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PARAGUAY

INNOVATING THE TRAINING MODEL IN THE RURAL WATER AND SANITATION SECTOR

(PR-T1299)

DONORS MEMORANDUM

This document was prepared by the project team consisting of Jorge Oyamada (WSA/CAR) and Natalia Laguyás (LAB/IEN), Project Team Co-Leaders; Luis Fernández (LAB/CPR); Ruth Alicia Cabrera (CSC/CPR); Eduardo Bogado (WSA/CPR); Alex Riobo (INE/INE); Francisco Manjarres (WSA/CPR); Manuel Urquidi (LMK/CBO); Juan Pedeflous (FML/FOM); Margarita Garcia de Paredes (RSM/SEG); and María Laura Lanzalot (DSP/DVF).

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PROJECT SUMMARY

INNOVATING THE TRAINING MODEL IN THE RURAL WATER AND SANITATION SECTOR (PR-T1299)

In recent decades, access to water and sanitation services in Latin America and the Caribbean has increased significantly. Yet 19.19% of dwellings in Paraguay are not connected to a water system, and 29.1% of dwellings in rural areas do not have safe drinking water.

This limited reach is compounded by the fact that the delivery of water services in Paraguay is highly fragmented. Records from the National Environmental Sanitation Service (SENASA) indicate that there are more than 4,500 community-based water and sanitation providers that deliver water services to nearly 46% of the country's population (approximately 3.2 million people). Most of these community-based organizations struggle to consistently deliver continuous, quality services, due to constraints on their access to financial resources to expand networks and/or improve existing ones, ensure that their workforce has the relevant skills, and purchase goods and services from specialized vendors that help them meet needs related to operation and maintenance of water systems.

These quality issues and constraints on expanding coverage have adverse impacts on health, education, and employment, especially among women, due to their responsibilities in caring for their households and families.

In light of the situation and focusing on one aspect of the problems facing the sector, this project proposes to develop a digital platform with three key service areas: (i) capacity building for sector service providers; (ii) a marketplace for inputs and vendors; and (iii) a sector information system.

The project is innovative inasmuch as its approach is to mobilize various entities to address the challenges facing the rural water and sanitation sector through a platform that connects various actors, generating a network effect whereby the platform's usefulness increases even more with each user, facilitating its expansion. By project-end, the platform will be developing a market that will transform rural water and sanitation services for 379,080 residents of rural areas in Paraguay (departments of Guairá, Canindeyú, and San Pedro), who will see service improvements (reflected in increased use of chlorination and shorter wait times for services to be restored after outages).

The project is aligned with the IDB Group Country Strategy with Paraguay 2019-2023 and supports the sustainability of the rural water and sanitation work that the Bank has been carrying out in Paraguay through several loans and technical cooperation operations. It offers an innovative solution to the challenges faced by the sector in terms of ensuring that the workforce has the relevant skills and being able to fulfill needs when acquiring goods and services.

Avina Asunción will be responsible for project implementation and execution and will coordinate activities closely with SENASA, the project co-lender and one of its beneficiaries.

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INFORMATION AVAILABLE IN THE TECHNICAL DOCUMENTS SECTION OF THE IDB LAB PROJECT INFORMATION SYSTEM

ABBREVIATIONS

AECID	Agencia Española de Cooperación Internacional para el Desarrollo [Spanish Agency for International Development Cooperation]
ERSSAN	Ente Regulador de Servicios Sanitarios [Sanitation Service Regulatory Agency]
ESSAP	Empresa de Servicios Sanitarios del Paraguay [Sanitation Services Company of Paraguay]
FONPRODE	Fondo para la Promoción del Desarrollo [Development Promotion Fund]
Indela	Initiative for digital rights in Latin America
MSMEs	Micro, small, and medium-sized enterprises
OCSAS	Organizaciones Comunitarias de Servicios de Agua y Saneamiento [Community-based Water and Sanitation Organizations]
p.p.	Percentage point
SDG	Sustainable Development Goal
SENASA	Servicio Nacional de Saneamiento Ambiental [National Environmental Sanitation Service]
SIASAR	Rural Water and Sanitation Information System

PARAGUAY
INNOVATING THE TRAINING MODEL IN THE RURAL WATER AND SANITATION SECTOR
(PR-T1299)

EXECUTIVE SUMMARY

Country and geographic location:	Departments of Guairá, Canindeyú, and San Pedro, Paraguay		
Executing agency:	Avina Asunción		
Focus area:	Inclusive cities / Essential services		
Coordination with other donors/Bank operations:	The project complements the "Water and Sanitation System Construction Project for Small Cities and Rural and Indigenous Communities in Paraguay" (operation PR-L1094), whose activities include not only expanding the coverage of water and sanitation services but also developing and implementing a strategy to provide technical assistance to sanitation boards and developing guidelines to mainstream gender in water and sanitation interventions. The project is cofinanced by the Kingdom of Spain's Development Promotion Fund (FONPRODE), managed by the Spanish Agency for International Development Cooperation (AECID).		
Direct and indirect beneficiaries:	The beneficiaries will be 379,080 residents of rural areas in Paraguay (in the departments of Guairá, Canindeyú, and San Pedro), who will see service improvements. In addition, 1,945 people will receive technical training; 3,245 people will receive management training; 76,000 people will be educated in sound water management, hygiene, basic sanitation, and community organization; and 645 community-based water and sanitation organizations (OCSAS) will use the platform's services. SENASA will also benefit since it will receive the platform developed. These figures will continue to increase after the project ends, because the project will leave in place a platform with a sustainable business model that allows it to continue operating even after the project's contributions and support have ended.		
Financing:	Nonreimbursable technical-cooperation funding:	US$500,000	36%
	Counterpart contribution:	US$879,700	64%
	Total budget:	**US$1,379,700**	**100%**
Execution and disbursement period:	36 months for execution and 42 months for disbursement		
Special contractual clauses:	The following will be conditions precedent to the first disbursement: (i) the annual work plan and the milestone plan will have been submitted; (ii) the project general coordinator will have been selected; and (iii) an agreement will have been signed between Avina Asunción and SENASA.		
Environmental and social impact review:	This operation was screened and classified in accordance with the requirements of the IDB's Environment and Safeguards Compliance Policy (Operational Policy OP-703) on 26 May 2020. Since the impacts and risks are limited, the project is proposed as a Category "C" operation.		
Unit with disbursement responsibility:	Country Office in Paraguay (CPR)		

