# Ex-Post Project Evaluation 2014：Package IV-1

# (the Philippines)

**January 2016**


**JAPAN INTERNATIONAL COOPERATION AGENCY**

**SANSHU ENGINEERING CONSULTANT**


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Republic of the Philippines

Ex-Post Evaluation of Japanese ODA Loan Project
"Subic Bay Port Development Project"

External Evaluator: Yasuhiro Kawabata,
Sanshu Engineering Consultant

## 0. Summary

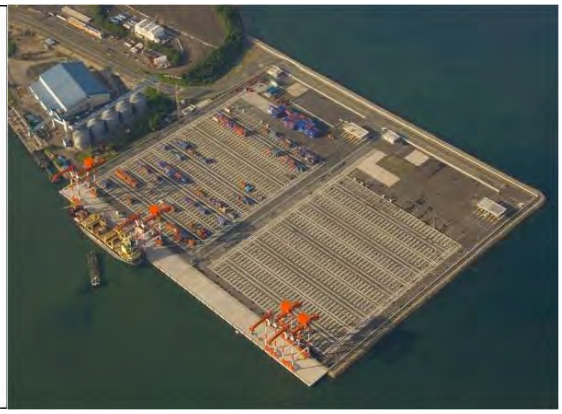
The objective of the project was to increase cargo handling capacity for the Subic Port, and facilitate and promote distribution in the Central Luzon including the Subic area by constructing a new container terminal and rehabilitating existing port facilities in the Subic Bay Freeport Zone, which is located at about 80 km north-west of Metro Manila, thereby contributing to promotion of regional economic development and to alleviation of congestion at Manila Port. The project has been highly relevant to the development plans and needs of the Philippines, as well as Japan's ODA policies. However, projection of handling cargo volume at the planning stage was overestimated, and preparation of a comprehensive plan and review for organic and effective use and operation of container terminals after the project completion was not thorough. Thus, it is considered that there were some problems in planning a project and the approach to address issues. Its relevance is therefore considered fair. The project cost was lower than planned, but the project period was significantly longer than planned. Therefore, efficiency of the project is considered fair. Regarding the effectiveness, it was verified that the volume of non-container cargos handled was higher than the projected volume and thus rehabilitation of the existing port has to some extent achieved its effect. However, the actual cargo handling volume at Subic Port including that at the new container terminal in 2014 is about 77,177 TEU, which is only 10% of the projected volume. As for qualitative effects by the project, promotion of smooth and efficient logistic systems and contribution to development of regional economy were anticipated. However, the executing agency considers that appearance of expected qualitative effects by the project is limited at the ex-post evaluation stage, since the actual handling volume of container cargo is much lower than projected. With respect to impact of the project, since the number of container ships which call at Subic Port is much lower, resulting in much fewer cargo handling volume at the container terminals, increase of employment opportunities has not taken place. Thus, contribution to the development of regional economies is limited. The project has achieved its objectives at a limited level. Therefore, effectiveness and impact of the project are low. No major problems have been observed in the institutional and technical aspects of the operation and maintenance of facilities and equipment constructed/installed/procured under the project. Currently, there are also no problems in the operation and maintenance system. However, some minor problems have

been observed in terms of financial status. Therefore, sustainability of the project effects is fair.

