

Republic of Indonesia

FY2022 Ex-Post Evaluation Report of Japanese ODA Loan

“Lower Solo River Improvement Project (II)”

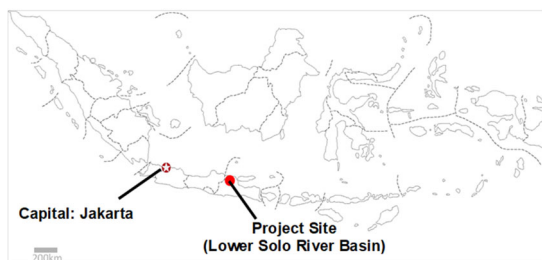
External Evaluator: Masumi Shimamura, Mitsubishi UFJ Research and Consulting Co., Ltd.

0. Summary

This project improved the lower reaches of the Solo River in East Java Province with the aim of mitigating flood damages and providing a stable water supply in the area, thereby contributing to the economic development of the East Java Region through improvement of investment environment, etc. In the lower reaches of the Solo River, water resource development is progressing from a comprehensive perspective, including flood control and water utilization, and the objective of this project is consistent with the policies and needs at the time of the appraisal and the ex-post evaluation. However, there were some issues with the appropriateness of the project plan and approach regarding the introduction of Flood Forecasting and Warning System (hereinafter referred to as “FFWS”) and land acquisition. The project is consistent with Japan’s development cooperation policy and concrete results can be confirmed through collaboration with another project within JICA. The project also contributes to the SDGs goals, an international framework. Therefore, its relevance and coherence are moderately low. In terms of project implementation, the project cost was within the plan, but regarding the project period, the project is not completed at the time of the ex-post evaluation because land acquisition by the executing agency has not been completed. Therefore, efficiency of the project is moderately low. Regarding project effects, quantitative indicators related to water utilization have not achieved the targets, and contribution to improvement of investment environment is partial. However, it was confirmed through interviews with the executing agency and local residents, etc., as well as concrete evidence data, that the objectives for flood control, which directly affects many lives, have been achieved, that no flood damage has occurred on the main Solo River since 2015, and that people’s living conditions have been improved. Thus, effectiveness and impacts are high. Regarding operation and maintenance, slight issues have been observed in the financial, and environmental and social aspects including the current status, however, there are good prospects for improvement/resolution. Therefore, sustainability of the project effects is high.

In light of the above, this project is evaluated to be satisfactory.

1. Project Description



Project Location



Bojonegoro Barrage

(source: external evaluator)

1.1 Background

The Solo River is the largest river on the island of Java, flowing through the provinces of Central Java and East Java. The basin has encountered severe water shortages during dry season and frequent and extensive flooding during rainy season, resulting in marked imbalance of water resources between dry and rainy seasons. In addition, East Java province, which is located in the lower reaches of the Solo River, includes cities such as Surabaya, Indonesia's second largest city, and Gresik, and in addition to water shortages, water demand was expected to increase. The Indonesian government has been promoting comprehensive development of water resources in the Solo River Basin, and as part of this, the government has been implementing flood control and water utilization projects in the lower reaches of the Solo River with its own funds as well as the "Lower Solo River Improvement Project (I)," the Phase I project, with ODA loan to address 10-year return period flood control. Continuing on these projects, it was an urgent issue to proceed with water resource development from a comprehensive perspective, including flood control and water utilization, to protect the lower reaches of the Solo River from flood damage and to realize a stable water supply.

1.2 Project Outline

The objective of this project is to mitigate flood damages and provide a stable water supply in the lower reaches of the Solo River Basin, East Java Province, by implementing river improvement works (development of regulating reservoirs and ancillary drainage channels, barrage, etc.), thereby contributing to the economic development of the East Java region through improvement of investment environment, etc.

Loan Approved Amount / Disbursed Amount	9,345 million yen / 8,515 million yen
Exchange of Notes Date / Loan Agreement Signing Date	March 2005 / March 2005
Terms and Conditions	Interest Rate 1.3% Repayment Period 30 years (Grace Period 10 years) Conditions for Procurement General Untied
Borrower / Executing Agency	Republic of Indonesia / Ministry of Public Works and Housing, Director General of Water Resources (hereinafter referred to as "DGWR")
Project Completion	Not complete
Target Area	The lower reaches of the Solo River Basin, East Java Province
Main Contractors (Over 1 billion yen)	PT. Brantas Abipraya (Indonesia) / PT. Hutama Karya (Indonesia) (JV), PT. Waskita Karya (Indonesia) / PT. Adhi Karya (Indonesia) (JV), PT. Pembangunan Perumahan (Indonesia) / PT. Wijaya Karya (Indonesia) (JV)
Main Consultant (Over 100 million yen)	Nippon Koei Co., Ltd. (Japan)
Related Studies (Feasibility Studies, etc.)	<ul style="list-style-type: none"> • Comprehensive Development and Management Plan Study for Bengawan Solo River Basin (CDMP) (Ministry of Public Works: Former Ministry of Settlement and Regional Infrastructure) (April 2001) • Implementation Program for this project (Ministry of Public Works: Former Ministry of Settlement and Regional Infrastructure) (March 2004)
Related Projects	[ODA Loan] <ul style="list-style-type: none"> • Lower Solo River Improvement Project (I) (L/A signing: December 1995)

2. Outline of the Evaluation Study

2.1 External Evaluator

Masumi Shimamura, Mitsubishi UFJ Research and Consulting Co., Ltd.

2.2 Duration of Evaluation Study

This ex-post evaluation study was conducted with the following schedule.

Duration of the Study: December 2022-January 2024

Duration of the Field Study: May 17-June 6, 2023, August 19-27, 2023

2.3 Constraints During the Evaluation Study

The project is not yet complete, as part of the outputs (construction of Jabung Regulating Reservoir and ancillary drainage channels) has not been completed due to the incomplete land acquisition. However, a certain degree of effectiveness has been achieved, and the evaluation decisions have been made based on the results of qualitative survey and specific evidence data.

3. Results of the Evaluation (Overall Rating: B¹)

3.1 Relevance/Coherence (Rating: ②²)

3.1.1. Relevance (Rating: ②)

3.1.1.1 Consistency with the Development Plan of Indonesia

At the time of the appraisal, the Indonesian government has identified the improvement of civil life as one of its policy issues in *the New National Medium-Term Development Plan (REPENAS) (2005-2009)*. Under this, the government has implemented water resource development and flood control projects that affect civil life. The government also formulated a new law on water resource management in March 2004, taking into account the state of democratization, decentralization, and administrative transparency. In the new law, water resource management was to be planned, implemented, monitored, and evaluated in a comprehensive manner for water resource conservation and water disaster control for each basin.

At the time of the ex-post evaluation, the Indonesian government places “strengthening environmental measures and improving resilience to natural disasters and climate change” as one of the seven priority issues in *the National Medium-Term Development Plan (RPJMN, 2020-2024)*. In addition, DGWR, the executing agency, has formulated *the Strategic Plan (Rencana Strategis) (2020-2024)*, and implements flood control measures in river basins, mainly structural measures such as river improvement, but also non-structural measures such as flood forecasting as one of the countermeasures for water resources management. The flood control plan for the lower reaches of the Solo River is based on *the Master Plan for the Comprehensive Development of the Lower Solo River Basin*³ (April 2001). Based on the Master Plan, DGWR has formulated *the Strategic Plan for Water Resources Management*

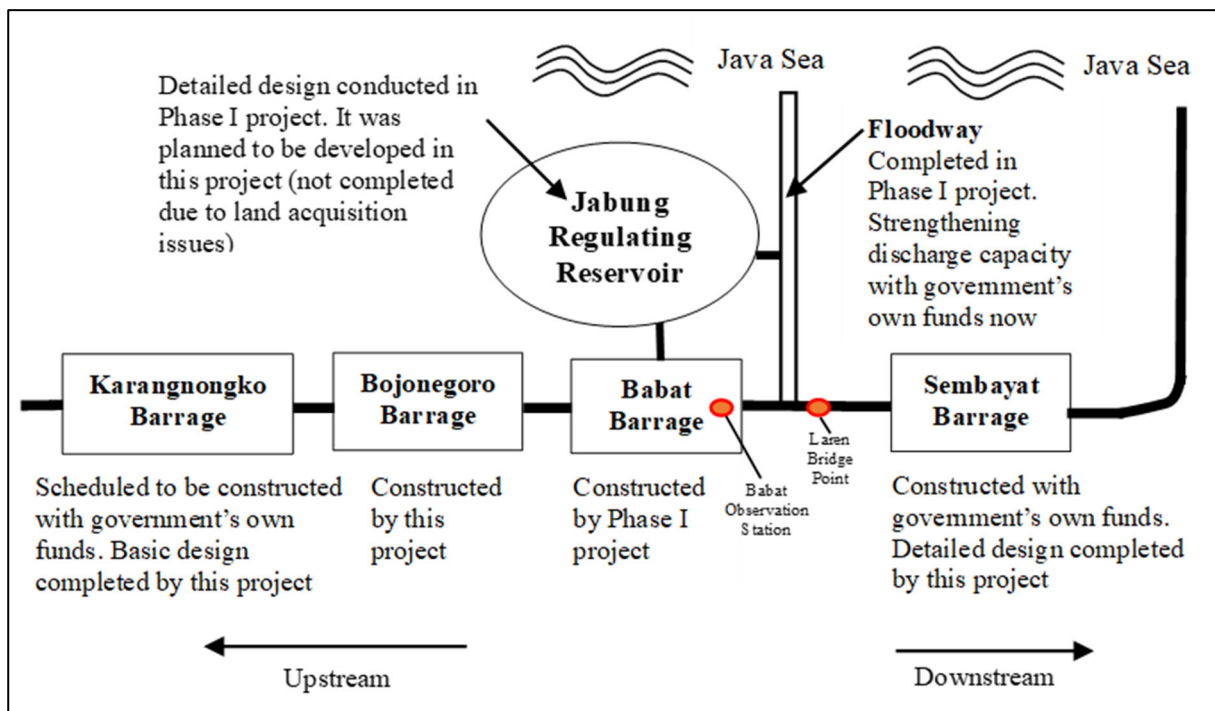
¹ A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

² ④: Very High, ③: High, ②: Moderately Low, ①: Low

³ *The Master Plan for the Comprehensive Development of the Lower Solo River Basin* has since been reviewed and updated (and was also reviewed in the consulting services for this project).