I. THE PROBLEM AND THE OPPORTUNITIES

1.1 In recent decades, access to water and sanitation services in Latin America and the Caribbean has increased significantly. Yet 19.19% of dwellings in Paraguay are not connected to a water system, and 29.1% of dwellings in rural areas do not have safe drinking water. There are also significant weaknesses in terms of service quality and continuity. According to the Multiple Indicator Cluster Survey (2016), just 40.8% of rural households have an improved drinking water source within their home that provides water that is not contaminated and is available in adequate amounts. However, that figure climbs to 60.2% in urban areas, which is a clear indication of the rural-urban divide.

1.2 The limited coverage problem is compounded by the fact that the delivery of water services in Paraguay is highly fragmented. According to the Continuous Household Survey (2017), 22.7% of dwellings are served by the Sanitation Services Company of Paraguay (ESSAP), 32.53% by the National Environmental Sanitation Service (SENASA)[1] through sanitation boards, 13.41% by community networks, and 12.17% by private networks.

1.3 SENASA database records indicate that there are more than 4,500 community-based water and sanitation providers (OCSAS)[2] that deliver water services to around 46% of the country's population (approximately 3.2 million people). Most of these community-based organizations struggle to consistently deliver continuous, quality services, due to constraints on their access to financial resources to expand networks and/or improve existing ones, ensure that their workforce has the relevant skills, and purchase goods and services from specialized vendors that help them meet needs related to operation and maintenance of water systems.[3]

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[1] The National Environmental Sanitation Service (SENASA) is a technical agency of the Ministry of Public Health and Social Assistance that was created by Law 369/1972 and partially modified by Law 908/1996. SENASA has various responsibilities in environmental sanitation activities: planning, promotion, and execution of works to expand water and sanitation service delivery. It is responsible for communities with up to 10,000 residents. SENASA can also build basic water and sanitation systems in indigenous communities, campesino communities, and other settlements, using resources from the national budget or international sources, whenever the population of the community is not large enough to make a water system profitable enough to spark the interest of private business investors and therefore a non-profit community management approach must be applied. However, significant challenges remain in terms of installation of water discharge systems, overall system sustainability, and maintaining the quality levels required by the national regulatory agency, the Sanitation Service Regulatory Agency (ERSSAN).

[2] OCSAS are non-profit community organizations with full legal capacity, whose members are neighbors who use or benefit from of the works carried out.

[3] Directors and board members do not receive a salary or a stipend for leading the board, and very few people in these communities are willing to take on these roles. Though those who do accept these positions generally put forth their best effort, many do not have the abilities or skills required for effective management.

1.4 In particular, these quality issues and constraints on expanding coverage have adverse impacts on health, education,[4] and employment, especially among women due to their responsibilities in caring for their households and families. In 64% of households with limited or no access to water, women shoulder the responsibility for supplying the home with water (compared to 24% for men).[5]

1.5 Beyond financial issues, the **drivers** behind these quality issues and obstacles to expansion include:

a. **Insufficient training and technical assistance services.** SENASA has been promoting the creation of OCSAS and providing technical assistance to successfully expand service coverage. However, the OCSAS' demand for technical assistance and job skills certification exceeds SENASA's institutional capacity to respond to the high number of training and assistance requests in due time and manner. There is also a lack of technicians who are able to provide the required technical assistance, especially outside of Paraguay's largest cities. The problem is exacerbated by the fact that OCSAS are scattered across the country and by the high level of turnover among OCSAS administrators.

b. **Ineffective coordination of the local market for goods and services.** The local supply of goods and services for the water and sanitation sector is limited, and service providers in rural areas struggle to find and access the scant supply that does exist of the goods and services required for their work due to logistical and financial constraints.

c. **Weaknesses in available sector information.** There is a lack of data and indicators on service delivery in rural areas, driven by the lack of a system that centralizes data and by the high cost of data collection stemming from the sheer number of OCSAS, how spread out they are across the country, and how hard it is to reach them. As a result, data quickly become outdated. In addition, quality control services (physical-chemical and bacteriological studies) are concentrated in large urban areas, which makes it difficult to generate data on water quality. Lastly, the sector does not lend itself to producing comprehensive data, since the large number of entities involved has led to a multitude of databases that are not interoperable.

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[4] Barde, Julia Alexa, and Juliana Walkiewicz (2013). The Impact of Access to Piped Drinking Water on Human Capital Formation - Evidence from Brazilian Primary Schools, *Beiträge zur Jahrestagung des Vereins für Socialpolitik 2013: Wettbewerbspolitik und Regulierung in einer globalen Wirtschaftsordnung*, ZBW - Deutsche Zentralbibliothek für Wirtschaftswissenschaften, Leibniz-Informationszentrum Wirtschaft, Kiel und Hamburg. The authors of this study, conducted in Brazil, focus on whether a child (in the fourth grade, with an average age of 10.8) had access to running water at home when Brazilian standardized tests were administered between 1999 and 2005. The authors found a significant relationship between access to tap water at home and academic test scores (it explains 11% of the standard deviation in test scores). Available at: http://hdl.handle.net/10419/79808.

[5] The following infographic summarizes the gender implications of water issues: https://publications.iadb.org/publications/spanish/document/%C2%BFTiene-g%C3%A9nero-el-agua.pdf.

1.6 The ongoing **COVID-19 pandemic** has shown that continuous access to quality water is a must, since it is vital for hygiene measures that are key to avoiding or reducing the spread of disease, such as frequent handwashing and cleaning and disinfecting homes and frequently used objects.