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

## 1. Project Description


Project Location



Subic Bay Port Container Terminal

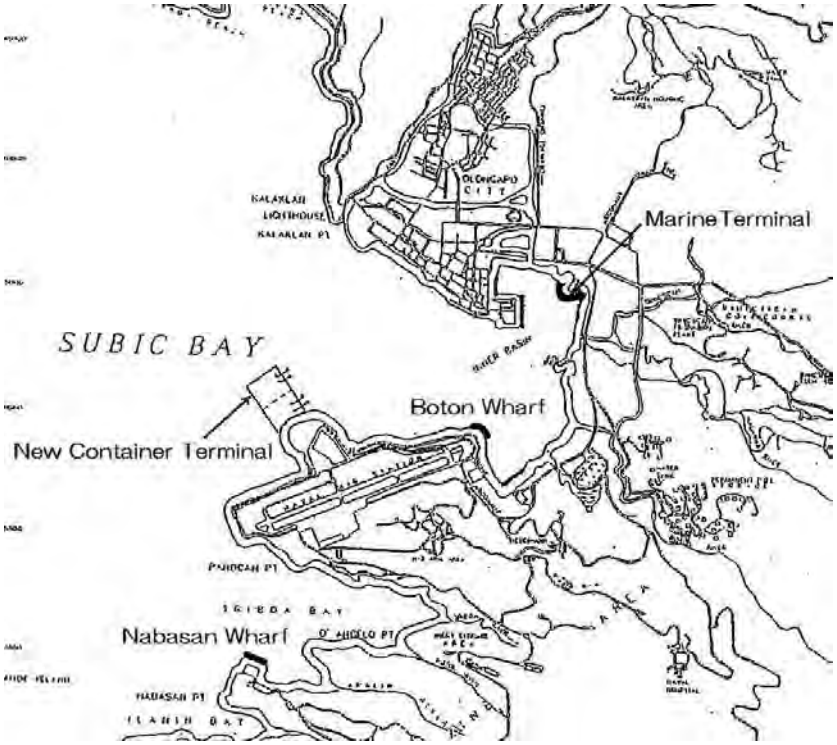
### 1.1 Background

With its distinctive geographical character of an archipelago consisting of more than 7,000 islands, the Philippines relied heavily on maritime transportation in its economy and society so that improvement of port facilities was essential to expedite smooth maritime distribution at the appraisal stage. Development and improvement of port facilities had not been appropriately undertaken even though the cargo volume handled at ports had been increased due to economic development and internationalization of the Philippines. Thus, congestion was common at all the main ports. Increase in handling load at Manila Port was especially pronounced due to economic activities concentrating in the Metro Manila area. Decongestion at major ports including Manila Port and expansion of container cargo handling facilities were considered urgently addressed issues in order to maintain sustainable economic growth in the Philippines. Thus, the Philippine government had promoted port development projects. However, investment had concentrated in Manila Port, which is a core port for cargo handling. Under the circumstances, it was considered essential to develop local main ports in order to promote dispersing handling cargo to each regional center and develop ports, which can serve as a supplemental and alternative port for Manila Port such as Batangas Port, located in the south of Manila Capital Region and Subic Port in the north.

### 1.2 Project Outline

The objective of the project was to increase cargo handling capacity for the Subic Port, and facilitate and promote distribution in the Central Luzon including the Subic area by constructing a new container terminal and rehabilitating existing port facilities in the Subic

Bay Freeport Zone, which is located at about 80 km north-west of Metro Manila, thereby contributing to promotion of regional economic development and to alleviation of congestion at Manila Port. The location of the project site is shown in Figure 1.




Source: JICA document

Figure 1 Location of Project Site

| | |
|---|---|
| Loan Approved Amount/ Disbursed Amount | 16,450 million yen/15,683 million yen |
| Exchange of Notes Date/ Loan Agreement Signing Date | August 2000/August 2000 |
| Terms and Conditions | For civil work: Interest Rate: 0.95%,<br>Repayment Period: 40 years (Grace Period: 10 years)<br>Conditions for Procurement: Tied (Special ODA Loan)<br>For consulting services: Interest Rate: 0.75%<br>Repayment Period: 40 years (Grace Period: 10 years)<br>Conditions for Procurement: Bilateral tied |
| Borrower / Executing Agency(ies) | Subic Bay Metropolitan Authority (SBMA) |
| Final Disbursement Date | December 2010 (originally December 2009) |

| | |
|---|---|
| Main Contractor (Over 1 billion yen) | Shimizu Corporation (Japan)/Penta Ocean Construction Corp.(Japan)/Toa Corporation (Japan) (JV) |
| Main Consultant (Over 100 million yen) | Overseas Coastal Area Development Institute (Japan) /Oriental Consultants Co. (Japan)/Basic Technology and Management Corporation (Philippines) /DCCD Engineering Corporation (Philippines) /Environmental Counselors, Inc.(Philippines) (JV) |
| Feasibility Studies, etc. | Master Plan (JICA: Development Study, August 1999)<br>Feasibility Study (JICA: Development Study, August 1999) |
| Related Projects | Yen Loan Projects:<br>・Batangas Port Development Project (II) (L/A signed in September 1998)<br>・Subic-Clark-Tarlac Expressway Project (L/A signed in August 2000)<br>・Central Luzon Link Expressway Project (L/A signed in March 2012) |

