Republic of the Philippines

Ex-Post Evaluation of Japanese ODA Loan

"Iloilo Flood Control Project (I) (II)"

External Evaluator: Kenichi Inazawa, Octavia Japan Co., Ltd.

0. Summary

This project implemented river improvement works (Iloilo River, Jaro River, Aganan River, Tigum River and Upper Ingore Creek) in Iloilo City and Pavia Municipality, Panay, Visayas, in the central Philippines, with the aim of mitigating flood disasters. At the time of the appraisal and ex-post evaluation, the project is consistent with the country's development policy concerning flood control and disaster mitigation. It is also consistent with development needs such as flood control infrastructure development. Thus, the relevance of the project is high. With river improvement works implemented through the project, initial targets were achieved in terms of discharge capacity and it became possible to respond to a 20-year return period flood. Since the completion of the project, no water overflow or flood has occurred due to heavy rain or typhoons, with no financial damage or damage to households. In addition, according to beneficiary survey results, improvements have been observed in terms of health, sanitation and living environment as a result of the reduction in flood disasters. Thus, the effectiveness and impact of the project is high. However, the project costs and project period significantly exceeded the initial plan; thus, efficiency is low. On the other hand, no major problems have been observed in terms of the institutional, technical and financial aspects of the operation and maintenance carried out by the executing agency; thus, project sustainability is high.

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

1. Project Description

Project Location

Jaro Floodway Constructed by the Project

1.1 Background

As the Philippines is located in the tropics, many of the typhoons generated in the Pacific Ocean hit the Philippines every year, exposing the country to difficult geographical and metrological conditions. Many towns are located in the lowlands and are therefore more likely to be affected by floods, especially in the rainy seasons. The total damage resulting from natural disasters was 11,381 million peso in 1999, prior to the appraisal of the project, which accounted for approximately 0.4% of the country's GNP at the time. As such, it was a serious factor hindering the economic and social development of the country.

Iloilo City, capital of the Iloilo region in the Province of Iloilo, located in Panay (West Visayas) in the central Philippines, was expected to become the center for West Visayas's economic growth, having the seventh largest population in the country at the time of the appraisal of the project. However, geographically, the city consists largely of plains with an average elevation of 3m above sea level and is regularly affected by floods caused by typhoons and torrential rain. Prior to the commencement of the project, the entire city had been flooded in July 1994, affecting about 25,000 households. The city was also devastated by six flood cases between 1998 and 2001 (affecting 119,028 households in total). Therefore, there was an urgent need for implementing flood control measures such as river-facility developments, with a view toward mitigating flood-related disasters.

1.2 Project Outline

The objective of the project is to mitigate flood damages in the target areas by implementing flood control works for the major rivers of the Province of Iloilo, Panay, Visayas in the central Philippines, thereby contributing to the improvement in sanitary and living conditions of the residents and to the economic development.

Loan Approved Amount/ Disbursed Amount	Phase I: 458 million yen / 338 million yen
	Phase II: 6,790 million yen / 6,728 million yen
Exchange of Notes Date/ Loan Agreement Signing Date	Phase I: September 1998 / September 1998
	Phase II: March 2002 / March 2002
Terms and Conditions	(Phase I & II) Main Construction: Interest Rate:1.7%, Repayment Period 30 years (Grace Period 10 years), Condition for Procurement: General Untied Consulting Service: Interest Rate: 0.75%, Repayment Period 40 years (Grace Period 10 years), Condition for

	Procurement: Bilateral Tied
Borrower / Executing Agency(ies)	The Government of the Philippines / The Department of Public Works and Highways (DPWH)
Final Disbursement Date	Phase I: January 2002 Phase II: September 2010
Main Contractor (Over 1 billion yen)	Phase I: N/A Phase II: Hanjin Heavy Industries & Construction Co., Ltd. (South Korea) (Contract Package I), China International Water & Electric Corporation (China) (Contract Package II)
Main Consultant (Over 100 million yen)	Phase I: CTI Engineering Co. Ltd. (Japan) / Basic Technology and Management Corporation (the Philippines) / Woodfields Consultants Inc. (the Philippines) (JV) Phase II : (Component 1)CTI Engineering International Co., Ltd. (Japan) / Basic Technology and Management Corporation (the Philippines) / Woodfields Consultants Inc. (the Philippines) (JV), (Component 2) CTI Engineering International Co., Ltd. (Japan) / Wood Fields Inc. (the Philippines) / Pertconsult International (the Philippines) (JV)
Feasibility Studies, etc.	F/S “Iloilo Flood Control Project” JICA (February 1995)
Related Projects	(Technical Cooperation) Dispatch of experts (river management) (Technical Cooperation) “The Project for Enhancement of Capabilities in Flood Control and Sabo Engineering of DPWH” (January 2000 – June 2005) (Technical Cooperation) “Strengthening the Flood Management Function of DPWH” (July 2005–June 2010) (Technical Cooperation) “Community Based Adaptation and Resiliency against Disasters” (April 2012 – March 2015)

2. Outline of the Evaluation Study

2.1 External Evaluator

Kenichi Inazawa (Octavia Japan Co., Ltd.)

2.2 Duration of Evaluation Study

Duration of the Study: November 2013 - December 2014

Duration of the Field Study: March 3 - 16, 2014, May 18 - 25, 2014

3. Results of the Evaluation (Overall Rating: B[1])

3.1 Relevance (Rating: ③[2])

3.1.1 Relevance to the Development Plan of the Philippines

At the time of the appraisal of the project, the government of the Philippines formulated the "Medium-Term Philippine Development Plan" (1993-1998), which emphasized the importance of disaster prevention and flood disaster mitigation through the development of flood control infrastructures. The subsequent "Medium-Term Philippine Development Plan" (2001-2004) aimed for the continued development of flood control infrastructures of the industrial and agricultural regions in Metro Manila and flood-prone areas as well as for the realization of integrated river basin management including afforestation.

At the time of ex-post evaluation, the "Mid-Term Philippine Development Plan" (2011-2016) places an emphasis on the necessity of conserving river basins and developing efficient infrastructures in order to mitigate flood risks. The following strategies are proposed to realize the plan: (1) prioritizing the construction of flood control infrastructures in flood-prone areas; (2) incorporating climate change adaptation measures in the planning and designing of flood control infrastructures; (3) developing a mechanism which allows prompt fund allocation for the restoration and rehabilitation of flood control infrastructures; and (4) promoting the participation of Local Government Units (LGUs) and others in the maintenance of flood control infrastructures and disaster mitigation measures. It can be observed that flood control and anti-disaster measures were and continued to be important at the time of the appraisal and ex-post evaluation of the project; therefore, it can be judged that there is consistency with the development policy.

3.1.2 Relevance to the Development Needs of the Philippines

At the time of the appraisal of the project, Iloilo City had the seventh largest population in the country and was expected to become the center for economic development of West Visayas. However, the city was regularly affected by floods because geographically it consists largely of

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

[2] ③: High, ② Fair, ① Low

plains with an average elevation of 3m above sea level. Torrential rain which hit the area in July 1994 almost flooded the entire city, affecting about 25,000 households. Additionally, the city was devastated by six flood cases between 1998 and 2001 (totally 119,028 households were affected. Therefore, it was an urgent task for the city to implement flood control measures.

