supported the implementation of the National Program for Evaluating Water Quality, producing videos and manual. Thanks to the strong results, the experience was shared with Peru's National Water Agency.

¹⁵⁹ Pilots have been implemented that provided lessons learned and recommendations to be scaled up in large investment projects. In one project that was financed in three Central American countries for water and sanitation service in schools, different types of interventions were tested and the lessons learned are being implemented in a loan US\$350 million loan in Mexico.

leveraging loans of US\$395 million and local counterpart funding of US\$150 million) with 20 operations in 14 countries. In addition, through the SFW the Bank has launched a series of initiatives to promote innovative actions and tools for addressing challenges in the region, ranging from “condominial” sanitation to geo-referenced monitoring systems,¹⁶⁰ to actions to improve the impact of projects on gender aspects or the system of rural indicators.

- 4.29 An example of joint work with executing agencies in the region is the Rural Sanitation Strategy. As noted above, sanitation solutions must be tailored to people’s real needs. For the last year, work has been under way on such a strategy. This has involved evaluating projects in execution and assessing models used in Africa and India, working with countries to identify lessons learned, best practices, and new approaches and technologies that will boost project impact. The goal is to develop a sustainable model that is appropriate to the beneficiaries with whom the Bank is working in the region, by the end of 2014.
- 4.30 The Bank has also developed a series of products to support operators in the sector, and they have been very well accepted. One of them is the network of Water Operators Partnerships in Latin America and the Caribbean (WOP-LAC), which the Bank developed and coordinated between 2007 and 2012 at the request of UN-Habitat. The WOP-LAC network seeks to encourage technical cooperation and sharing of knowledge and experience among W&S operators with a view to enhancing the efficiency of service delivery. During its management of the network, the Bank helped organize 32 exchanges among operators and 28 training workshops on topics of interest to operators (business management, reducing unaccounted-for water, etc.). More than 60 utilities in the region are members of WOP-LAC.
- 4.31 Another noteworthy product is AquaRating, a joint initiative of the Bank with the International Water Association. AquaRating is a knowledge tool of voluntary and universal use that offers an objective rating of the integrated management of W&S service providers, based on criteria of accessibility, quality, efficiency, sustainability, and transparency. AquaRating fills a gap in the sector by establishing a model that combines the setting of performance standards in all areas of a W&S service provider, the evaluation of the utility’s management practices by an audit firm to ensure the reliability of the information, and the guarantee of an independent entity (AquaRating, sponsored by the International Water Association).
- 4.32 **Innovation and technologies.** The Bank has been a leader in promoting and supporting the development of appropriate technologies that enable the countries to meet major investment and service management challenges, using fewer resources or obtaining better results. This is the case of support for sewerage projects using the condominial methodology, achieving savings of nearly 50% compared to conventional technologies, which have been included in projects with SEDAPAL in Peru, and in Paraguay (where the Bank has also been supporting its inclusion in public policy for the sector and in design

¹⁶⁰ WSA has supported the development of geo-referenced monitoring systems for rural networks in several countries in the region (Paraguay, Honduras, Nicaragua, Panama, and Dominican Republic, www.siasar.org), as a mechanism for enhancing the sustainability of infrastructure that is built.

standards). Between 2010 and 2013, the Bank also implemented the Energy Efficiency Program for W&S utilities, conducting energy audits for 15 operators in the region, designing action plans for better use of energy, and producing manuals on audit and maintenance of electromechanical equipment. The manuals have been published and made available to the public. The action plans were widely used in the preparation of loan components in many countries, including Guyana, Suriname, Jamaica, Barbados, El Salvador, Nicaragua, and Panama.