## 2. Outline of the Evaluation Study

### 2.1 External Evaluator

Yasuhiro Kawabata, Sanshu Engineering Consultant

### 2.2 Duration of Evaluation Study

Duration of the Study: November 2014 – October 2015
Duration of the Field Study: January 4 – 21, 2015, March 25 – April 11, 2015

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

### 3.1 Relevance (Rating: ②[2])

#### 3.1.1 Relevance to the Development Plan of the Philippines

The development objective of the transport sector in "the Mid-Term Development Plan 1999-2004" was to support the social-economic development in the Philippines by providing the safe and reliable transport services. In order to achieve the objective, the following strategies were established: 1) reduction of government's involvement in the transport infrastructure development and promotion of the private sector participation; 2) enhancement of quality of existing infrastructure by appropriate rehabilitation and maintenance management; 3) introduction of the appropriate legal framework and price

[1] A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory
[2] ③: High, ② Fair, ① Low

policy to foster the competitive market, and others. Regarding the subject project, the government identified it as the transport network development project in the bases conversion and development program, which aimed at the socio-economic development in the central Luzon region[3].

Under the current "Mid-Term Development Plan 2011-2016", the following agendas are to be addressed in order to achieve the inclusive growth: good governance, promotion of investment, infrastructure development by the PPP scheme, social security reforms, enhancement of tax collection capacity, peace building/national security and others. In "Chapter 5: Accelerating Infrastructure Development" of the Development Plan, it is stated that seamless multimodal transport networks and logistics systems are needed in order to promote productivity and trade competitiveness. Particularly, the Subic-Clark-Manila-Batangas (SCMB) Corridor, where the project is located, accounts for two-third of the country's GDP, and is considered an important region. The Clark-Subic Region has also been envisioned as the best international service and logistics hub in the Southeastern Asia.

As mentioned above, at appraisal and at ex-post evaluation, the implementation of the project conforms to the development policies of the Philippine Government.

3.1.2 Relevance to the Development Needs of the Philippines

The project site, Subic Port was designated as "Subic Bay Freeport Zone" in 1992 after the US Navy withdrew the Subic Base. Since then, the handling volume of cargo and container cargo at Subic Port has rapidly increased. However, since operation of Subic Port had been undertaken by only the facilities which US Navy left, the handling volume of cargo already exceeded the handling capacity as of 2000. Thus, Subic Port could not handle non-container/container cargoes originated at Subic Port and surrounded areas including Bataan Industrial Park, Clark Industrial Park and Luisita Industrial Park. In order to respond to the situation, construction of a container terminal and rehabilitation/expansion of existing facilities were considered essential in order to make increasing logistics smooth and promote trade. At the appraisal stage, the burden of Manila Port was notable (handled 76.4% of trade cargo, 39.2% of total cargo and 68.8% of container cargo as of 1998), thus implementation of the project was needed in order to prepare an alternative port for Manila Port as well. At the appraisal stage, it was considered that Manila Port was already heavily congested and that further expansion of Manila Port was not feasible.

Around the Subic area, the Central Luzon Regional Growth Hub including above mentioned three industrial parks is located. It is more convenient to transport and ship the

[3] Source: JICA documents

cargo originated at the growth hub from Subic Port, which has more advantage in terms of travel distance compared with that to/from Manila Port. Thus, even at the post evaluation stage, the development need of the Subic Port is high. However, the type and volume of cargo (products and commercial goods) originated at the growth hub have not necessarily reached the level to which the container terminal of Subic Port is effectively utilized. In addition, no regular navigational routes connecting with major foreign cities including those in Japan had not been established yet and this was considered disadvantage. (In Autumn 2014, the regular service connecting with Shanghai, Hakata, Pusan and Xiamen was open.)

