



Approach Paper

Study Proposal Sustainability of Water and Sanitation Interventions in Rural Areas



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ABBREVIATIONS

DGEEC	Dirección General de Estadística, Encuestas y Censos [Statistics, Surveys, and Census Bureau]
ERSSAN	Ente Regulador de Servicios Sanitarios [Sanitation Services Regulatory Agency]
OVE	Office of Evaluation and Oversight
PAYSRI	Programa de Agua Potable y Saneamiento de Pequeñas Comunidades [Water Supply and Sanitation Program for Small Communities] (approved by the IDB in 2013)
PCR	Project Completion Report
SENASA	Servicio Nacional de Saneamiento Ambiental [National Environmental Sanitation Service]

I. INTRODUCTION

- 1.1 Sustainability is one of the key considerations to ensure the impact of water and sanitation programs on the population and achieve medium- and long-term development goals. However, there is limited quantitative and qualitative evidence showing which variables are the most relevant for promoting the sustainability of water and sanitation systems, particularly in rural areas, and determining the role of the various stakeholders involved in the sustainability of these systems.
- 1.2 The existing literature considers several geographic, technical, financial, operational, and social elements as factors linked to higher levels of sustainability of water and sanitation systems in rural areas. These factors include the type of communities to be served in terms of population, geographic location, and isolation, the community's level of involvement in the operation and maintenance of these systems, the social or institutional capital existing in the community, the technology and innovation used in the water service, the technology and innovation used in the sanitation service, the population's financial commitment and ability to repay the investment and types of subsidies, and the financial models during and after the implementation of the service.
- 1.3 This document describes the proposal of the Office of Evaluation and Oversight (OVE) to evaluate the sustainability of the interventions of the Inter-American Development Bank (IDB) in the delivery of water and sanitation services financed under the Water Supply and Sanitation Program for Small Communities in Paraguay (PR-0118).
- 1.4 After reviewing the literature to identify the factors associated with greater sustainability of the water and sanitation systems financed by the Bank, the study will use a quantitative methodology (surveys) and qualitative methodology (focus groups, semi-structured interviews) to measure how these factors influence the sustainability of the interventions and determine the role of the various stakeholders.
- 1.5 The proposed evaluation is consistent with one of the Bank's key lines of work, and is associated with the sustainability of its operations at both the financial and operational level, which compromises the effectiveness of such operations in the medium and long term. In general, the design of the operations does not provide for strategies to ensure their sustainability, nor is there an established methodology for analyzing this variable after the programs have ended.¹ The proposal is also in line with the interest expressed by Paraguay's National Environmental Sanitation Service (SENASA) in evaluating the outcomes of its Water Supply and Sanitation Program for Small Communities, particularly with respect to the sustainability of water supply systems in rural areas².

¹ Impeding the evaluation of the outcome indicators and the analysis of their sustainability.

² An initial analysis of the outcomes of the Water Supply and Sanitation Program for Small Communities in Paraguay was performed in the 2009-2013 Country Program Evaluation (CPE) prepared by OVE (2013).

- 1.6 This evaluation constitutes an initial approximation to OVE's future evaluation of the Bank's role in the delivery of water and sanitation services in the region's rural areas, as well as the sustainability of its operations, and is an initial pilot to determine and apply the study methodology and test the measurement tools.

II. BACKGROUND

A. The water and sanitation situation in Paraguay

- 2.1 Paraguay is one of the countries of Latin America and the Caribbean that has the lowest rate of water supply coverage in rural areas, according to the most recent data from the 2011 Permanent Household Survey (DGEEC). Although 85.5% of the urban population has a water connection in the home, only 59.1% of the rural population does, with a national average of 75.1%.
- 2.2 The water and sanitation sector in Paraguay has some unique features compared with the rest of Latin America, due to the abundance of water resources and their distribution throughout the country, as well as the decentralized management of water supply and the existence of multiple public, private, and community operators, particularly in rural parts of the country.³ The large number of operators in Paraguay represents a significant challenge in terms of their regulation and supervision, but also provides an interesting opportunity for developing the sector and expanding services.
- 2.3 Sanitation coverage rates are also very low. Although coverage is as high as 68% in Asunción, it is below 19% in the urban areas of the rest of the country (ERSSAN, 2013). There are no sanitary sewer systems in rural areas, and sanitation solutions are either communal or individual, primarily in the form of latrines. Nationally, sewage treatment is practically nonexistent: only 8% of sewage is treated.⁴ The lack of appropriate sewage and wastewater collection systems and the virtual absence of treatment have a significant impact on the quality of water resources, particularly groundwater, thereby endangering the very supply of water used for human consumption.
- 2.4 Although the institutional restructuring of Paraguay's water and sanitation sector began in 2000, little institutional progress has been made. Progress in the regulatory and supervisory activities of the Sanitation Service Regulatory Agency (ERSSAN) has been slow and not very effective, and the function of regulating the use and