1.7 Building and consolidating in-house capacities is critical to system sustainability and service quality. The effectiveness of traditional, in-person training strategies is limited due to cost and logistical constraints, so there are no continuously offered, quality opportunities for specialized training that cover the entire region.

1.8 The needs and constraints discussed above open a window of opportunity to use technology and create business opportunities, with a diversity and inclusion approach, to develop the sector.

II. THE SOLUTION

A. Project description

2.1 The **general objective** of the project is to spur the development of the community water and sanitation sector in rural areas through a digital platform with three key service areas: (i) capacity building for sector service providers; (ii) a marketplace for sector-related service providers and inputs; and (iii) a sector information system.

2.2 **Intervention model:** The development of the platform will harness new technologies, thereby breaking from the traditional in-person training model and ensuring that the platform can have a nationwide reach at an affordable cost.

2.3 Training contents will incorporate several different modalities: (i) blended courses that make use of SENASA's training activities, its virtual classroom,[6] and the lab that will be set up in the city of San Lorenzo; and (ii) online,[7] interactive courses that feature gamification,[8] augmented reality, and virtual reality components.[9] For

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[6] http://aula.senasa.gov.py/.

[7] Data from GSMA Intelligence indicate that total number of mobile connections in Paraguay stood at 7.7 million in June 2018. The country now has more than four million smartphone connections. This figure should increase to 4.7 million in 2020, amounting to a penetration rate of over 66% by year-end 2020.

[8] Gamification is the application of game techniques (from analog games, video games, role-playing games, etc.) to non-game environments. Its most simple form entails giving rewards (such as points, medals, and student rankings) for effort.

[9] International experience has proven the effectiveness of the use of these technologies in vocational training. A.C. Boud and Chris Baber of the University of Birmingham, United Kingdom, carried out research on the effectiveness of augmented reality and virtual reality on water pump assembly. The result of the research showed at the participants found augmented reality and virtual reality easier to use in assembly than technical drawings. Also important, augmented reality technology proved to be more effective for the participants in assembling the machinery. This is partly because there was no tangible aspect to virtual reality. Also, the virtual reality was not as effective because the operators could only use one hand to navigate the environment. Pitt Meadows Plumbing is another example of a pump industry player that has embraced technology to train its employees. Noteworthy positive features of using augmented reality and virtual reality include the ability to train without the risk of damaging expensive equipment and a better understanding among trainees of the processes than when technical drawings were used.

the latter, technical training providers will be invited to use the platform to disseminate their training materials, using models like Coursera and edX.

2.4 The strategy will leverage the technical contents of the consolidated capacity-building program for OCSAS[10] and other materials developed by SENASA[11] and will include gender[12] and climate change[13] topics. Different levels of skills certification will be offered to operators, administrators, and associations of OCSAS, in partnership with SENASA and a technical training institute. This will help the project reach the target audience.

2.5 Through its marketplace, the platform will be a tool for bringing together supply and demand for service providers and inputs for the rural water and sanitation sector, as well as for disseminating technology, as it will make it easier for entrepreneurs and innovative companies to share content and encourage OCSAS to exchange experience and knowledge.

2.6 The platform can also be used to compile basic information on the state of rural water systems, major challenges in operation and maintenance, and needs in terms of inputs, technical assistance, and training, drawing from a self-reporting mechanism for OCSAS that use the platform and the DOCSAS tool,[14] which can be used to establish a baseline and measure performance at the sanitation board level. The platform will ultimately make it easier to report the data required by the regulator and strengthen providers' transparency and user communication mechanisms. The development of the platform and data management will adhere to the Principles for Digital Development that have been endorsed by the IDB Group.[15]

2.7 The project is a pilot that will cover three departments, which will ensure that the necessary adjustments and iterations can be made during execution so the platform can later be rolled out nationwide through SENASA or replicated in other countries with similar sector challenges and characteristics.

2.8 Since it is a pilot, a proof of concept will be prepared to develop the program. A management model and a business model for the three key service areas will be developed, with a view to generating revenue to ensure their sustainability (see paragraph 3.10 for more details on the options that will be explored for generating revenue and ensuring platform sustainability that will be explored).

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[10] Regional program that has already been developed by Fundación Avina with funding from the Porticus Foundation.

[11] SENASA has training material that it has developed over the course of several years under loans from the Bank and other donors (in addition to materials developed by Fundación Avina). The contents and format of these materials will be adapted for use under the project framework.

[12] In addition, the project will have activities that promote gender equality, specifically by encouraging women to pursue vocational and technical training (a male-dominated activity).

[13] Some of the opportunities identified focus on sound water use and optimal use of small electromechanical facilities, striving for energy efficiency.

[14] A diagnostic assessment tool for OCSAS created by Fundación Avina and the Confederation of Community-based Water and Sanitation Organizations. Available at:

http://sabersocial.virtual.avina.net/Conocimiento.aspx?documentId=155.

[15] https://digitalprinciples.org.

2.9 **Innovation:** The project adopts an approach that mobilizes entities to address the challenges facing the rural water and sanitation sector through a platform that connects various actors, generating a network effect whereby the platform's usefulness increases even more with each user, which facilitates its expansion and improvement. As Efosa Ojomo[16] has indicated, not all innovations are created equal, and market-creating innovations transform products (and services) by making them more affordable and accessible for all.

2.10 There is no platform for the rural community water sector with a comprehensive approach like the one proposed, which links digital content (including training, using industry 4.0 technologies), a marketplace that brings together supply and demand for sector-related services and inputs, and a data collection system designed to collect critical data on rural community water systems, which can be used to measure need and formulate the institutional support response.

B. Project beneficiaries

2.11 The departments of Guairá, Canindeyú, and San Pedro have been chosen as the target areas for this first stage. ERSSAN data indicate that water network coverage rates in 2018 stood at 81.5% in Guairá, 64.3% in Canindeyú, and 65.7% in San Pedro.