However, Subic Port has recently functioned as an alternative and supplemental port for Manila port. In order to alleviate congestion at Manila Port, where congestion is particularly heavier (the average demurrage time was 5 to 7 days as of 2014), the Philippine Government issued an Executive Order (EO) in September, cognizant of the fact that congestion around Manila Port and the vicinity impedes economic activities not only in Manila Capital Region, but also the other regions in the country, and exerts adverse impact to Philippine economy. According to the EO, when Manila Port is congested and/or in an emergency situation, Subic Port together with Batangas Port are to function as an alternative port for Manila Port. In fact, since congestion at Manila Port has been worsened, the number of ships which make a call at Subic Port increased in 2014.

The handling volume of container cargo at Manila Port is shown in Table 1.

Table 1　Handling Volume of Container Cargo at Manila Port

Unit: 1000 TEUs

| Port | 2000 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|
| North Harbor Port | - | 554 | 772 | 866 | 895 | 1,032 |
| South Harbor Port | 577 | 988 | 977 | 1,014 | 983 | 762 |
| Manila International Container Terminal (MICT) | 951 | 1,613 | 1,713 | 1,827 | 1,901 | 1,877 |
| Total | 1,528 | 3,155 | 3,462 | 3,707 | 3,779 | 3,671 |

Source: Philippine Ports Authority：Annual Reports 2010-2013, Ports Statistics, Port Expert Report

Note 1: TEU (twenty-foot equivalent unit)

Seaport Department Management Office

Access Road

As stated in 3.1.2, at the appraisal time, the handling volume of cargo at Subic Port had already exceeded the handling capacity. At the Ex-post evaluation stage, Subic Port handles non-container cargo and container cargo which are originated at the port surrounding areas, and serve as an extension port for Manila Port. The project conforms to the development needs.

### 3.1.3 Relevance to Japan's ODA Policy

Under "the Medium-Term Strategy for Overseas Economic Cooperation Operations" (issued in December 1999), which was effective at the appraisal stage, the assistance to the following agendas was listed as the priority agenda for the Philippines: strengthening of economic structure for the sustainable growth and overcoming factors, which constrain growth, poverty alleviation and correction of disparity among regions, assistance to environmental protection measures including disaster prevention, and development of human resources and institutional reforms. As the JICA's policy at the appraisal stage, it planned to assist the development of the economic infrastructure including the transport sector in order to ensure the sustainable economic growth, and to resolve the bottleneck for economic development[4].

### 3.1.4 Appropriateness of Project Planning and Approach

As discussed later, the number of container ships which call at Subic Port is much less than expected (2,591 ships in 2014) after the project was completed. The actual handling volume of container cargo as of 2014 is only about 10% of the projected volume. According to JICA documents, it was noted: i) at the appraisal stage, Manila Port had been congested. Thus, development of ports, which could be an alternative and supplemental port for Manila

[4] Source: JICA documents

Port was essential since further expansion of Manila Port was considered difficult.; and ii) the project objective was also to contribute to alleviation of congestion at Manila Port. However, expansion of Manila Port was actually possible, and at Manila International Container Terminal, Berth No. 6 was constructed during the project implementation and moreover construction of additional Berth No. 7 was planned (both Berth 6 and 7 have been constructed as of reporting date). Even at Manila South Port, reconstruction/conversion of the existing No. 9 Pier to a container terminal was planned (reconstruction/conversion has been done as of reporting date). These facts reveal that definite plans and strategies which address and aim at alleviation of traffic congestion around Manila Port area by organically and effectively operating three ports around Manila Capital Region including Manila Port, Batangas Port and Subic Port had not been established.

Critical issues at the project planning stage are: 1) Preparation of a comprehensive plan for organically and effectively operating three ports including Manila Port, Batangas Port and Subic Port, which are located in the Manila Capital Region was lacking. A comprehensive plan should have been prepared together with the physical development of port infrastructure (hardware) and 2) Even though the potential demand was anticipated around the Subic Port, not only development of port facilities but also attraction and promotion activities to the brokers/custom agents, shipping lines, container transporters, warehouse/storage operators and other relevant business sectors are essential. Moreover, various incentives/preferential treatment including reduction/exemption of taxes, lowering charges and tolls, simplification of examination documents, reduction of process time were to be introduced. However, efforts to address and monitor these agendas were considered insufficient.

