

Ex-Ante Evaluation
Middle East Division II, Middle East and Europe Department
Japan International Cooperation Agency

1. Outline of the Project

- (1) Country: The Republic of Iraq (hereinafter referred to as “Iraq”)
 - (2) Project Name: Samawah Water Supply Improvement Project (hereinafter referred to as the “Project”)
 - (3) Project Site / Target Area: Samawah City, Muthanna Governorate
- Signing Date of the Loan Agreement: December 24, 2023

2. Background and Necessity of the Project

- (1) Current State and Issues Surrounding the Water Sector and the Priority of the Project in Iraq

By the 1980s, coverage of the water supply services in Iraq reached 95% in the urban areas. However, the wars and the consequent deterioration of the security conditions interfered with the operation and maintenance of the water supply systems, which resulted in a decline of the water quality and water supply services. According to the 2011 census, about 25% of the population served by piped water could only receive the water for less than two hours per day, and the standard of infrastructure for the water and sewage sectors has regressed significantly since then.

According to the National Development Plan 2018-2022 in Iraq, the coverage of the piped water supply services in the Muthanna governorate was 78.8% in 2016, the second lowest in all 18 governorates in Iraq and lower than the national average of 89.8%. Samawah City, the capital of Muthanna Governorate, has no major water treatment plant (WTP) in the city and relies much on the WTPs in Rumaitha City, located 25 km north, as a drinking water resource, and water supply service time totals less than six hours a day in the city’s urban area.

In addition, the salinity of the Euphrates River is exceptionally high due to the drop in the water level caused by Turkey’s construction of an upstream dam and the rising of seawater from the Persian Gulf. Whereas the Total Dissolved Solids (TDS) of the water was 600 mg/L in 1970, it has increased to more than 2,000 mg/L since 2020 (Source: Preparatory Survey for the

Samawah Water Supply Improvement Project (hereinafter referred to as the “Preparatory Survey”)), which requires desalination before the water is distributed to the people. (Note: According to WHO guidelines, 1,000 mg/L or less in the TDS of the water is the standard for drinking water.)

Since July 2018, protests demanding improvement and stabilization of public services, such as in the fields of water and electricity, have spread to southern Iraq, including Samawah City, so establishing a stable water supply is an urgent issue. The Project aims to ensure a steady supply of safe water to the residents of Samawah City by constructing water supply facilities, which include desalination facilities.

The policy of the Al-Sudani Government, inaugurated in October 2022, also focuses on improving public services as a priority issue. The Project, which will contribute to stabilizing and strengthening social and economic infrastructure and fulfilling public services, is in line with Iraqi Government’s development policy.

(2) Japan’s and JICA’s Policy and Operations in the Water Sector

The Country Assistance Policy by the Government of Japan for Iraq (July 2017) sets “Basic Living Infrastructure Rehabilitation” as one of the priority areas, and the Project is consistent with this policy. In addition, the Project will help to improve the level of water service provision, operation and management, and consumer satisfaction in Samawah City, and will contribute to JICA’s Global Agenda “19. Sustainable Water Resources and Water Supply”.

(3) Other Donors’ Activities

The World Bank, the United States, the United Kingdom, Germany, and other donors have supported the water supply sector in Iraq. The World Bank has supported the Baghdad Water Supply and Sewerage Improvement Project (210 million USD). The U.S. Agency for International Development (USAID) has been continuously assisting with water supply and sanitation-related areas through 3 billion USD in grant aid for humanitarian assistance since 2014. Kreditanstalt für Wiederaufbau (KfW) will support the Al Khadir and Al Daraji Water System Project through 76.3 million EURO in grant aid to construct a water treatment plant with reverse-osmosis (RO) desalination facilities in Khadir and Daraji cities, which are adjacent to Samawah City.

3. Project Description

(1) Project Description

1) Project Objective

The objective of the Project is to improve water supply volume, water quality and service hours, and make effective use of water resources, by constructing water supply facilities, including desalination facilities in Samawah City, Muthanna Governorate, thereby contributing to providing a stable supply of treated water and promoting economic and social development in the city.