(POLA) for the Solo River and *the Water Resources Management Implementation Plan (RENCANA)*,⁴ a concrete plan for implementing the Solo River Basin management based on the plan. Based on these plans, DGWR is working on comprehensive water resources management in the Solo River Basin by linking the preceding Phase I project, this project, and the government’s own funded projects. (See Figure 1 and Table 1 for the location map of major flood control infrastructure and storage capacities of major facilities in the lower reaches of the Solo River for Phase I project, this project and government’s own funded projects, respectively.)

Based on the above, the project, which aims to reduce flood damage and ensure stable water supply through improvement of the lower reaches of the Solo River and development of ancillary facilities, is consistent with Indonesia’s development policy at the time of the appraisal and the ex-post evaluation.



Source: Prepared from questionnaire responses

Figure 1: Location Map of Major Flood Control Infrastructure for Phase I Project, This Project and Government’s Own Funded Projects

⁴ *The Strategic Plan for Water Resources Management (POLA) and the Water Resources Management Implementation Plan (RENCANA)* are also updated from time to time, the latest being the 2023 edition.

Table 1: Storage Capacities of Major Facilities in the Lower Reaches of the Solo River

Structures	Completion Year	Storage Volume (million m ³)	Remark
Karangnongko Barrage	2027 (planned)	59.0	Scheduled to be constructed with government's own funds (2023-2027). Basic Design conducted by this project.
Bojonegoro Barrage	2012	13.0	Constructed by this project. In operation.
Babat Barrage	2003	30.0	Constructed by Phase I project. In operation.
Jabung Regulating Reservoir	Incomplete	30.5	It was planned to be developed in this project but not completed due to land acquisition issues.
Floodway (Rubber Dam) (Note)	2001	2.0	Completed in Phase I project. In operation. Government is strengthening discharge capacity of floodway from 640 m ³ /sec. to 1,000 m ³ /sec. with its own funds (2019-2023).
Sembayat Barrage	2017	10.0	Constructed with government's own funds. Detailed Design completed by this project. In operation.

Source: Results from questionnaire and interview survey of the DGWR

Note: The floodway is designed to discharge water into the Java Sea during floods, but during the dry season it is used for water storage, and thus a rubber dam is constructed at the end of the floodway to store water.

3.1.1.2 Consistency with the Development Needs of Indonesia

At the time of the appraisal, the Solo River Basin was severely affected by flooding during the rainy season, with 19 reports of flood damage since 1994 through March 2004, mainly in Bojonegoro, the target area of this project. In addition, East Java Province, which is located in the lower reaches of the Solo River Basin, is home to cities such as Surabaya, Indonesia's second largest city, and Gresik, and is one of the largest economic regions in the country, and water demand was expected to increase. Protecting these areas from flood damage and providing a stable water supply were highly necessary from the perspective of regional economic development and improvement of investment environment.

Since February 2015, up to the time of the ex-post evaluation, there has been no flood damage to the downstream area due to the overflow of the main Solo River. However, flooding during the rainy season in the area surrounding the Jabung Regulating Reservoir, which has yet

been developed by the project, and flooding of tributaries connected to the Solo River (such as Lamong River) have caused flood damage in some areas of Gresik Regency. For this reason, the Indonesian government continues to promote river improvement and flood control efforts using its own funds and is promoting construction of flood control facilities and water resource development in the entire Solo River Basin.

Therefore, the project is in line with the development needs of Indonesia both at the time of the appraisal and the ex-post evaluation.

3.1.1.3 Appropriateness of the Project Plan and Approach

The project plan and design were based on the lessons learned from the similar projects.⁵ Specifically, with regard to the FFWS, in addition to hard measures by improving facilities, the plan was to develop the FFWS, which would be a new system for DGWR, and to strengthen staff capacity as a soft measure and provide integrated support on both hard and soft sides, and integrated support was actually provided. However, it did not go well, and the FFWS was not in operation at the time of the ex-post evaluation. DGWR explained the following four points (problems regarding software utilization and operational implementation systems) as reasons for this.

- Training regarding the FFWS operation was not sufficient: The FFWS software uses MIKE11, which is a common software that is widely used overseas. The training was conducted at the software company's Singapore office, but training period was three days, and participants were three members of the Solo River Office (Balai Besar Wilayah Sungai, Bengawan Solo; hereinafter referred to as "BBWS"), under DGWR, which is responsible for operation and maintenance. Participants were unable to acquire sufficient skills during the short training period and were unable to fully utilize the FFWS.
- BBWS concluded a maintenance contract for the FFWS software (461 days from September 17, 2013), but was unable to get sufficient support: Communication with the software company was via email, and there was no on-site after-sales support. BBWS did not actively approach the software company for assistance regarding unclear points, and generally took a passive stance.
- Efforts to improve the accuracy of the FFWS did not go well: In order to improve the accuracy of the system, in addition to water level, flow volume, and rainfall data that the FFWS measures and automatically imports, it is necessary to collect many variable data (land use data, water gate opening data, land elevation data, river shape data, etc.),

⁵ In this project, appropriate measures were to be considered while confirming the appropriateness of the land acquisition plan and the progress during the project. In addition, soft (capacity development) measures were to be implemented in an integrated manner, such as development of FFWS and strengthening of implementation capacity of the executing agency staff, etc.

however, BBWS field staff were not able to fully utilize the FFWS, and this did not lead to improved accuracy.

- DGWR's backup and support system for BBWS was not sufficiently established: DGWR did not have a system in place to support BBWS, and the actual operation was left to BBWS. According to DGWR, there was a reorganization of the Ministry of Public Works and Housing in 2020, and Directorate of Water Resources Engineering Development was newly established. The Directorate's mission is to provide detailed backup support when each River Office introduces a new technology or a new system until the field staff is fully proficient in using them. Such a system was not fully established, and support for BBWS was not sufficient. At the time of the ex-post evaluation, DGWR expressed to the external evaluator that it would work with the Directorate to make maximum efforts toward restarting the FFWS. Since the facilities related to the FFWS have been developed under the project, DGWR intends to integrate the facilities with the system and restart the FFWS.

Regarding land acquisition, appropriate measures were considered based on lessons learned from similar projects in the past, while confirming the relevance of the land acquisition plan and the progress during the project. However, as mentioned later in "3.2.1 Project Outputs" and "2) Resettlement and Land Acquisition" in "3.3.2.2 Other Positive and Negative Impacts," due to the incomplete land acquisition for the Jabung Regulating Reservoir, construction of the reservoir and some water gates and other facilities have not been completed. In Phase I project, land acquisition is not completed because residents living on private land refused to accept compensation and resettle. The land at issue in this project is state land, where residents do not reside, and the residents, who make a living from agricultural and fishing activities, have filed a lawsuit in court seeking compensation for their livelihood. In this project, based on the experience in Phase I project, DGWR and BBWS were aware of the risks that land acquisition will become an issue during planning and were making preparation, and encouraging local governments to promote the plan during the project implementation stage, checking the progress, and patiently and carefully proceeding with discussions and negotiations while giving due consideration to farmers and fishermen. As a result, land acquisition for private land was completed, but a lawsuit was filed regarding state land. On the other hand, although the plan at the time of the appraisal was to begin preparations for land acquisition prior to the signing of the loan agreement, preparations actually began one year and 10 months after the signing of the loan agreement.

In terms of equity, it was confirmed from the interviews with DGWR and BBWS that the project was designed to ensure that the benefits of the project, both in terms of flood control and water utilization, would not be disproportionately benefiting a particular person or group of people, and that the project would benefit all the people in the project area.

From the above, it can be concluded that there were some problems with the project plan and approach.

3.1.2 Coherence (Rating: ③)

3.1.2.1 Consistency with Japan's ODA Policy

Japanese government placed “building a democratic and just society” as one of its priority areas in its *Country Assistance Program for Indonesia (November 2004)* and aimed to “improve basic public services” by providing support for development of public goods needed in terms of rural and regional development, improving maintenance and management system of these public services, and taking measures against natural disasters such as frequent floods, landslides and droughts, in order to promote local self-reliance and development. This project aims to reduce flood damage and provide stable water supply through river improvement and the development of ancillary facilities, and it can be said that the project objectives were consistent with Japan's development cooperation policy at the time of the appraisal.

3.1.2.2 Internal Coherence

Internal coherence has been secured for this project since collaboration with Phase I project, Lower Solo River Improvement Project (I), took place and concrete effects have been generated. As mentioned earlier in “3.1.1.1 Consistency with the Development Plan of Indonesia,” the river improvement in the lower reaches of the Solo River is based on *the Master Plan for the Comprehensive Development of the Lower Solo River Basin*, and the comprehensive water resources management in the lower reaches of the Solo River Basin is being implemented in collaboration with Phase I project, this project and the government's own funded projects. According to DGWR and BBWS, the flood control targets for the lower reaches of the Solo River at the time of the ex-post evaluation are as follows. The government aims to complete river improvement work to cope with 25-year return period flood by 2030.

<Flood Control Targets of *the Master Plan for the Comprehensive Development of the Lower Solo River Basin* (the Latest Version)>

- Phase I project + government's own funded project: responding to 10-year return period flood
- Phase I project + this project + government's own funded project: responding to 20-year return period flood
- Government's own funded project after this project: responding to 25-year return period flood

As will be discussed later in “3.3.1.1 Quantitative Effects (Operation and Effect Indicators),”

the achievements of the operation and effect indicators are not the effects of this project alone. In addition, qualitative effects and impacts are not effects specific to this project, but are due to synergistic effects with Phase I project and government's own funded projects. (See "3.3 Effectiveness and Impacts" for specific synergistic effects.)

From the above, the indicators for this project were set based on the assumption of collaboration with related projects, and project effects have been generated through the actual collaboration.

3.1.2.3 External Coherence

This project was implemented in collaboration with Indonesian government's own funded projects, and concrete results have been generated. In terms of consistency with international framework, an interview with DGWR confirmed that the project contributes to goal 11 of the SDGs, "make cities and human settlements inclusive, safe, resilient and sustainable." Specific results will be discussed later in "3.3.2 Impacts," but the project has contributed to improving safety, hygiene, and livelihoods of residents and farmers in the lower reaches of the Solo River Basin.

From the above, the project is consistent with Indonesia's development plans and development needs, however, there were some issues with the appropriateness of the project plan and approach. The project is consistent with Japan's development cooperation policy, and coordination with another project within JICA and Indonesian government's own funded projects have taken place, and concrete results can be confirmed. The project also contributes to the SDG goal 11, which is an international framework. Therefore, its relevance and coherence are moderately low.

3.2 Efficiency (Rating: ②)

3.2.1 Project Outputs

This project provided support for river improvement and development of ancillary facilities in the lower reaches of the Solo River. Table 2 shows a comparison of major planned and actual outputs.