2.12 Priority has been given to these three departments because the project partners have ample social capital there, their local governments have the political will to work on these issues, they have a healthy mix of urban and peri-urban communities and at least one active association of OCSAS, and their OCSAS are varied in size, which will allow the tool to be tested in different conditions.

2.13 In addition, they are departments where SENASA, Avina Asunción, and their network of partners have carried out interventions under various projects in recent years and continue to have a presence on the ground, which will facilitate the monitoring and support process.

2.14 The OCSAS selected for the pilot will be chosen based on such criteria as their demand for the products offered on the platform, high smartphone penetration rates, and physical access between rural areas and nearby urban centers. These criteria may be reevaluated during execution in order to seek the best results for implementation, and the OCSAS may be reprioritized to better measure results.

2.15 The main beneficiaries of the project will be 50% of the OCSAS located in these three departments (645 OCSAS), which deliver water services to some 379,080 people. As a result, these people will enjoy better water service, measured through the percent increase in chlorination use (a proxy for service quality) and the decrease in wait times for service to be restored after outages caused by system failures (a proxy for service continuity).

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[16] Ojomo, Efosa and Rich Alton (2020). Avoiding the Prosperity Paradox: How to build economic resilience in a post-COVID world. Available at: https://www.christenseninstitute.org/wp-content/uploads/2020/07/Avoiding-The-Prosperity-Paradox.pdf.

2.16 The communities served by the project pilot will be rural communities outside of the departmental capitals that have fewer than 10,000 residents and a high percentage of low-income residents. Data from the Bureau of Statistics, Surveys, and Census indicate that the poverty rate in the department of Guiará stands at 33.9% (approximately 75,000 people, of whom 15,000 are living in extreme poverty). All told, 60% of the department's population resides in rural areas, where poverty rates are higher. According to the same source, the poverty rate in San Pedro is 36.7% (approximately 156,000 people, of whom 42,000 live in extreme poverty). Over 80% of the population of the department of San Pedro lives in rural areas. In Canindeyú, the total poverty rate stands at 38% (84,000 people, of whom 17,000 are living in extreme poverty).[17]

2.17 The project beneficiaries will also include: (i) training providers that join the platform (including professional training institutes, universities, companies, and other institutions), enabling them to reach a population that is currently underserved due to its remote location; (ii) goods suppliers and service providers that join the platform to use the marketplace feature, which will find a new outlet for making sales and marketing their services to this market segment that they currently struggle to reach; (iii) households in rural areas, who will know who to contact when they want to make sanitation improvements in their homes; (iv) people who receive technical training (plumbers, electricians, etc.) who can develop services for OCSAS and private customers; (v) SENASA, which will benefit by receiving the platform developed under the program; and (vi) local governments, which will have updated sector data that allow them to better plan their interventions.

2.18 Since the project targets rural communities outside of the Paraguayan capital and includes three lines of action on the platform, a large number of micro, small, and medium-sized enterprises (MSMEs) will be included among the direct beneficiaries of the project. All told, 1,945 people (e.g., electricians and plumbers) should receive technical training. The project will benefit 645 OCSAS, which are classified as MSMEs.[18] In addition, 550 input suppliers and service providers should join the marketplace, and at least 50% are expected to be MSMEs.

C. Project components

2.19 The components have been organized to reflect the drivers of the problem identified (see paragraph 1.3 on). Beyond the three components, the project includes two crosscutting components that deal with the technological development of the platform and the documentation and dissemination of lessons learned from the project.

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[17] Data for San Pedro are from 2018, while data for Canindeyú and Guairá are from 2017 since data for 2018 are not available. Data from: https://www.dgeec.gov.py/assets/documento/3916cPobreza_dpto_EPH%201997-98_2018.xls.

[18] According to SENASA data, the OCSAS involved in the pilot have weak management capacity, are small/medium in size, have fewer than 50 employees, and have annual sales of less than US$850,000. In Paraguay, the official definition of MSME includes economic units with annual sales of up to six billion guaraníes (approximately US$850,000) and up to 50 employees.

Component 1: Capacity building (IDB Lab: US$172,400; Counterpart contribution: US$373,900)

2.20 The **objective** of this component is to expand the availability of training opportunities for rural water and sanitation service providers and users, with differentiated modules, so they can access the highest quality training and the best training experience regardless of their location, overcoming the barriers of cost, location, and content accessibility.

2.21 The **activities** to be carried out include: (i) a survey of demand for training, which will be carried out by holding focus groups in each department with a representative sample of OCSAS to learn more about their most pressing problems and needs and Internet and smartphone penetration rates (these focus groups will be organized in partnership with departmental associations of OCSAS); (ii) development of a training proposal with a comprehensive approach to service delivery;[19] (iii) creation of digital training content by updating SENASA's training materials and mobilizing various training providers (institutions and university training centers that have a presence on the ground, input suppliers, health organizations, private sector actors, nongovernmental organizations, etc.) and will include activities to foster ties between these institutions and the creative sector with the support of Federación de Industrias Creativas;[20] (iv) development of a sustainability model, to include mapping training providers in the sector and leveraging use of the platform to roll out its virtual opportunities; (v) establishment of a permanent SENASA training workshop at its San Lorenzo office, so SENASA will have facilities equipped for in-person practicums; and (vi) a pilot study of SENASA's virtual training opportunities.

2.22 The expected **outputs** of these activities are: (i) a training platform, developed and in operation;[21] (ii) 10 training providers registered with and uploading content to the platform (includes professional training institutes, universities, companies, and other institutions);[22] (iii) 25% of registered platform users completing trainings (disaggregated by gender);[23] (iv) the entire SENASA training program uploaded

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[19] This will have to address managerial, technical, and administrative issues as well as responsible use of the service.

[20] Different models will be used to get these two sectors involved and support the proposed improvements, like creativity bonds and competitions. This activity also includes adapting SENASA's training opportunities to a virtual format, incorporating interactive games and augmented and virtual reality applications.