- 4.33 One example of interagency cooperation is the Prototype Caribbean Regional Fund for Wastewater Management (CReW), created in 2011 by the Global Environment Facility in association with the IDB and the United Nations Environment Programme, in the amount of US\$20 million. The fund has 13 member countries in the English- and Spanish-speaking Caribbean. Its objective is to test financing mechanisms that will ensure the sustainability of wastewater treatment projects. It includes the creation of a national revolving fund in four countries (Belize, Jamaica, Guyana, and Trinidad and Tobago). The program calls for actions to improve environmental policies, standards, and regulations, to strengthen W&S operators, and to construct works. The program responds to the most important environmental demand in the Caribbean which is to cover the great deficit in wastewater treatment that is now having a sharp environmental impact on water bodies.
- 4.34 Furthermore, reflecting the Bank's commitment to support member countries in adapting to the effects of climate change, WSA is taking the lead in developing and applying the first regional platform for integrated modeling of water and climate change, known as Hydro-BID. This platform includes hydrology and climate analysis modules for estimating flows (volume and speed) and it can be modulated at the regional, country, watershed or sub-watershed level depending on the needs of the user. The platform includes hydroclimatic information for the entire region, covering more than 230,000 subwatersheds. Hydro-BID is being implemented in Argentina, Peru, Brazil and Haiti, among other countries, in the context of various Bank operations, for purposes as varied as development of comprehensive watershed management plans, design of an industrial park, and integrated management of reservoir systems.
- 4.35 With respect to participation in other Bank initiatives, WSA has supported implementation of the Emerging and Sustainable Cities Initiative (ESCI) and the Biodiversity and Ecosystem Services (BES) program. At least 14 WSA staff members have worked directly on diagnosis and priority setting for the sector in 20 cities in the regular program (including those that were added in 2014), and nine cities in the additional program (cities added to the initiative with their own funds or with funding from local development banks). The relationship established between WSA and ESCI has been mutually beneficial: ESCI has benefited from the leadership and technical expertise of WSA specialists, and WSA has

added cities to its project portfolio.¹⁶¹ WSA is a member of the BES working group and the partnership between WSA and BES has resulted in a pilot project for the environmental and economic evaluation of biodiversity and ecosystem services associated with an investment project. The BES theme has been incorporated into the sector note, and WSA specialists have received training in economic evaluation aspects related to BES.

- 4.36 WSA has also worked with the Social Protection and Health Division on its initiative relating to Neglected Tropical Diseases (NTDs), which the Bank is coordinating with the Sabin Vaccine Institute and the Pan American Health Organization (www.neglecteddiseases.net) in several countries of the region, aimed at speeding the control and elimination of these diseases which affect more than 100 million people in LAC, using an inter-sector focus that promotes investment in W&S and integrates NTD prevention actions into primary healthcare services. This collaboration has translated into W&S operations with NTD treatment components in various countries of the region. As well, WSA has a long and successful tradition of working with the Environmental Safeguards Unit (ESG) on preparing, implementing, and supervising water and sanitation projects by assigning ESG specialists to the division's projects, on preparing the Bank's annual report on sustainability, and on analyzing and evaluating the environmental and social aspects of importance to the sector, its investments, and its sustainability. WSA will continue to work jointly with these divisions and will seek to initiate coordination with other areas such as the Fiscal and Municipal Management Division and the private sector window.
- 4.37 Taking into account international evidence, lessons learned and the challenges, the Bank will give priority over the next three years to helping countries to make access more equitable and to achieve universal coverage of W&S services of adequate quality (potability, continuity, and pressure), strengthening governance in the sector and the efficiency and sustainability of utilities management, increasing linkages with the private sector in managing utilities or delivering specific services for which the sector's public utilities are responsible, and increasing the specific adoption of social and environmental aspects in operations.
- 4.38 The Bank has a team of professionals with solid knowledge and experience in water and sanitation projects. However, projects dealing with water resources, storm drainage, and solid waste also represent a significant portion of the overall portfolio (19%). Given the volume of demand, the professionals (both at Headquarters and in the field) will seek to strengthen the areas mentioned through training and coordination with other entities and

¹⁶¹ Examples of WSA participation in ESCI include cities such as Mar del Plata, which was included in WSA programs for solid waste and sanitation (waste management and construction of a wastewater treatment plant), Montevideo (where ESCI preinvestment funds are financing a study of flooding in the Arroyo Pantanoso basin and a feasibility study for construction of a new sanitary landfill), Tegucigalpa (where an integral urban project is planned that will include a component for cleanup of the Río Choluteca), Port-of-Spain (where a W&S component is expected to be included in a loan for urban sustainability), Cochabamba (where financing is sought for studies for the cleanup of the Río Rocha), and Asunción (with studies for the extension of networks for cleaning up the Lago Itaipu).

institutions that have experience with these issues, in order to improve the capacity for dialogue with member countries.¹⁶²

- 4.39 Recognizing the Bank's comparative advantages and the challenges relating to W&S in the region, as well as their lesser value added, over the next three years the Bank will not give priority to activities such as: (i) combined sewers, if the separation of wastewater is necessary to preserve the quality of water bodies into which effluents are discharged; (ii) interventions not associated with urban watersheds and that do not involve integrated management of water resources; or (iii) storm drainage systems in cities with less than 50,000 inhabitants or in rural areas, or in cities that pose no current or potential human risks from flooding.

