

Ex-Ante Evaluation (for Japanese ODA Loan)

1. Name of the Project

Country: The Republic of Iraq

Project: Sewerage Construction Project in Kurdistan Region (I)

Loan Agreement: June 29, 2015

Loan Amount: 34,417 million Yen

Borrower: The Government of the Republic of Iraq

2. Background and Necessity of the Project

(1) Current State and Issues of the Sewage Sector in Iraq

Since the Iraq War ended in 2003, the Republic of Iraq has continued to experience a high level of economic growth that exceeds 6 percent annually on average (according to IMF statistics), as well as a population increase of 2.5 percent per year (according to the 2012 UN World Population Prospects). The country also continues to see improvements in economic infrastructure for its petroleum and other industries. In the sewerage sector, many facilities were built up until the 1980s; however, the Iran-Iraq War that started in the early 1980s, followed by the Gulf War, economic sanctions, and the Iraq War, resulted in few rehabilitation or maintenance projects being carried out on these sewerage facilities. This led to serious deterioration in sewer treatment plant and pipe functionality. As of 2011, the sewerage coverage rate was just over 30 percent in the country overall (according to the Iraq National Development Plan 2013–2017). As a result, the country is experiencing environmental pollution caused by harmful wastewater discharge as well as diarrhea and other health problems caused by unsanitary living conditions stemming from untreated sewage.

In Erbil, the core city of the Kurdistan Region of Iraq with a 3.5 percent annual population increase (according to the Regional Development Strategy for the Kurdistan Region 2013–2017) and rapid urbanization, raw sewage infiltrates the ground, and there are concerns about the risks of polluting the groundwater, which is a source of drinking water in the region. Although general wastewater is discharged outside the city through storm water pipes installed in recent years, sewage treatment plants have not been installed, and diluted general wastewater is released into the rivers that serve as public water sources, spreading pathogens and worsening the water quality. In the surrounding agricultural areas, river water is used for irrigation, damaging crops and leading to health concerns such as the outbreak of water-borne infectious diseases via produce raised in polluted water.

The construction of sewerage facilities able to handle the increase in wastewater from the region's growing population is therefore a pressing concern from the standpoint of improving sanitation conditions for local residents by preventing groundwater pollution and the need to more strictly manage water resources.

(2) Development Policies for the Sewage Sector in Iraq and the Priority of the Project
The National Development Plan 2013–2017 cites the achievement sustainable sanitation conditions as a means of addressing the Millennium Development Goals. In addition, the Regional Development Strategy for the Kurdistan Region 2013–2017

includes the targets of increasing the percentage of the population served by sewerage networks and ensuring quality control of waters flowing into the rivers so that this water is in line with international standards. This project is therefore in line with the NDP 2013–2017 as well as the Regional Development Strategy for the Kurdistan Region 2013–2017 in that it aims to improve water quality by constructing sewerage facilities.

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

Japan's Country Assistance Policy for Iraq (June 2012) stipulates "basic living infrastructure rehabilitation" as a priority area, with improvement in water, sewage, and other aspects of the sanitary environment considered particularly crucial development issues. The project is thus consistent with these policies. In terms of past JICA assistance, an ODA loan was granted in FY2009 for the Baghdad Sewerage Facilities Improvement Project (Engineering Services).

(4) Other Donors' Activity

No other forms of donor support have been confirmed for the sewage sector in the Kurdistan Region.

(5) Necessity of the Project

As indicated above, improving sanitation conditions for local residents by preventing groundwater pollution is an urgent task. In implementing this project, the autonomous government of the Kurdistan Region will need to make use of Japan's excavation and wastewater treatment technologies, which are superior in terms of shorter construction periods, ease of maintenance and operation, and other features. As this project addresses these issues, it is in line with the development policies of the Iraqi government as well as policies of the Government of Japan and JICA, making its implementation highly necessary and relevant.

3. Project Description

(1) Project Objective(s)

The objective of the Project is to enhance the sewage treatment capacity by establishing a sewerage system in Erbil City, Kurdistan Region, located in northern Iraq, thereby contributing to the improvement of the sanitary environment and ensure water resources for effective utilization in the region.

(2) Project Site/Target Area

Erbil City (southwestern area), Kurdistan Region

(3) Project Component(s)

- 1) Construction of sewerage facilities: Construct a wastewater treatment plant (standard activated sludge method, maximum daily wastewater volume of 210,000 cubic meters), operate and maintain the plant and other facilities (for approximately three years following construction), install an MBR unit, etc.
- 2) Sewerage pipe installation: Construction of trunk sewer pipes, primary pipes, secondary pipes, and house connections as well as the installation of private discharge facilities and relay pumping stations
- 3) Consulting services (detailed design work, bidding assistance, construction supervision, training, activities to educate residence on the use of sewerage water, operations and maintenance support, etc.)

(4) Estimated Project Cost (Loan Amount)
84,412 million Yen (Loan Amount: 34,417 million Yen)

(5) Schedule

From May 2015 to December 2023 (total of 104 months). Project completion is defined as the end of the defect liability period.

(6) Project Implementation Structure

- 1) Borrower: The Government of the Republic of Iraq
- 2) Guarantor: None
- 3) Executing Agency: Ministry of Municipalities and Tourism (MOMT), Kurdistan Region
- 4) Operation and Maintenance System: Responsibility for operation and falls on the Erbil Sewerage Directorate (ESD), which has jurisdiction over sewerage projects in the Erbil Governorate and takes orders from the General Directorate of Water & Sewerage (GDWS), the organization in charge of water and sewerage projects within the MOMT. Because a wastewater treatment plant has never been constructed in Erbil before, the ESD does not have the experience needed to operate and maintain a sewerage project. Therefore, consultants hired with funds from the ODA loan would carry out training and other activities to establish an operation and maintenance system as well as strengthen ESD capacity.

