

Ex-Ante Evaluation (for Japanese ODA Loan)

1. Name of the Project

Country:	The Republic of Peru
Project:	Northern Lima Metropolitan Area Water Supply and Sewerage Optimization Project (II)
Loan Agreement:	January 9, 2013
Loan Amount:	5,078 million yen
Borrower:	The Republic of Peru

2. Background and Necessity of the Project

(1) Current State and Issues of the Water Supply and Sewerage Sector in Peru

The Lima metropolitan area (hereinafter referred to as the “metropolitan area”), which is the area served by Servicio de Agua Potable y Alcantarillado de Lima (Lima’s state-run water supply and sewerage service; hereinafter referred to as “SEDAPAL”), has a desert climate with almost no rainfall throughout the year, and has an extremely serious water shortage, especially during the dry season, due to the extreme population density in the metropolitan area coupled with very scarce water sources. At the same time, to fulfill the water supply and sewerage demand due to the population increase in the metropolitan area while achieving sustainable operations wherein the fees collected generally cover the investments, maintenance, and management costs, SEDAPAL must work to secure new water sources and water treatment capacity while effectively utilizing limited water resources. However, SEDAPAL’s rate of water that is unaccounted for has reached some 40% for the metropolitan area as a whole, and within the area the northern part has a seriously high rate of Non-Revenue Water (hereinafter referred to as “NRW”) (47%) compared with the central and southern parts (37% and 28%, respectively) for which water supply and sewerage system improvements have already been implemented. Moreover, the northern part is also at a low standard in terms of average water supply hours per day (19.8 hours/day) compared with the central part (22.1 hours/day) and the southern part (23.5 hours/day), because of the lack of water supply capacity due in part to the high rate of NRW and problems with water sources.

With regard to sewerage, the aging pipes, problems with materials, and lack of sewerage flow volume are causing pipe clogs and breakage, and in the northern part these issues are frequently causing outflow and emission of sewerage, as well as ground sinkage. These issues are resulting in a deterioration of the sanitation environment for local residents, and improving the situation is an urgent challenge in the metropolitan area.

(2) Development Policies for the Water Supply and Sewerage Sector in Peru, and Priority of the Project

The government of Peru has formulated the National Sanitation Plan 2006-2015, which aims to promote the modernization of water supply and sewerage sector management, improvement of the sustainability of water supply and sewerage services, improvement of service quality, improvement of the financial status of water supply and sewerage business units, expansion of water supply and sewerage facilities, and other improvements.

For the metropolitan area, although the construction of a water treatment plant in Huachipa and an aqueduct in the northern part of the metropolitan area is being advanced under the yen loan projects Lima Marginal Areas Sanitary Improvement Project (I) and (II) (Signing of L/A: 2000 (I) and 2010 (II)) for securing water treatment capacity, to utilize the water treatment

facility to the fullest, the government of Peru is assigning the promotion of improvements to the water supply and sewerage system in the water supply area for the treatment plant as its highest priority issue, with the Northern Lima Metropolitan Area Water Supply and Sewerage Optimization Project (II) (hereinafter referred to as the “Project”) as the second stage.

(3) Japan and JICA’s Policy and Operations in the Water Supply and Sewerage Sector

Japan’s project development plan for the Republic of Peru lists “correcting disparities in the improvement of economic and social infrastructure,” “environmental measures,” and “disaster prevention measures” as the three priority sectors for aid. Water supply and improvement of sanitation constitute one of the most important development issues within the “environmental measures” priority sector for aid, and aid is currently underway under the “water program” with focus on numerous instances of loan aid and technical cooperation.

(4) Other Donors’ Activities

The World Bank (hereinafter referred to as the “IBRD”) is providing aid in the form of water supply and sanitation facility improvements, system improvements, etc. for rural areas through loans to rural water supply and sanitation improvement programs. Moreover, under the Northern Lima Metropolitan Area Water Supply and Sewerage Optimization Project (I), it is undertaking the rehabilitation of the northern Lima metropolitan area’s aging water supply and sewerage pipe network and the establishment of the sector through cofinancing with JICA, Germany’s reconstruction credit institute (hereinafter referred to as the “KfW”), and the IBRD.

The Inter-American Development Bank (hereinafter referred to as the “IDB”) is supporting the strengthening of capabilities of Peru’s Ministry of Housing, Construction and Sanitation, which is in charge of the water sector, and system improvements for the water supply and sewerage sector (including improvements to the management of water supply and sewerage business units in regional cities) in coordination with the KfW and the German Agency for International Cooperation (GIZ) through a policy program loan (Second-Generation Sanitation Sector Reform Program).

(5) Necessity of the Project

In the northern Lima metropolitan area, the water supply system has a high rate of NRW due to water leakage, etc., while the sewerage system has issues with outflow of sewerage due to broken sewer pipes, and these issues are leading to waste of funds on precious water sources for the area, a deterioration of the sanitation environment for local residents, operational losses for SEDAPAL, and other issues. Consequently, the immediate improvement of these conditions in the metropolitan area is an urgent issue for Peru and SEDAPAL. The Project is in accord with the government of Peru’s development policies and with Japan and JICA’s aid policy. Therefore it is highly necessary and relevant that JICA should support implementation of the Project.

3. Project Description

(1) Project Objective

The objective of the Project is to improve the quality, efficiency and sustainability of the water and sewerage service in the north region of the metropolitan area of Lima, by optimizing the water supply and sewerage system, thereby contributing to the betterment of

the sanitary condition in the Project area.