Regarding civil work, construction of the Jabung Regulating Reservoir and associated drainage channel has not been completed because land acquisition has not been completed.⁶ Bojonegoro Barrage was developed as planned. There were changes in the number of observation stations and installations of the FFWS ancillary equipment (changed from 27 locations to 21 locations). The results of interviews with DGWR and consultants confirmed that installation site and quantity of rain gauges and water level gauges were changed as it was

⁶ The package for the Jabung Regulating Reservoir, whose construction was suspended due to incomplete land acquisition, is the J-2 (1) package.

confirmed that they had been installed near the planned installation sites. It was also confirmed that the remaining observation stations were to be installed in stages after BBWS staff at the site gained experience in operation and maintenance. These responses were based on the actual situation and needs in the field, and the changes in scope are deemed appropriate. Consulting services were implemented as planned.

Table 2: Comparison of Major Planned and Actual Outputs

Item	Plan	Actual	Comparison/Reasons for Change
Civil Works	Construction of Jabung Regulating Reservoir and accompanying drainage channel (water storage capacity of 30.5 million m ³)	Construction of the regulating reservoir's connecting channel and some of the water gates has progressed, but is not yet completed	Not yet completed due to incomplete land acquisition
	Construction of Bojonegoro Barrage (movable barrage: barrage width 140 m)	Construction of Bojonegoro Barrage (movable barrage: barrage width 140 m)	As planned
Ancillary Facilities (FFWS)	15 rainfall observation stations, 12 water level observation stations	10 rainfall observation stations, 6 water level observation stations, 2 rainfall + water level observation stations, 3 water level + water quality observation stations	Changed the observation stations according to actual needs. It was decided that the remaining observation stations would be installed after BBWS staff working at the observation stations gained experience in operation and maintenance
Consulting Services	<ul style="list-style-type: none"> • Detailed design • Tender assistance • Construction supervision • Study and review of existing Master Plan for Solo River Basin management • Detail design review of dike, Sembayat Barrage and Jero swamp development, etc. • Training of staff of executing agency, etc. 	<ul style="list-style-type: none"> • Detailed design • Tender assistance • Construction supervision • Study and review of existing Master Plan for Solo River Basin management • Detail design review of dike, Sembayat Barrage and Jero swamp development, etc. • Training of staff of executing agency, etc. 	<ul style="list-style-type: none"> • As planned. • As planned. • As planned. • As planned. • As planned. • As planned.

Source: Information provided by JICA, results from questionnaire survey and interviews with DGWR



Water Gate Control Room of Bojonegoro Barrage
(Source: external evaluator)



FFWS Installed Near Bojonegoro Barrage
(Source: external evaluator)



Area Where Land Acquisition has not been Completed in Jabung Regulating Reservoir (used as fishpond) (Source: external evaluator)

3.2.2 Project Inputs

3.2.2.1 Project Cost

Table 3 shows the planned project cost and the actual cost at the time of the ex-post evaluation. The total project cost was planned to be 10,995 million yen (of which 9,345 million yen was to be covered by Japanese ODA loan) at the time of the appraisal, while the actual cost was 10,438 million yen⁷ (of which 8,515 million yen was covered by Japanese ODA loan) at the time of the ex-post evaluation, which was kept within the plan⁸ (95% of the plan).

Since the project has not yet been completed due to incomplete land acquisition, a comparative analysis of inputs commensurate with outputs was conducted for verification purposes. The project costs (at the time of planning and at the time of the ex-post evaluation) for the outputs excluding the portion of package J-2 (1) for the unfinished Jabung Regulating Reservoir were calculated and compared and analyzed, respectively (Table 4), which was within the plan (95% of the plan). One possible reason for this is that the project cost was kept down due to the appreciation of yen⁹.

⁷ The exchange rate was calculated at 1 IDR = 0.0096762 yen. (From the IMF International Financial Statistics 2005-2018 average rate)

⁸ As the project is not completed at the time of the ex-post evaluation, there is a possibility that land acquisition cost and remaining construction cost for the Jabung Regulating Reservoir and associated drainage canals to be borne by the Indonesian side may increase in the future.

⁹ The exchange rate at the time of the appraisal was 1 IDR = 0.012 yen.

Table 3: Planned Project Cost and the Actual Cost at the Time of the Ex-post Evaluation
(Unit: million yen)

Item	Plan	Actual at the Time of the Ex-post Evaluation	Comparison
ODA Loan Portion	9,345	8,515	
Indonesian portion	1,650	1,923	
Total	10,995	10,438	95% of the plan

Source: Information provided by JICA, results from questionnaire survey and interviews with DGWR

Table 4: Planned Project Cost and Actual Cost at the Time of the Ex-post Evaluation Excluding Package J-2 (1) Portion for the Unfinished Jabung Regulating Reservoir

(Unit: million yen)

Plan	Actual at the Time of the Ex-post Evaluation	Comparison
9,931	9,474	95% of the plan

Source: Calculated based on the information provided by JICA and results from questionnaire survey and interviews with DGWR

Note: According to DGWR, planned cost at the time of the appraisal for the incomplete Package J-2 (1) was IDR 109,964,539,271 (1,064 million yen), and the actual cost at the time of the ex-post evaluation was 99,597,834,900 (964 million yen).

3.2.2.2 Project Period

Table 5 shows the planned and the actual project period. The planned period at the time of the appraisal was 110 months, from April 2005 to May 2014. Regarding the actual period, the period up to the second field survey (March 2005 to August 2023) was 222 months, which significantly exceeded the plan (202% of the planned period). As mentioned above, the main reason for the delay is that the land acquisition has not yet been completed and thus the project is not complete. In addition, delay in selection of contractors was a factor in extending the project period. Initially, the plan was to select contractors for the development of the Jabung Regulating Reservoir in one package, but the selection was divided into two packages (J-2 (1) and J-2 (2)). However, for both packages, all bidders' proposals did not comply with the requirements set out in the bidding documents, leading to re-tendering and delays in contractor selection.

The loan disbursement period was extended from July 2015 to September 2017, but DGWR did not extend the period, stating that it would continue its operations with its own funds after the end of the loan disbursement extension period.

Table 5: Comparison of Planned and Actual Project Period

Item	Plan	Actual
Total Project Period (Note 1)	Apr. 2005-May 2014 (110 months)	Mar. 2005-Project not completed. (222 months until Aug. 2023)
Signing of Loan Agreement	Apr. 2005	Mar. 2005
Selection of Consultants	Apr. 2005-Apr. 2006 (13 months)	Apr. 2005-Aug. 2006 (17 months)
Consulting Services	Apr. 2006-May 2014 (98 months)	Aug. 2006-Apr. 2017 (98 months)
Land Acquisition	Jan. 2005-Dec. 2010 (72 months)	Jan. 2007-Not completed as of Aug. 2003
Tendering and Conclusion of Contract	Jul. 2006-Mar. 2009 (33 months)	Sept. 2007-Nov. 2013 (75 months)
Civil Works	Jun. 2008-May 2013 (60 months)	Nov. 2008-Not completed as of Aug. 2023 (Note 2)
Warranty Period	May 2013-May 2014 (13 months)	Jan. 2017-Jan. 2018 (Note 3)

Source: Information provided by JICA, results from questionnaire survey and interviews with DGWR

Note 1: The definition of project completion is completion of warranty period (definitions at the time of the appraisal).

Note 2: Package J-2 (1) of the Jabung Regulating Reservoir, whose construction was suspended due to incomplete land acquisition, was completed in January 2017.

Note 3: Warranty period for Package J-2 (1) of the Jabung Regulating Reservoir, where construction was suspended due to incomplete land acquisition.

3.2.3 Results of Calculations for Internal Rates of Return (Reference only)

The economic internal rate of return (EIRR) for the project at the time of the appraisal was calculated to be 8.1%, assuming the project cost (excluding taxes) and operation and maintenance costs as “costs,” and reduction in flood damages (reduction in damages to assets such as farmlands, houses, and infrastructure facilities), supply of water for industrial and domestic use (amount willing to pay) and supply of water for agricultural use (amount of production increase considering changes in crop types and cropping patterns) as “benefits,” and the project life as 50 years. On the other hand, although attempts were made to collect benefit-related data (reduction in flood damages and supply of water for agricultural use), DGWR, BBWS, and local governments did not accumulate these data from the time of the appraisal to the time of the ex-post evaluation. Basic data that could be used for analogical reasoning was also missing and could not be collected thus, a recalculation of EIRR at the time of the ex-post evaluation was not possible.

Therefore, efficiency of the project is moderately low.

3.3 Effectiveness and Impacts¹⁰ (Rating: ③)

3.3.1 Effectiveness

3.3.1.1 Quantitative Effects (Operation and Effect Indicators)

At the time of the appraisal, (1) “water supply by use” (industrial, domestic and agricultural) (2) “annual maximum flow at flood control reference point,” (3) “discharge capacity at flood control reference point,” (4) “annual reduction in number of flood by overflow,” (5) “annual highest water level,” (6) “annual maximum inundated area” and “(7) annual maximum number of inundated houses” were set as quantitative effect indicators of the project. (1) is an indicator for water utilization and (2) through (7) are indicators for flood control. Table 6 summarizes the baseline values, target values and actual values for 2020 to 2022 for each indicator. As mentioned above, it should be noted that the effects of the project on water utilization and flood control are not the result of this project alone, but are the results of synergistic effects with Phase I project and the government’s own funded projects.

Table 6: Operation and Effectiveness Indicators of the Project

Indicators	Baseline Value (2004 Actual Values Unless Otherwise Indicated)	Target Value (2015, 1 Year After Completion)	Actual Value (Percentages in parentheses indicate achievement rates)		
			2020	2021	2022
Water Supply by Use (Industrial) (m ³ /day) (Note 1)	64,282	266,458	71,818	74,120	67,698 (25%)
Water Supply by Use (Domestic) (m ³ /day) (Note 1)	23,760	127,094	24,251	23,328	60,452 (48%)
Water Supply by Use (Agricultural) (m ³ /day) (Note 1)	1,926,029	2,558,995	N.A.	1,823,040	1,529,280 (60%)
Annual Maximum Flow at Flood Control Reference Point (m ³ /second) (Note 2) (Note 3)	2,207 (1981-1999 maximum daily average flow)	2,530 (for 20-year return period flood of 3,480)	1,704 Dec. 15, Babat observation station	3,101 Nov. 18, Babat observation station	2,865 Nov. 19, Babat observation station

¹⁰ When providing the sub-rating, Effectiveness and Impacts are to be considered together.