V. GOALS, PRINCIPLES, DIMENSIONS OF SUCCESS, AND LINES OF ACTION THAT WILL GUIDE THE BANK'S OPERATIONAL ACTIVITIES AND RESEARCH

A. Bank goal and work principles in W&S

- 5.1 This Sector Framework's goal for the Bank is to support the countries in achieving universal access to sustainable, high-quality water and sanitation (W&S) services. Given the heterogeneity of the issues surrounding these services in the different countries, the technical sector notes that are prepared in the framework of country strategies will lay out the actions needed to address the specific conditions and needs of each country. The following principles will govern Bank actions, gearing its work towards knowledge generation, country dialogue, and design and implementation of sovereign and nonsovereign guaranteed (loan, grant, and technical cooperation) operations:
- a. Achieve universal access to W&S services, improving opportunities for the low-income and most vulnerable population, increasing wastewater treatment, and improving the quality and efficiency of service delivery, and ensuring adequate management of assets to guarantee their operation and maintenance.
 - b. Promote technically comprehensive solutions that foster sustainability from an engineering, economic, environmental, social, institutional, and financial standpoint. This encompasses, not only providing infrastructure, but also actions to improve management and service delivery efficiency (institutional strengthening of public providers and linking private operators to their management), governance, adopting dimensions related to gender, indigenous populations, or Afro-descendant populations, and promoting financing arrangement for proper operation and maintenance of the services.
 - c. Improve coordination with other sectors (social, health, climate change, and urban development, among others) and promote multisector interventions with them, seeking greater social and economic impacts.

¹⁶² Details on how to achieve these objectives will be presented during the budget discussions.

- d. Incorporate the concept of water security in the W&S sector, to have resources of adequate quality and quantity for all uses, taking into consideration climate change criteria.

B. Dimensions of success and their lines of action

- 5.2 In order to support the countries in sustainably achieving universal coverage in W&S and ensuring quality, the sector's main challenges, which are mentioned in Section III, must be addressed: (i) unequal access to and poor quality of services; (ii) limited institutional governance; (iii) inefficient service management, low private sector participation, and financial instability; and (iv) little inclusion of social and environmental considerations. Based on these challenges, and on the provisions in the Public Utilities Policy (OP-708), four dimensions of success are proposed that seek to achieve the proposed goal. First, the population's access is increased, focusing on vulnerable zones and low-income households and enhancing service quality. This dimension seeks to close existing gaps, adequately addressing remote households with innovative solutions, enhancing the quality of all services and increasing wastewater coverage. Second, sector governance is strengthened and States place priority on W&S investments, an appropriate sector structure is defined, with clear roles and responsibilities that make it possible to provide specific guidelines to all sector agents. Third, the operators are strengthened to boost efficiency in service management, seeking financial sustainability and increasing private sector participation. Lastly, the programs and projects promoted are environmentally and socially sustainable and their design takes into account cultural and climate change considerations.
- 5.3 Each of these dimensions of success includes lines of action that set out operational and knowledge activities to which the Bank must give priority while this water and sanitation SFD is in effect. The lines of action were defined taking into account country needs, international evidence, and the good practices identified, together with lessons learned from Bank projects in recent years. They are: (i) differentiated approach for addressing rural and periurban areas; (ii) comprehensive interventions that improve water quality and reduce flood-related risks; (iii) management of assets that ensure operation and maintenance, enhancing the quality of service delivery; (iv) incentives for governments to give priority to the sector and strengthen government institutions; (v) promoting reliable information systems; (vi) autonomous, efficient service delivery business arrangements; (vii) financial arrangements that ensure sustainability; (viii) social and cultural inclusion mechanisms; and (ix) promoting water security.
- 5.4 To accomplish these lines of action, operational and analytic activities were set out and were defined with the governments and principal stakeholders in the region; the Bank will give priority to these while this SFD is in effect. These activities aim to strengthen country dialogue, design and execute better projects, and propose a knowledge agenda that provides innovative tools to the region. The Bank will also set forth an agenda for evaluations, so as to increase the lessons learned and identify key factors of project success.