Furthermore, the project is planned to include a three-year operation and maintenance component in the wastewater treatment plant construction contract after the construction is completed. During this period, efforts will be made to improve the capacity and know-how of Kurdistan Regional Government so that the Kurdistan Regional Government is able to carry out wastewater treatment plant operation and maintenance.

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

1) Environmental and Social Consideration

- ① Category: B
- ② Reason for Categorization: The project is not located in a sensitive area, nor does it have sensitive characteristics, nor is it considered a sensitive sector under the JICA guidelines for environmental and social considerations (April 2010). Its potential adverse impacts on the environment are therefore not likely to be significant.
- ③ Environmental Permit: Preparation of an Environmental Impact Assessment (EIA) report for this project is required under Kurdistan Regional Government law, and the EIA prepared by the executing agency has been approved by the recipient government.
- ④ Anti-Pollution Measures: No significant negative environmental impacts are expected, as sludge generated at the wastewater treatment plant is scheduled to be transported to a newly constructed final disposal site for landfill disposal.
- ⑤ Natural Environment: The project site is not located in or near environmentally sensitive areas such as national parks, and adverse impact on the natural environment is assumed to be minimal.

- ⑥ Social Environment: The project will involve the acquisition of agricultural sites totaling about 54 hectares from about ten agricultural landowners. Either replacement land or compensation equivalent to reacquisition costs for lost structures and crops will be provided in line with regulations stipulated by the City of Erbil.
 - ⑦ Other/Monitoring: In accordance with the environmental monitoring plan for this project, the GDWS (which is responsible for sewerage projects under the executing agency (MOMT)) and contractors will monitor for atmospheric, water quality, or other forms of pollution during the construction period, while the ESD and contractors will monitor for pollution once the facilities are in use.
- 2) Promotion of Poverty Reduction: N/A
3) Promotion of Social Development: N/A

(8) Collaboration with Other Donors: N/A

(9) Other Important Issues

In implementing this project, the Kurdistan Regional Government will need to make use of Japan's excavation and wastewater treatment technologies, which are superior in terms of shorter construction periods, ease of maintenance and operation, and other features. The Special Terms for Economic Partnership (STEP) guiding the use of Japanese technologies shall therefore apply.

4. Targeted Outcomes

(1) Quantitative Effects

1) Performance Indicators (Operation and Effect Indicators)

Indicator	Baseline (Actual Value in 2014)	Target (2025) Expected value two years after project completion
Beneficiary: Sewerage service population (persons)	0	540,000
Amount of treated wastewater (m ³ /day)	0	210,000
Collection ratio of household sewerage charge (%)	0	77
BOD of outflow from WWTP (mg/L)	N/A	25 or less
BOD of flow in storm sewer pipes in Pilot Area (mg/L)	N/A	40 or less
Coverage ratio of sewerage service (see note)	0	32

Note: Equal to Sewerage service population divided by the population of the Erbil city administrative region and multiplied by 100 (Sewerage service population is the number of people whose homes are connected to the sewer line and have signed sewerage contracts)

(2) Qualitative Effects

Prevents pollution of the natural environment

(3) Internal Rate of Return

Based on the conditions indicated below, the Economic Internal Rate of Return (EIRR) of this project was calculated as 10.70%, while the Financial Internal Rate of Return (FIRR) was 2.20%.

【EIRR】

Costs: Project costs (excluding taxes), operation and maintenance expenses

Benefits: Reduction in treatment costs, improved public health and hygiene, land use benefits, increased tourism revenue, improved living environment, reducing of greenhouse gases

Project life: 40 years

【FIRR】

Costs: Project costs, operation and maintenance expenses

Benefits: Revenue from sewer service fees

Project life: 40 years

5. External Factors and Risk Control

Extreme worsening of public security.

6. Lessons Learned from Past Projects

(1) Lessons learned from evaluating similar projects

A lesson cited in the ex-post evaluation for the Southern Lima Metropolitan Sewerage Improvement Project in the Republic of Peru, for example, was that unnecessary implementation delays could be prevented by eliminating any anxiety and/or misunderstandings on the part of residents who will be affected by the project through conducting public relations and educational activities by the time construction work begins. It was learned that it is critically important to convey accurate information on the purposes, benefits and environmental impacts of the project.

(2) Lessons for this project

In light of the lessons mentioned above, there are plans to have the executing agency hold stakeholder meetings for affected local residents in the target city to provide sufficient information on project details to local residents and others as well as provide a forum for feedback. Consultants and others will also plan to advise and train the executing agency on educational activities designed to enhance stakeholders' understanding of the significance of sewerage projects, their benefits, and more.

7. Plans for Future Evaluation

(1) Indicators to be Used

- 1) Beneficiary: Sewerage service population (persons)
- 2) Amount of treated wastewater (m³/day)
- 3) Collection ratio of household sewerage charge (%)
- 4) BOD of outflow from WWTP (mg/L)
- 5) BOD of flow in storm sewer pipes in Pilot Area (mg/L)
- 6) Coverage ratio of sewerage service (%)
- 7) Economic Internal Rate of Return (EIRR)
- 8) Financial Internal Rate of Return (FIRR)

(2) Timing

Two years after the completion of the Project