Discharge Capacity at Flood Control Reference Point (m ³ /second) (Note 2)	2,530 (flow rate of 20-year return period flood is 3,480, of which 640 is discharged to the Java Sea and 310 is overflowed)	2,530 (of which, at the flow rate of 20-year return period flood, 310 is stored in Jabung Regulating Reservoir as a result of the project)	3,170 Babat observation station	3,170 Babat observation station	3,170 Babat observation station
Annual Reduction in Number of Flood by Overflow	Once in 10 years	Once in 20 years	No flood damage to the downstream area since 2015 due to overflow of the main Solo River		
Annual Highest Water Level (m) (Note 3)	+8.90 (highest water level at Babat observation point) (1981-1999)	+6.43 (Laren Bridge point)	+5.35 Dec. 16, Laren Bridge point	+6.22 Jan. 13, Laren Bridge point	+5.51 Oct. 25, Laren Bridge point
Annual Maximum Inundated Area (ha)	14,955 for 20-year return period flood level	0 for 20-year return period flood level	No flood damage to the downstream area since 2015 due to overflow of the main Solo River. Bojonegoro Barrage and Jabung Regulating Reservoir floodway (developed in the Phase I project and currently being strengthened with government's own funds) are functioning, reducing the risk of broken dike and improving flood control capacity.		
Annual Maximum Number of Inundated Houses (house)	29,675 for 20-year return period flood level (Calculated based on figures as of 1994, considering the population growth rate)	0 for 20-year return period flood level			

Source: Documents provided by JICA (baseline values and target values), questionnaire responses and interviews with DGWR, BBWS and PJT1 (actual values)

Note 1: Water supply by use (industrial, domestic, agricultural) is water supply data from Jasa Tirta I Public Corporation (PJT1), which uses the Solo River as its water source and supplies raw water to the area surrounding the project site. This includes the amount of water supplied to Local Water Supply Company (PDAM Bojonegoro, PDAM Lamongan, PDAM Gresik) and large-scale factories (oil refineries, fertilizer factories), etc., which are major customers of PJT1.

Note 2: The observation point for actual values is at Babat. (No observations are made at the Laren Bridge point thus data from the Babat observation point, which is close to the Laren Bridge point, is shown.)

Note 3: Since the data for each of the annual maximum flow and the annual highest water level are observed at different observation points and on different dates, and there is also flow downstream from the floodway (see Figure 1 for the location of observation points) it is not possible to simply compare the actual values of the two indices.

The performance of indicators related to water use were significantly lower than the target. Specifically, the achievement rates of water supply by use in 2022 for industry, domestic, and agriculture were 25%, 48%, and 60%, respectively. The main reasons are: 1. the Jabung Regulating Reservoir (storage capacity of 30.5 million m³) has not been developed because of incomplete land acquisition; 2. DGWR has set a cap on the volume of water to be withdrawn and to be allocated in order to secure water resources for the entire Solo River Basin; and 3. there are water uses that DGWR and BBWS are not aware of.

Regarding 1., as mentioned above, the Jabung Regulating Reservoir is not completed, and the water storage expected at the time of the appraisal has not been realized. Regarding 2., in order to use the water resources of the Solo River, it is necessary to obtain a “water intake permit,”¹¹ and water users cannot withdraw more than the upper limit of the amount of water permitted.¹² Regarding 3., water sources other than the Solo River include groundwater, well water, reservoirs, and spring water, and local small businesses and village-owned enterprises (hereinafter referred to as “BUMDES”) draw water from these sources.¹³ Local residents also receive water for daily use from BUMDES. In addition, during the field survey, it was confirmed that farmers and others are pumping water from the Solo River for agricultural activities without permits, and that the volume of non-revenue water¹⁴ is increasing.¹⁵ Interviews with DGWR and BBWS confirmed that the target values set for water use at the time of the appraisal were based on the actual water demand, taking into account water intake restrictions, and were not set excessively.

Most of the targets for flood control indicators have been achieved, and the project purpose of responding to 20-year return period flood has largely been achieved. Discharge capacity at flood control reference point is the maximum flow rate at which floodwater can flow safely at the flood control reference point, and the actual value is 3,170 m³/sec. Furthermore, by comparing discharge capacity with annual maximum flow at flood control reference point, if the annual maximum flow is less than the discharge capacity, it means that water that has

¹¹ Water intake permits are issued through BBWS. The basis for setting limits on water allocation and water intake by DGWR is as follows.

- *Strategic Plan for Water Resources Management (POLA)* (2023) indicating the direction of Solo River basin management
- *Water Resources Management Implementation Plan (RENCANA)* (2023) which is a concrete plan for implementing Solo River Basin management based on POLA

¹² In reality, demand for water exceeds the upper limit, resulting in water shortage. Therefore, large factories such as oil refineries and fertilizer plants, which are major customers of PJT1, are taking risk measures by securing water sources other than the Solo River by developing their own reservoirs or taking water from the Brantas River as a backup. As a result, water supply by use (industry) in 2022 is lower than that of the previous year.

¹³ Water intake from these sources requires a separate permit from the local government.

¹⁴ Non-revenue water here refers to the amount of water distributed from the Solo River as water source but does not result in the revenue for PJT1.

¹⁵ Water supply by use (agriculture) in 2022 is lower than the previous year’s water supply, possibly due to an increase in non-revenue water.

increased due to heavy rain, etc. can safely flow down the river. The actual value of annual maximum flow is lower than the discharge capacity in all years. In addition, the annual highest water level is below the upper limit in all years. Regarding annual reduction in number of floods by overflow, annual maximum inundated area, and annual maximum number of inundated houses, there has been no flood damage to the downstream area due to the overflow of the main Solo River since 2015.

3.3.1.2 Qualitative Effects (Other Effects)

The qualitative effects of the project, “reduction of flood damage” and “stable water supply” are described below. The “improvement of investment environment through stable water supply in the lower reaches of the Solo River Basin,” which was set as a qualitative effect at the time of the appraisal, was categorized as impacts. Therefore, the said indicator is described below in “3.3.2.1 Intended Impacts.”

(1) Reduction of flood damage

DGWR and BBWS have confirmed that there has been no flood damage to the downstream areas due to the overflow of the main Solo River since February 2015. In addition, as a result of the qualitative survey¹⁶ conducted during the project site visit, all the survey respondents (84 people) replied that after the project, the flooding of the main Solo River during the rainy season has been controlled, and no flood damage has occurred in the surrounding area.

Table 7 shows the trends in rainfall data (monthly average value) in the Solo River Basin from 2015 to 2022. In February 2015, when the last flood occurred due to overflow of the main Solo River, the rainfall was 356.50 mm. According to the local report,¹⁷ the water level of the Solo River at the Bojonegoro observation point reached 13.36 meters on February 12, 2015. In addition, according to the report by the Bojonegoro Regional Disaster Mitigation Agency, three people drowned due to the rising water level of the Solo River since February 10 of the same year. Since 2015, heavy rains exceeding 356.50 mm have occurred in years and months indicated in orange in Table 7, but as described above, flooding of the main Solo River has been prevented. This is considered to be due to the synergistic effects of Phase I

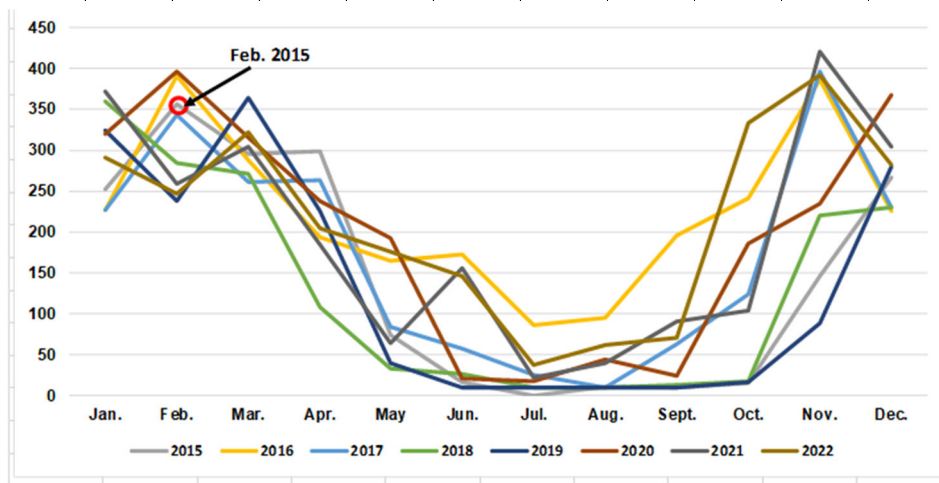
¹⁶ The qualitative survey was conducted through interviews with a total of 84 people in the project area, including water supply organization staff (4 people), businesspeople (14 people), agricultural people (33 people), and local residents other than those listed above (33 people). The breakdown is (by regency) 41 from Bojonegoro, 43 from Gresik, (by gender) 68 men, 16 women, (by age) 4 in their 20s, 23 in their 30s, 20 in their 40s, 27 in their 50s, 10 in their 60s or older. Water supply organization staff include one person each from PJT1 and the three Local Water Supply Company (PDAM Bojonegoro, PDAM Lamongan, PDAM Gresik), and business personnel include oil refineries and fertilizer factories that are large customers of PJT1's, as well as hotels with small businesses, restaurants, car wash companies, laundries, etc. The gender bias is due to the fact that the key informants, such as water supply organizations and businesspeople, tend to be men, as well as due to local customs.

¹⁷ Dinas Kominfo, Provinsi Jawa Timur (East Java Province Communication and Information Office)
<https://kominfo.jatimprov.go.id/read/umum/43552>

project, this project, and the government’s own funded projects.

Table 7: Rainfall Data for Solo River Basin Monthly Average Value (unit: mm)

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
2015	252.49	356.50	295.19	298.58	73.80	16.97	0.36	11.06	10.28	15.35	146.03	266.78
2016	226.91	390.48	287.69	193.65	164.71	173.07	86.01	95.30	196.28	241.69	386.42	226.37
2017	226.91	343.25	261.42	263.73	84.19	57.28	25.93	10.39	63.39	123.59	396.76	229.92
2018	359.80	284.91	271.28	108.23	33.72	26.36	10.00	10.02	13.26	17.83	220.50	230.57
2019	324.61	237.86	364.49	226.00	39.65	10.04	10.25	10.04	10.14	16.05	88.47	279.85
2020	320.60	396.52	315.11	238.04	192.29	20.94	17.91	44.81	23.86	185.71	234.26	367.31
2021	371.67	258.88	304.61	185.43	64.63	156.46	21.60	40.32	90.51	104.39	420.53	305.11
2022	291.26	246.72	322.36	204.54	176.00	145.77	37.75	62.22	70.56	333.00	392.31	282.73



Source: Prepared based on the data provided by BBWS

Based on the above interviews with DGWR and BBWS, qualitative survey results, and rainfall data in the Solo River Basin, it can be considered that the project has contributed to reducing flood damage in the lower reaches of the Solo River Basin.