2) Project Components

i.) Construction of the Samawah Water Treatment Plant

Construction of the water treatment plant (design capacity of 81,000 m³/day, including desalination facilities (RO membranes)), and operation and maintenance (hereinafter referred to as "O&M") for five years after completion of the Project. The O&M cost for the first two years is covered by the loan, but the loan does not cover the latter three years.

ii.) Installation of the Power Transmission Line to the Samawah Water Treatment Plant (not covered by the loan)

iii.) Installation of the Treated Water Transmission Line and the Brine Discharge Line

iv.) Consulting Services

Basic design, detailed design, bidding assistance, and construction supervision (training, operation and maintenance management support, water transmission, and distribution pipe network mapping support, etc.).

3) Project Beneficiaries (Target Group): Residents of Samawah City (about 320,000 people)

(2) Estimated Project Cost

58,191 million Japanese Yen (Japanese ODA loan: 45,298 million Japanese Yen)

(3) Schedule

January 2024 - November 2031 (95 months)

Commencement of the facilities' service is considered to mark the Project's completion. The contractor for the water treatment plant is responsible for O&M for five years after its completion (until November 2034). Since the loan covers O&M costs for the first two years (until November 2031), the two years

until November 2031 are also included in the cooperation period.

(4) Project Implementation Structure

- 1) Borrower: The Government of the Republic of Iraq
- 2) Guarantor: None
- 3) Executing Agency: Ministry of Construction, Housing, Municipalities and Public Works (hereinafter referred to as “MCHMPW”)
- 4) Operation and Maintenance System: Muthanna Water Directorate (hereinafter referred to as “MWD”)

(5) Collaboration and Sharing of Roles with Other Donors

1) Japan’s Activity

JICA’s cooperation in the water supply sector for Iraq includes the Basrah Water Supply Improvement Project (L/A signed in June 2008), the Water Supply Improvement Project in Kurdistan Region (L/A signed in March 2009), the Water Supply Sector Loan Project in Mid-Western Iraq (L/A signed in March 2010), the Basrah Water Supply Improvement Project (II) (L/A signed in May 2018), and the Water Supply Improvement Project in Kurdistan Region (II) (L/A signed in September 2018), totaling approximately 140,387 million Japanese Yen.

2) Other Donors’ Activity

The plan for KfW’s Al Khadir and Al Daraji Water System Project is to construct a water treatment plant with RO desalination facilities in the cities of Khadir and Daraji, which are adjacent to Samawah City. In the Project, JICA will closely share information with KfW on safety in Samawah City and the surrounding area, as well as technical details on the operation of water supply facilities. In addition, information on safety measures will be collected through the Embassy of Japan in Iraq, the United Nations, and other government agencies.

(6) Environmental and Social Considerations

1) Environmental and Social Considerations

- i.) Category: B
- ii.) Reason for Categorization: The Project is not located in a sensitive area, nor has sensitive characteristics, nor falls into sensitive sectors under the JICA Guidelines for Environmental and Social Considerations (April 2010), and its potential adverse impacts on the environment are not likely to be significant.
- iii.) Environmental Permit: The Environment Impact Assessment (EIA)

report for the Project was approved by the Government of Iraq's Ministry of Environment in November 2019.

- iv.) Anti-Pollution Measures: The concentrated brine generated from the water treatment process will be discharged into the Eastern Euphrates Drainage, and it has been confirmed that there will be no significant difference in TDS between the water in the Eastern Euphrates Drainage and the concentrated brine discharged, and that there will be no significant environmental impact. The sludge generated from the water treatment plant will be taken to the East Euphrates Landfill for proper disposal.
- v.) Natural Environment: The project site is not located in any protected area such as a national park. Undesirable impacts on the natural environment are assumed to be minimal.
- vi.) Social Environment: The land where the water intake facilities, water treatment plants, and other facilities are to be constructed in the Project, is all government-owned land and does not require land acquisition or relocation of residents.
- vii.) Other/Monitoring: During construction, the contractor will monitor air quality, water quality, waste, and noise/vibration. During service, water quality will be monitored by MWD's planning and monitoring engineers.