In response to such a situation, the project constructed floodways and carried out river improvement works with the aim of responding to a 20-year return period flood (1/20 exceedance probability[3]) initially and then later on to a 50-year return period flood with the subsequent project[4]. As a result, there has been no single flood associated with heavy rains or typhoons (disasters associated with river flooding[5] such as that of Iloilo River, Jaro River, Aganan River and Tigum River) since the completion of the project. On the other hand, the city continues to experience flooding from drainage and small rivers (inland flood) in parts of the project area in Iloilo City and Pavia Municipality, which needs to be addressed in both cities. The Department of Public Works and Highways (hereinafter referred to as "DPWH"), the executing agency of the project, is currently formulating a master plan for the drainage development. In addition, DPWH is formulating the subsequent project which aims to make the entire Iloilo City and Pavia Municipality resilient to a 50-year return period flood as mentioned above. In light of the above, it can be said that there continue to be high development needs for flood control facilities at the time of ex-post evaluation.

3.1.3 Relevance to Japan's ODA Policy

The Country Assistance Plan for the Philippines, which was developed by the Ministry of Foreign Affairs of Japan in August 2000, identified the following priority fields: (1) "strengthening the economy and overcoming growth constraints toward sustained economic growth"; (2) "rectification of disparities (alleviating poverty and redressing regional disparities)"; (3) "environmental protection and anti-disaster measures"; and (4) "human resources development and institution building." Out of these, it was stipulated in (3) that

[3] Exceedance probability indicates scales of floods. Every how many years a flood is likely to occur on average is expressed as a percentage.

[4] "The project" in this evaluation report represents the phase I and II of the "Iloilo Flood Control Project". It is also referred as "Stage I". In terms of the subsequent project which is individually planned by the government of the Philippines, it is referred to as "Stage II." As described in the paragraph, the project constructed floodways and carried out river improvement works with the aim of responding to a 20-year return period flood initially and then to a 50-year return period flood with the subsequent project. In terms of the project outputs, it will be explained at "3.4. Efficiency."

[5] River flooding is a phenomenon that water flows over or breaks a dike thereby flooding houses and agricultural lands. Inland flood, on the other hand, refers to a flood caused by water discharged to rivers and drainages because of insufficient drainage capacity; and it occurs even if water does not flow over a dike. (Source: the Ministry of Land, Infrastructure, Transport and Tourism of Japan)

"because frequent large-scale natural disasters constrain development, and also tend to impact more heavily on the poor, we will continue to provide aid for flood and sand control and earthquake-related measures, while also assisting in developing the necessary systems and capacity in related government institutions from a medium- to long-term perspective." In addition, JICA prepared its "Medium-Term Policy for Overseas Economic Cooperation Operations" in December 1999, which highlighted development issues of and assistance policy for the Philippines. The policy identified the following priority fields: (1) "making economies more resilient and overcoming constraints in order to achieve sustainable growth (e.g., appropriate macroeconomic management, reinforcing industrial structures, and developing economic infrastructures)"; (2) "poverty alleviation and correction of regional disparities"; (3) "environmental protection including disaster prevention as well as disaster prevention measures"; and (4) "human resource development and system building."

The project provided supports for the strengthening of disaster prevention functions of the Philippines and is consistent with (3) "environmental protection and anti-disaster measures", one of the priority fields of the above-mentioned Country Assistance Plan for the Philippines. It is also in line with (3) "environmental protection including disaster prevention as well as disaster prevention measures" found in the Medium-Term Policy for Overseas Economic Cooperation Operations. It is thus consistent with the assistance policy of Japan.

The project has been highly relevant to the country's development plan, development needs, as well as Japan's ODA policy. Therefore its relevance is high.

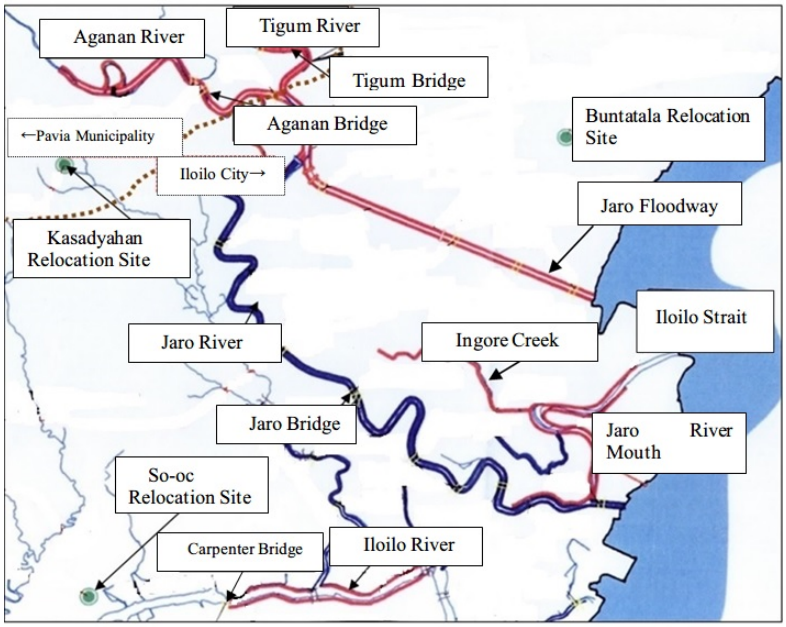


Figure 1: Locations of the Project Sites

3.2 Effectiveness[6] (Rating: ③)

3.2.1 Quantitative Effects (Operation and Effect Indicators)

1) Discharge Capacity and Maximum Water Level

The project implemented river improvement works for the main rivers in Iloilo City and Pavia Municipality (Iloilo River, Jaro River, Aganan River and Tigum River) with the aim of mitigating floods so that they would be resilient to a 20-year return period flood. As a result, discharge capacity[7] improved and became more than what was targeted at all measurement points (Table 1). It can be observed that the river cross sections (river width and dike height) have been secured as a result of the river improvement works of the project, which led to the improvement in discharge capacity.

Table 1: Changes in the Discharge Capacity

at the Time of the Project Appraisal and at the Time of Ex-Post Evaluation

(Unit: m^3/second)

Indicator	Measurement Point	Before the Project Commencement		At Ex-Post Evaluation
		Baseline (1998)	Target (2007)	Actual (2013)
Discharge Capacity	(1) Jaro Bridge[8]	204	150	150
	(2) Aganan Bridge	260	550	800
	(3) Tigum Bridge	354	450	600
	(4) Carpenter's Bridge	296	350	350

Source: JICA appraisal document (at the time of the project appraisal), questionnaire answers (at the time of ex-post evaluation)

Note: The measurement points ((1)-(4)) are shown in Figure 1: Locations of the Project Sites

On the other hand, maximum water levels[9] could not be reviewed or analyzed because the regional office of DPWH responsible for the operation and maintenance of the project (hereinafter referred to as "the Regional Office VI[10]") did not measure maximum water levels during heavy rains and typhoons at the measurement points shown in Table 2[11]. According to

[6] Sub-rating for Effectiveness is to be put with consideration of Impact.

[7] It refers to a water volume which can flow without flooding at a certain measurement point.

[8] It was expected that the discharge capacity of Jaro Bridge would decrease from 204m^3/second at the time of the project appraisal to 150m^3/second at the time of ex-post evaluation, unlike the other three bridges. It is because a flood way was planned to be constructed in Jaro River as part of the project, and it was expected that some water in Jaro River would be diverted to the flood way. (Refer to Figure 1: Locations of Project Sites.) Therefore, the reduction in the discharge capacity at Jaro Bridge was anticipated at the initial planning stage.

[9] It is a quantitative indicator to evaluate whether the water level is within a safe range at a flood control reference point during floods. The highest water level (meter elevation) of the year is measured at a flood control reference point.

[10] Their mandate is to measure river water levels after the project completion.