Accordingly, the project has been highly relevant with the Philippine development plan and needs, as well as Japan's ODA policies. However, projection of handling cargo volume at the planning stage was overestimated, and preparation of a comprehensive plan and review for organic and effective use and operation of container terminals after the project completion was not thorough. Thus, it is considered that there were some problems in planning of a project and the approach to address issues. Its relevance is therefore considered fair.

### 3.2 Efficiency (Rating: ②)

#### 3.2.1 Project Outputs

The original and actual output of the project is shown in Table 2.

Table 2　Output (Planned and Actual)

| | Project Scope at Appraisal Stage | Project Scope at Project Completion |
|---|---|---|
| Civil Work | i) Construction of a new container terminal<br>・construction of container berths (2 berths) length 560m<br>・construction of container yard (about 30 ha)<br>・construction of an access road (a 3.6km 4-lane road)<br>・construction of buildings (a management office, 2 gates, 2 substations)<br>・construction of navigation aid facilities (27 buoys, a lighting beacon, a radar system)<br>・construction of ancillary facilities (fire extinguishing, water supply, power supply)<br>ii) Rehabilitation of existing port facilities<br>・Improvement of piers (expansion of piers), and dredging | i) Construction of a new container terminal<br>・construction of container berths (2 berths) as planned<br>・construction of container yard (about 30 ha) as planned<br>・construction of an access road (a 3.1km 4-lane road) almost as planned<br>・construction of buildings (a management office, 2 gates, substations (a main and 2 substations), a warehouse) almost as planned<br>・construction of navigation aid facilities (21 buoys, 2 lighting beacons, a radar system, a range light) almost as planned<br>・construction of ancillary facilities (fire extinguishing, water supply, power supply, a closed circuit TV) almost as planned<br>ii) Rehabilitation of existing port facilities<br>・Improvement of piers (rehabilitation of Marine Terminal, Boton Wharf and Nabasan Wharf and repair/replacement of existing pier fixtures) almost as planned |
| Procurement of major equipment and goods | ・gantry cranes (41ton class x 4 units) for a new container terminal<br>・a tugboat<br>・an environmental monitoring boat<br>・speed boats (5 units) | ・gantry cranes (41ton class x 4 units) as planned<br>・a marine garbage collector<br>・an oil skimmer<br>・a search and rescue boat<br>・3 multi-purpose patrol boat<br>・a line handling boat |
| Consulting services | i) Basic surveys (topographic survey, soil investigation)<br>ii) Detail designs<br>iii) Preparation of bidding documents and assistance in bidding process (for procurement of civil works and a port operator)<br>iv) Construction supervision<br>v) Implementation of an additional environmental study, and<br>vi) Monitoring of compliance of conditions stipulated in the Environment Compliance Certificate and environmental management<br><br>Foreign expert: 283 M/M<br>Local experts: 286 M/M<br>Local assistants: - M/M | as planned<br><br>Foreign expert: 353 M/M<br>Local experts: 631 M/M<br>Local assistants: 988 M/M |

Source: JICA documents, Interview with the executing agency

Note 1: Originally, civil work and equipment were to be procured in one package under the International Competitive Bidding procedure. Because of application of the Special ODA Loan, bidders were tied to Japanese firms.

Civil work was completed almost as planned. Although there are some changes in bill of quantities and work items, these changes were made based on the results found during detail designs, and thus, they are considered appropriate.

Regarding procurement of equipment and goods, review on needs (type and quantities) was made during the project implementation, and some changes were made on the type and quantities. These changes were made based on the results (on needs and priority) of inventory and demand surveys during the detail designs, and they are considered appropriate.

Consulting services were undertaken as planned. However, the length of assignment was extended more than planned since the implementation period was lengthened.

Results of Responses to the Questionnaire on Application of Special ODA Loan from the Executing Agency: Regarding the terms and conditions applied to the procurement procedure and process under the Special ODA Loan, there was no particular problem. The technical level of contractors was extremely high, and the project management was satisfactory. Thus, the project was completed as planned. The technical transfer to subcontractors was also properly done.

