

Ex-Ante Evaluation (for Japanese ODA Loan)

1. Name of the Project

Country: The Independent State of Papua New Guinea

Project: Port Moresby Sewerage System Upgrading Project

Loan Agreement: January 29, 2010

Loan Amount: 8,261 million yen

Borrower: The Independent State of Papua New Guinea

2. Background and Necessity of the Project

(1) Current State and Issues of the Sewerage Sector in Papua New Guinea

In Papua New Guinea, more than 80% of the population live in villages. However, sewerage systems have been developed mainly in Port Moresby and urban cities. The sewerage systems were developed in the 1960s to the early 1970s before the independence in the inland area of Port Moresby by Australia which was governing the country, and were also developed in 1999 and 2000 in the urban cities (Mount Hagen, Madan, etc.) by the loan from the ADB. Particularly in Port Moresby where the population is concentrated, three sewage treatment plants are in operation (Waigani, Gerehu, and Morata) which services for the population of 90,000 of the inland area of Port Moresby which has a total population of 290,000. The treated wastewater quality of those sewage treatment plants are good in general, however, some of the facilities need repair due to aging.

On the other hand, there is no sewage treatment plant in the coastal area of Port Moresby, where 67,000 people are living. For this reason, sewage is once pre-treated in septic tank, etc., and discharged in the ocean via undersea discharge pipe, or discharged by underground seepage. The current quality is extremely above the standard tolerance value, 23-2,400 MPN/100ml of coli bacteria (environmental standard of PNG: 200 MPN/100ml), 1.4-4.2 mg/l of nitrogen (no standard in PNG, 0.3mg/l for standard in Japan), 0.21-0.69 mg/l of phosphorus (no standard in PNG, 0.03mg/l for standard in Japan). Discharge of such sewage of insufficient treatment to the ocean is causing water contamination in the coastal area, and is destroying the ocean environment including bleaching coral reefs, etc., as well as causing deterioration of hygienic environment of the local residents and affecting their health, especially those living on the sea. The ratio of waterborne diseases in the coastal area is higher than the others; average diarrheal morbidity is 31% in the coastal area, while 5% in the city.

(2) Development Policies for the Sewerage Sector in Papua New Guinea and the Priority of the Project

In the Medium Term Development Strategy 2005 – 2010 by the Government of Papua New Guinea, the nationwide public health service is positioned as the priority area, particularly focusing the basic services of the urban areas including public health. In addition, protection

of coral reefs is also one of the priority issues.

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

In the Fifth Pacific Islands Leaders Meeting of May 2009, Japan called for the environment and climate change as one of the pillar of the support to the Pacific islands. Additionally, infrastructure development in order to comply with the rapid socioeconomic growth is also one of the priority areas of JICA's Assistance. With regards to the past assistance of JICA to the sewerage sector of Papua New Guinea, is the Goroka Water Treatment Facilities Construction Project (PN-I-1) (L/A signed in 1978, loan amount: 155 million yen), where the residents' sanitary conditions was improved due to the enhancement of the sewerage facility of Goroka in the Eastern Highlands Province. Furthermore, the city water of Port Moresby was developed with the grant aid in 1994.

(4) Other Donors' Activity

The ADB had made a loan for the water supply and sewerage development project in the urban cities in 1999 and 2000, however, has no assistance for the sewerage project of Port Moresby. The World Bank also has not made loans for the sewerage field.

(5) Necessity of the Project

As stated above, since there is no sewage treatment plant in the coastal area of Port Moresby, development of sewerage facilities in this area (sewage= treatment plant, trunk pipe/branch pipe of the sewage pipes, water conduit as well as relay pumping stations, etc.) is essential for the improvement of the sanitary conditions of the local residents and ocean environment. Moreover, this project complies with the development policy of Papua New Guinea and the assistance policy of JICA. Therefore, the necessity and relevance of the ODA loan is high.

3. Project Description

(1) Project Objectives

The objective of this project is to develop sewerage facilities in the coastal area of Port Moresby in order to contribute to provide sewerage services to the area, prevent the discharge of contaminated water to the coastal waters, thereby establishing a sanitary living environment of the area, as well as to improve the residents' living environment and activate the industries.

(2) Project Site/Target Area

Coastal area of Port Moresby

(3) Project Components

1) Sewerage facilities

- a Construction of sewage treatment plant (13,800m³/day, oxidation ditch technique),

access road (1.73 km), undersea outflow pipe (1.4km)

b Pipelining of sewage pipes (17.2km of trunk pipe, 17.7km of branch pipe)

c Construction and repair of pumping stations (8 sites for construction, 9 sites for repair)

2) Consulting service

Bidding support, construction management, monitoring support, etc.