[11] However, the Regional Office VI is formulating a plan for the procurement and introduction of water gauge equipment as of May 2014. Thus it can be expected that river water levels will be measured during heavy

the Regional Office VI, while there were four heavy rains/typhoons of about 5-20 year exceedance probability in the targeted areas since the completion of the project, there has not been any damage thanks to the project which made the areas resilient to a 20-year return period flood[12]. It is presumed that damage would have been significant had there be no project.

Table 2: Actual and Target Maximum Water Level before the Project Commencement

(Unit: meter elevation)

Indicator	Measurement Point	5-year Return Period		10-year Return Period		20-year Return Period	
		Before Comme-ncement	After Comp-letion	Before Comme-ncement	After Comp-letion	Before Comme-ncement	After Comp-letion
Maximum Water Level	(1) Jaro Bridge	8.00	4.40	8.60	4.70	9.30	5.20
	(2) Aganan Bridge	13.60	12.94	14.50	13.64	15.30	14.23
	(3) Tigum Bridge	2.42	1.00	13.04	11.80	13.78	12.70
	(4) Carpenter's Bridge	1.40	1.40	1.60	1.60	1.80	1.80

Source: JICA appraisal document

2) Changes in the Damage and the Number of Affected Households in Iloilo City

As it was discussed above, there has not been any flood-related disaster since the completion of the project, nor has there been any problem of overflow (river flooding). Table 3 shows that the amount of damage and the number of affected households were significant at the time of the appraisal of the project; and there are none after the project completion.

Table 3: Changes in the Damage and the Number of Affected Households in Iloilo City

Indicator	5-year Return Period		10-year Return Period		20-year Return Period	
	Before Comme-ncement	After Comp-letion	Before Comme-ncement	After Comp-letion	Before Comme-ncement	After Comp-letion
Amount of Damages in Iloilo City (million peso)	589	0	713	0	863	0
The Number of Affected Households in Iloilo City (no. of households)	16,191	0	19,242	0	21,990	0

Source: JICA appraisal document (before commencement), the answers to the questionnaire and results of the interviews with Iloilo City Government (after completion)

rains/typhoons in the future.

[12] A super typhoon (Frank), which was said to be a 50-year return period typhoon, hit the area in June 2008. Heavy rain and increased water levels caused river flooding, significantly affecting all parts of Iloilo City and Pavia Municipality. It will be discussed further in Output under Efficiency.

Photo 1: Flood before the Commencement of the Project (Iloilo City)

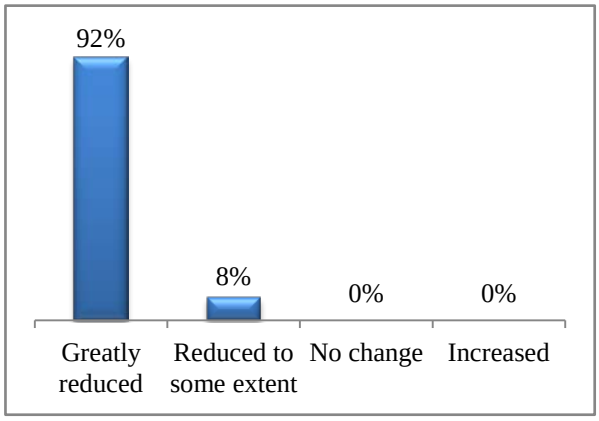
Photo 2: Tigum River after the River Improvement Works

3.2.2 Qualitative Effects (Mitigating Flood Disasters)

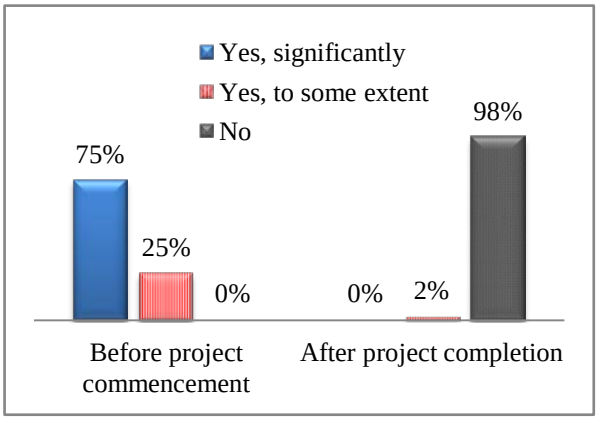
A beneficiary survey was conducted targeting the residents of Iloilo City and Pavia Municipality concerning the reduction in flood frequency and flood damage attributed to the project. Samples were drawn based on the random sampling method (123 persons[13]), and it used a questionnaire. The beneficiary survey results are reviewed below.

The main results are shown in Figure 2. Question 1 was about reduction in flood frequency. All the respondents answered “greatly reduced” or “reduced to some extent”; thus it can be observed that flood related disasters have decreased. Additionally, from Question 2-5 it can be observed that the damage to the basic infrastructures, including inundation above floor level, casualties and damages to the household goods and infrastructures such as electricity and water supply systems, significantly reduced after the project implementation. In addition, as Question 6 shows, many people responded that flood damages to roads and public transportations generally reduced as well. According to the beneficiaries who were interviewed, they commented, “There were floods frequently before the commencement of the project. Every time flood damages occurred, we had to do major repairs or rebuild houses, but there is no need for that now.” Based on this comment in addition to the survey results shown in Figure 2, it can be judged that the frequency and damages of flood significantly reduced after the project completion as compared to before the commencement of the project.

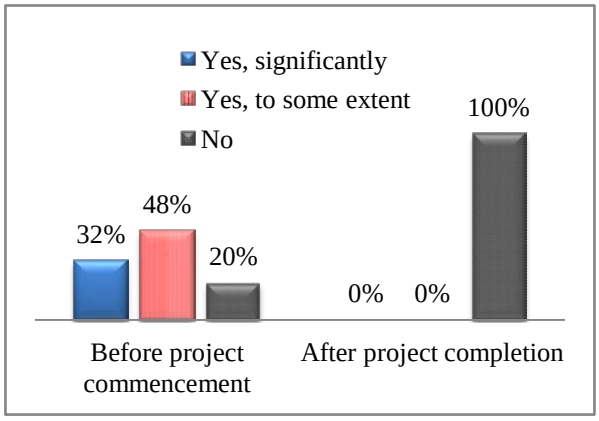
[13] Respondents are composed of the following: 21% men and 79% women, 2% in their 20s, 16% in their 30s, 34% in their 40s, 31% in their 50s and 17% in their 60s.



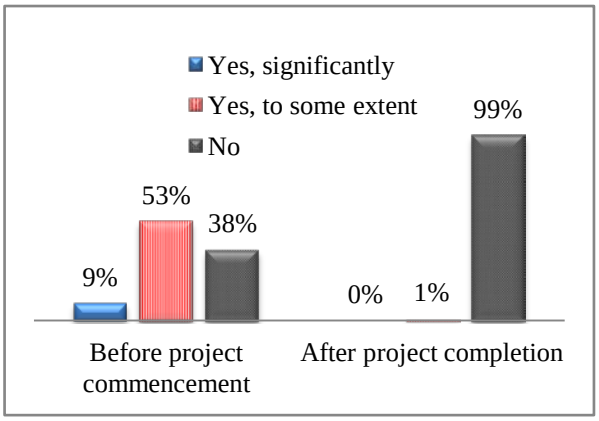
Question 1: Do you think the flood frequency reduced?