³ There are an estimated 2,771 verified systems operating in Paraguay (ERSSAN, 2013), 29 of which are in the larger cities and are operated by the Sanitation Services Company of Paraguay; 1,480 are operated through sanitation boards supported by SENASA, and 1,095 are operated by "other operators," including 299 'aguateros' [small private operators providing services primarily in the greater Asunción area], 779 neighborhood commissions, and 17 other institutions (binational entities, CONAVI, etc.). Of the 2,771 providers identified by ERSSAN, 60% had fewer than 100 connections and 88% had no more than 300 connections.

⁴ Water and Sanitation Program for the Chaco Region and Intermediate Cities in the Eastern Region of Paraguay (PR-L1060/PR-G1001).

protection of water resources performed by the Department of the Environment and the Environmental Health Bureau is still deficient. On the other hand, SENASA has been strengthening its leadership and technical competencies through an ongoing assistance program for rural and indigenous communities, which has included an important component on the institutional strengthening of the service.

B. Water Supply and Sanitation Program for Small Communities

- 2.5 In February 2001, the Bank approved the Water Supply and Sanitation Program for Small Communities (PR-0118) for an initial amount of US\$17.1 million (IDB loan for US\$12 million and US\$5.1 as the local contribution).⁵ The objective of the program was to help improve health conditions in small communities in Paraguay through the provision of water and basic sanitation services.⁶ The program is part of the Paraguayan government's strategy to provide water and sanitation services to rural and indigenous communities through SENASA.⁷
- 2.6 The program has three components: two related to the expansion of water and sanitation systems (water supply systems for small and indigenous communities) and one related to the institutional strengthening of SENASA (institutional strengthening for the expansion of services). The program ended in December 2010, four years after the original date, at a total cost of US\$17,630,900.⁸
- 2.7 The program benefitted from the experience of the executing agency (SENASA), which had participated in the execution of a similar program carried out with the support of the World Bank (P039983, approved in 1997 for US\$40 million), which at the time program PR-0118 was formulated had completed its third stage for the construction of rural water supply systems for a total of US\$40.8 million. The management plan proposed in the program strengthened the areas previously identified as weaknesses in the programs with the World Bank, such as: SENASA's poor execution capacity, which is why an external management company was hired, and the verified poor technical and managerial capacity of the sanitation boards, which led to a more intensive component involving the training of operators.

⁵ In 2009, the Bank approved the second phase of the program (PAYSRI, PR-L1022) for US\$60 million to finance the expansion of water and sanitation services in rural and indigenous communities. The PAYSRI targets rural communities with an estimated population of fewer than 2,000 inhabitants that do not have water and sanitation systems or, if they do, need expanded coverage and/or infrastructure improvements.

⁶ The specific objectives of the program were to: (i) extend the coverage of drinking water and basic sanitation systems to small communities of up to 3,000 inhabitants without such services and ensure their sustainability; (ii) promote the extension of services to indigenous communities through the execution of a pilot component to put in place 10 systems in these communities; and (iii) strengthen the institutional framework for the expansion and administration of services in order to accelerate present and future increases in coverage.

⁷ Using this same strategy, the Water and Sanitation Program for Rural and Indigenous Communities PAYSRI 2 (PR-L1022) approved by the Bank in 2009 for US\$60 million is currently in execution.

⁸ Ultimately, the Bank contributed US\$11,863,650 (1.1% less than planned) and the counterpart contributed US\$5,767,240 (13.1% more than planned).

