

**Ex-Ante Evaluation (for Japanese ODA Loan)**  
**South America Division, Latin America and the Caribbean Department, JICA**

**1. Basic Information**

Country: The Republic of Paraguay (Paraguay)

Project: The Project for Water and Sanitation for the Metropolitan Area of Ciudad del Este

Loan Agreement: August 27, 2020

**2. Background and Necessity of the Project**

(1) Current State and Issues of the Water and Sanitation Sector in Paraguay

In the Republic of Paraguay (Hereinafter referred to as “Paraguay”), water supply coverage stands at 78 percent, sewerage coverage at 11 percent, and wastewater treatment coverage at two percent as of 2017, according to Paraguay’s Regulatory Agency for Sanitation Services (ERSSAN). There are regional disparities within the country, and people in the Alto Parana Department of eastern Paraguay have poorer access to water and sewerage services; for example, water supply coverage is 39.7 percent while sewerage coverage is 2.3 percent, with no wastewater treatment facilities.

The project target area, i.e., the metropolitan area of Ciudad del Este is the second largest urban center in Paraguay. It accounts for some 70 percent of the population of Alto Parana Department, and borders Brazil and Argentina. A national census shows that metropolitan populations are on the rise, which is expected to entail an increase in water demand and a deterioration in the living environment. Nevertheless, water supply services in the metropolitan area of Ciudad del Este are low in quality and efficiency. The Paraguayan Sanitary Services Company (ESSAP), which provides such services in parts of Ciudad del Este, supplies water for less than 12 hours a day in about 11 percent of its service area. This is due in part to the aging of existing water treatment plants. The area is also served by over 250 private water suppliers, about 71 percent of which fail to meet ERSSAN water quality standards. In the dry season, the amount of water in the Lago de la Republica, a water source for the area, decreases by around 30 percent. In addition to these issues, rising electric power costs have been weighing heavily on water supply operations. The power cost of the existing waterworks has jumped 50 percent over the past two years due to aging facilities and growing electricity charges. Power consumption at ESSAP’s existing waterworks in the metropolitan area accounts for 8.8 percent of the company’s total expenditures, the third largest outlay following personnel expenses and overhead expenses. These conditions point to the urgent need to address the growing water demand and the aggravating living environment, and deliver water and sewage services efficiently with lower electricity costs.

In Paraguay’s National Development Plan 2030 (Plan Nacional de Desarrollo Paraguay 2030), the Government of Paraguay calls for securing, improving, and maintaining certain levels of living standards for the people as one of the strategies to achieve poverty reduction and social

development. It sets out the specific goal of securing access to water and sanitation services for all. The Project for Water and Sanitation for the Metropolitan Area of Ciudad del Este (“the Project”) is considered an important undertaking in Paraguay’s water and sanitation sector. The government plans to improve water services and develop sewerage in the metropolitan area of Ciudad del Este in six phases by 2051. The Project falls under Phase 1, covering two of the four cities that constitute the metropolitan area. From Phase 2 onward, water and sewage services are planned to be extended to all four cities.

(2) Japan’s and JICA’s Cooperation Policy and Operations in the Water and Sanitation Sector  
In its Country Assistance Policy for the Republic of Paraguay (April 2012), the Government of Japan has identified two priority areas: (i) Reduction of inequalities and (ii) Sustainable economic development. The policy states that the aim is to build and improve infrastructure, noting that improving the country’s weak economic and social infrastructure, including water infrastructure, is essential to promote equal and sustainable economic development. The Project, which is part of the Water and Sanitation Improvement Program in Paraguay, aims to deliver safe and stable water and sanitation services, and thus is consistent with these policies.

The JICA Country Analysis Paper for Paraguay, as revised in November 2014, also identifies water resources as a priority area. Accordingly, JICA has assisted with the country’s water supply services, including facility operation and maintenance, through ODA Loans, Grants, and Technical Cooperation. In 2012, JICA and the Inter-American Development Bank (“the IDB”) set up a co-financing framework, known as Co-financing for Renewable Energy and Energy Efficiency (CORE). In 2016, the scope of CORE was expanded to include ODA-graduate countries in South America and the Caribbean as well as the water and sanitation, and transportation sectors. The Project, which is designed to develop energy-efficient water and sewage systems, is the first project in the water and sanitation sector under the expanded CORE scheme, and is expected to promote energy efficiency in Paraguay.