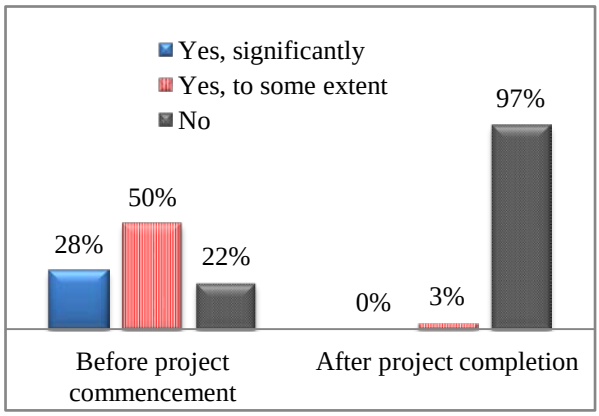
Question 2: Did dirt, mud, trash or other debris enter into the house due to floods?



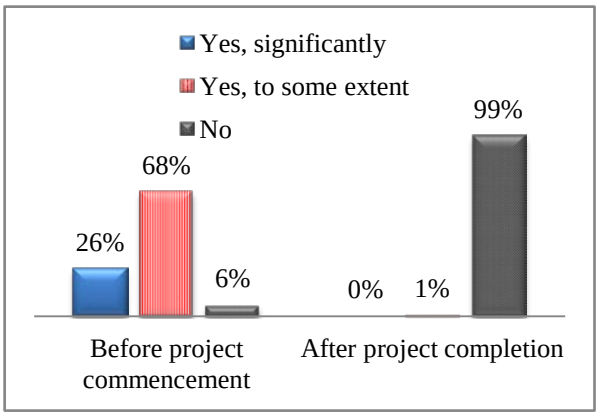
Question 3: Were there damages to household goods due to floods before and after the project?



Question 4: Were there damages to human due to floods before and after the project?



Question 5: Were there damages to the infrastructures (electricity, water supply and communication facilities) due to floods before and after the project?



Question 6: Were there damages to roads and public transportations due to floods before and after the project?

Figure 2: The Results of the Beneficiary Survey
(Reduction in Flood Disasters)

In addition, according to the interviews with Iloilo City Government and Pavia Municipality Government, they commented, “Thanks to the completion of the project, there are less concerns about floods. There was a lot of anxiety about flood during the typhoon season every year, but now, citizens are feeling safer.” Therefore, it can be judged that the project has not only mitigated flood disasters but also brought a feeling of safety to the citizens.

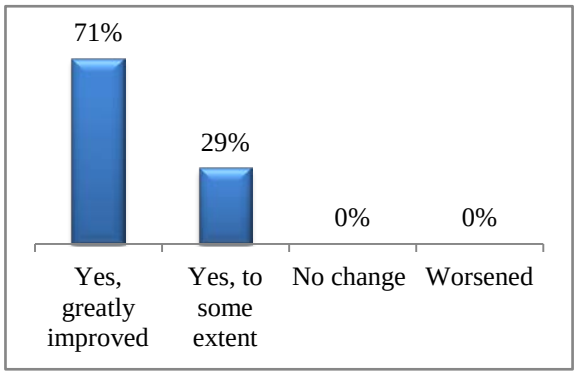
3.3 Impact

3.3.1 Intended Impacts

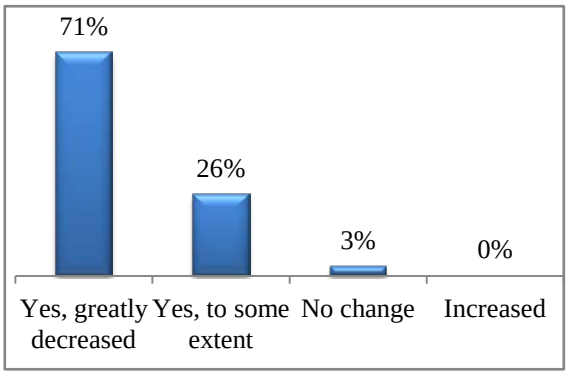
3.3.1.1 Improvement in the Sanitation and Living Conditions in the Target Areas

Iloilo City used to be attacked by frequent typhoons at the time of the appraisal of the project. The typhoon of July 1994 caused large-scale flooding (affecting roughly 25,000 households) in the city, having a serious impact on health and sanitation of the local residents. It was thus expected that the project would lead to the improvement in living conditions of the local residents by reducing flood related disasters.

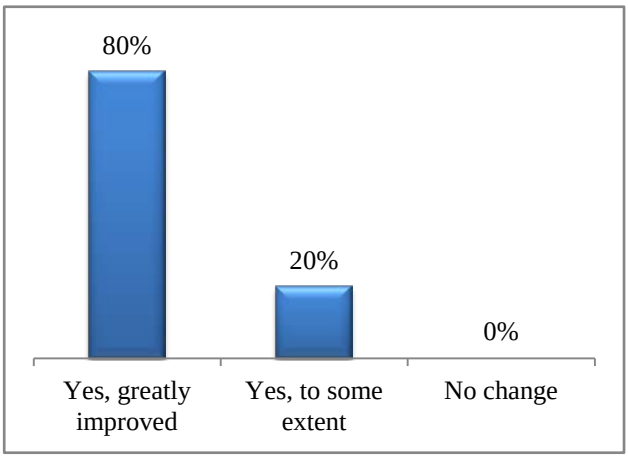
The beneficiary survey, which was conducted as part of this evaluation study, also looked into such aspects. As it can be seen from Question 7-8 shown in Figure 3, a large proportion of the local residents think that sanitation and living conditions have improved and waterborne infections have reduced as a result of the development of river facilities by the project. Additionally, as it can be seen from Question 9, a large proportion of the respondents said that the security situations improved in their neighborhoods. Therefore, it can be judged that the project is contributing to the improvement in health, sanitation and living conditions of the residents.



Question 7: Do you think the implementation of the project has contributed to the improvement in the sanitation of the area?



Question 8: Do you think the implementation of the project has led to a reduction in waterborne infections?



Question 9: Do you think the security of the area has improved as a result of the implementation of the project?

Figure 3: Results of the Beneficiary Survey
(Improvement in Sanitation and Living Conditions)

3.3.2 Other Impacts

3.3.2.1 Impacts on the Natural Environment

At the time of the project appraisal, it was confirmed that mangrove forests existed near the project sites, such as near the mouths of Jaro River and Jaro floodway. This is why mangrove was reforested by the project, and impacts on the mangrove forests were monitored. No particular negative impacts were observed. The mangrove reforestation is also contributing to the improvement in the landscape of the areas around the project sites.

Additionally, at the time of the appraisal of the project, it was anticipated that the areas near the Jaro floodway construction site might be affected by saltwater intrusion. It was thus required that the impacts on the well water near the downstream of the floodway and the water intake should be monitored. Counter measures against saltwater intrusion were also needed in case any negative impact was observed. These measures were taken as planned. According to the Regional Office VI, no saltwater intrusion to the well water or the water intake is observed at the time of ex-post evaluation.

There were no major problems associated with air or water pollution, wastes and noise throughout the project implementation period. With regard to the issue of noise, some noticeable noise occurred during the construction for the river improvement; however, the contractor gave sufficient consideration during the construction (mainly by being thoughtful of the construction hours). As a result, there was no complaint from the residents.

The Environment Impact Assessment (EIA) was conducted prior to the appraisal. The Environmental Compliance Certificate (ECC) was issued by the Department of Environmental and Natural Resources (DENR) in April 1998.

With regard to the institutional arrangement for the environmental monitoring, the Planning and Design Department of the Regional Office VI is responsible. They periodically monitor the project sites and the surrounding areas. According to the Department, there has been no negative environmental impact since the completion of the project.