[21] The platform will be considered in operation when content has been uploaded and is being accessed by users.

[22] To ensure the quality of trainings uploaded to the platform, the project will work with accredited training institutions, curate content, make use of the student feedback system to assess the quality of the training content, and take action when the training does not meet the expected quality standards. Guidelines will also be established for how contents should be recorded.

[23] The platform will make it possible to collect comprehensive statistics on students, their education levels, and their ages, as well as data on the courses completed, certificates obtained (when offered by the course), and feedback on contents, methods, and other aspects of the training. The platform will include measures to safeguard personal data.

onto the platform;[24] and (v) 50% of all training modules on the platform harnessing technology to deliver content using different modalities (e.g., virtual reality, augmented reality, gamification).

Component 2: Marketplace for inputs and providers (IDB Lab: US$17,280)

2.23 The **objective** of this component is to help bring together supply and demand for sector goods and services through a feature that showcases supply so demand can be met and adds value to the services provided by service providers and input suppliers.

2.24 Facilitating and streamlining interactions will break down information asymmetries and lower the cost of interactions between vendors and buyers. Thus, the platform's marketplace will reduce the cost of coordination, thereby expanding the market and opportunities for supply and demand to interact.

2.25 The marketplace will be used to channel goods supplied by businesses that sell inputs (e.g., motors, water pumps, meters, measurement systems, generators, etc.) to service providers as well as by businesses that sell materials and inputs for building and/or improving in water and/or sanitation facilities to families or professionals working in the sector (e.g., masons, plumbers, electricians, etc.). The vendors could also include hardware stores, which sell several inputs (e.g., tools, tubes, taps, paint, chlorine, etc.) and materials depots that sell construction materials (e.g., sand, tiles, sanitation products, etc.).

2.26 The **activities** to be carried out include: (i) a market analysis and profile of potential platform users, as well as follow-up to encourage them to join the marketplace; and (ii) design of a business model for the marketplace to ensure its sustainability.

2.27 The expected **outputs** of these activities are: (i) 150 input suppliers registered on the platform; (ii) 400 service providers registered on the platform; (iii) 1,250 users visiting the marketplace (disaggregated by vendors and customers, including OCSAS, private individuals, and companies); and (iv) 80% of total users (vendors and buyers) indicating satisfaction with their use of the platform.

Component 3: Information system (IDB Lab: US$38,000; counterpart contribution: US$219,200)

2.28 The **objective** is to monitor the coverage, quality, and sustainability of rural water and sanitation services, by gathering and generating data and information that various sector actors can use to better plan and coordinate activities.[25]

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[24] This program has eight modules: community organization, administration/accounting, operations and maintenance, plumbing, electricity, water quality, climate change and integrated water resource management, and sanitation and hygiene.

[25] Paraguay is part of the Rural Water and Sanitation Information System (SIASAR). The project will generate data for SIASAR as progress is made in implementing the system. It should be noted that SIASAR only addresses the need for data on rural areas and does not focus on data on services in peri-urban areas, which is also of interest to SENASA. It will be able to obtain that information using this system, which will be based on self-reporting by service providers.

2.29 The activities to be carried out include: (i) an analysis of the state of structures; (ii) development of an information system and integration with other platform features (including migration of data from SENASA's databases); (iii) support and monitoring of the information system; (iv) technical assistance on water and sanitation information systems; and (v) implementation of a mobile water quality lab.

2.30 The expected outputs of these activities are: (i) an information system, developed and in operation;[26] (ii) 645 OCSAS registered with the system and uploading preliminary information to it; (iii) 80% of registered OCSAS will have updated their information in the past six months; and (iv) system data measures up to open data/open governance standards (in other words: complete, timely, accessible, and license-free for replication).

Crosscutting component A: Development of the platform's technological infrastructure (IDB Lab: US$73,320; counterpart contribution: US$104,880)

2.31 This component brings together activities related to the technical development of the platform's infrastructure drawing from the exploration, analysis, and design activities included in the aforementioned components.[27] This component would finance: (i) development of the platform's brand/image/narrative, which is essential for the platform to gain a foothold and recognition among the target public; (ii) design of the platform landing page, where users will be able to register and access the three key service areas (the training, marketplace, and information system modules); (iii) backend and frontend development and programming; (iv) programming the platform with the following functions: georeferenced providers, an evaluation system for marketplace services, and user rankings and feedback; (v) website maintenance and updating; (vi) the server where all of the data and files needed for the website to function properly will be stored, and safeguards for the data displayed on the platform; (vii) a digital community manager (the person responsible for overseeing the platform and customer service); and (viii) development of technological infrastructure, which will include a technology for social change approach to ensure that the technical development responds to the needs of the target users and engages with the leaders of the water boards and their communities from the planning stage through implementation of the technology.

2.32 The platform's infrastructure will take into account the following: the platform should offer not only online content but also content that can be downloaded and viewed offline; it should be able to interact with various types of devices (e.g., smartphones, tablets, and computers); it should be able to generate certificates that can be shared; the experience should be inclusive and have bilingual content; and users should be able to rate the quality of the platform contents.

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[26] The system is considered in operation when it is integrated with the platform's other components and the datasets it generates are available to the public.

[27] All three components include activities to better understand the concerns and needs of OCSAS, vendors, and other potential users of the platform.

Crosscutting component B: Documentation and dissemination of lessons learned (IDB Lab: US$36,000; counterpart contribution: US$21,400)

2.33 The **objective** is to document and showcase lessons learned from project execution and the challenges of developing a platform as a strategy for addressing this challenge.

2.34 The **activities** to be carried out include: (i) preparation of a communications plan for the project, reflecting the innovative nature of the proposal; (ii) development of communication products that are part of that plan; (iii) a launch workshop and a project-end workshop with stakeholders; and (iv) three knowledge products.

2.35 The expected knowledge products are: (i) documentation of the process, including lessons learned and best practices; (ii) a case study on adapting information technology to the water and sanitation sector and rural communities; and (iii) guides to facilitate expansion of the platform to other departments in Paraguay and the rest of the region.