1. Dimension of Success 1. Countries achieve universal access to water and sanitation while improving service quality

- 5.5 The Bank will support countries in the quest for universal access to W&S and in their efforts to improve service quality, reducing inequities in access by focusing efforts on those areas (rural and periurban) that are lagging furthest behind and on low-income households, increasing wastewater treatment and improving service quality, to ensure the long-term sustainability of investments.
- 5.6 **Lines of action.** The following lines of action are proposed for achieving this dimension of success:
- a. Promote differentiated approaches in rural and periurban areas that increase the population's access to W&S services, narrowing both socioeconomic and geographic gaps.
 - b. Increase comprehensive interventions that improve water quality and reduce flood-related risks.
 - c. Implement appropriate asset management practices that ensure efficient operation, maintenance, and use, to improve the quality and efficiency of delivery of W&S services.
- 5.7 **Operational activities.** To accomplish the aforementioned lines of action, the Bank would give priority to the following operational activities while this SFD is in effect:
- a. Investments to increase W&S coverage and implement alternative, low-cost technologies to have a greater impact on the low-income population.
 - b. Investments that increase coverage of wastewater collection and handling and improve the quality of bodies of water.
 - c. Urban drainage, solid waste, and water resource programs that promote a multisector approach to interventions, taking into account climate change, gender, and ethnicity considerations.
 - d. Projects that finance system rehabilitation and maintenance and enhance quality in terms of continuity, potability, volume, and pressure.
 - e. Projects that incorporate the use of appropriate, low-cost technologies to increase the impact of Bank-supported interventions.
- 5.8 **Analytic activities.** The proposed analytic activities that will complement the operational activities are:
- a. Updating of Sector Strategic Plans that identify existing gaps and coverage differences within the countries and make it possible to take specific measures based on needs.
 - b. Analysis of good practices that determine the most efficient and effective mechanisms for serving the fringe population in periurban and rural zones (small towns and remote areas).

- c. Support for pilot projects to increase knowledge on the design, construction, and operation of appropriate, low-cost technologies.

2. Dimension of Success 2. Sector governance is strengthened and States give priority to W&S actions

5.9 The Bank will support countries to consolidate and strengthen a sector structure that will make it possible to prioritize the sector, to define roles and responsibilities in institutions, and to promote the development and application of public policies and standards that meet local needs and conditions; this will bring about stability in investments, attract private resources to the sector, and boost transparency, leading to increased coverage and enhanced long-term sustainability.

5.10 **Lines of action.** The following lines of action are proposed for achieving this dimension of success:

- a. Develop incentive mechanisms in the framework of public policy so that governments give priority to the sector and strengthen their institutions in a comprehensive, multisectoral manner.
- b. Promote reliable information systems in the countries for designing public policy, regulation, and control.

5.11 **Operational activities.** In the period covered by this SFD, the proposed operational activities associated with these lines of action are:

- a. Public policy reforms that enable governments to appropriately manage storm drainage and solid waste services.
- b. Strengthening oversight and regulatory bodies in the sector, to enhance support for small towns and rural communities.¹⁶³
- c. Technical assistance to support and promote policies that encourage interaction among entities for developing multisectoral,¹⁶⁴ comprehensive initiatives.
- d. Strengthening municipal management in W&S and technical assistance for developing and implementing information systems that boost transparency and accountability in sector institutions.

5.12 **Analytic activities.** The proposed analytic activities while this SFD is in effect are:

- a. Determine the role and effectiveness of the regulation of State enterprises.
- b. Identify the determinants of critical decisions for the sector (investments, rates, management models, etc.) from an economic policy viewpoint.

¹⁶³ Bodies responsible for formulating policies, coordinating financing, proposing technical standards, planning investments, developing educational and environmental programs, regulatory frameworks adapted to public enterprises, and monitoring performance of the sector and of service providers.

¹⁶⁴ Coordination with the health sector in particular could generate greater impacts for beneficiaries.