- 2.8 The program under evaluation was to benefit 75,000 inhabitants in small rural communities and 2,000 inhabitants in indigenous communities, through the construction of 100 water supply systems and 10 individual sanitation solutions, all sustainable. Another objective of the program was to create 10 sanitation board associations and reduce the number of past due loan payments.
- 2.9 With respect to obtaining the outputs included in the program design, 100 water systems were constructed in small communities, which benefited 57,693 inhabitants.⁹ Although the project completion report indicates that 94% of the systems were in good condition and in operation as of December 2010, subsequent visits to the targeted communities found problems in some systems. In addition, 11 water systems were constructed in indigenous communities, which provided service to 2,636 inhabitants, and 270 home water purification filters were distributed.
- 2.10 The institutional strengthening component to expand services did not reach the programmed targets. Two sanitation board associations were created out of the 10 initially planned, due to a change in SENASA's strategy, which focused on the creation of sanitation board associations in the areas of the country that had more sanitation boards in operation, as well as the creation of associations that could be self-sustainable, which required a larger number of sanitation boards than what existed in the project area. In addition, during the delay in the program's startup, SENASA supported the creation of five more sanitation board associations. The objective associated with reducing the number of past due payments from 18% to 9% with respect to the total number of payments on loans with an outstanding balance was not achieved either: the total number of past due payments to remaining payments increased from 35% in 2004 to 56% in 2010.
- 2.11 The information contained in the PCR is insufficient to evaluate the sustainability of the activities and the proposed development objectives. Therefore, although a baseline survey was conducted at the beginning of the program, a follow-up survey is needed and certain sections of the questionnaire must be adapted in order to be able to analyze the key factors for ensuring the sustainability of the interventions.

⁹ During the project preparation phase, the average size of each community was estimated to be approximately 150 families with five members each, i.e., the total population to benefit from 100 systems would be 75,000 inhabitants. This analysis was not fully completed during the execution of the program, since during the community identification phase the average community had only 117 families, so the total number of beneficiaries was 57,693 personas. This situation was partly due to the time that passed between the preparation of the program (2001) and the beginning of the community identification phase (2004), as well as to the fact that rural communities that still do not have water supply systems are getting smaller and smaller in terms of population, and are increasingly isolated (PCR, 2011).

III. PROPOSED EVALUATION

A. Objective and scope of the evaluation

- 3.1 The objective of the evaluation is to measure the sustainability of the Bank's interventions in the supply of water and sanitation services financed by the Water Supply and Sanitation Program for Small Communities (PR-0118).
- 3.2 The evaluation starts by considering that, in order to achieve the development goals associated with the expansion of water and sanitation services, the sustainability of these services—understood as the long-term maintenance of the quality of the service provided in the interventions—must be guaranteed at the technical, financial, and operational level. Once this quality can be sustained over time, it will be possible to improve the population's conditions, particularly in terms of health indicators. Accordingly, the evaluation seeks to identify the factors and good practices that can be correlated with higher levels of sustainability of the systems that were constructed.
- 3.3 The scope of the evaluation includes 100 water and sanitation interventions in rural communities financed by the program in the eastern region of Paraguay.

B. Evaluation questions

- 3.4 The two basic questions the evaluation seeks to answer are as follows:
- What practices and strategies promote the sustainability of the water and sanitation systems that were constructed?
 - What is the role of the various stakeholders in the sustainability of the water and sanitation systems that were constructed?

C. Methodology and activities

- 3.5 The methodology to be followed to evaluate the Water Supply and Sanitation Program for Small Communities (PR-0118) is based on a quantitative and qualitative analysis of the variables associated with the sustainability of the interventions in the 100 communities selected for the study.
- 3.6 The methodology has the following phases:
- **Review of the literature and identification of the key factors determining the sustainability of the water and sanitation interventions in rural areas (September-November 2013).** After reviewing the specialized literature, OVE will identify the set of variables associated with the sustainability of water and sanitation programs in rural areas. These variables will be key to identifying some of the questions to be included in the follow-up survey that will be conducted in the communities where the interventions under the program being evaluated took place.
 - **Analysis and description of the intervention models proposed by SENASA and the IDB to address the improvement of water and**

sanitation service coverage in rural communities (November 2013). The models for SENASA and IDB intervention in the various targeted communities will be formulated based on the activities and characteristics of the systems (at the technical, financial structure, and operational levels, among others). This classification will make it possible to link the outcomes related to the variables that determine the sustainability of the water and sanitation interventions with the characteristics of such interventions.