3.3.2.2 Land Acquisition and Resettlement

Concerning resettlement, 505 households were relocated as shown in Table 4. The Resettlement Monitoring Task Force (RMTF) was formed by different stakeholders during the project[14]. The households subject to resettlement were briefed, advocacy works were conducted, and the progress was monitored.

Table 4: The Planned and Actual Number of Resettled Households and Land Acquired

		Initial Plan	Actual
Resettlement (Unit: household)	(1) Illegal settlers	416	398
	(2) Landowners	109	109
	Total	525	505
Acquired land near the rivers targeted by the project (Unit: ha)		99.0	83.7

Source: the Regional Office VI

With regard to the land acquired near the river improvement construction sites[15], as shown in Table 4, 83.7ha was acquired, which was slightly less than the initial plan (99ha). It is because the riverbanks were gradually eroded by the river stream during the project appraisal and implementation, as a result of which the area subject to land acquisition decreased[16]. The compensation paid to the landowners was about 1.25 billion peso in total. The payment of the compensation was made smoothly based on the mutual agreement between DPWH and the landowners.

On the other hand, Buntatala (2.6ha) and So-oc (1.8ha) in Iloilo City were developed as relocation sites through the project, as it will be discussed in "3.4.1 Output" under Efficiency. In the project a total of 505 households including illegal settlers and landowners were relocated to the above-mentioned two sites as well as to Kasadyahan (4.3ha) in Pavia Municipality

[14] This taskforce consisted of Iloilo City Government and Pavia Municipal Government, the National Housing Authority (NHA), Iloilo City Urban Poor Federation, Inc. (ICUPFI) and other community based organizations. The taskforce monitored the progress of resettlement and land acquisition. According to the city/municipal government of Iloilo City and Pavia Municipality, the activities functioned smoothly.

[15] Mainly, these are lands occupied by illegal settlers and lands owned by landowners.

[16] The landowners showed their understanding of the matter.

developed as a relocation site by the National Housing Authority (NHA) under another project. With a view to ensuring smooth resettlement, the Regional Office VI covered the resettlement costs including the cost of relocation while providing food for some time. According to the resettled residents (So-oc) who were interviewed, they commented, "We were a little anxious before the resettlement. But now after the resettlement, we are satisfied with the relocation site. In So-oc, we have a health center, markets and schools as well as water supply service. Before the relocation, we used to live in areas where such facilities were geographically dispersed and not easily accessible. Here, on the other hand, the site has been developed in such a way that those facilities are close to each other[17]. So we can say that we have a good environment for living. Security is also good, and it is quiet here." Based on such a comment, it can be judged that the resettlement process was carried out smoothly and that the level of satisfaction is high concerning the living conditions after the resettlement.

Photo 3: Relocation Site (So-oc)

Photo 4: Facilities Developed in So-oc (From front: church and water tower)

3.3.2.3 Unintended Positive/Negative Impact

1) Enhanced Understanding for the Project through Information Education Campaign and the Impact on Environment

The "Information Education Campaign" was held during the implementation of the project. This was mainly carried out by the consultant employed under the project and the Regional Office VI through radio broadcasting, TV commercials, distribution of calendars and posters with the aim of publicizing the necessity/importance of the project, the expected effects/impacts and the importance of maintaining the facilities to the local residents. Residents near the project sites commented in the interviews, "We were able to understand the necessity of the river improvement works. The project was meant to protect our livelihoods." Thus it can be judged that the residents' understanding for the project has been deepened.

As part of the project, Material Recycle Facilities (hereinafter referred to as "MRF") were

[17] The facilities were developed within the relocation sites with the view of improving accessibility.

constructed with the objective of preventing illegal waste disposal and promoting proper waste disposal. It has been confirmed through the interviews with the local barangays as well as Iloilo City Government and Pavia Municipality Government that the amount of waste dumping decreased through the utilization of MRF after the completion of the project. For example, in the case of Iloilo River, the amount of waste from the river has significantly reduced from 10-15 large trucks/week at the time of the project appraisal to 2-3 trucks/week after the project completion. At the time of ex-post evaluation the MRF are mainly managed by the barangays around the project sites and Iloilo City Government, while the Regional Office VI expressed their will to continue hosting seminars on the means of utilizing MRF and proper water disposal. Based on the above facts, it can be judged that the utilization of MRF is contributing to the improvement in the landscape of the areas near the project sites and to the improvement in the environmental awareness.

2) Impact of the Promenade Construction along the Rivers on Tourism

Promenades were constructed by the initiative of Iloilo City Government in some parts along the rivers that have been improved by the project. The promenades have become recreation areas for tourists who visit Iloilo City and also for the local residents. Hotels and restaurants have been constructed along the promenades, and the areas are lively. It is believed that the flood reduction as a result of the project has assured the safety and these buildings have been constructed. In addition, there exists a mangrove forest along the promenades, which is presumably contributing to the improvement in the environmental awareness of the tourists and visitors.

Photo 5: An Example of Material Recycle Facilities (MRF)

Photo 6: Promenade (mangrove forest exists between the promenade and the river)

The project has largely achieved its objectives. Therefore its effectiveness and impact are high.

3.4 Efficiency (Rating:①)

3.4.1 Project Outputs

Table 5 shows the planned and actual outputs of the project.

Table 5: The Planned and Actual Outputs of the Project

Plan (At the Time of the Appraisal)	Actual (At the Time of Ex-Post Evaluation)
【Iloilo Flood Control Project (I)】 ■ Consulting service for the detailed design (detailed design, preparation of tender documents, a river environment improvement study and others: 193MM in total: 93MM for international consultants, 100MM for local consultants) and the cost related to the development of relocation sites	【Iloilo Flood Control Project (I)】 ■ The consulting service for the detailed design was provided as planned. (305.48MM in total: 80.75MM for the international consultants, 224.73MM for the local consultants.) As for the development of the relocation sites, 2.6ha of land was developed in Buntatala, Iloilo City.
【Iloilo Flood Control Project (II)】 1) Civil Works a) River Improvement Aganan River improvement: 3.9km Tigum River improvement: 2.0km Improvement of upper Jaro River: 1.0km Improvement of the mouth of Jaro River: 5.6km Improvement of midstream of Iloilo River: 4.2km Improvement of upper Ingore creek: 3.0km & associated bridge construction: 3 bridges b) Construction of Floodway Construction of Jaro floodway: 4.8km / associated bridge construction: 3 bridges c) Development of Relocation Sites Development of relocation sites for the residents subject to resettlement: 22.5ha (So-oc: 2.5ha, San Isidro: 20ha) 2) Consulting Service ■ Component 1 (Main Tasks) a) Support for the procurement; b) Construction management; c) Operation and maintenance training for DPWH and Iloilo City Government staffs; and d) Environment management (impacts on water quality, noise,	【Iloilo Flood Control Project (II)】 1) Civil Works a) River Improvement Aganan River improvement: 4.26km Tigum River improvement: as planned Improvement of upper Jaro River: as planned Improvement of the mouth of Jaro River: as planned Improvement of midstream of Iloilo River: 3.8km Improvement of upper Ingore creek: as planned & associated bridge construction: as planned b) Construction of Floodway Construction of Jaro floodway: as planned Associated bridge construction: 4 bridges c) Development of Relocation Sites Development of relocation sites for the residents subject to resettlement: 1.8ha (1.8ha was developed in So-oc only as the planned 20ha in San Isidro was canceled) 2) Consulting Service ■ Component 1 (Main Tasks) Mostly implemented as planned. (However, the actual workload was more than planned because the construction expanded in scale.)