(2) Stable water supply

Table 8 shows the trends in water supply volume of the three Local Water Supply Companies (Perusahaan Daerah Air Minum; hereinafter referred to as “PDAM”),¹⁸ which supply water to the surrounding areas using the Solo River as their water source. PDAMs are major customers of Jasa Tirta I Public Corporation (Jasa Tirta 1; hereinafter referred to as “PJT1”), a state-owned company affiliated with the Ministry of Public Works and Housing,

¹⁸ The three companies are PDAM Bojonegoro, PDAM Lamongan, and PDAM Gresik.

- Water sources used by PDAM Bojonegoro include deep wells and springs in addition to the raw water from the Solo River purchased from PJT1. The amount of water supplied from the Solo River is 21.24% of the company’s total water supply.
- PDAM Lamongan uses only raw water from the Solo River purchased from PJT1.
- PDAM Gresik uses two sources of water: raw water from the Solo River and the Brantas River, which are purchased from PJT1. Before 2021, PDAM Gresik used only the Brantas River as its source of water, but from 2022 onwards, raw water has been purchased from the Solo River.

which purchase raw water from the Solo River from PJT1, purify it, and supply it to surrounding areas.

PDAM Bojonegoro's water supply is increasing every year. PDAM Lamongan's water supply decreased slightly in 2021, but recovered in 2022. PDAM Gresik used only the Brantas River (Java Island's second largest river flowing through East Java Province) as its water source before 2021, but since 2022 it has been purchasing raw water from the Solo River from PJT1 to supply water to the surrounding areas. As described in the qualitative survey results below, the operation of the Sembayat Barrage, which was constructed with the government's own funds (detailed design was conducted in this project), has expanded the water supply of the Solo River, and PDAM Gresik is now able to use the Solo River as its new water source.

Table 8: Trends in Water Supply Volume of Each PDAM (Only the Water Volume Supplied from the Solo River as the Water Source is Extracted)

(Unit: million m³/year)

Name of Local Water Supply Company	2018	2019	2020	2021	2022
PDAM Bojonegoro	1,957,194	2,062,125	2,109,630	2,304,345	2,520,835
PDAM Lamongan	5,569,025	5,797,987	5,871,589	5,781,427	6,200,436
PDAM Gresik	-	-	-	-	1,144,588

Source: Data obtained from each Local Water Supply Company (PDAM)

As a result of the qualitative survey, it was confirmed that water supply situation during the dry season improved after the project for all the water supply organizations (a total of 4 organizations in PJT1 and each PDAM). In addition, after the project, the number of complaints from customers about the amount of water supply decreased. However, all four organizations indicated that water supply was still limited during the dry season, although water supply had stabilized compared to before the project.

As a result of the qualitative survey, out of the 14 businesspeople, only two of them, the staff of an oil refinery and a fertilizer factory, which are large customers of PJT1, said that they are using Solo River water for their businesses. The remaining 12 companies were running small businesses using groundwater/well water supplied by BUMDES. Five of these 12 people were doing businesses outside of PDAM's water supply area. The remaining seven people indicated reasons for not using the Solo River water, including the high cost of water charged by PDAM and the poor quality of the water provided by PDAM during the dry season. When interviewed with two companies, an oil refinery and a fertilizer factory, about the water supply situation before and after the project, they mentioned that stable water

supply has been realized since the Bojonegoro Barrage started operation. However, as noted in footnote 12, these large-scale factories are taking risk countermeasures by building their own reservoirs or drawing water from the Brantas River to secure water sources other than the Solo River.

As a result of the qualitative survey, it was found that all 66 people (33 people involved in agriculture and 33 people living in the area) do not use water from the Solo River, but instead use groundwater and well water supplied by BUMDES. The reasons for not using the Solo River water are the same as those running the small businesses above. Some farmers were pumping water from the Solo River for agricultural work without permits.

Based on the above results of the trends in water supply volume from the Solo River in each PDAM and the qualitative survey, it can be said that the project has contributed to stable water supply of the Solo River compared to before the project, however, water supply during the dry season is still limited.

There is a difference in the effects of flood control and water utilization in this project, and when interviewed DGWR and BBWS about the reasons for this, they have responded that “reduction of flood damage in the lower reaches of the Solo River is a matter that directly affects many lives and is being addressed as a top priority.” In light of this, this ex-post evaluation places more emphasis on flood control, which directly affects the lives of many people.

3.3.2 Impacts

3.3.2.1 Intended Impacts

The state of generation of effects on “improvement of investment environment through stable water supply in the lower reaches of the Solo River Basin,” “improvement of living environment” and “economic development of the East Java Region,” which were categorized as the impacts of the project were confirmed from the results of questionnaire survey and interviews with DGWR, qualitative survey, data on the number of customers of water supply institutions as well as statistical data.

(1) Improvement of investment environment through stable water supply in the lower reaches of the Solo River Basin

Tables 9 to 12 show the trends in the number of customers of water supply organizations (PJT1 and each PDAM, a total of 4 organizations). Overall, the number of business and factory customers is on the rise. In particular, PDAM Gresik, shown in Table 12, has come to supply water from the Solo River from 2022 onwards, and has signed new large-scale contracts with 15 factories in the Gresik JIPE Industrial Park. As mentioned above, this is

due to the expansion of the Solo River water supply as a result of the operation of the Sembayat Barrage, which was constructed with the government's own funds. Along with the development of the JIPE Industrial Park, new residential areas are also scheduled to be developed in the surrounding area, and PDAM Gresik is actively marketing the area to expand the water supply for domestic use.

Table 9: Trends in the Number of PJT1 Customers

	2018	2019	2020	2021	2022
Industry	4	4	4	4	4
PDAM	3	3	3	3	4

Source: PJT1

Note: PDAM has four institutions: Bojonegoro, Lamongan, Blora, and Gresik (new contract signed with Gresik in 2022)

Table 10: Trends in the Number of PDAM Bojonegoro Customers

	2018	2019	2020	2021	2022
Domestic	29	31	29	27	26
Business	34,520	36,969	39,291	40,122	42,333
Others	2,505	2,593	2,681	2,823	2,867

Source: PDAM Bojonegoro

Table 11: Trends in the Number of PDAM Lamongan Customers

	2018	2019	2020	2021	2022
Domestic	19,409	23,703	24,321	24,476	27,460
Industry	13	15	15	18	20
Others	1,906	1,363	1,394	1,433	1,481

Source: PDAM Lamongan

Note: New customers after 2021 include a manufacturing plant for water meter valves, an animal feed plant, a concrete plant, a cold storage warehouse, etc.

Table 12: Trends in the Number of PDAM Gresik Customers

	2018	2019	2020	2021	2022
Domestic	93,396	97,372	101,321	78,520	82,455
Of which, Solo River Water Users	-	-	-	-	5,593
Business	215	226	235	169	173
Of which, Solo River Water Users	-	-	-	-	15
Others	1,821	1,947	2,024	1,389	1,572
Of which, Solo River Water Users	-	-	-	-	194

Source: PDAM Gresik

On the other hand, as a result of the qualitative survey, three out of 14 businesspeople (21%) answered that “this project is contributing to the improvement of investment environment.” Specifically, respondents stated that “construction of the Bojonegoro Barrage has improved the surrounding landscape and increased the number of cafes and other facilities around the barrage,” and that “the access road constructed by the project has improved the convenience of movement, and small business activities such as laundry shops, food stalls, and stores have started business.”

Although it is not possible to verify the causal relationship with this project, as reference information, the Gross Regional Domestic Product (hereinafter referred to as “GRDP”), and the production values in industrial, commercial, construction, and agricultural sectors in Bojonegoro Regency, the project area located in the lower reaches of the Solo River, and in Gresik Regency, the project area further downstream of the Solo River are shown in Table 13. GRDP decreased in both regencies in 2020 but has been on the rise since the following year, achieving a V-shaped recovery. Similarly, the production values of commercial, construction, and agricultural sectors in Bojonegoro Regency and industrial, commercial, construction, and agricultural sectors in Gresik Regency decreased temporarily in 2020 or 2021 but recovered from the following year. The production value of the industrial sector in Bojonegoro Regency is on an increasing trend, with no decrease seen. It is possible that the temporary decline in 2020 or 2021 may have been due to the spread of COVID-19. Movement restrictions against COVID-19 were imposed throughout Indonesia, including in this region, with significant impacts on economic and social activities. At the time of the ex-post evaluation, the Indonesian government has lifted the movement restrictions.

Table 13: GRDP and Production Values in Industrial, Commercial, Construction, and Agricultural Sectors in Bojonegoro and Gresik Regency

(Unit: billion IDR)

	2019	2020	2021	2022
Bojonegoro Regency				
Gross Regional Product (Nominal GRDP)	78,046	70,259	84,201	100,493
Production Value in Industrial Sector (Manufacturing)	4,680	4,764	5,149	5,720
Production Value in Commercial Sector (Wholesale/Retail trade, etc.)	6,677	6,338	6,973	7,846
Production value in Construction Sector	5,514	5,450	5,721	6,447
Production Value in Agricultural Sector	9,820	9,964	9,857	10,876
Gresik Regency				
Gross Regional Product (Nominal GRDP)	138,894	134,269	144,656	163,908
Production Value in Industrial Sector (Manufacturing)	66,603	66,584	72,265	81,039
Production Value in Commercial Sector (Wholesale/Retail trade, etc.)	18,295	16,743	18,261	20,775
Production value in Construction Sector	13,484	12,625	12,904	14,328
Production Value in Agricultural Sector	10,285	10,337	10,160	11,085

Source: Indonesia Central Bureau of Statistics (BPS)

From the above, the project has contributed to improving the investment environment in the surrounding area to a certain extent, but the number of factories supplied with water by PJT1 has not increased. PDAM Bojonegoro's customers are mainly small and micro business customers. There has been no significant increase in the number of factories serviced by PDAM Lamongan. Therefore, large-scale effects are considered to be partial, such as the industrial park in Gresik, which PDAM Gresik has newly started supplying water since 2022.

