

Ex-Ante Evaluation (for Japanese ODA Loan)

1. Name of the Project

Country: The Socialist Republic of Viet Nam

Project: Bien Hoa City Drainage and Wastewater Treatment Systems Project, Stage 1

Loan Agreement: August 30, 2017

Loan Amount: 24,700 million Yen

Borrower: The Government of the Socialist Republic of Viet Nam

2. Background and Necessity of the Project

(1) Current State and Issues of the Water Environment Sector in Viet Nam

Urban areas in Viet Nam have been seeing an increase in domestic wastewater amid rapid economic growth and urbanization. Yet urban sewerage coverage has remained low--about 15 percent as of 2015. For this reason, urban sewage largely undergoes primary treatment through septic tanks. Lack of proper maintenance of such tanks, including sludge removal, means inappropriate treatment of wastewater. As a result, rivers and other waterways in urban areas are experiencing increasing pollution loads from untreated wastewater in addition to rainwater. This in turn is seriously exacerbating the water quality of the rivers and seas into which such waterways flow. The Prime Minister's Decision of April 2016 approving revised orientations for water drainage in urban centers and industrial parks up to 2025, with a vision toward 2050, set out a target of increasing the percentage of sewage treated (in volume) to 50% by 2025 in urban areas across the country.

(2) Development Policies for the Water Environment Sector in Viet Nam and the Priority of the Project

Although Bien Hoa City is now constructing its first wastewater treatment plant (with a capacity of 3,000 m³/day) by own budget, it may not be able to cope with the growing needs for wastewater treatment. Wastewater generated in the city is discharged untreated into the Dong Nai River, a source of tap water for Ho Chi Minh City, the largest city in Viet Nam. This is taking its toll on the water environment and public health, posing a pressing challenge. The levels of biochemical oxygen demand (BOD) in the existing canals in Bien Hoa City range from 74 to 693 mg/L. These levels are much higher than the water quality standard for surface water in Viet Nam (TCVN 5942:1995) and on par with those of untreated wastewater. This means that improving the water quality of the rivers and other waterways in the city poses another challenge. These circumstances prompted the Dong Nai Provincial People's Committee to develop a sewerage and environmental master plan for the urban and industrial areas in Bien Hoa City for 2003-2020 to improve the current situation surrounding water supply, water drainage, and sewage treatment. The master plan calls for, among other targets, developing sewerage in all urban areas in Bien Hoa City by constructing three wastewater treatment plants (with a total capacity of 185,000 m³/day) and nine pumping stations in the city. The Bien Hoa City Drainage and Wastewater Treatment Systems Project, Stage 1 (the Project) is designed to develop drainage and wastewater treatment systems in the priority areas, as stage 1, identified in the master plan.

(3) Japan and JICA's Policy and Operations in the Water Environment Sector

Japan's Country Assistance Policy for the Socialist Republic of Viet Nam, (December 2012), states that Japan will assist the country in "addressing

emerging environmental issues (urban environment, natural environment) caused by rapid urbanization and industrialization” in the priority area, “Response to Fragility.” The JICA Country Analysis Paper for the Socialist Republic of Viet Nam (March 2014) also identifies addressing urban problems associated with rapid economic development and industrial clustering as one of the priority issues. The Project is consistent with the above policy and analysis. JICA has extended assistance to Hanoi City, Ho Chi Minh City, Hai Phong City, Hue City and Binh Duong Province to develop sewerage and build the structure and capacity to operate and maintain it in ODA loan projects, including the Hanoi Drainage Project for Environment Improvement and the Ho Chi Minh City Water Environment Improvement Project.

(4) Other Donors’ Activity

The World Bank identified the qualitative improvement of infrastructure in general, including infrastructure for the urban water environment, as one of the three pillars of its assistance in its Country Partnership Strategy for Viet Nam for 2012-2016. Under the strategy, it is conducting sewerage development projects in several provinces and cities. Similarly, the Asian Development Bank (ADB) identified urban infrastructure development including water supply systems as well as improved services as one of the six priority areas in its Country Partnership Strategy for Viet Nam for 2012-2015. Under the strategy, the ADB is also conducting sewerage development projects in several provinces and cities.

