

Ex-Ante Evaluation

Southeast Asia Division 1, Southeast Asia and Pacific Department, JICA

1. Basic Information

Country: The Republic of Indonesia (Indonesia)

Project: Jakarta Sewerage Development Project (Zone 1)

Loan Agreement: March 31, 2020

2. Background and Necessity of the Project

(1) Current State and Issues of the Sewerage Sector and Priority of the Project in Indonesia

In the Republic of Indonesia (hereinafter referred to as "Indonesia"), the responsibility for wastewater treatment lies with local governments, which have the responsibility for drawing up detailed plans as well as developing, operating and maintaining sewerage according to national development plans and guidelines that are drawn up by the central government. However, in the present situation, the central government mostly bears part of the initial cost of sewerage development, and the local governments bear the remainder of initial cost, the operation and maintenance costs, and any facility replacement costs. In the Special Capital Region of Jakarta (Daerah Khusus Ibukota Jakarta, hereinafter referred to as "DKI"), which is the capital city of Indonesia, a public corporation for sewerage (Perusahaan Daerah Pengelolaan Air Limbah DKI Jakarta, hereinafter referred to as "PD PAL Jaya") was established under the supervision of the assistant governor in 1991, and is in charge of the operation and maintenance of the sewerage business.

However, owing to repeated changes of administration, the Asian monetary crisis in 1997, and the decentralization policy thereafter, the sewerage service coverage ratio in Indonesia still remains only under 3% (Development of Wastewater Management System 2013) which has resulted in a marked delay in sewerage improvement compared with the surrounding ASEAN countries (approximately 20% in Thailand and approximately 65% in Malaysia (Global Water Market 2012)). DKI is also behind in infrastructure improvement despite the increase in population and commercial clusters which resulted from the rapid economic growth, and the sewerage service coverage ratio in DKI is only approximately 11% (PD PAL Jaya for Zone 0, RPJMD Province DKI Jakarta 2017-2022).

Under these circumstances, Indonesia is working on a national strategy to increase the access ratio to safely managed sanitation services. Moreover, in DKI, according to the Wastewater Management Master Plan, which was revised under technical

cooperation from JICA, an improvement plan has been drawn up to divide DKI into 15 sewerage zones and to gradually increase the sewerage system development ratio to 20% by 2020 (short-term target), to 50% by 2030 (mid-term target), and to 80% by 2050 (long-term target). In the improvement plan, constructing sewerage system in Zones 1 and Zone 6, which are sewerage zones located in the central part of DKI, is regarded as a "priority project" which has to be carried out by 2020.

(2) Japan and JICA's Cooperation Policy and Operations in the Sewerage Sector

In the Country Assistance Policy for the Republic of Indonesia dated on September 2017, the Japanese government identified "Assistance for correction of inequality and establishment of a safe society" as one of the priority areas and provided support for improvement to urban infrastructure, including sewerage. Moreover, in JICA Country Analysis Paper for Indonesia dated on June 2018, urban environmental improvement in the metropolitan area was remarked as one of the important issues, and support for water environment improvement, including sewerage improvement, was provided in the Paper. In this way, the Jakarta Sewerage Development Project (Zone 1) (hereinafter referred to as "the Project") is in line with these policies. In addition, the Project will contribute to enhancing its water environment, citizens' living conditions, urban development in the Jakarta metropolitan area, and to SDGs Goal 6 "Ensure availability and sustainable management of water and sanitation for all people."

(3) Other Donors' Activities

1) The World Bank and others

The World Bank has carried out the Jakarta Sewerage and Sanitation Project (an approved amount of 22.4 million USD) since June 1983 and has constructed 80 public toilets in addition to sewerage development in Zone 0. Moreover, from 2003, the World Bank provided support for improvement of the sanitary environment through the SANIMAS program (a community-led on-site wastewater management program) in six cities jointly with the Bremen Overseas Research and Development Association (BORDA), and the Australian government. From 2006 onward, the Ministry of Public Works and Housing is expanding the said program.

2) Asian Development Bank and Australian government

Since May 2014, the Asian Development Bank and the Australian government have been carrying out the Metropolitan Sanitation Management Investment Project, which is a co-financing project with a target of individually connecting a total of 70,400 houses to the sewer network in Jambi, Palembang, Pekanbaru, Makassar and Cimahi. Asian Development Bank identified

improvement of urban sanitation as one of its priority areas in its Country Partnership Strategy (CPS) (2016-2019).