(2) Improvement of living environment

As a result of the qualitative survey, all 66 people, including agricultural people (33 people) and residents (33 people), responded that there has been no flooding due to the overflow of the main Solo River, and that the sanitary environment during the rainy season has improved and the living environment has improved. In addition, 92% (61 people) responded that they were afraid of floods before the project, but they can now live with peace of mind after the project, and 71% (47 people) responded that they became more aware of disaster prevention and are taking flood countermeasures after the project. Other comments

include, “Access roads were constructed by the project, making travel more convenient,” “Local residents were able to participate in the construction work and earn extra income during the project period,” and “After the completion of the Bojonegoro Barrage, landscape has improved and it has become a place for residents to relax.”

Based on the above, it can be considered that the project is contributing to the improvement of living environment of surrounding residents.

(3) Economic development of the East Java Region

Although it is difficult to verify a direct causal relationship with the project since economic development is affected by factors other than the project, in order to confirm the assumptions made at the time of the appraisal, Table 14 shows the GRDP and the production values of industrial, commercial, construction, and agricultural sectors in East Java Province¹⁹ for 2019-2022. GRDP decreased in 2020 but has been on the rise since the following year, achieving a V-shaped recovery. Similarly, the production values of the industrial, commercial, and construction sectors temporarily decreased in 2020, but recovered from the following year. The production values of the agricultural sector are steadily increasing. It is thought that the temporary decrease in 2020 may have been affected by the spread of COVID-19.

Table 14: GRDP and Production Values of Industrial, Commercial, Construction, and Agricultural Sectors in East Java Province

(Unit: billion IDR)

Item	2019	2020	2021	2022
Gross Regional Product (Nominal GRDP)	2,345,549	2,299,808	2,454,716	2,730,907
Production Value in Industrial Sector (Manufacturing)	711,055	705,263	753,752	835,711
Production Value in Commercial Sector (Wholesale/Retail trade, etc.)	433,800	412,016	452,684	509,939
Production value in Construction Sector	220,275	213,813	222,709	246,876
Production Value in Agricultural Sector	201,253	208,186	212,632	226,696

Source: Indonesia Central Bureau of Statistics (BPS)

In light of the above analysis of improvements in the investment environment and living environment, it can be inferred that this project has contributed to a certain extent to the economic development of East Java Province.

¹⁹ East Java Province consists of 29 regencies and nine cities, including Bojonegoro and Gresik Regencies, which are the target areas of the qualitative survey.

3.3.2.2 Other Positive and Negative Impacts

1) Impacts on the Environment

This project was classified as Category A based on *the JBIC Guidelines for the Confirmation of Environmental and Social Consideration* (formulated in October 1999) since it involves the construction of a new large-scale reservoir. The Environmental Impact Assessment (EIA) for the development of the Bojonegoro Barrage and the Jabung Regulating Reservoir was approved by the East Java Provincial Government in December 2002 and November 2004, respectively.

According to DGWR and BBWS, environmental monitoring was conducted during the construction period based on the environmental management plan and the environmental monitoring plan, and BBWS reported the monitoring results to the East Java Provincial Government and Bojonegoro Regency every six months. It was confirmed through questionnaire responses and interviews that no negative impacts were reported during or after the project regarding the monitoring items of air quality, noise, river water quality, groundwater, and ecosystem. As for noise, it was pointed out that loud noises exceeding 55 dBA²⁰ were temporarily made, but there were no complaints from nearby residents. During the construction period, environmental mitigation measures were implemented, and silt fences were installed to protect against turbid water generated by river construction.

According to interviews with residents during the field survey, construction vehicles came and went during construction and there were temporary impacts such as dust and noise and the Solo River turned muddy, but no one complained of any particular problems and they indicated that there were no problems after the project.

Based on the above and the on-site inspection, it is considered that there was no particular negative impact on the environment.

2) Resettlement and Land Acquisition

According to questionnaire responses and interviews with DGWR and BBWS, the project only involved land acquisition and did not require resettlement (no residents are living in the land subject to land acquisition).

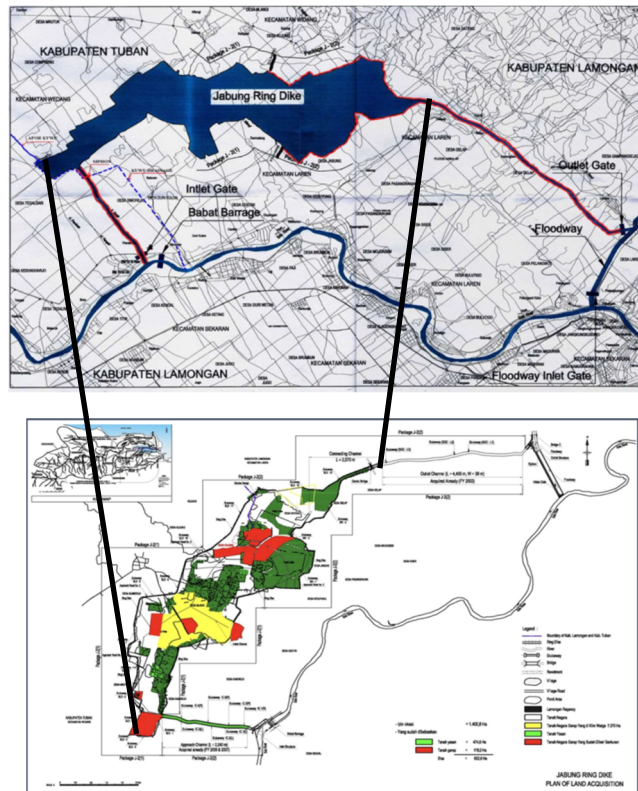
The issue of land acquisition on state land for the Jabung Regulating Reservoir remains unresolved. Specifically, people who engage in fishing and farming on land (258.11 ha) of the targeted state land for which compensation was not approved by the National Land Agency filed a lawsuit in court seeking compensation for their livelihoods. After going through the District and High Courts, the plaintiffs (farmers and fishermen) won their case

²⁰ 55 dBA is a slightly noisy level with loud irregular noise coming from outdoors. The International Finance Corporation (IFC) / World Bank noise level guidelines state that noise levels should not exceed 55 dBA during the day time (7:00-22:00) and 45 dBA during the night time (22:00-7:00) in residential areas.

in the Supreme Court's ruling on September 19, 2018, and it was confirmed that the government would pay compensation. At the time of the ex-post evaluation, the National Land Agency is currently surveying 485 plots of the target land, and DGWR aims to complete the process by the expiration date (December 2024) of the Location Determination Decree issued by the East Java Governor. However, there is no concrete prospects as to whether the surveying process and compensation calculation/agreement will be completed by the expiration date.

DGWR and BBWS responded that land acquisition procedures were carried out appropriately in accordance with Indonesian law and JICA guidelines. In addition, it was also confirmed with DGWR and BBWS that the process of land acquisition in the areas where land acquisition has already been completed was carried out in accordance with the land acquisition plan, and that the status of land acquisition was monitored. During the project implementation stage, they approached local governments (East Java Province, Tuban Province, etc.) to promote the plan, monitored the progress and persistently carried out discussions and negotiations while giving due consideration to the affected fishermen and farmers.

The location map of the Jabung Regulating Reservoir is shown in Figure 2. The area shown in yellow is the land (258.11ha) for which the plaintiff won in the Supreme Court judgment. The green area is private land (582.74 ha) and land acquisition has been completed. The red area is state land (178 ha) that has been certified as eligible for compensation by the National Land Agency, and land acquisition has been completed. The white area is state land (377.26ha) that is not subject to compensation payments, and there has been no particular movement from fishermen or farmers so far. According to BBWS, in light of the Supreme Court ruling, there is a movement for a new lawsuit from fishermen and farmers who operate on white area, seeking compensation.



Source: Prepared from materials provided by DGWR

Figure 2: Location Map of Jabung Regulating Reservoir

Based on the above, the issue of land acquisition for the Jabung Regulating Reservoir remains unresolved at the time of the ex-post evaluation, and there is no concrete prospect for its future. However, the executing agency continues to seriously deal with the land acquisition issues in order to realize the development of the Jabung Regulating Reservoir, and has indicated its intention to see the project through the end.

3) Gender Equality

No particular impact on gender due to the project could be confirmed.

4) Marginalized People

No particular impact on marginalized people due to the project could be confirmed.

5) Social Systems and Norms, Human Well-being and Human Rights

As mentioned above in “(2) Improvement of living environment” in “3.3.2.1 Intended Impacts” as a result of the qualitative survey, over 90% of respondents answered that they were able to live with peace of mind after the project. More than 70% of respondents answered that their awareness of disaster prevention increased after the project and that they

were taking flood countermeasures.

6) Unintended Positive / Negative Impacts

As mentioned above in “(1) Reduction of flood damage” in “3.3.1.2 Qualitative Effects (Other Effects),” due to synergistic effects of Phase I project, this project, and the government’s own funded projects, the project objective of preparing for 20-year return period flood has largely been achieved.

The project has not achieved its quantitative indicator targets regarding water use, and its contribution to improvement of investment environment is partial. However, targets for flood control, which directly affects many lives, have been achieved, and no flood damage has occurred on the main Solo River since 2015, improving people’s living conditions. In addition, Indonesian government is continuing to develop water resources-related infrastructure in the lower reaches of the Solo River using its own funds. In light of the above, this project has mostly achieved its objectives. Therefore, effectiveness and impacts of the project are high.

3.4 Sustainability (Rating: ③)

3.4.1 Policy and System

At the time of the ex-post evaluation, there are no changes to *the National Medium-Term Development Plan (2020-2024)* or DGWR’s *Strategic Plan (Rencana Strategis) (2020-2024)*, and the government’s policy of reducing flood damage and ensuring stable water supply through river improvement remains unchanged. In addition, it was confirmed through interviews with DGWR that there are no changes to the water resource management system in the Water Resources Law, Regulations of the Ministry of Public Works and Housing based on the Law, and the Statutory Plan.²¹ (Policy and system described in “3.1.1.1 Consistency with the Development Plan of Indonesia” remain unchanged.)

From the above, sustainability of policy and system of the project is assured.

²¹ The following is a chronological summary of the government’s legal and governance system in this sector.