Boats procured under the Project

Gantry Cranes

3.2.2 Project Inputs

3.2.2.1 Project Cost

The estimated project cost at appraisal was 19,353 million yen, of which the Japanese ODA loan was 16,450 million yen. The actual project cost was 18,172 million yen, of which the Japanese ODA loan was 15,683 million yen. The actual project cost was lower than planned, and is equivalent to 94% of the planned cost.

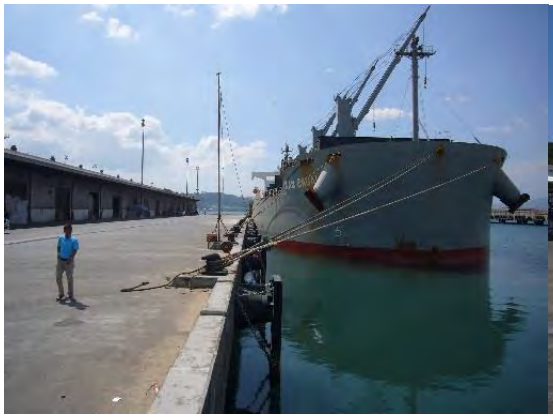
Table 3　Comparison of Project Cost (Planned and Actual)

(Unit: million yen)

| Category | Planned | | | | | Actual | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | ODA loan (foreign) | Local currency | | Total | | ODA loan (foreign) | Local currency | | Total | |
| | | Own fund | ODA loan | Total | ODA loan | | Own fund | ODA loan | Total | ODA loan |
| ・Civil Work/Procurement of equipment and goods | 9,510 | 2,117 | 4,017 | 15,644 | 13,527 | 12,200 | 2,243 | 2,019 | 16,462 | 14,219 |
| Container Terminal | 4,831 | | | | | - | - | - | - | - |
| Rehabilitation of existing facilities | 718 | | | | | - | - | - | - | - |
| Procurement of equipment | 3,458 | | | | | - | - | - | - | - |
| Price escalation | 503 | | | | | - | - | - | - | - |
| ・Physical contingency | 951 | 0 | 613 | 1,564 | 1,564 | 16 | 0 | 0 | 16 | 16 |
| ・Consulting services | 911 | 0 | 448 | 1,359 | 1,359 | 1,268 | 0 | 180 | 1,448 | 1,448 |
| ・Administration cost | 0 | 786 | 0 | 786 | 0 | 0 | 246 | 0 | 246 | 0 |
| Total | 11,372 | 2,903 | 5,078 | 19,353 | 16,450 | 13,484 | 2,489 | 2,199 | 18,172 | 15,683 |

Source: JICA documents, Interview with the executing agency, Project Completion Report
Exchange rates: at appraisal　1 US$ =110 yen,　1peso =2.8 yen
average during implementation (2001 - 2010): 1 peso = 2.12 yen
Price escalation: foreign currency1.2%/year, local currency 1.2%/year
Physical contingency: civil work 10%
Cost estimation made: January 2000
Note 1: VAT and taxes are not included since the project was implemented within the properties of SBMA, where taxes are exempted.

The reason why the actual project cost was lower than planned is due to appreciation of yen during the project implementation. (1 peso = 2.8 yen ⇒ 1 peso = 2.12 yen)　The actual project cost is equivalent to about 102% of the planned cost in local currency.



Marine Terminal

Boton Wharf

3.2.2.2 Project Period

The originally planned project period was from August 2000 (signing of the Loan Agreement) to August 2007 (civil work completion) with a total period of 85 months.

Originally, it was anticipated that a completed terminal would be sequentially open to traffic[5] without waiting for completion of all the civil work. However, the actual completion date of civil work was December 2009 with a total period of 113 months, or equivalent to 133% of the plan. Operation of a terminal, which was planned to be sequentially open to traffic without waiting for completion of all the civil work did not commence even after completion of all the civil work. The date when operation of New Container Terminal 1 (NCT1) commenced was April 2008 and that of New Container Terminal 2 (NCT2) was October 2012, and the operational dates were substantially delayed. In case the operational date for New Container Terminal 2 (October 2012) is considered to be project completion taking into consideration the time when the impact appears, the actual project period is 173% of the plan, which is significantly longer than planned.