D. Project impact, monitoring, and evaluation

2.36 **Impact.** At the end of project execution, 379,080 people should have better service (better quality measured as the percent increase in chlorination use, and better continuity of service measured as the decrease in wait times for service to be restored after outages).[28] Chlorination use should increase 20 percentage points among OCSAS that participate in the project. In addition, the project should heighten awareness of the importance of sound water use and billing based on metered consumption at the OCSAS (measured through a 20 percentage-point increase in the coverage of household metering at beneficiary OCSAS).

2.37 The project outcomes are: 1,945 people will have received technical training (plumbing, electricity, and other specializations that support water systems); 3,245 people will have received management training (administrators); 76,000 people will have been educated in sound water management, hygiene, basic sanitation, and community organization; 645 OCSAS will be using the platform's services; and a platform with three key service areas will have been developed, including a sustainable business model so it can continue operations even after the project's support and contributions have ended. By Year 3, at least 40% of the people who successfully complete trainings should be women, and at least 60% of input and service vendors registered on the platform should be MSMEs.

2.38 **Project monitoring and evaluation.** A baseline study[29] will be prepared to develop the indicator dashboard. In addition, the project will coordinate with Avina Asunción and SENASA to develop a monitoring system on the platform. In addition to the standard IDB Lab semiannual reports (project supervision reports), there will

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[28] Service quality data will be collected from a representative sample of several OCSAS when they are brought in to the project and focus groups are held to survey their training needs (Component 1 activity).

[29] The baseline study will be prepared using the DOCSAS diagnostic assessment tool developed by Fundación Avina, and two measurements will be taken: one during the focus groups at the beginning of the project and one before the first training session (which will include a before-and-after evaluation of each participant).

be a final evaluation to document the main lessons learned from the project and share information with key stakeholders.

2.39 When developing the project's knowledge products and final evaluation, the following questions will be addressed: By what percentage has the use of chlorination and other good practices for safe service increased among service providers? Are operations and maintenance protocols being implemented correctly after trainings? Has continuity of service in the communities improved relative to the baseline and the 24-hour benchmark? Has the coverage of household metering increased? What change has there been in terms of the financial impact on families of incidents in which children and older adults experience diarrhea from consuming unsafe water (medical expenses, school missed, days of leave taken from work)? What percentage of children (age 0 to 5), adolescents, and older adults (broken down by gender) benefit from better service delivery performance indicators? Have service providers instituted the following practices: developing annual work plans and budgets, holding meetings, and establishing boards of directors that closely monitor accountability? Which training approach has been the most successful in terms of course completion rates and certifications? What are the best ways to teach complex concepts/techniques? What role does SENASA play in getting other training providers to use the platform? What are the best strategies for introducing technology into training in rural communities (analyzing the different incentives that the project offered to reduce the risk of participation on the platform with training contents and/or in the development of contents with a different pedagogical approach, such as augmented reality, virtual reality, or gamification)? What motivates students to learn and builds their resilience? What helps students retain knowledge?

III. Alignment, Scalability, and Project Risks

A. Alignment with the IDB Group and the Sustainable Development Goals

3.1 The project is aligned with the **Update to the Institutional Strategy** (document GN-2933-5) inasmuch as it builds upon the priority area of technology and innovation to make a contribution to the challenge of social inclusion and equality while incorporating the crosscutting themes of climate change and environmental sustainability and gender equality and diversity.

3.2 The project aligns with the **IDB Group Country Strategy with Paraguay 2019-2023** (document GN-2958), in particular with the "improve the coverage and quality of infrastructure" and "improve access to job training" objectives. It also supports the sustainability of the work the Bank has been carrying out in the rural water and sanitation sector in Paraguay. Loan PR-L1094, currently in execution, is the continuation of a line of work in rural water and sanitation with SENASA that began under loans 1312/OC-PR and 2222/OC-PR. Execution of those loans has been satisfactory.

3.3 In addition, the project complements technical cooperation operation PR-T1234 (IDB Lab) and technical cooperation operation PR-T1224 (IDB Water and Sanitation Division), which are cofinancing activities intended to boost the functionality and sustainability of rural water and sanitation systems through an innovative model with methods for behavioral change using the social arts, and the

development and adaptation of financial products for the sector. These activities should be able to use the platform as a channel to reach users, OCSAS, and vendors of goods and services. It also contributes to the work of strengthening information management and transparency systems and mechanisms in the water and sanitation sector, complementing the activities financed under technical cooperation operations ATN/AA-17281-RG and ATN/MA-17280-RG, which are currently supporting the ERSSAN, the Water and Sanitation Bureau (DAPSAN), and the ESSAP.

3.4 The project also complements the work that IDB Lab has carried out to foster the development of the creative economy (technical cooperation operation PR-T1232), tapping the creative economy's capacity for innovation to strengthen and provide solutions for a traditional sector. It complements IDB Lab technical cooperation operation PR-T1281, which seeks to co-create solutions with impact by linking innovation needs and innovation supply and whose activities include holding open innovation processes with civil society.

3.5 The project is aligned with the **Water and Sanitation Sector Framework Document** (document GN-2781-8), in particular with the following dimensions of success: "utilities management is efficient, innovative, and sustainable and private sector participation increases" and "sector governance is strengthened, and States give priority to water and sanitation actions."

3.6 Furthermore, the project is aligned with the following **Sustainable Development Goals** (SDGs) set out by the United Nations General Assembly:

a. SDG 1 – No poverty (Target 1.4), due to the project's objective of improving the quality of water services for households and because the communities served by the project pilot will be rural communities outside of the capitals of their departments (San Pedro, Guairá, and Canindeyú), where a higher percentage of the population belongs to vulnerable groups (33.4% compared to 17.5% in urban areas in Paraguay).[30]

b. SDG 6 – Clean water and sanitation (Targets 6.1 and 6.b), because the project seeks to improve household access to water services and improve the managerial capacities of OCSAS (the cooperatives that provide those services).

c. SDG 10 – Reduced inequalities within and among countries (Target 10.b), since the project is located in Paraguay, a landlocked country.

d. SDG 11 – Sustainable cities and communities (Target 11.1), because the project seeks to promote access to adequate, safe, and affordable water services, mainly through improvements in water chlorination.