<Legal system>

- Water Resources Law (Law Number 17 of 2019 concerning Water Resources)

<Regulations of the Ministry of Public Works and Housing>

- Regulation of the Minister of Public Works and Housing Number 4/PRT/M/2015 concerning Criteria and Determination of River Areas
- Regulation of the Minister of Public Works and Housing Number 17/PRT/M/2017 concerning Guidelines for Forming a Coordinating Team for Water Resources Management at the River Basin Level
- Regulation of the Minister of Public Works and Housing Number 21 of 2020 concerning River Channel Diversion

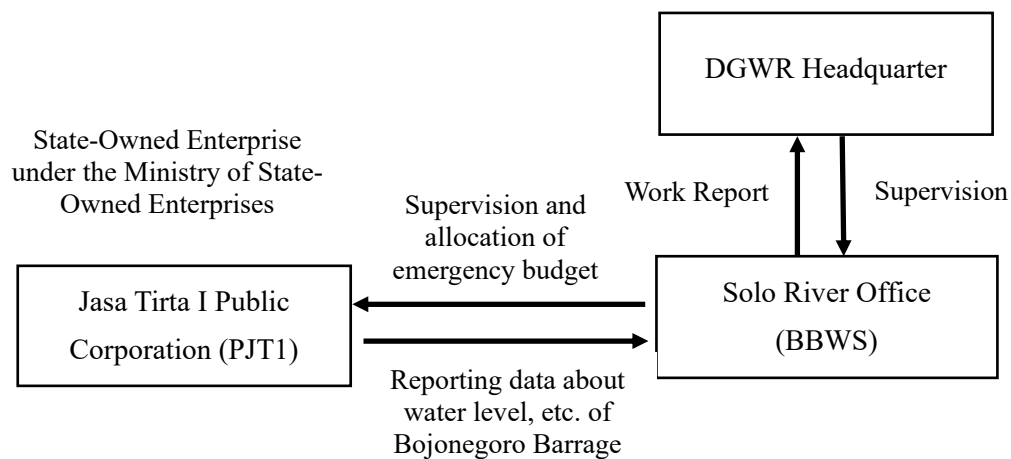
<Statutory Plans of the Minister of Public Works and Housing>

- *Strategic Plan for Water Resources Management (POLA) (2023)* indicating the direction of Solo River basin management
- *Water Resources Management Implementation Plan (RENCANA) (2023)* which is a concrete plan for implementing Soli River Basin management based on POLA

3.4.2 Institutional/Organizational Aspect

PJT1 is responsible for operation and maintenance of the Bojonegoro Barrage developed by the project. PJT1 is also responsible for operation and maintenance of water resource-related infrastructure such as the Babat Barrage, floodway, and the Jabung Regulating Reservoir outlet (spillway) that were constructed by Phase I project. PJT1 conducts operation and maintenance (routine maintenance, preventive maintenance, minor repairs, emergency repairs, etc.) of water resource-related infrastructure owned by DGWR in a total of five comprehensive river basins, including the Solo River and the Brantas River. In addition, as mentioned earlier in “3.3 Effectiveness and Impacts,” PJT1 also supplies water (raw water) to large users such as Local Water Supply Company in Solo River Basin (PDAM Bojonegoro, PDAM Lamongan, PDAM Gresik, etc.) and large factories.²² BBWS under DGWR, is in charge of water resource development (investment projects) and major repairs that cannot be handled by PJT1.

The organizational relationship diagram for operation and maintenance of the project is shown in Figure 3. Supervision and work reports are conducted among DGWR, BBWS, and PJT1. (PJT1 reports to BBWS on a quarterly basis data and information on the Bojonegoro Barrage, including water levels and volumes, water supply customer information, financial status, water allocation information, etc.) Division of roles and authority of each organization is clear and there are no problems. There are no particular concerns regarding communication and coordination or decision-making, either.



Source: Prepared from questionnaire responses

Figure 3: Organizational Relationship Diagram for the Operation and Maintenance of this Project

PJT1 Division 3 is in charge of operation and maintenance work in the field. Division 3 consists of 200 staff, 54 full-time employees and 146 contract employees, and is responsible for operation and maintenance of the Solo River Basin, including this project. At the

²² The roles and responsibilities of PJT1 are stipulated in Government Regulation No. 46/2001 regarding PJT1.

Bojonegoro Barrage and the Babat Barrage constructed by Phase I project, water levels and volumes are constantly monitored, and Division 3 staff are stationed at the site in three shifts 24 hours a day, 365 days a year. Interviews with the staff in the field during the project site inspections indicated that the current staffing levels are mostly sufficient.

From the above, no particular problem has been identified regarding the institutional/organizational aspect of operation and maintenance.

3.4.3 Technical Aspect

The staff in charge of operation and maintenance of PJT1 Division 3 have acquired technical knowledge at graduate schools, universities, and vocational schools, and hold civil, mechanical, and electrical engineer qualifications. It was confirmed through questionnaire responses and interviews that the staff have acquired the basic skills necessary to perform day-to-day operation and maintenance work.

Maintenance manuals have been prepared and utilized in a timely manner at the on-site operation and maintenance offices adjacent to each barrage in the Solo River Basin, including the Bojonegoro Barrage. According to the on-site operations and maintenance staff, once the Karangnongko Barrage, which is under construction with government's own funds, is completed (scheduled for completion in 2027), a total of four barrages (Karangnongko, Bojonegoro, Babat, and Sembayat) will be developed in the basin, and a comprehensive manual that synchronizes the four barrages will need to be developed.

Training was conducted to BBWS and PJT1 staff in the operation of water gates of the Bojonegoro Barrage, maintenance and inspection of mechanical and electrical equipment, water level and water volume measurement techniques, and inspection of embankment, among others, to strengthen operation and maintenance management capacity through the consulting services provided by the project. According to interviews with participants of the training, many of them are still engaged in operation and maintenance work, share the training content with other staff members, and continue to maintain knowledge and skills they acquired through the training in their daily maintenance work. PJT1 also conducts regular training at least once a year on the Bojonegoro Barrage water gate operation, maintenance and inspection of mechanical and electrical equipment, measurement of water level and water volume, safety management of infrastructure facilities, staff safety, health, environment, etc. with more than 10 PJT1 staff participate in each training session. In addition, daily on-the-job training is provided to younger staff members by skilled senior staff members to improve their technical skills.

From the above, it is considered that the staff of PJT1 has sufficient technical capacity to conduct ordinary operation and maintenance work, and there are no particular problems.

3.4.4 Financial Aspect

The budget and actual expenditures for operation and maintenance costs for the Solo River Basin, including the project, are shown in Table 15.

Table 15: Operation and Maintenance Costs for the Solo River Basin, including the Project (Note 1)
(Unit: million IDR)

	2020	2021	2022
Budget	35,375	36,951	37,130
Actual Expenditure (Note 2)	29,905	37,691	37,908

Source: Results of questionnaire survey and interviews with PJT1

Note 1: Operation and maintenance costs for PJT1 Division 3.

Note 2: The reason that actual expenditures in 2021 and 2022 exceeded the budget was due to emergency repairs such as repairing damaged embankments. The excess amount was appropriated from the budget of other departments in PJT1.

According to PJT1, operation and maintenance costs of the project are covered by water fees collected from water users, but due to the lack of water resources in the Solo River, revenue is limited and it is not enough for PJT1 to carry out all operation and maintenance activities.²³ For this reason, PJT1 is trying to make up for the shortfall by diversifying its operations²⁴ with the aim of increasing revenue. In addition, various efforts are being made to prioritize operation and maintenance activities, to minimize the negative impacts of budget shortfalls, and to effectively utilize BBWS budget by conducting maintenance activities in cooperation with BBWS.

Financial data for the entire PJT1 is shown in Table 16. PJT1 is self-financed and receives no subsidies from the government. Although operating revenue decreased in 2020, there was a V-shaped recovery in 2021, with revenue exceeding that in 2019. On the other hand, operating expenses are increasing year by year, so although income is on a recovery trend, it remains at over 60% of 2019, and profit is also over 70% of 2019. According to PJT1, COVID-19 did not have any particular impact on its finances.

²³ The water rate level for supplying raw water to users is determined by the Ministry of Public Works and Housing. According to BBWS, the 2022 operation and maintenance cost for PJT1 was 32% of the annual budget required for operation and maintenance of the lower reaches of the Solo River Basin, as calculated in a 2015 study conducted by the Ministry of Public Works and Housing.

²⁴ According to PJT1, it sells bottled drinking water sourced from the Brantas River, provides water quality testing services, and provides office building rental services.

Table 16: Financial Data for the Entire PJT1

(Unit: million IDR)

	2018	2019	2020	2021
Operating Revenue	501,058.36	544,732.79	488,617.75	570,198.28
Operating Expenses	365,049.37	391,332.67	411,939.17	474,728.56
Income	136,008.99	153,400.12	76,678.58	95,469.72
Non-Operating Income	38,592.52	15,115.04	12,703.24	12,527.36
Non-Operating Expenses	27,858.26	11,613.98	3,523.71	4,244.00
Non-Operating Income (Loss)	10,734.26	3,501.06	9,179.53	8,283.36
Income Before Income Tax Expense	146,743.25	156,901.18	85,858.11	103,753.08
Income Tax Benefit	32,915.40	35,857.34	20,311.85	17,725.80
Profit for the Year	113,827.84	121,043.84	65,546.26	86,027.28
Other Comprehensive Income	0.38188657	-952.4	6,335.19	-
Total Other Comprehensive Income After Tax	117,197.39	120,091.49	71,881.45	548.16
Income of Owners of the Parent	113,827.8	121,025.90	65,515.85	85,976.52
Non-Controlling Interests	-	17,972.10	30.41	50.77
Comprehensive Income of Owners of the Parent	117,197.40	120,073.50	71,851.04	86,524.67
Non-Controlling Interests	-	17,972.10	30.41	50.77

Source: PJT1 Annual Report (2021)

According to PJT1, once the Karangnongko Barrage, which is under construction with the government's own funds, is completed (scheduled for completion in 2027), it is expected that water utilization capacity of the Solo River will be strengthened and shortage of water resources will be alleviated. Accordingly, PJT1's revenue is expected to increase, and increase in operation and maintenance budget can also be expected.

From the above, it can be said that although there are some problems with the financial aspects of operation and maintenance, there is a high prospect of improvement in the medium term.

3.4.5 Environmental and Social Aspect

As mentioned above in "2) Resettlement and Land Acquisition" in "3.3.2.2 Other Positive and Negative Impacts," land acquisition for the Jabung Regulating Reservoir has not been completed, and DGWR aims to complete the procedure by December 2024. But there is no concrete prospect at the time of the ex-post evaluation. However, the executing agency has expressed its intention to see the project through the end to realize the development of the

Jabung Regulating Reservoir.

3.4.6 Preventative Measures to Risks

According to BBWS, due to the effects of global warming and other factors, localized torrential rains are occurring in a short period of time, causing a rapid rise in river water levels, and the risk of flooding is increasing due to damage to weak areas of embankments. For this reason, PJT1 is taking measures to address risks, such as revising the barrages' water gate operating manuals to be able to handle sudden increases in water.