(7) Cross-Sectoral Issues

1) Climate Change

The Project will contribute to a stable water supply for the residents of Samawah City in the context of reduced rainfall due to climate change and rising salinity in rivers due to seawater going upstream. This will be achieved by constructing a water supply facility that includes desalination facilities, thereby helping the region adapt to climate change. In addition, the Project plan includes installing an energy recovery system and a photovoltaic power generation facility, and the mitigation effect for climate change (estimated GHG emission reductions) from these measures is approximately 5,000 tons/year CO₂ equivalent.

2) Measures Against HIV/AIDS and Other Infectious Diseases

The Project is expected to reduce the incidence of infectious and parasitic diseases by improving the water supply via constructing water supply facilities.

Since this is a large-scale infrastructure development project where workers

will be concentrated at one construction site for a prolonged period, HIV/AIDS countermeasures, such as educational activities on prevention, diagnosis, and treatment of sexually transmitted diseases, will be implemented for all related workers, including drivers, who will enter and leave the construction site during the construction period.

(8) Gender Category: GI (Gender mainstreaming needs study/analysis project)

Details of Activities / Reason for Categorization: Although the gender mainstreaming needs were studied and confirmed in the Preparatory Survey, actual engagements for gender equality and empowerment of females failed to be taken. The Project, however, includes a plan to promote the employment of female workers and also to establish a consultation service on sexual harassment and facilities for female workers (e.g., separate toilets for men and women) to improve the working environment for female workers at the construction site.

(9) Other Important Issues: None

4. Targeted Outcomes

(1) Quantitative Effects

1) Outcomes (Operation and Effect Indicators)

Indicator	Baseline (Actual value in 2022)	Target (2031) [2 years after project completion]
1. Production capacity (Design Capacity)	0 m ³ /day	81,000 m ³ /day
2. Turbidity of the treated water from a major source	Higher than 5 NTU	Lower than 5 NTU
3. Total dissolved solids in the treated water from a major source	More than 1,500 mg/L	Less than 1,000 mg/L
4. Service hours per day	Less than 6 hours in 60% of the urban area	More than 12 hours throughout the whole urban area

* Actual values for treated water from existing water treatment plants

** Maximum allowable drinking water quality standards (IQS 417) for Iraq

2) Impact

Expanding the water distribution network, and increasing enrollment in public water services.

(2) Qualitative Effects

Improvement of the health and living environment for residents in the target area and industrial and economic development through the provision of safe and stable water supply services

(3) Internal Rate of Return

Based on the assumptions listed below, the economic internal rate of return (EIRR) for the Project is 6.0%. Since the annual cash flow will be negative during the project life period, the financial internal rate of return (FIRR) is not calculated.

[EIRR]

Cost: Capital investment costs (construction, general and administrative, consulting services, physical services), O&M cost (*excluding taxes on these costs)

Benefits: Increased water use, reduced costs for alternative water sources (e.g., purchase of drinking water), reduction in water-related diseases

Project Life: 30 years

5. External Factors and Risk Control

(1) Preconditions: None

(2) External Factors: The security situation at the project site is not expected to drastically deteriorate.

6. Lessons Learned from Past Projects

The ex-post evaluation of the “Urban Water Supply and Sanitation Improvement Program” in India indicated that it is essential to estimate the demand for water supply services and the willingness and capacity of residents to pay, set the highest affordable water rates, and make a realistic plan for providing water connections to individual houses.

In light of the fact that MCHMPW started to introduce metered water supply charges in October 2022, the Project will provide cooperation in further reviewing the water supply charge system and planning the expansion of water transmission and distribution areas through training. This is in order to establish a sustainable water supply operation and maintenance management system.

7. Evaluation Results

The Project is in line with the country's development issues and policies, as well as the cooperation policy and analysis of the Government of Japan and JICA. Therefore, it will contribute to improving the level of drinking water services in Samawah City through the construction of a water treatment plant (including a desalination plant equipped with RO membranes) and the installation of water pipes. Moreover, the Project is likely to contribute to the achievement of SDG 6 (ensure availability and sustainable management of water and sanitation for all). Therefore, it is essential for JICA to cooperate with the Iraqi side's implementation of the Project.

8. Plan for Future Evaluation

(1) Indicators to be Used

As indicated in Section 4.