3. Project Description

(1) Project Objective

This project is to improve wastewater treatment and sanitation access in DKI by introducing a sewerage system, which consists of sewer network and wastewater treatment plant, thereby contributing to enhancing its water environment, citizens' living conditions and urban development.

(2) Project Site / Target Area:

Zone 1 of DKI

(3) Project Component(s)

The Project includes the construction of a wastewater treatment plant and a sewer network in Zone 1 of DKI (planned population is 1.24 million in 2030) and comprises the following.

- 1) Construction of Wastewater Treatment Plant (wastewater treatment capacity: 240,000 m³/day)
- 2) Construction of Sewer Network (total length of approximately 80 km)
- 3) Consulting services (e.g. construction supervision, techniques transfer (e.g. improvements of the sewerage service and support for drafting plans for sludge treatment), awareness-raising activities for residents, and support for environmental and social considerations)

(4) Estimated Project Cost (Loan Amount)

89,661 million Japanese yen (of which, eligible for Japanese ODA Loan is 57,061 million Japanese yen)

(5) Schedule

The estimated period is from March 2020 to May 2027 (87 months in total). The Project will be completed on the date on which all the facilities begin to be made available (scheduled in November 2025).

(6) Project Implementation Structure

- 1) Borrower: The Government of the Republic of Indonesia
- 2) Guarantor: None
- 3) Executing Agency: Directorate General of Human Settlements, Ministry of Public Works and Housing (hereinafter referred to as "DGHS")
- 4) Operation and Maintenance System: DKI Provincial Government

- (7) Collaboration and Division of Roles with other Projects and Donors
- 1) Japan's assistance activities: Since 2014, Japan has been dispatching Sewerage Management Advisor to DGHS to support smooth planning and implementation of this Project, and formulation of technical standards and guidelines.
 - 2) Other Development Partners' assistance activities: None
- (8) Environmental and Social Consideration/Poverty Reduction/Social Development
- 1) Environmental and Social Consideration
 - ① Category: B
 - ② Reason for Categorization: The Project is classified as Category B because it does not fall under a sector likely to have any significant impact on the environment or have characteristics that are liable to cause adverse impacts, and is not located in or near sensitive areas, as specified in the "JICA Guidelines for Environmental and Social Considerations" (published in April 2010).
 - ③ Environmental Permit: The environmental impact assessment report of the Project (AMDAL) was approved by the Directorate of Environmental Management of the DKI Provincial Government in December 2018.
 - ④ Anti-Pollution Measures: During construction, any negative impact regarding air quality, water quality, noise and vibration shall be minimum by reduction of the amount of muddy water by water sprinkling, utilization of wastewater treatment facilities, usage and regular maintenance of low-noise vehicles, machines and materials and the installation of temporary fencing as noise measures, to meet Indonesian domestic standards. Once the sewerage system is in service, the negative impact of odors, noise and vibration will be reduced through the arrangement of facilities, as well as machines and materials for deodorization and soundproofing measures, and by using ventilation and deodorization, to meet the Indonesian domestic standards. For water quality, wastewater will be monitored to identify any leaks of untreated wastewater early and to take measures against the leaks. Moreover, sludge will be disposed appropriately through reclamation at a disposal site designated by DKI after the sludge has been regularly checked for pollution and has been dehydrated.
 - ⑤ Natural Environment: The project target area does not fall within a national park or other susceptible area or its surroundings, and it is inferred that the Project has the minimum undesirable effect on the natural environment.
 - ⑥ Social Environment: The Project does not involve land acquisition and resettlement, as it comprises the construction of a wastewater treatment plant

on land owned by the Government, and the construction of a sewer network under road sites. No special opposition was raised to carrying out the Project during negotiations with the Project stakeholders.

- ⑦ Other/Monitoring: Contractors and the DKI Provincial Government will monitor the air and water quality, noise, and vibration during construction, and the DKI Provincial Government will monitor water quality, odors, noise, and vibration as well as sludge pollution and treatment after the sewerage system goes into service.