[30] Data retrieved from: https://www.dgeec.gov.py/Publicaciones/Biblioteca/documento/5781_Pobreza%20Monetaria%202019_Boletin.pdf.

3.7 The operation fits within the IDB Lab thematic area of **Inclusive Cities** (document MIF/GN-238-1) since it is consistent with its objective of testing innovative and scalable market-based solutions that democratize access to sustainable public services and create economic opportunities.

B. Scalability

3.8 The project is a pilot that will be implemented in three departments. This will afford the opportunity to make the adjustments and modifications required so it can then be scaled up nationwide, working with SENASA, associations of OCSAS, and the Paraguayan Federation of Sanitation Boards (FEPAJUS), in coordination with local governments.[31] Partnerships with private actors (e.g., wireless telecommunications companies) will also be necessary. In Paraguay alone, the project could be scaled up to reach 4,500 OCSAS that provide water services to around 46% of the Paraguayan population (some 3.2 million people).[32]

3.9 These results will continue to expand after the project ends, because it will leave in place a continuously operating training system, marketplace, and sector dashboard managed by SENASA, which will invite private and public entities to make use of the platform to bring their content and services to rural residents. In addition, the use of new technologies (gamification/virtual reality/augmented reality) in the platform's contents will encourage young people to become more actively involved in water management and mitigate emigration from rural communities. The effort should have an immediate impact on making people more employable, and these people could even start their own businesses to sell their services.

3.10 During execution, the project will work with SENASA to develop a business model that will ensure that the platform's three key service areas are sustainable. Institutional and legal arrangements for management of the platform will be explored,[33] as well as several potential sources of revenue, including: (i) complementing certain courses with freemium features and pay for certification features (following the models of platforms like edX and Coursera); (ii) advertising for sector-related goods and services (hardware stores, electricians, construction materials, household cleaning supplies, etc.); (iii) charging training providers a fee to use the platform; (iv) commission fees for the marketplace; and (v) partnering with microfinancing opportunities for sector goods and services.

3.11 In response to the COVID-19 crisis, the Paraguayan government, through Law 6,524 of 25 March 2020, designated SENASA as a directly affected agency for the public health response. Accordingly, it has plans to build wells to expand the coverage of safe water services and be able to implement the first line of

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[31] SENASA database records indicate that there are more than 4,500 OCSAS[31] that deliver water services to around 46% of the country's population (approximately 3.2 million people).

[32] The projected cost of scaling up the project is the cost of the platform's operations/maintenance (excluding capital expenditure for its development) divided by the number of beneficiaries of the pilot. The estimated cost at project end is US$0.40 per beneficiary.

[33] This analysis will determine whether the platform will be operated and maintained by SENASA or by a third party.

defense in containing the spread of the disease (hand washing). In this context, the project has become even more important, as virtual training can be used to ensure that these new investments will be sustainable and resilient in circumstances that call for social distancing, like the current crisis.

C. Project risks

3.12 **Risk:** Resistance to change and reluctance to accept the proposal and project outputs among stakeholders. **Mitigating factors:** The OCSAS will be involved in the design and development of the platform to ensure that it responds to needs, uses, and local customs regarding how people relate to technology. Behavioral change activities will also be included to make adopting the technology more user-friendly. Community facilitators have been included in the early stages of the project to support the process.

3.13 **Risk:** The limited depth of the local market could limit the pool of training and service providers willing to join the platform. **Mitigating factors:** Various measures have been included to encourage training providers to join the platform: economic incentives, initiatives to showcase the benefits of joining, visits, and a design process that involves providers to ensure the platform meets their needs in terms of accessing new clients. If only a few vendors and buyers use the platform, it would have repercussions for platform sustainability, so the business model will consider several sources for generating revenue.

3.14 **Risk:** High dropout rates for the trainings. **Mitigating factors:** The project should develop training content that is engaging and organized in short, modular formats so students can see the progress they have made in a short amount of time and also see their training translate into gains because it can be quickly applied at the OCSAS. The project should ensure that instructors are agile and able to follow up with students who are pursuing distance learning for the first time. To ensure a commitment to the trainings, the OCSAS' executive staff will be asked to participate and cover costs associated with in-person trainings. During execution, corrective measures will be recommended whenever there is evidence that objectives concerning training content and methods are not being met.

3.15 **Risk:** The OCSAS do not follow through with uploading data to the information system. **Mitigating factors:** The ability to process transactions and access SENASA trainings will be conditional on uploading data and keeping it up to date. SENASA will also encourage OCSAS to use the system.

3.16 **Risk:** The quality of Internet connections in rural areas could hinder the usability of the platform. **Mitigating factors:** The project includes activities to develop partnerships with local entities that could offer Internet services should the network fail or provide the OCSAS with equipment to consult platform contents (including organizations that offer mobile computer labs). In addition, when contents are developed, attention will be paid to the fact that Internet connections may be intermittent/non-continuous (contents will be able to be downloaded and updated once the user signs in again).

IV. COST AND FINANCING

4.1 The total cost of the project is US$1,379,700, with US$500,000 (36%) to be provided by IDB Lab as a nonreimbursable contribution and US$879,700 (64%) by the local counterpart (at least 50% of which will be in cash).