The Project will contribute to achieving two goals of the SDGs, i.e., Goal 6 (ensure availability and sustainable management of water and sanitation for all) and Goal 13 (take urgent action to combat climate change and its impacts).

### (3) Other Donors’ Activities

The water and sanitation sector in Paraguay has drawn continuous assistance from the IDB, the World Bank, the Development Bank of Latin America (CAF), and the Spanish Agency for International Development Cooperation (AECID). The IDB, the co-financer of this Project, places importance on both capacity building for the agencies concerned and infrastructure development; therefore, it considers the Project as a priority undertaking.

### **3. Project Description**

#### (1) Project Objective

The objective of the Project is to provide water and sewage services in Ciudad del Este, the second largest metropolitan area in Paraguay, in a safe and efficient manner by newly constructing energy-efficient water and sewage facilities, and renovating existing ones to make them energy-efficient, thereby contributing to a better living environment in the area.

#### (2) Project Site / Target Area

The metropolitan area of Ciudad del Este in Alto Parana Department (Ciudad del Este city and Presidente Franco city) (population: approximately 400,000)

#### (3) Project Components

##### 1) Installation and renovation of water and sewage facilities

- New construction (water): Water intake facilities, water treatment plants, transmission pipes, water distribution networks, pumping stations, water distribution centers, water flow meters, water meters, etc.

- New construction (wastewater): Primary treatment facilities, pumping stations, sewer pipes, sewer networks, etc.

- Renovation: Two existing water treatment plants, existing water distribution and sewer networks, etc.

2) Consulting services: Detailed design of renovations to existing facilities, detailed design of new water and sewer networks, bidding support, construction supervision, support for building the institutional and operational capacity of ESSAP, etc.

#### (4) Estimated Project Cost (Loan Amount)

Estimated Project Cost: 21,482 million yen (of which 9,130 million yen is covered by the ODA loan)

#### (5) Schedule

August 2020 - July 2027 (84 months in total). The Project will be completed upon termination of the consulting services (July 2027).

#### (6) Project Implementation Structure

1) Borrower: The Republic of Paraguay

2) Guarantor: None

3) Executing Agency: The Water and Sanitation Directorate, Ministry of Public Works and Communications (MOPC-DAPSAN)

4) Operation and Maintenance Agency: Paraguayan Sanitary Services Company (ESSAP)

#### (7) Cooperation and Sharing of Roles with Other Donors

The Project will be under the supervision of the IDB, the co-financer, based on the framework agreement of the CORE scheme.

(8) Environmental and Social Consideration / Cross-Cutting Issues / Category of Gender

1) Environmental and Social Consideration

(i) Category: B

(ii) Reason for Categorization: The Project is unlikely to have a significant negative impact on the environment because it does not involve any sensitive sector, characteristic, or area as illustrated in the JICA Guidelines for Environmental and Social Considerations, announced in April 2010.

(iii) Environmental Permit: An environmental impact assessment (EIA) is required by Paraguayan law for the Project. A draft EIA has already been prepared. The final EIA will be completed with the help of the IDB and submitted to the Ministry of the Environment and Sustainable Development (MADES) for approval (scheduled for around October 2021).

(iv) Anti-Pollution Measures: In accordance with the Environmental and Social Management Plan, which has been developed under Paraguay's environmental management law, a number of measures will be taken to meet Paraguay's emission and discharge standards with regard to air and water quality, noise, etc. during the construction work. Measures to be taken against possible water pollution, noise, and foul odors after the facilities are put into use include storing sludge and the like appropriately, and surrounding possible sources of these hazards with vegetation. Sludge generated from the treatment process will be landfilled by private companies licensed by MADES.

(v) Natural Environment: Because the project area is not situated in or around any sensitive area such as a national park, the adverse impact on the natural environment is expected to be minimum.

(vi) Social Environment: The Project will not involve any involuntary resettlement. Yet the construction of a water distribution center under the Project will entail the acquisition of a tract of land measuring about two hectares.