Table 4 Comparison of Project Period (Planned and Actual)

| | Planned (at L/A signing) | Actual |
|---|---|---|
| Selection of a consultant | April 2000 – March 2001 | July 2000 – November 2000 |
| Consulting services Detail design | April 2001 – March 2002 | February 2001 – June 2002 |
| Assistance in tendering (P/Q, bidding ) | April 2002 – June 2003 | December 2001– May 2003 |
| Supervision, technical assistance | July 2003 – August 2007 | February 2001 – December 2009 |
| Civil work/procurement of equipment and goods | July 2003 – August 2007 | May 2004 – December 2009 |

Source : JICA documents, Responses to the Questionnaire

Main reasons for extension of the project period are as follows:

1) There is an absence of about one year after the bidding was completed. After opening of bids in March 2003, it took a long time to negotiate with the lowest bidder and conduct the awarding process on the result of selection within the executing agency. Signing the contract was done in March 2004.
2) The period required for civil work and procurement of equipment and goods was originally planned to be 50 months. However, the actual period spent was 68 months. Reasons for delay are variation orders made and civil work and equipment procurement as stated below, which were added/implemented due to anticipated saving in the loan amount toward the end of project completion. Main additional work and equipment procured are building a warehouse (about 10,000 $m^2$), installation of a

[5] Originally planned operation-commencing dates were May 2005 for Container Terminal 1 and August 2006 for Container Terminal 2, respectively. The actual operation-commencing dates were April 2008 for Container Terminal 1 and October 2012 for Container Terminal 2, respectively.

closed circuit television (CCTV) system, installation of a range light, and procurement of oil spill fences. These additionally procured work and equipment have supported the smooth port operation and strengthened the capacity/function for increasing handling volume of cargo. Thus, these additional work and procured equipment are considered appropriate.

The project cost was lower than planned, but the project period was significantly longer than planned. Therefore, efficiency of the project is considered fair.

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

Economic Internal Rate of Return (EIRR) and Financial Internal Rate of Return (FIRR) of the Project calculated at the appraisal stage were 25.7% and 4.5%, respectively. Regarding the EIRR and FIRR at the ex-post evaluation stage, since relevant data on costs and benefits needed to calculate the EIRR and FIRR was not provided by the executing agency, EIRR and FIRR are not recalculated.

## 3.3 Effectiveness[6] (Rating: ①)

### 3.3.1 Quantitative Effects (Operation and Effect Indicators)

In the appraisal documents, only numbers of EIRR and FIRR are shown as quantitative operational indicators. Thus, effectiveness of the project will be assessed in terms of the cargo handling volume, which is the representative indicator for port projects.

#### （1） Cargo Volume Handled (yearly)

Table 5 Cargo Volume Handled (yearly)

| Name of port | Actual | | | | | | Planned |
|---|---|---|---|---|---|---|---|
| | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2014 |
| Subic Port: ・Container cargo: TEU | 29,252 | 34,318 | 33,573 | 36,304 | 37,460 | 77,177 | 738,000 |
| ・Non-container cargo: ton | 2,214,666 | 2,244,899 | 2,593,117 | 2,214,704 | 2,404,649 | 6,083,000 | 4,730,000 |
| Manila Port: ・Container cargo: TEU | 2,874,807 | 3,154,702 | 3,461,734 | 3,706,851 | 3,778,861 | 3,490,187 | 3,671,984 |

Source: Philippine Ports Authority： Annual Reports 2010-2013 and Ports Statistics
Responses to the questionnaire, JICA documents
Note 1: TEU (twenty-foot equivalent unit): an inexact unit of cargo capacity often used to describe the capacity of container ships and container terminals.
Note 2: Planned figures were taken from the JICA documents.
Note 3: Container Terminal 1 at Subic Port was open to traffic in April 2008 and Terminal 2 in October 2012. Actual volume is the total of two terminals.
Note 4: The total container cargo handling volume at both NCT1 and NCT2 in 2014 was about 74,000TEU.
Note 5: Volume at Manila Port is a total of those at North Harbor Port, South Harbor Port and International Container Terminal.