(4) Estimated Project Cost (Loan Amount)

10,802 million yen (Loan amount: 8,261million yen)

(5) Schedule

The planned implementation schedule of the project is from January 2010 to September 2015 (69 months in total). The use of the facilities will start in September 2015, which is regarded as the completion date of the project.

(6) Project Implementation Structure

1) Borrower: The Independent State of Papua New Guinea

2) Executing Agency: Independent Public Business Corporation

3) Operation and Maintenance System:

Port Moresby water and sewerage services corporation (EDA RANU) owned by IPBC (Independent Public Business Corporation)

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

1) Environmental and Social Consideration

a Category: A

b Reason for Categorization: This project corresponds to Classification Category A of “Japan Bank for International Cooperation Guidelines for Confirmation of Environmental and Social Considerations” (established April 2002), for it is vulnerable area to the environmental impacts.

c Environmental Permit: An Environmental Impact Assessment (EIA) report as related to this project has already been approved on May, 2006. An Environmental Permit has already been acquired on December, 2007.

d Anti-Pollution Measures: Treated wastewater shall satisfy the drainage standards of Japan or those of international, and shall also satisfy the environmental standards of Japan and Papua New Guinea for the ocean area of where water is discharged. Therefore, impact due to discharge of treated wastewater is not particularly predicted.

e Natural Environment: An area likely to be subjected to impact (coral reef) is included in the proposed site for the undersea outflow pipe. Therefore, measures such as prevention of sediment runoff or spreading, selection of a outflow pipe of minimum impact, and transplantation of coral reef on the pipeline route, etc., shall be taken.

f Social Environment: Approximately 11 ha (27.18 acre) of land acquisition shall be required, which is to proceed according to the procedures of Papua New Guinea. The proposed site for the access road which is included in the land to be acquired shall involve transfer of 10 households. However, compensation has already been executed

upon residents' consent, and transfer is complete.

g Other / Monitoring: EDA RANU shall monitor the quality of the treated wastewater, and the growth situation of the coral reefs.

2) Promotion of Poverty Reduction: Since improvement of the water quality of the coast of Port Moresby is expected to maintain the ocean environment and increase the fish hauls, it is also expected to improve the living of the poverty group that depends on fishing.

3) Promotion of Social Development (e.g. Gender Perspective, Measure for Infectious Diseases Including HIV/AIDS, Participatory Development, Consideration for the Handicapped etc.): Validate implementation of a pilot project for creating access to sewerage treatment facilities for the people living on the sea, which were dumping domestic waste and sewer to the sea directly, and, contribute to prevention of water contamination and improvement of residents' health through hygiene education at the same time. Moreover, this project is a major project which takes place in a country threatened by infection of HIV, and construction workers are to work in a site for a long-term. Therefore, HIV measures shall be taken with the cooperation of the health officials of Port Moresby.

(8) Collaboration with Other Donors: None

(9) Other Important Issues

A pilot project is planned for people living on the sea, who cannot access to the sewerage facility due to the structure of their residence.

4. Targeted Outcomes

(1) Performance Indicators (Operation and Effect Indicator)

Indicator	Baseline (Actual Value in 200x)	Target (2017) 【Expected value 2 years after project completion】
Sewered population (people)	0	48,600
Volume of sewage treatment (m ³ /day)	0	13,100
Utilization rate of sewerage facilities (%)	—	71.2
Concentration of BOD discharged (mg/l)	190	20
Percentage of sewered population (%)	27	61

(2) Internal Rate of Return

Based on the conditions indicated below, the Economic Internal Rate of Return (EIRR) of this project is 8.4%.

【EIRR】

Cost: Construction cost, operation and maintenance cost (excluding tax)

Benefit: Increase of tourism revenue, reduction of waterborne diseases, increase of fish haul

Project Life: 30 years

5. External Factors and Risk Control

Impact to the proposed site for the sewage treatment plant and undersea outflow pipe due to natural disasters.

6. Lessons Learned from Past Projects

In the past ex-post evaluation, we have learned that it is significant to establish systems and methods for operation management. With the above in mind, strengthening of operation and maintenance management system shall be aimed through technical assistance, etc., by consultation services in this project.

7. Plan for Future Evaluation

(1) Indicators to be Used

- 1) Sewered population (people)
- 2) Volume of sewage treatment (m³/day)
- 3) Utilization rate of sewerage facilities (%)
- 4) Concentration of BOD discharged (mg/l)
- 5) Percentage of sewered population (%)
- 6) Economic Internal Rate of Return (EIRR)

(2) Timing

Two years after project completion