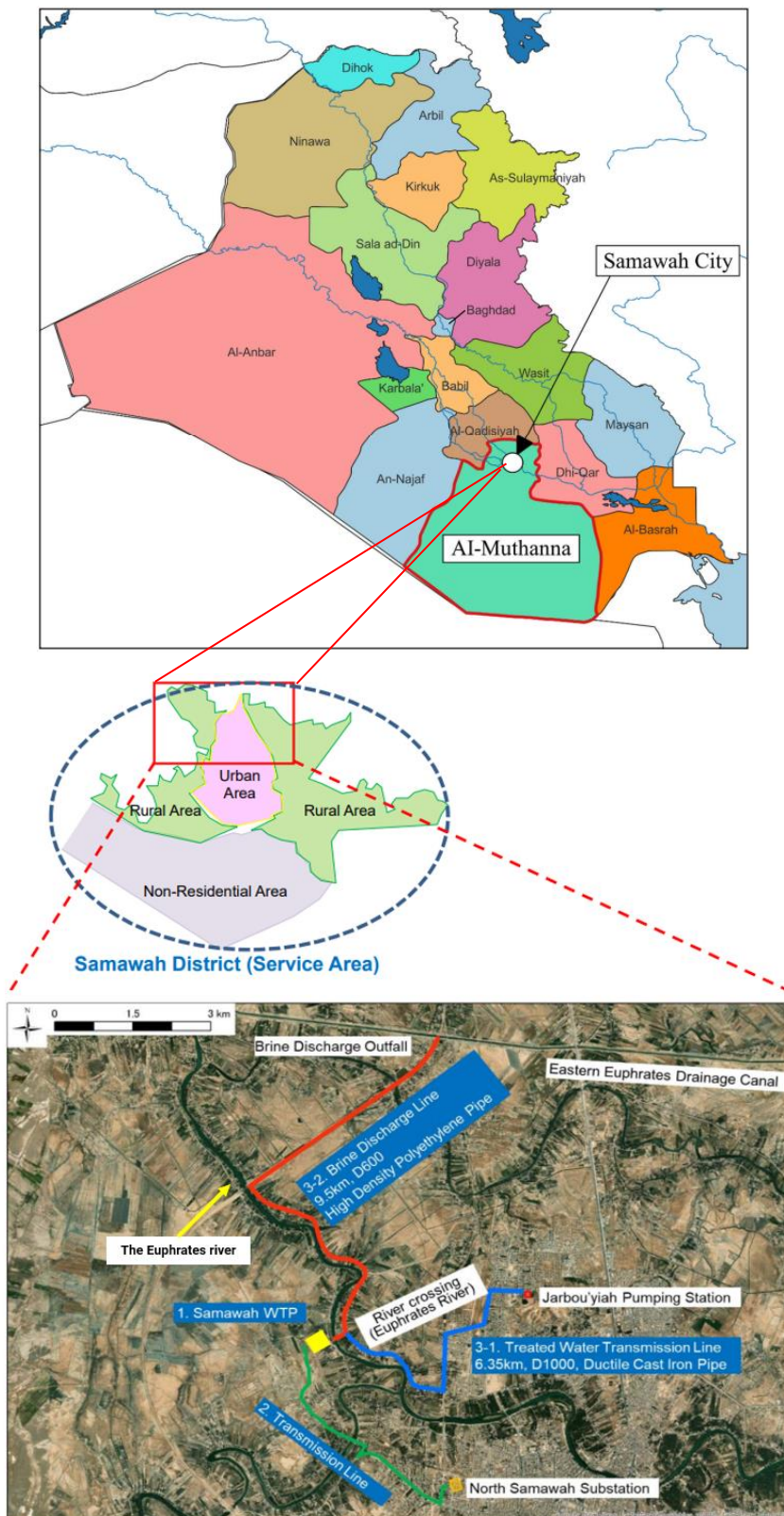
(2) Future Evaluation Schedule

Ex-post evaluation: Two years after the Project's completion

END

Attachment: Map of the Samawah Water Supply Improvement Project

Map of the Samawah Water Supply Improvement Project



Source: Preparatory Survey for the Samawah Water Supply Improvement Project