3. Dimension of Success 3. Utilities management is efficient and sustainable and private sector participation increases

- 5.13 The Bank will strengthen W&S operators in order to improve the coverage and quality of service, and will promote public-private partnerships in the sector in areas such as service management or the delivery of specific services to governments or public utilities.
- 5.14 **Lines of action.** The following lines of action are proposed for this dimension:
- a. Promote the establishment and strengthening of autonomous and efficient utilities (public, private or mixed, regional and rural community-based).
 - b. Financial arrangements that ensure the long-term sustainability of investments.
- 5.15 **Operational activities.** In the period covered by this SFD, the proposed operational activities for accomplishing these lines of action are:
- a. Technical assistance for developing mechanisms and incentives that increase private sector involvement in managing utilities and in financing investments.
 - b. Design actions plans for utilities to improve their operational, business, technical, and financial management¹⁶⁵ and provide technical assistance for their implementation, so they can be more autonomous and efficient (through corporate governance tools, among others).
 - c. Design and support the gradual application of financing arrangements that enable companies to recover operation and maintenance costs and efficiently expand services (including wastewater treatment).
 - d. Develop and implement arrangements to support rural communities, particularly in the works post-construction phase, that guarantee the operation and maintenance of the W&S solutions implemented.
- 5.16 **Analytic activities.** The proposed activities that should be given priority are:
- a. Analysis of which programs are most effective in boosting the efficiency and quality of urban utilities. Specifically, this would aim to conduct studies on unaccounted-for water and asset management, since the Bank has been developing corporate governance, business management, and energy efficiency tools.
 - b. Case studies, good practices, and tools to facilitate operators' access to capital markets.
 - c. Determine how to enhance the sustainability of rural service delivery, through an institutional analysis of the oversight bodies in the rural sector.

¹⁶⁵ In such aspects as control of unaccounted-for water, increased bill collection, efficient energy use, boosting labor productivity, customer service, information systems, and access to credit and capital markets.

4. Dimension of Success 4. Projects and programs are environmentally and socially sustainable and incorporate climate change and cultural considerations

- 5.17 The Bank will be proactive in ensuring that projects take into account aspects relating to participation, gender, indigenous populations, minorities such as Afro-descendants, and a systematic understanding of the nature of environmental and climate change problems in order to enhance the sustainability of W&S services.
- 5.18 **Lines of action.** The following lines of action are proposed for achieving this dimension of success:
- a. Develop mechanisms that increase user training and participation and take into account considerations related to gender and ethnic minorities throughout the project cycle, to ensure the sustainability of investments.
 - b. Promote water security in the region.
- 5.19 **Operational activities.** In the period covered by this SFD, the Bank will give priority to the following activities in the sector:
- a. Develop incentives and training through technical assistance for users to make rational use of water and adopt appropriate hygiene practices.
 - b. Implement cost-effective solutions for increasing the rate of in-house connections and placing value on the services.
 - c. Design mechanisms in the countries to safeguard service access for vulnerable groups (including the gender focus and attention to indigenous communities).
 - d. Strengthen communities with rural and small systems, so that they take charge of managing the services through boards or associations. Technical assistance will be provided for their formation and, if necessary, to propose public policy reforms to facilitate their operation.
 - e. Technical assistance to design and implement incentives for reducing the generation of solid waste, increasing recycling, and formalizing recyclers.
 - f. Investments and technical assistance for promoting integrated water resource management,¹⁶⁶ risk management, and flood control¹⁶⁷ and consideration of climate change aspects in service delivery (from the design of infrastructure through to its operation and maintenance), to increase water security in the region and strengthen utilities' environmental management.
- 5.20 **Analytic activities.** The proposed analytic activities that should be given priority are:

¹⁶⁶ Activities under this line of action that involve the agricultural sector will be conducted in a manner consistent with the Agriculture and Natural Resources Management Sector Framework Document (document GN-2709-2).

¹⁶⁷ Activities under this line of action will be conducted in a manner consistent with the Disaster Risk Management Policy (operational policy OP-704).

- a. Case studies and good practices for the inclusion of social and cultural variables in the design and implementation of public policies and investment projects.
- b. Design tools for identifying the foreseeable impacts of climate change at the local level, and more effective and efficient measures for adaptation.

5.21 In addition, WSA will work in a crosscutting manner to develop effective tools for disseminating its knowledge products to sector clients and authorities.

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