air and natural environment, environmental monitoring on excavated sediment, and support for the development and implementation of the mangrove reforestation plan, etc.) (Planned MM) 458MM (international: 171MM, local: 287MM) ■ Component 2 (Main Tasks) e) Support for the resettlement measures (including assisting the resettlement procedures, assisting the land acquisition and compensation process, assisting the monitoring to prevent resettled residents from returning to the project sites, assisting the development of livelihoods improvement program); f) Support for the advocacy works targeted at local residents (campaigns to explain the benefits of rivers to the life of the citizens, the importance of flood management, prevention of illegal waste disposal, prevention of riverside occupation by illegal settlers and maintenance of the river facilities, etc.); g) Studies on the sediment in upper Iloilo River and Jaro River and the current situation of the forest; and h) Review of the waste disposal plan of Iloilo City (Planned MM) 393MM (international: 63MM, local: 330MM)	(Actual MM) <u>610.34MM</u> (international: 188.81MM, local: 421.53MM) ■Component 2 (Main Tasks) The tasks listed in the left-hand column were carried out mostly as planned. (However, the task e) was scaled back.) (Actual MM) 308.45MM (international: 72.26MM, local: 236.19MM)
	【Additional Output】 a) The super typhoon (Frank) which occurred in 2008 damaged one section of the river which had been improved by the project. Repair work was done and riverbank protection concrete walls were constructed; and b) three above-mentioned MRF were constructed along the rivers targeted by the project; while additional 14 MRF were constructed after the Information Educational Campaigns as a result of the recognition of their usefulness (= 17 MRF in total)

The reasons for the discrepancies between the plan and the actual outputs shown in Table 5 are explained below:

【Iloilo Flood Control Project (I)】

The actual MM for the detailed design was more than the plan because it took longer to identify the relocation sites than expected, which will be explained in the project period section.

In fact, Buntatala was selected as a relocation site to be developed; and roads, water supply and electrification facilities were developed within this site (2.6ha).

【Iloilo Flood Control Project (II)】

1) Civil Works

Both "a) River Improvement" and "b) Construction of Floodway" were implemented mostly as planned. As for the improvement section of Aganan River, the actual is slightly more than the plan because it was found at the time of the detailed design that soil was fragile in some places on both sides of the upstream and it became necessary to expand the construction work for the concrete riverbank protection walls. The improvement work for the midstream of Iloilo River turned out to be slightly less than the plan because the project scope had to be re-examined at the time of the detailed design, as a result of which 3.8m extension was judged to be appropriate. The number of bridges constructed along Jaro floodway became four due to a change made at the time of the detailed design. It was because residents living in the relatively populous areas on both sides of Jaro floodway demanded that access should be improved[18].

With regard to "c) Development of Relocation Sites", only 1.8ha was developed in So-oc whereas the initial plan was to develop 2.5ha of land. It is because out of the residents to be resettled mainly Pavia citizens opted for relocation within the same municipality during the course of the procedure[19]. With regard to San Isidro, the plan of developing 20ha of the relocation site was canceled because from the beginning this 20ha of land was meant for Stage 2, which is the subsequent project of the project. In other words, although it was included in the original plan in consideration of the progress of Stage 2, it turned out that there were more illegal settlers than expected who would be subject to resettlement under Stage 2 (2,800-3,000 persons). Given that many problems needed to be addressed in relation to resettlement, it was judged that developing it as part of the Stage 2 project in the future would be more realistic.

2) Consulting Service

The actual MM of Component 1 exceeded the plan because the construction was expanded in scale due to the additional construction shown in Table 5. On the other hand, the actual MM was less than the plan for Component 2 because the development of the above-mentioned relocation site (development of 20ha in San Isidro) was postponed, as result of which workload in relation to "e) Support for the resettlement measures" reduced from the plan.

Given that all of the above discrepancies and changes have logical explanations and that it

[18] More concretely, they requested that they wanted to be able to easily move between the two sides of the river.

[19] These residents were relocated to Kasadyahan area which had been developed by the National Housing Authority (NHA) prior to the commencement of the project.

can be judged that these responses were realistic in order for the project to carry on, it can be judged that the changes made to the outputs were appropriate.

3.4.2 Project Inputs

3.4.2.1 Project Cost

The total project cost was planned to be 10,448 million yen (out of which 7,248 million yen was to be funded by ODA loan), whereas in reality the project cost was 12,841 million yen (out of which 7,068 million yen was financed by ODA loan), which was slightly more than planned (123% of the plan). The cost exceeded the plan because of the following: (1) The super typhoon (Frank) which occurred in June 2008, which is said to be a 50-year return period typhoon, damaged the structures such as riverbank protection walls that were being improved at the time. As it became necessary to carry out additional construction works, the construction cost increased (roughly 2.8 billion yen more for the total construction cost); and (2) Concerning the land acquisition, as the development of economic and infrastructures advanced during the project implementation in Iloilo City and Pavia Municipality, agricultural lands were turned into commercial and residential areas, which increased the land acquisition cost[20] (roughly 1.5 billion yen more for the total land acquisition cost)[21].

3.4.2.2 Project Period

The project period was planned to be 75 months (Phase I: 14 months from September 1998 to October 1999, Phase II: 61 months from March 2002 to March 2007). In reality it was significantly delayed and took 162 months (Phase I: 40 months from September 1998 to December 2001, Phase II: 122 months from March 2002 to April 2012)[22], which was 216% of the plan. The reasons for the delay are as follows: (1) It took longer to identify and negotiate the relocation sites; (2) It took time to process the bidding on the contractor; (3) The allocation of the local currency was delayed because the Philippine government chose to tighten its fiscal policy[23]; (4) The process of land acquisition was delayed due to the prolonged negotiation with landowners; and (5) The riverbank protection slope and others were damaged by the super

[20] It is because agricultural and mixed land tends to be cheaper to acquire.
[21] The cost for this scope increased (4.3 million yen in total) while there was some reduction in cost concerning the above-mentioned cancellation of the relocation site development (although the net decrease is not unknown); and at the end the total cost is more than what was planned.
[22] It was completed in April 2012, which is when the facilities began providing services (the start of the use of the river facilities after completion of the civil works).
[23] It took significant time to obtain the approval from the National Economic and Development Authority (NEDA), for the amount exceeded the planned project cost. Especially, all budget approvals were delayed including that for ODA loan projects due to the tight fiscal policy of the Philippine government from FY2003 to FY2005.

typhoon (Frank) which occurred during the project implementation; and additional construction works were carried out. While the civil works were completed by April 2012, the contractor of Contract Package I for the main construction[24], a contractor of the project has not handed over the improved facilities to DPWH at the time of ex-post evaluation (March 2014). Currently, the contractor is conducting an inspection upon facility completion and making repairs as needed. The main reason for the delay in the handover is the delay in the contractor's internal procedure.

3.4.3 Results of Calculations of Internal Rates of Return (Reference only)

Economic Internal Rate of Return (EIRR)

EIRR was recalculated based on the same condition as what was applied at the time of the appraisal by considering the reduction of the amount of damages in 20-year return period or smaller floods near Iloilo River and Jaro River as a benefit, considering the construction cost for the river improvement and floodway and the increase in the maintenance cost attributed to the project as costs, and assuming a project life of 50 years. The recalculated EIRR is 19.1%, which is slightly lower than 22.8% at the time of the appraisal. The main reasons are as follows: (1) Additional construction became necessary because some damages were made by the typhoon during the project implementation, which increased the construction cost; and (2) the DPWH promised to allocate 50 million peso yearly for the operation and maintenance starting from 2014, which is more than what was presumed in the EIRR calculation at the time of the appraisal (roughly 9.5 million peso).

Both project cost and project period significantly exceeded the plan. Therefore efficiency of the project is low.