(vii) Other/Monitoring: During the construction work, contractors will monitor water quality, noise, vibration, and ecological impacts under the supervision of MOPC-DAPSAN. After the facilities are put into use, the Ciudad del Este branch of ESSAP will monitor such aspects as water quality, noise, waste, and ecological impacts under the oversight of ESSAP's headquarters.

2) Cross-Cutting Issues

In the Nationally Determined Contributions (NDC), which the Government of Paraguay has formulated in accordance with the Paris Agreement, the country aims to reduce by 20 percent the projected GHG emissions of 429 million, specifically 83 million tons, by 2030. The

Project, which aims to support energy saving by introducing energy-efficient pumps and other equipment, will generate the climate benefit equivalent to a reduction of some 7,000 tons of CO<sub>2</sub> per year.

3) Category of Gender: [gender-responsive project] GI (S) (gender integrated project)

Description of Activities and Reason for Categorization: The Project will involve developing and introducing a gender equality policy at ESSAP, and providing its staff with training aimed at preventing domestic violence and promoting more engagement of female engineers under the policy of promoting a greater role for women in infrastructure.

(9) Other Important Issues: N/A

#### 4. Targeted Outcomes

(1) Quantitative Effects

1) Performance Indicators (Operation and Effect Indicators)

Indicator	Baseline (2019)	Target (2027)*
Number of household water connections	32,151	52,464
Additional amount of water supply (l/s)	0	325
Number of household sewer connections	14,571	47,687
Number of sewage treated households	0	41,378
Amount of sewage treated (l/s)	0	420
Electricity consumption for water supply (kWh/m <sup>3</sup> )	0.53	0.48
CO <sub>2</sub> emissions reduced (tons/year)	-	7,000 (estimate)

\* The target is to be achieved by 2027 in line with the target year for the IDB.

(2) Qualitative Effects

A better living environment and an improved capacity to both operate and maintain water and sewage facilities in the target area.

(3) Internal Rate of Return

The internal return is not calculated for the water supply portion of the Project. Reliable calculation of the benefit from the Project is difficult because no accurate information is available for the current baseline given there are too many private water suppliers. The economic internal rate of return (EIRR) of the sewerage portion is calculated to be 12.26 percent based on the conditions indicated below. The financial internal rate of return (FIRR) is not calculated because it is assumed that tariff revenues alone cannot cover the project costs and the operation/maintenance costs for both water and sewage services.

[EIRR] (Sewerage)

Cost: Project costs and maintenance/operation costs (both excluding tax)

Benefits: Increased revenues resulting from a smaller number of absences due to deteriorating health status, as well as an improved living environment owing to reduced amounts of

wastewater being exposed to public roads

Project Life: 30 years

### **5. External Factors and Risk Control**

(1) Preconditions: (i) Procedures at the Congress of Paraguay to approve the E/N and L/A of the Project will not be delayed significantly. (ii) Land acquisition (approx. 2 ha) will be done smoothly.

(2) External Factors: No substantial change will be made to the ESSAP personnel under pressure from the national political regime.

### **6. Lessons Learned from Past Projects**

Lessons have been drawn from the Water Supply and Sewerage System Improvement Project, an ODA loan project for El Salvador that was earlier co-financed with the IDB. The ex-post evaluation report of the project points out that co-financing procedures which were complicated for the implementing agency resulted in some portions of the construction work lagging behind schedule. The report concludes that in a co-financing project, even if project implementation supervision is commissioned to a co-financer, project management procedures should preferably be streamlined in consultation with the agencies concerned in the partner country. In the Project, the IDB will be responsible for project supervision in line with applicable guidelines under the framework of CORE co-financing with the IDB. In consultation with the agencies concerned, project management procedures will be agreed in an operational manual.

### **7. Evaluation Results**

The Project is consistent with the development policies of Paraguay as well as Japan's and JICA's cooperation policies. It will also contribute to two of the SDGs: Goal 6 (ensure availability and sustainable management of water and sanitation for all) and Goal 13 (take urgent action to combat climate change and its impacts). Therefore, it is highly necessary to support the implementation of the Project.

### **8. Plan for Future Evaluation**

(1) Indicators to be Used

As indicated in sections 4. (1) to (3).

(2) Timing

Two years after project completion (ex-post evaluation)

End