2) Cross-Cutting Issues

- ① Measures against Climate Change: The Project contributes to Climate Change adaptation since it decreases the frequency of city flooding and improves public sanitation and environment. This is because of the improvement of drainage function in the city by constructing a wastewater treatment plant and a sewer network.
- ② Measures against AIDS, HIV and other infectious diseases: Contractors will implement measures against HIV and AIDS for workers when carrying out engineering work.
- ③ Consideration for persons with disabilities and elderly persons: When carrying out awareness-raising activities, appropriate consideration will be given to the locations and the methods of those activities in view of the participation of any residents with disabilities.

3) Gender category: (Gender Project) GI (S) Integrated gender activity project

Activities/Classification Rationale: In order to promote women's participation in carrying out the Project, as well as its operation, maintenance and management, machines and materials which are easy for women to use will be selected to be used in the Project. Therefore, the Project is classified as an integrated gender activity project.

- (9) Other Important issues: The Project will use space-saving and highly-efficient wastewater treatment methods in which Japanese techniques can be used, in addition to jacking methods where Japanese companies have relative superiority.

4. Targeted Outcomes

(1) Quantitative Effects

1) Outcomes (Operation and Effect Indicators)

Indicator	Baseline [Actual value in 2017]	Target (2028) [3 years after project completion]
Population Covered by Sewerage Service (person)	0	989,389
Sewerage Service Coverage (%)	0	80
Capacity of Wastewater Treatment (m ³ /day)	0	240,000
Amount of Treated Wastewater (m ³ /day)	0	200,000
Effluent BOD Concentration (mg/L)	No data	Less than 20

(2) Qualitative Effects: Improved living and sanitary environment for residents

(3) Internal Rate of Return

Based on the following preconditions, the Economic Internal Rate of Return (EIRR) will be 21.00%. It is impossible to calculate the Financial Internal Rate of Return (FIRR) as the net profit will be negative every year during the project life.

Costs: Initial construction cost, replacement cost, operation and maintenance cost of wastewater treatment plant and sewer (tax and residual value are excluded).

Benefits: Saving of up-grading of septic tanks, saving of operation and maintenance cost of individual treatment plants, increased value of land, sale of reclaimed water.

Project Life: 35 years

5. Preconditions / External Conditions

(1) Preconditions: None

(2) External factors: None

6. Lessons Learned from Past Projects

In the results of the ex-post evaluation of the Denpasar Sewerage Development Project (I) (a Japanese ODA loan project for Indonesia), clogged sewer networks due to dumping was identified as a problem. Measures such as awareness-raising activities and explanatory meetings to prevent residents from dumping, the procurement of garbage suction cars, and garbage removal operations, have been effective on tackling this problem. The project will minimize any negative effects derived from dumping by providing environmental education to the local residents through the consulting service

of the Project.

Moreover, as individual connections of commercial facilities made less progress in the said Project than expected, it was indicated at the time of the ex-post evaluation that the facility utilization ratio was only approximately 64%. In the Project, it is planned that the interceptor sewerage system (wastewater is intercepted from the existing drains and pump stations) will be developed and this will enable to collect wastewater without carrying on with new individual connections, except in pilot areas where separate sewerage system will be developed.

In the results of the ex-post evaluation of the Ho Chi Minh City Water Environment Improvement Projects (I), (II), and (III) (Japanese ODA Loan projects for Vietnam), it was indicated that a composting facility used for the sludge treatment stopped operations due to bad smell and that the cause was an insufficient period of training (three months) provided to the operators of the executing agency, who had no experience in operating a large-scale wastewater treatment plant. With a full understanding of the above lesson, the Project plans to include O&M training for two years in the construction contract of the wastewater treatment plant in which the operator's capacity will be enhanced.

7. Evaluation Results

The Project is consistent with Indonesia's development issues and policies, as well as Japan's and JICA's cooperation policies and analysis, and will contribute to enhancing water environment, citizens' living conditions and urban development in the Jakarta metropolitan area by constructing a wastewater treatment plant and a sewer network. In this way, the Project is expected to contribute to achieving SDGs Goal 6 (Ensure availability and sustainable management of water and sanitation for all). Therefore, it is highly necessary for JICA to provide support for the implementation of the project.

8. Plan for Future Evaluation

(1) Indicators to be Used

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

(2) Timing

Ex-post evaluation: Three years after project completion.

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