3.5 Sustainability (Rating: ③)

3.5.1 Institutional Aspects of Operation and Maintenance

The institutional setup for the operation and maintenance of the project as well as roles and responsibilities are described below.

1) <u>The Regional Office VI:</u> The Maintenance Management Department of the Regional Office VI is responsible for the patrolling and inspection of the main river facilities developed by the project (Jaro floodway, riverbank protection walls, drainages, etc.) as well as for the operation and maintenance of the vehicles and heavy machinery owned by the office. On

[24] Mainly these are improvements of Aganan River and Tigum River.

the other hand, it is the Planning Management Department that is responsible for contracting local companies for the supervision and monitoring of the cleaning and repairs of the river facilities, dredging and disposal of soil wastes (silt, etc.).

2) Iloilo City Government: The office is responsible for activities related to social considerations (non-structural measures) associated with the project (managing and cleaning the promenades and MRF near the river facilities, controlling the illegal settlers near the facilities, etc.).
3) Pavia Municipality: The office will be responsible for the maintenance of the drainage facilities constructed by the project, for the maintenance of the access roads along Tigum and Aganan Rivers as well as for the cutting of trees near the river facilities[25].

There are eight staff members at the Maintenance Management Department of the Regional Office VI. According to the Regional Office VI, the staffing level is sufficient to conduct the patrolling/inspection of the river facilities. There are three staff members who supervise and monitor local companies contracted for the maintenance works; and according to them there is no problem in terms of the institutional aspects.

At the time of the appraisal of the project, it was expected that Iloilo City Government would also be responsible for maintaining the improved river facilities after completion. However, as described in 2) above, the city government is only conducting activities related to social considerations (non-structural measures) at the time of ex-post evaluation[26]. Given such a situation, the Regional Office VI would be mainly responsible for the maintenance of the improved river facilities, according to DPWH headquarters and the Regional Office VI.

In addition, it is expected that Pavia Municipality will be responsible for the maintenance of drainage facilities and access roads. However, as discussed above in "3.4.2.2 Project Period" under Efficiency, the facilities have not been handed over by the contractor of Contract Package I to DPWH. Therefore, no actual work has been done though the municipality has the intention of taking charge of the maintenance work[27]. Until the facilities are handed over, the contractor is responsible for maintaining the river facilities in the areas under this package.

As discussed above, the operation and maintenance of the project is being carried out

[25] As it will be discussed below, it is expected to begin after the handover of the facilities under Contract Package I.
[26] At the time of ex-post evaluation, DPWH signed a Minutes of Agreement (MOA) with the city government, which said that the city government would only be in charge of the matters related to social considerations (non-structural measures) for the time being. It was not possible to obtain details on staff assignment.
[27] DPWH and Pavia Municipality plan to sign a MOA concerning maintenance work following the completion of the handover. The number of maintenance staff at Pavia Municipality is not known at this point because the maintenance work is expected to begin in the future (as it will also be explained below).

differently from what was initially expected at the time of the project appraisal in that Iloilo City Government is only conducting activities related to social considerations (non-structural measures) for the time being. Nevertheless, the Regional Office VI is taking the initiative in maintaining the facilities for the meantime, and there are no concerns about the institutional aspects. On the other hand, Pavia Municipality intends to duly conduct the maintenance work once Contract Package I is handed over[28]. Therefore, it can be presumed that there are no major concerns about the institutional aspects of the operation and maintenance of the project.

3.5.2 Technical Aspects of Operation and Maintenance

Similarly to the above-mentioned institutional aspects, the technical aspects of the operation and maintenance were evaluated by reviewing the works of the Regional Office VI. The staff members of the Maintenance Management Department have sufficient work experience and long years of service. When staff is newly recruited, On-the-Job Training (OJT) is provided for 2-3 months. Newly recruited staff members were briefed by the contractors and learned how to use equipment/machines such as heavy machinery during the project implementation. In addition, companies contracted for the removal of soil wastes (e.g., silt) have sufficient technical standards because their technical standards are evaluated during the competitive tendering process. The Planning and Design Department, which supervises and monitors contractors, have staff with ample work experience. Judging from the above facts, there are no major concerns about the technical aspects of the operation and maintenance of the Regional Office VI, an office currently responsible for the operation and maintenance.

According to the interview with Pavia Municipal Government, which will be responsible for the maintenance of the facilities after the handover of the above-mentioned Contract Package I, they commented, “We do not have any concrete operational and maintenance implementation plan because we are still waiting for the handover of Contract Package I facilities; therefore, we cannot plan for staff assignment or training at this point. However, once the handover is completed, we will plan and implement training for staff members.” Additionally, it was observed through interviews that the management and staff members of the municipality were fully aware of the importance of the maintenance work and they have knowledge and abilities to carry out the required tasks.

3.5.3 Financial Aspects of Operation and Maintenance

[28] It is anticipated that Pavia Municipality may encounter some challenges in carrying out the maintenance work at the initial stage. It is thought necessary that the Regional Office VI share the knowledge and experience, thereby follow up on their work as needed for some period of time.

Table 6 shows the operation and maintenance budget of the Regional Office VI concerning the project. It has been allocated since 2013. This is because one of the contractors, China International Water & Electric Corporation, was responsible for repairing the facilities from 2011 to 2012 (guarantee period), while the main construction work of Contract Package II[29] was completed in 2010. The 6th Regional Office thus began allocating the operation and maintenance budget and started their work in 2013. On the other hand, concerning Contract Package I, the facilities have not been handed over as discussed earlier; thus the contractor remains responsible for the management and repairs of the improved river facilities at the time of ex-post evaluation[30]. According to the interviews with DPWH headquarters, they commented, "The current budget, 50 million peso, is sufficient. On the other hand, we plan to continue allocating sufficient operation and maintenance budget in the future. We will at least allocate the same amount as the previous year in 2015 onward. Additionally, we are providing 150 million peso for the improvement of the river facilities (outside the project area) apart from the regular budget in 2014." Therefore, it can be said that there are no concerns about the budget allocation in terms of its amount or timing[31].

Table 6: Operation and Maintenance Budget for the Project

(Unit: peso)

	2011	2012	2013	2014
Operation and Maintenance Budget	N/A	N/A	10 million	50 million

Source: Answers to the questionnaire

3.5.4 Current Status of Operation and Maintenance

At the time of ex-post evaluation, there are no problems with the status of the operation and maintenance carried out by the Regional Office VI and the contracted companies. The 6th Regional Office develops the operation and maintenance plan, and the operation and maintenance works are carried out based on the plan[32]. As a periodic maintenance, the Regional Office VI uses speed boats to monitor Jaro floodway on a monthly basis, based on

[29] Mainly these are improvement works for Iloilo River and Jaro floodway.
[30] Thus the operation and maintenance budget shown in Table 5 corresponds to the improvement of Iloilo River and construction of Jaro floodway.
[31] According to the interviews with Pavia Municipality which will maintain the river facilities after the handover of Contract Package I, they commented, "We will immediately secure and allocate operation and maintenance budget including training budget following the completion of the handover." Based on such a comment, it can be presumed that there are no major concerns about operation and maintenance budget of the municipal government.
[32] There is no fuel or spare parts shortage concerning the vehicles and heavy machinery owned by the Maintenance Management Department of the 6th Regional Office. The heavy machinery is supposed to be inspected every 250 used hours, and in case there is any problem it will be addressed immediately. From the interviews it was observed that they had sufficient technical skills within the organization.

which the contracted company will do the repairs as needed. The cleaning of the riverbank protection concrete walls and river facilities, the removal of soil wastes (silt) and the cutting of trees around the rivers are being conducted periodically. Through the field study and interviews, no problems were observed in the status of the operation and maintenance.