Expenditure category	IDB Lab	Counterpart contribution	Total
Component 1: Capacity building	172,400	373,900	546,300
Component 2: Marketplace for inputs and vendors	17,280	-	17,280
Component 3: Information system	38,000	219,200	257,200
Component A: Technological development of the platform	73,320	104,880	178,200
Component B: Documentation and dissemination of lessons learned	36,000	21,400	57,400
Coordination and administration	143,100	160,320	303,420
Evaluation, audits, and contingencies	19,900	-	19,900
Total	**500,000**	**879,700**	**1,379,700**

V. PROJECT PARTNERS AND IMPLEMENTATION STRUCTURE

A. Description of the executing agency

5.1 Avina Asunción will be the project executing agency. Avina Asunción is a nonprofit association with legal status established in accordance with Paraguayan law. It is part of the Avina network, which consists of 17 legal entities. Avina Asunción has the same vision, mission, policies, procedures, and structure as the other associations in the network, and thus their relationship is not only financial, but also programmatic. This is reflected in its consolidated audited financial statements as well as in its annual reports.

5.2 Since 2009, the **Avina** network has promoted the strengthening of community water and sanitation management in Latin America through its Access to Water Program. With its regional viewpoint, the Avina network has acted as a bridge to facilitate exchanges of experience between sector stakeholders, including the Latin American Confederation of Community Water and Sanitation Organizations and governments. It has also facilitated the development of a variety of tools and platforms that consolidate knowledge in the area of community-based water management in the region. The Avina network has experience working with several IDB Group programs as an executing agency, including programs with IDB Lab and with the IDB Water and Sanitation Division.

5.3 Since 2013, Avina has had a Technology for Social Change Program, which is focused on the promotion and use of digital technologies to foster social progress and sustainable development. Its objective is to build innovative ways to strengthen community mobilization and citizen participation. The program's strategy is based on establishing collaborative processes that coordinate action on the ground (offline component) with the use of digital technologies to strengthen

participation and scale it up (online component). In the last seven years, Avina has developed collaborative processes around: (i) the development, use, and promotion of civic technologies (such as the Latin American Alliance for Civic Technology (ALTEC)); (ii) the promotion of public policies aimed at transparency and use of public data (such as the Initiative for Digital Rights in Latin America (Indela); (iii) the defense of human rights in digital spaces (such as Indela); and (iv) application of an online/offline strategy to all collaborative processes supported by Avina. The program's activities have facilitated the creation and strengthening of a civic technology and open data ecosystem in Latin America, consisting of stakeholders and organizations from all sectors of society, that has positioned itself as a regional model for the use of digital technologies in social processes. A preliminary mapping of this ecosystem can be accessed at ExploraLat.AM.

B. Implementation structure and mechanism

5.4 Avina Asunción will hire a general coordinator and an operations assistant for project execution. It will contribute by providing the physical and logistical structure required to execute the operation efficiently and effectively. It will also be responsible for the counterpart contribution needed to supplement the funds from the contribution so the activities can be executed. In addition, Avina Asunción will be responsible for submitting semiannual progress reports on project implementation using IDB Lab's project management platforms.

5.5 Although Avina Asunción is responsible for project implementation and execution, it will closely coordinate project activities with the National Environmental Sanitation Service (SENASA). Avina Asunción and SENASA will meet at least once per quarter to analyze project progress and make suggestions to improve project results. The operations assistant will act as secretary at these meetings.

5.6 Avina Asunción will sign an agreement with SENASA for project execution that sets out the financial and nonfinancial contributions it will make. The signing of this agreement to the Bank's satisfaction will be a condition precedent to the first disbursement.

VI. Fulfillment of Milestones and Special Fiduciary Arrangements

6.1 The executing agency will commit to IDB Lab's standard arrangements for results-based disbursements and procurement and financial management policies applicable to the private sector, consistent with the provisions of the Financial Management Policy for IDB-financed Projects (document OP-273-12), 12 June 2019 version, and the "Guide to management by milestones and financial supervision for the technical cooperation operations of IDB Lab and the Social Entrepreneurship Program."

6.2 The diagnostic assessment of executing agency needs found a low level of risk, since Avina Asunción has a financial management system acceptable to IDB Lab and a monitoring and reporting structure for submitting its institutional financial statements to the Bank.[34]

[34] Avina has executed and currently is executing various operations, with satisfactory results.

6.3 Project **disbursements** will be subject to verification of fulfillment of milestones, using means of verification agreed on by the executing agency and IDB Lab. Fulfillment of milestones does not exempt the executing agency from the responsibility of achieving the agreed results.

6.4 Unless the Bank determines otherwise during execution, the executing agency's **procurement policies** will be used. An annual procurement plan indicating the necessary procurements for project execution and fulfillment of milestones will be submitted annually, together with the annual work plan. IDB Lab will perform an ex ante review of the technical aspects of procurement as it deems necessary, especially for those procurements considered critical.

6.5 The executing agency will prepare its **annual financial statements** and make them available to the Bank. The Bank may use funds from the contribution to review the project's financial statements and use of project funds, verifying financial and procurement practices.

VII. ACCESS TO INFORMATION AND INTELLECTUAL PROPERTY

7.1 **Access to information.** The information contained in this document is classified as public upon approval under the Bank's Access to Information Policy.[35]

7.2 **Intellectual Property.** The intellectual property rights of project deliverables will be distributed as follows: (i) SENASA, a beneficiary of the project as well as its co-lender, will retain ownership of the platform and will give the Bank a free, nonexclusive license for noncommercial use; (ii) the property rights for the content uploaded onto the platform, developed under the project framework or independently, will be subject to the agreements made with the authors and institutions supporting the contents disseminated on the platform; and (iii) the Bank will retain intellectual property rights for all other project deliverables and will grant the executing agency and SENASA, free of charge, a nonexclusive license to publicly use, copy, distribute, reproduce, exhibit, and execute all project studies and results for noncommercial purposes within the country of execution.

7.3 The executing agency agrees to include a clause releasing all intellectual property rights, including copyrights, to the Bank in all contracts it signs with consultants under the project.

7.4 The executing agency will guarantee to the Bank that project execution does not and will not infringe on the rights of third parties. The Bank will be able to release, reproduce, or publish any information associated with the project and include SENASA's and the executing agency's names and logos in that information.

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[35] Link to the Bank's Access to Information Policy.