(5) Necessity of the Project

The Project is consistent with the development issues and plans of Viet Nam as well as JICA’s cooperation policy and analysis for the country. It will contribute to improving the public health environment in Bien Hoa City, Dong Nai Province. The Project is considered to be contributory to SDGs 6, thus given the above, JICA’s assistance for this project is highly necessary and relevant.

3. Project Description

(1) Project Objective

The Objective of the Project is to increase the wastewater treatment coverage in Bien Hoa City, Dong Nai Province, by constructing urban wastewater treatment facilities, thereby contributing to the improvement of sanitary conditions and sustainable development of the Province and its downstream region. (2)

Project Site/Target Area:

Bien Hoa City, Dong Nai Province

(3) Project Description

- 1) Development of sites for wastewater treatment plants
- 2) Construction of a wastewater treatment plant (treatment capacity: 39,000 m³/day) and two pumping stations (ICB)
- 3) Main intercepting sewers and sewer mains (pipe jacking method) (ICB)
- 4) Main intercepting sewers, sewer mains, quasi-trunk sewers, branch sewers (open cut method) (LCB)
- 5) Canal improvement (LCB)
- 6) Consulting services (detailed design, bidding assistance, capacity building for sewerage facility maintenance, public awareness-raising and public health education activities, construction supervision, etc.)

(4) Estimated Project Cost (Loan Amount)

30,467 million yen (Loan amount: 24,700 million yen)

- (5) Schedule
August 2017 to January 2026 (total 102 months). It will be considered completed when the facilities are put into service (January 2024).
- (6) Project Implementation Structure
 - 1) Borrower: The Government of the Socialist Republic of Viet Nam
 - 2) Executing Agency: Dong Nai Construction Investment Management Authority
 - 3) Operation and Maintenance System: The Dong Nai Provincial People's Committee (DPPC) will own the facilities and, under Vietnamese ordinances, select operation and maintenance (O&M) service providers.
- (7) Environmental and Social Consideration/Poverty Reduction/Social Development
 - 1) Environmental and social considerations
 - i) Category: B
 - ii) Reason for Categorization: The Project is likely to have significant adverse impacts due to the Project's characteristics under the Japan Bank for International Cooperation Guidelines for Confirmation of Environmental and Social Consideration (issued in April 2002).
 - iii) Environmental Permit: Two environmental impact assessment (EIA) reports were prepared for the Project: one on pumping stations, wastewater treatment plants and canals, and the other on sewers. DPPC approved the former on February 23, 2009, and the latter on February 11, 2015.
 - iv) Anti-Pollution Measures: Measures to be taken to mitigate air, water, noise and vibration pollution during the engineering work include ensuring regular maintenance of construction equipment by the contractors, laying waterproof sheets to prevent the outflow of wastewater, and using equipment that generates noise or vibration in enclosures at least 50 meters away from residential areas. The executing agency will take a number of mitigation measures for sludge generated in wastewater treatment plants after the facilities are put into service, including dewatering and disposing of it at waste disposal sites. All these mitigation measures will likely keep the environmental impact to a minimum.
 - v) Natural Environment: The project area is not located in any kind of sensitive areas such as national parks. It is thus reasonable to conclude that the Project will have a minimum adverse impact on the natural environment.
 - vi) Social Environment: The Project will entail the acquisition of about 8.8 hectares of land that involves the resettlement of 71 households. The land acquisition, resettlement and compensation processes will be completed by December 2017 in accordance with the JBIC Guidelines, as well as applicable domestic procedures in Viet Nam. Approximately 0.4 hectares of land in a separate sewer system area along the Kai River, which will involve the resettlement of 13 households, will be acquired prior the Project, during the period of the embankment construction project to be implemented by Dong Nai Province. The pipe jacking method will be partially adopted in laying sewers to keep the scale of land acquisition to a minimum.
 - vii) Other / Monitoring: In the Project, the air and water quality, noise and vibration levels and solid waste will be monitored by the executing agency during the engineering work, and by the O&M service provider after the facilities are put into service, both in cooperation with the consultant.
 - 2) Promotion of Poverty Reduction: None in particular

- 3) Promotion of Social Development (e.g. Gender Perspective, Measures for Infectious Diseases including HIV/AIDS, Participatory Development, Consideration for Persons with Disabilities, etc.): In organizing briefing meetings for local communities about setting sewerage charges, the executing agency will encourage the participation of women's associations and other groups in the communities concerned as part of efforts to involve the socially vulnerable, including women. It will hold such meetings when and where such people can readily participate.