(2) Project Site/Target Area

Six districts in the northern Lima metropolitan area (Comas, Carabayllo, Puente Piedra, Los Olivos, San Martín de Porres, Callao)

(3) Project Components

- 1) Civil engineering work (water main improvement, distributing reservoir and pump station rehabilitation, secondary water supply and sewerage pipe network rehabilitation, installation of water meters, installation of remote monitoring and control systems, etc.)
- 2) Procurement of maintenance supplies (supplies and equipment for survey and cleaning of the inside of water supply and sewerage piping, supplies and equipment for finding water leaks, etc.)
- 3) Consulting services (detailed design (D/D), bid assistance, construction supervision)

(4) Estimated Project Cost (Loan Amount)

15,553 million yen (yen loan amount: 5,078 million yen)

(5) Schedule

Planned for the period between January 2013 and December 2018 (72 months in total). The Project will be completed at the joint opening of the facilities.

(6) Project Implementation Structure

- 1) Borrower: The Republic of Peru
- 2) Executing Agency: SEDAPAL
- 3) Operation and Maintenance System: To be implemented by SEDAPAL through its northern service office (Gerencia Servicio Norte: GSN), which is its administrative hub in the northern area

(7) Environmental and Social Considerations/Poverty Reduction/Social Development

- 1) Environmental and Social Considerations
 - (i) Category: B
 - (ii) Reason for Categorization: Due to the fact that the Project does not cover sectors or characteristics that are liable to cause impact, nor areas that are prone to such impact, under the “JBIC Guidelines for Confirmation of Environmental and Social Considerations, dated April 2002”, and because the unfavorable impact on the environment is not considered to be major.
 - (iii) Environment Permit: The Environmental Impact Assessment (EIA) report for the Project will be created simultaneously with the detailed design, and will be

approved by the Sanitation Agency in the Ministry of Housing, Construction and Sanitation by the time bidding for the main construction work commences.

- (iv) Anti-Pollution Measures: The Project includes replacement of asbestos piping, but measures are planned to be taken by asbestos disposal specialists.
 - (v) Natural Environment: The area covered in the Project is not a national park or other area prone to impact, nor is it near such an area, so the unfavorable impact on the natural environment is deemed minimal.
 - (vi) Social Environment: Since the Project is focused mainly on rehabilitation of existing piping, it will entail no land acquisition or relocation of residents.
 - (vii) Others/Monitoring: In the Project, SEDAPAL plans to monitor airborne concentrations of sulfur dioxide, nitrogen dioxide, and carbon monoxide, as well as noise, based on the results of the Environmental Impact Assessment.
- 2) Promotion of Poverty Reduction: None in particular.
 - 3) Promotion of Social Development (gender perspective, measures for infectious diseases including HIV/AIDS, participatory development, consideration for persons with disabilities, etc.): None in particular.

(8) Collaboration with Other Donors

As with the Northern Lima Metropolitan Area Water Supply and Sewerage Optimization Project (I), parallel cofinancing with the IBRD and KfW is planned.

(9) Other Important Issues

None in particular.

4. Targeted Outcomes

(1) Quantitative Effects

- 1) Performance Indicators (Operation and Effect Indicators)

Indicator	Baseline (Actual Baseline in 2009)	Target (2018) [2 years after project completion]
Average NRW Rate in target sectors of the Project (%)	49.6	25
Average Service hours a day in target sectors of the Project (hrs/day) (hours/day)	19.8	24
Number of incidents caused by clogging of sewerage pipes in target drainage area of the Project (incidents/year)	4,438	888

- 2) Internal Rates of Return

Based on the foregoing assumptions, the economic internal rate of return (EIRR) for the Project will be 7.9%, and the financial internal rate of return (FIRR) will be 5.0%

[EIRR]

Costs: Project costs (excluding taxes), operation and maintenance costs
Benefits: Water supply and sewerage fee revenue for the portion of water leakage reduced, savings on operation and maintenance expenses, increase in water demand, amount of willingness to pay for improved water supply and sewerage service
Project life: 20 years

[FIRR]

Costs: Project costs, operation and maintenance costs
Benefits: Water supply and sewerage fee revenue
Project life: 20 years

(2) Qualitative Effects

Improvement of the sanitation environment.

5. External Factors and Risk Control

Any deterioration in the political or economic situation and any natural disasters in Peru or in the vicinity of the target areas.

6. Results of Evaluations and Lessons Learned from Past Projects

(1) Results of Evaluations of Similar Past Projects

Based on the results of ex-post evaluations of similar projects in the water supply and sewerage sector, in projects where fee collection is used to cover operation and maintenance expenses, it has been indicated that not only infrastructure improvement itself but also technical assistance with measures for NRW, etc. to the implementing organization has been important for the realization of sustainable operations of water and sewer projects.

(2) Lessons for the Project

In light of the abovementioned lesson, and since measures for NRW are important in SEDAPAL's sustainable operations within the Project, in addition to the rehabilitation of the secondary pipe network in the Project, aid has been underway since June 2012 through the technical cooperation project Project for Capacity Strengthening for Non-Revenue Water of SEDAPAL which aims to strengthen SEDAPAL's technical capabilities for addressing NRW.

7. Plan for Future Evaluation

(1) Indicators to be Used

- (i) Average NRW Rate in target sectors of the Project(%)
- (ii) Average Service hours a day in target sectors of the Project (hours/day)

- (iii) Number of incidents caused by clogging of sewerage pipes in target drainage area of the Project (instances/year)

(2) Timing

Two years after project completion.