No major problems have been observed in the institutional, technical and financial aspects of the operation and maintenance system. Therefore sustainability of the project effect is high.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

The project implemented rive improvement works (Iloilo River, Jaro River, Aganan River, Tigum River and Upper Ingore Creek) in Iloilo City and Pavia Municipality, Panay, Visayas, in the central Philippines, with the aim of mitigating flood disasters. At the time of the appraisal and ex-post evaluation, the project is consistent with the country's development policy concerning flood control and disaster mitigation. It is also consistent with development needs such as flood control infrastructure development. Thus, the relevance of the project is high. With river improvement works implemented through the project, initial targets were achieved in terms of discharge capacity and it became possible to respond to a 20-year return period flood. Since the completion of the project, no water overflow or flood has occurred due to heavy rain or typhoons, with no financial damage or damage to households. In addition, according to beneficiary survey results, improvements have been observed in terms of health, sanitation and living environment as a result of the reduction in flood disasters. Thus, the effectiveness and impact of the project is high. However, the project costs and project period significantly exceeded the project's initial plan; thus, efficiency is low. On the other hand, no major problems have been observed in terms of the institutional, technical and financial aspects of the operation and maintenance carried out by the executing agency; thus, project sustainability is high.

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

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

- At the time of ex-post evaluation, the Regional Office VI was not measuring data concerning maximum water levels during heavy rains and typhoons. As the data regarding maximum water levels during floods is essential for the analysis of project effects and

proper river management, it is recommended that an institutional system be established as soon as possible so that such data collection can be measured.

- At the time of ex-post evaluation, according to DPWH, the handover of Contract Package I of the project had not been completed due to the prolonged internal process of the contractor. While DPWH headquarters and the Regional Office VI had already requested the contractor to expedite the process, it is recommended that they continue pressing for prompt completion so that Pavia Municipality can commence operation and maintenance works as soon as possible.

4.2.2 Recommendations to JICA

- Concerning the facilities under Contract Package I, it is recommended that the JICA Philippines Office also follow the status through DPWH, monitor progress following the handover and pay attention to the institutional aspects of the operation and its maintenance. In case there are any concerns, it is recommended that JICA communicate with the Regional Office VI and Pavia Municipality as needed.

4.3 Lessons Learned

- The necessity to clarify and document concrete maintenance responsibilities based on the initial agreement on the institutional arrangement for maintenance

At the time of the appraisal, Iloilo City Government had agreed to take charge of operation and maintenance following the project's completion. In reality, however, the city government is only conducting activities related to social considerations (non-structural measures). The 6th Regional Office and JICA regularly communicated with the city government during project implementation, checking whether the city government continued its intention of standing by the agreement and discussing issues related to the institutional aspects of the operation and maintenance, such as the division of responsibility, the ratio of budget to be borne and staff assignment among the organizations involved. However, it would have been worth clarifying the demarcation of roles among the Executing Agency and the related agencies such as LGUs, at the time of the project formation before the appraisal, including the practical and specific maintenance works and required budget, and documenting the agreement with its effectiveness and continuity, in order to ensure that the vision concerning the maintenance system was being concretely shared following the project's completion, in addition to simply relying on the fact that these aspects had previously been agreed upon. After that, it would have been worth

checking and sharing the status among the related agencies periodically.

Comparison of the Original and Actual Scope of the Project

Item	Original	Actual
1. Project Outputs	【Iloilo Flood Control Project (I)】 ■ Consulting service for the detailed design (detailed design, preparation of tender documents, a river environment improvement study and others: 193MM in total: 93MM for international consultants, 100MM for local consultants) and the cost related to the development of relocation sites 【Iloilo Flood Control Project (II)】 1) Civil Works a) River Improvement Aganan River improvement: 3.9km Tigum River improvement: 2.0km Improvement of upper Jaro River: 1.0km Improvement of the mouth of Jaro River: 5.6km Improvement of midstream of Iloilo River: 4.2km Improvement of upper Ingore creek: 3.0km & associated bridge construction: 3 bridges b) Construction of Floodway Construction of Jaro floodway: 4.8km / associated bridge construction: 3 bridges c) Development of Relocation Sites Development of relocation sites for the residents subject to resettlement: 22.5ha (So-oc: 2.5ha, San Isidro: 20ha) 2) Consulting Service ■ Component 1 (Main Tasks) a) Support for the procurement; b) Construction management; c) Operation and maintenance training for DPWH and Iloilo City Government staffs; and d) Environment management (impacts on water quality, noise, air and natural environment, environmental	【Iloilo Flood Control Project (I)】 ■ The consulting service for the detailed design was provided as planned. (305.48MM in total: 80.75MM for the international consultants, 224.73MM for the local consultants.) As for the development of the relocation sites, 2.6ha of land was developed in Buntatala, Iloilo City. 【Iloilo Flood Control Project (II)】 1) Civil Works a) River Improvement Aganan River improvement: 4.26km Tigum River improvement: as planned Improvement of upper Jaro River: as planned Improvement of the mouth of Jaro River: as planned Improvement of midstream of Iloilo River: 3.8km Improvement of upper Ingore creek: as planned & associated bridge construction: as planned b) Construction of Floodway Construction of Jaro floodway: as planned / associated bridge construction: 4 bridges c) Development of Relocation Sites Development of relocation sites for the residents subject to resettlement: 1.8ha (1.8ha was developed in So-oc only as the planned 20ha in San Isidro was canceled) 2) Consulting Service ■ Component 1 (Main Tasks) Mostly implemented as planned. (However, the actual workload was more than planned because the construction expanded in scale.)

	monitoring on excavated sediment, and support for the development and implementation of the mangrove reforestation plan, etc.) (Planned MM) 458MM (international: 171MM, local: 287MM) ■ Component 2 (Main Tasks) e) Support for the resettlement measures (including assisting the resettlement procedures, assisting the land acquisition and compensation process, assisting the monitoring to prevent resettled residents from returning to the project sites, assisting the development of livelihoods improvement program); f) Support for the advocacy works targeted at local residents (campaigns to explain the benefits of rivers to the life of the citizens, the importance of flood management, prevention of illegal waste disposal, prevention of riverside occupation by illegal settlers and maintenance of the river facilities, etc.); g) Studies on the sediment in upper Iloilo River and Jaro River and the current situation of the forest; and h) Review of the waste disposal plan of Iloilo City (Planned MM) 393MM (international: 63MM, local: 330MM)	(Actual MM) <u>610.34MM</u> (international: 188.81, local: 421.53MM) ■Component 2 (Main Tasks) The tasks listed on the left-hand column were carried out mostly as planned. (However, the task e) was scaled back.) (Actual MM) 308.45MM (international: 72.26MM, local: 236.19MM) 【Additional Output】 a) Repair work after the super typhoon in 2008 and the construction of concrete riverbank protection walls; b) 14 MRF were added (= 17 MRF in total)
2. Project Period	75 months	162 months
3. Project Cost		
Amount paid in Foreign currency	4,056 million yen	6,800 million yen
Amount paid in Local currency	6,392 million yen	6,041 million yen

Total	10,448 million yen	12,841 million yen
Japanese ODA loan portion	7,248 million yen	7,068 million yen
Exchange rate	Phase I: 1PHP = 4.0 yen (September 1998), Phase II: 1PHP = 2.3 yen (March 2002)	Phase I: 1PHP = 2.62 yen (average rate for the project period from September 1998 to December 2001), Phase II: 1PHP = 2.12 yen (average rate for the project period from March 2002 to April 2012)