3.4.7 Status of Operation and Maintenance

The facilities of the Bojonegoro Barrage developed by the project are operating without any problems, and operation and maintenance status is good and there are no problems. On the other hand, the FFWS is not operational. See "3.1.1.3 Appropriateness of the Project Plan and Approach" for the reason. As mentioned above, since 2015, there has been no flood damage to the downstream area due to the overflow of the main Solo River, and there have been no negative impacts due to the non-operation of the FFWS. At the time of the ex-post evaluation, DGWR expressed to the external evaluator that it would make maximum efforts in collaboration with the newly established Directorate of Water Resources Engineering Development to restart the FFWS.

Spare parts are stored at the PJT1 Division 3 field office adjacent to the Bojonegoro Barrage. At the time of the ex-post evaluation, no major repairs were required, and purchases and storage were considered to be the minimum. In addition, spare parts can be procured within Indonesia, and there were no particular problems.

Based on the above, regarding operation and maintenance status, the FFWS is not being used at the time of the ex-post evaluation, but maximum efforts will be made to restart it.

Slight issues have been observed in the financial, and environmental and social aspects including the current status of operation and maintenance, however, there are good prospects for improvement/resolution. Therefore, sustainability of the project effects is high.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

This project improved the lower reaches of the Solo River in East Java Province with the aim of mitigating flood damages and providing a stable water supply in the area, thereby contributing to the economic development of the East Java Region through improvement of investment environment, etc. In the lower reaches of the Solo River, water resource development is progressing from a comprehensive perspective, including flood control and water utilization, and

the objective of this project is consistent with the policies and needs at the time of the appraisal and the ex-post evaluation. However, there were some issues with the appropriateness of the project plan and approach regarding the introduction of FFWS and land acquisition. The project is consistent with Japan's development cooperation policy and concrete results can be confirmed through collaboration with another project within JICA. The project also contributes to the SDGs goals, an international framework. Therefore, its relevance and coherence are moderately low. In terms of project implementation, the project cost was within the plan, but regarding the project period, the project is not completed at the time of the ex-post evaluation because land acquisition by the executing agency has not been completed. Therefore, efficiency of the project is moderately low. Regarding project effects, quantitative indicators related to water utilization have not achieved the targets, and contribution to improvement of investment environment is partial. However, it was confirmed through interviews with the executing agency and local residents, etc., as well as concrete evidence data, that the objectives for flood control, which directly affects many lives, have been achieved, that no flood damage has occurred on the main Solo River since 2015, and that people's living conditions have been improved. Thus, effectiveness and impacts are high. Regarding operation and maintenance, slight issues have been observed in the financial, and environmental and social aspects including the current status, however, there are good prospects for improvement/resolution. Therefore, sustainability of the project effects is high.

In light of the above, this project is evaluated to be satisfactory.

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

<Understanding water sources and water usage status in water supply areas>

One of the reasons why the actual values of quantitative effect indicators for water use were significantly lower than the target values is that there are water uses that are not grasped by DGWR and BBWS. In addition, field survey also confirmed that farmers and others are pumping water from the Solo River for agricultural and other activities without permission. Therefore, it is important for BBWS and PJT1, in cooperation with local governments,²⁵ to first survey the locations of wells, reservoirs, springs, etc., their water storage capacities and water supply destinations, and to understand water sources other than the Solo River and their water use in the water supply area. In addition, as a countermeasure against non-revenue water, it is desirable for BBWS and PJT1 to investigate the actual situation of illegal water intake and take measures such as holding discussions with water user associations to prevent individual farmers from drawing water from the Solo River in a disorderly manner.

²⁵ A permit from the local government is required to take water from water sources such as wells, reservoirs, and springs.

<Smooth and prompt action to restart the FFWS>

The FFWS is not in operation at the time of the ex-post evaluation. DGWR is expected to take smooth and prompt action in cooperation with the newly established Directorate of Water Resources Engineering Development and make maximum efforts to restart the FFWS.

<Systematic preparation for the development of the Jabung Regulating Reservoir>

Regarding the land acquisition issue in the state land of the Jabung Regulating Reservoir, the Supreme Court ruled in favor of the farmers and fishermen, and it was confirmed that the government would pay compensation for their livelihood. At the time of the ex-post evaluation, the National Land Agency was surveying 485 plots of target land, and DGWR aims to complete the land procedures by December 2024. DGWR and BBWS are expected to proceed with preparations in a planned manner, including securing budgets, so that they can promptly start the development of the Jabung Regulating Reservoir as soon as possible after the completion of the procedures.

<Preparation of a comprehensive manual that synchronizes the four barrages>

Manuals regarding the operation of water gates for the barrages that have been developed in the lower reaches of the Solo River (Bojonegoro Barrage, Babat Barrage, and Sembayat Barrage) have been prepared individually for each barrage and are not coordinated. Once the Karangnongko Barrage, which is currently under construction with the government's own funds, is completed (expected completion in 2027), a total of four barrages will be in operation. So DGWR, BBWS and PJT1 should cooperate and coordinate to develop a comprehensive manual that synchronizes the four barrages before the Karangnongko Barrage is completed.

4.2.2 Recommendations to JICA

None.

4.3 Lessons Learned

Importance of early preparation and coordination for land acquisition

Land acquisition has not yet been completed for both Phase I project and this project, and the projects are not yet completed. In Phase I project, residents living on private land refused to accept compensation and relocate. The land at issue in this project is state land, where residents do not reside, and the residents, who make a living from agricultural and fishing activities, have filed a lawsuit in court seeking compensation for their livelihood. Based on the experience in Phase I project, DGWR and BBWS have recognized the risk of land acquisition becoming an issue when planning and have prepared for this project, and as a result, land acquisition on private land was completed, but the project developed into a lawsuit regarding state land. In addition, the project had planned to start preparations for land acquisition prior to the signing of the loan agreement,

but preparations actually started one year and 10 months after the signing of the loan agreement. DGWR could have found a way to resolve the issue through discussions with the people who are engaged in agriculture and fishing on state lands by consulting with them from an early stage prior to the start of the project and by explaining the specific benefits of the development of the Jabung Regulating Reservoir under the project to gain their understanding. Therefore, it is important for the executing agencies to ensure sufficient preparation time for discussions with potential stakeholders from the time of project formulation, to negotiate making all possible predictions, and to take all measures.

Importance of detailed training and adequate support system on the part of the executing agency when introducing a new system

The FFWS installed in this project is not in operation at the time of the ex-post evaluation. Based on lessons learned from similar projects in the past, the plan was to provide integrated support for both hard infrastructure and soft infrastructure by strengthening the capacity of the executing agency staff, etc., in addition to hard infrastructure measures through construction of facilities. Although integrated support was actually provided, it did not work out as a result. The FFWS was a new system for DGWR and BBWS, and the consulting services for this project provided training on the operation of the FFWS. However, training period was short, only three days, and the training location was not on-site in the Solo River Basin, so practical technology transfer did not take place. As a result, the trainees were unable to acquire sufficient skills and did not know how to deal with problems when they actually occurred on site. In addition, the system to support BBWS was not in place within the Ministry of Public Works and Housing, and DGWR left the actual operation to BBWS in the field, and BBWS staff in the field were unable to fully utilize the FFWS. Therefore, when introducing a new system or a technology in a project, it is important for the executing agency to establish a backup system in full cooperation with related organizations from the planning stage. In addition, training should be planned and implemented in a practical manner so that trainees can fully understand and operate the equipment appropriately on their own. It is important to secure the training period necessary for acquiring the skills and to provide detailed technology transfer.

5. Non-Score Criteria

5.1 Performance

5.1.1 Objective Perspective

None.

5.2 Additionality

The additionality of this project is JICA's support for comprehensive water resource

management to the lower reaches of the Solo River Basin. This project is based on *the Comprehensive Development Master Plan for the Lower Solo River Basin*, and JICA has supported water resource development in the lower reaches of the Solo River Basin by Phase I project and this project from a long-term and comprehensive perspective, including flood control and water utilization. As part of the consulting services for this project, *the Comprehensive Development Master Plan for the Lower Solo River Basin* was reviewed, and detailed design of the Sembayat Barrage, which was developed with the government's own funds, and basic design of the Karangnongko Barrage, which will be developed with the government's own funds, were conducted under this project. In fact, synergistic effects of Phase I project, this project, and the government's own funded projects have resulted in responding to 20-year return period flood, indicating that support for water resource management in the lower reaches of the Solo River Basin from a long-term and comprehensive perspective has been successful.

(End)

Comparison of the Original and Actual Scope of the Project

Item	Plan	Actual
1. Project Outputs	<p>1) Civil Works</p> <ul style="list-style-type: none"> Construction of Jabung Regulating Reservoir and accompanying drainage channel (water storage capacity of 30.5 million m³) Construction of Bojonegoro Barrage (movable barrage: barrage width 140m) <p>2) Ancillary Facilities (FFWS)</p> <ul style="list-style-type: none"> 15 rainfall observation stations, 12 water level observation stations <p>3) Consulting Services</p> <ul style="list-style-type: none"> Detailed design Tender assistance Construction supervision Study and review of existing Master Plan for Solo River Basin management Detail design review of dike, Sembayat Barrage and Jero swamp development, etc. Training of staff of executing agency, etc. 	<p>1) Civil Works</p> <ul style="list-style-type: none"> Construction of the regulating reservoir's connecting channel and some of the water gates has progressed, but is not yet completed As planned <p>2) Ancillary Facilities (FFWS)</p> <ul style="list-style-type: none"> 10 rainfall observation stations, 6 water level observation stations, 2 rainfall + water level observation stations, 3 water level + water quality observation stations <p>3) Consulting Services</p> <ul style="list-style-type: none"> As planned As planned As planned As planned As planned As planned
2. Project Period	April 2005-May 2014 (110 months)	March 2005-Project not completed (222 months until August 2023)
3. Project Cost		
Amount Paid in Foreign Currency	2,205 million yen	8,515 million yen
Amount Paid in Local Currency	8,790 million yen (local currency 732,500 million IDR)	1,923 million yen (local currency 198,780 million IDR)
Total	10,995 million yen	10,438 million yen
ODA Loan Portion	9,345 million yen	8,515 million yen
Exchange Rate	1 IDR = 0.012 yen (As of September 2004)	1 IDR = 0.0096762 yen (Average between 2005 and 2018)
4. Final Disbursement	October 2017	

(End)