- **Design and implementation of the follow-up survey in the communities benefited by the program's interventions in the study area (December-January 2014).** Once the key variables to be analyzed have been identified, OVE and SENASA will jointly prepare a follow-up survey to be conducted in a sample of the 100 communities selected. The survey questions will be based on the analysis of the baseline survey conducted by SENASA in connection with the program,¹⁰ including some questions associated with the variables correlated to the sustainability of the water and sanitation systems that can be quantitatively evaluated. Prior studies conducted on this program and other related documentation provided by SENASA will also be taken into account.¹¹ The survey will be accompanied by on-site verification of the water and sanitation systems that were constructed (operational status, maintenance, administration of payments, etc.)
- **Qualitative evaluation of variables associated with the operational sustainability of the systems through focus groups and interviews of key stakeholders (January 2014).** Through focus groups with representatives of the sanitation boards, associations, and SENASA, the evaluation will delve into qualitative issues such as social and institutional capital before and after the implementation of the project, local ownership of the project, etc. In addition, semi-structured interviews will be conducted with certain stakeholders to obtain, contrast, and verify some of the key considerations involved in the sustainability of the interventions.
- **Statistical and qualitative analysis, assessment of the interviews and focus groups, and validation of results with SENASA (February 2014).** After it receives the data from the follow-up survey, focus groups, and

¹⁰ The survey conducted at the community level shows an initial approximation on the community's level of development, in that in general it poses questions such as: the existence of other public services, means of communication and transportation, the primary productive and social activities, existing grassroots organizations, and community beliefs and customs.

¹¹ The documentation provided by SENASA includes the study conducted by the National University of Asunción (2008) on the midterm evaluation of the Water Supply and Sanitation Program for Small Communities, as well as the program's Operating Regulations for executing the program in rural communities, which set out the general policies, conditions, and procedures governing program execution, particularly the eligibility requirements, prioritization, and financing of the communities and projects to be executed.

BIBLIOGRAPHY

- Aquastat, 2013. *Review of World Water Resources by Country*. United Nations Food and Agriculture Organization.
- DGEEC, 2011. *Encuesta permanente de hogares* [Permanent Household Survey]
- ERSSAN, 2013. *Análisis de cobertura de agua potable y alcantarillado sanitario* [Analysis of Water Supply and Sanitary Sewer System Coverage]. Updated May 2013.
- Fernández, D., Aguilera, C., Bóbeda J., and Giménez, J., 2010. *Plan estratégico sectorial de agua potable y saneamiento de Paraguay* [Strategic Plan for the Water and Sanitation Sector in Paraguay]. Technical Note #115. Inter-American Development Bank.
- IDB, 2013. *Nota sectorial. Sector Agua Potable y Saneamiento* [Sector Report: Water and Sanitation Sector]. Note prepared by Jorge Oyamada (WSA/CPR), Kleber Machado (INE/WSA), and Sergio Campos (WSA/CAR) as part of the Paraguay Country Program Evaluation 2009-2013.
- IDB, 2011. *Programa de Abastecimiento de Agua y Saneamiento de Pequeñas Comunidades* [Water Supply and Sanitation Program for Small Communities]. Final Project Completion Report (PCR).
- National University of Asunción, 2008. *Evaluación de medio término. Programa de Abastecimiento de Agua y Saneamiento de Pequeñas Comunidades* [Midterm Evaluation. Water Supply and Sanitation Program for Small Communities.] School of Economics.
- Smits, S., Tamayo, S.P., Ibarra, V., Rojas J., Benavidez A., Bey, V. (2012) *Gobernanza y sostenibilidad de los sistemas de agua potable y saneamiento rurales en Colombia* [Governance and Sustainability of Rural Water Supply and Sanitation Systems in Colombia]. Inter-American Development Bank.
- United Nations 2013. *Millennium Development Goals. 2013 Report*.
- UNDP, 2008. *Equity and Development Report*.
- WHO/UNICEF, 2010. *Joint Monitoring Program for Water Supply and Sanitation. Paraguay*.