(8) Collaboration with Other Donors: None in particular

4. Targeted Outcomes

(1) Quantitative Effects

Performance Indicators (Operation and Effect Indicators))

Indicator	Baseline (Actual value in 2016)	Target (2025) [Expected value 2 years after project completion]
Population treated (persons)	0	92,732
Amount of wastewater treated (m ³ /day)	0	26,910
BOD concentration (in final effluent) (mg/L)	-	30
TN concentration (in final effluent) (mg/L)	-	30
Area to be inundated when the rainfall intensity is 80.0 mm/h or lower (5-year flood) (ha)	29	0
Area to be inundated when the rainfall intensity is 57.0 mm/h or lower (1-year flood) (ha)	72	0

(2) Qualitative Effects

Improvement of living environment in Bien Hoa City, Dong Nai Province; and climate change adaptation

(3) Internal Rate of Return

Based on the conditions indicated below, the economic internal rate of return (EIRR) of the Project is 2.4 percent. The financial internal rate of return (FIRR) is not calculated because the Project does not assume that it will be financed by utility revenues alone.

[EIRR]

Cost: Project cost (excluding tax), operation and maintenance expenses
Benefit: Fewer sanitation facilities, reduced medical expenses associated with water-borne infections, higher land prices, increased fishery revenues, less property damage due to inundation or flooding because of improved canals and drainage channels, fewer chances of reduced household and agricultural revenues

Project Life: 50 years

5. External Factors and Risk Control

None in particular

6. Lessons Learned from Past Projects

(1) Results of Evaluation of Similar Past Projects

From the ex-post evaluation of the Yamuna Action Plan Project, a Japanese ODA

loan project for India, and the “Study on the Integrated Plan of Environmental Improvement in the Catchment Area of Lake Billings in Sao Bernardo do Campo City in the Federative Republic of Brazil,” JICA has learned that, in order to produce positive project outcomes and ensure their sustainability after project completion, it is effective to conduct awareness-raising activities designed to raise public awareness about the environment and public health, and ensure community participation from earlier stages of the project. JICA has also learned that it is essential to strengthen the O&M structure from the financial, technical, and personnel aspects; that it is worth studying the possibility of outsourcing personnel training to private providers of consulting and other services as appropriate; and that it is important to support institutional improvements from a financial perspective, including reviewing the charging system and developing a loan scheme for poor people who may not be able to afford connection fees.

(2) Lessons for the Project

JICA will support activities to raise public awareness for improving the sanitary environment and provide a training program on the maintenance of sewerage facilities within the framework of consulting services. As part of its efforts to build the O&M capacity, JICA is now conducting the Technical Assistance Project for Enhancing the Management Capacity of Sewage Works. It will also work otherwise to build a structure for developing human resources to make up for the shortage of sewerage engineers in smaller cities that plan to develop sewerage in Dong Nai Province--which is covered by the Project--and elsewhere. Assistance will be offered to poor people who may not be able to afford connection fees. This will include loans financed by the revolving fund to be established with funds coming from the Dong Nai Provincial People’s Committee.

7. Plan for Future Evaluation

(1) Indicators to be Used

- 1) Population treated (persons)
- 2) Amount of wastewater treated (m³/day)
- 3) BOD concentration (in final effluent) (mg/L)
- 4) TN concentration (in final effluent) (mg/L)
- 5) Area to be inundated when the rainfall intensity is 80.0 mm/h or lower (five-year flood)
- 6) Area to be inundated when the rainfall intensity is 57.0 mm/h or lower (one-year flood) (ha)

(2) Timing

Expected value two years after project completion