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

According to JICA documents, projection of the handling volume of container cargo at Subic Port was made by estimating the demand in the Subic Port and the surrounding industrial parks (Clark, Luisita, and Bataan) by applying the unit volume (estimated based on the actual figure in past) to the planned area, and by adding the transshipment cargo volume, which was estimated by applying correlation with GDP. According to the projection made, the projected volume for 2007 and 2015 is 436,000 TEU and 781,000 TEU, respectively. The projected volume for 2014 estimated by prorating the projected volume for 2007 and 2015, is 738,000 TEU. Actual volume in 2014 was 77,177 TEU, which is only about 10% of the projected volume.

The reason for extremely lower actual volume compared with the projected volume is simply that the number of ships which make a call is much less. Until 2013, only two shipping lines including American President Line and Wanhai Lines operated the route connecting between Subic and Kaohsiung, Taiwan once a week each. However, carrying in and out of container cargoes at Manila Port was delayed due to enforcement of truck ban during the day time by Manila City, which enacted on February 24, 2014. (However, the truck ban was lifted on September 13, 2014.) Thus, since the operational delay (expansion of demurrage time)[7] of ship which calls Manila Port has constantly occurred, the number of ships which divert to Batangas Port and Subic Port has been increasing.

Another factor that contributes to increase of cargo handling volume can be the implementation of actions and activities for attraction and promotion, which are recommended in the Action Plan, which was prepared for aiming at promotion of utilization of Subic Port container terminals. Actions and activities recommended in the Action Plan were originally planned to be addressed and completed by 2014, and actions and activities are divided into 7 major items with further sub-items (Details are discussed in 4.2.1).

With respect to the recent situation of Subic Port, two lines including SITC Container Lines and Nippon Yusen Kaisha newly commenced a ship call once a week starting in fall 2014. Maersk Line also started a ship call (between Subic and Singapore) in January 2015. After that, Wanhai Lines and Nippon Yusen Kaisha increased the number of ship call by one each, resulting in 2 ship calls a week.

In addition, since a number of ships which make a call was much less, permanent offices of brokers/custom agents dealing with cargoes, shipping lines, container truckers, and warehouse/storage operators were not properly established in Subic. Then, it results in less number of ship calls, and this was one of the reasons for causing a vicious circle. Ultimately, increase of container ship calls at Subic Port depends on how many ships which currently loads or unloads at Manila Port divert to Subic. As the number of ships which calls at Subic

[7] Average demurrage time as of 2014 was 5 to 7 days (Source: Report of Philippines Chamber of Commerce)

Port increases, these relevant enterprises/entities would establish an permanent office, and loading/unloading of cargoes, custom clearance process, and transport by trucks will be done more smoothly which will lead to more ship calls at Subic.

Regarding projection of non-container cargos to be handled, the volume was estimated by category of cargo by applying correlation with GDP. According to the projection results, the projected volume for 2007 and 2015 is 2,912,000 tons and 4,990,000 tons, respectively. The projected volume for 2014 estimated by prorating the projected volume for 2007 and 2015, is 4,730,000 tons. Actual volume in 2014 is about 6,083,000 ton, which is 129% of the projected volume. The reason for substantial increase in 2014 is considered that the ship waiting for unloading/loading at Manila Port diverted to Subic Port. Non-container cargos handled at Subic Port are mainly fertilizer, grains, and used construction machines. The transporting vessels are smaller compared with the container ship and unloaded cargos can be transported by normal large trucks so that diverting call to Subic Port from Manila Port is easier.

### 3.3.2 Qualitative Effects

At the appraisal stage, the following two items were considered as qualitative effects by the project: i) promotion of smooth and efficient logistics systems and ii) contribution to development of regional economy. However, the executing agency considers that appearance of expected qualitative effects by the project is limited at the ex-post evaluation stage, since the actual handling volume of container cargoes is much lower than projected (10% of the planned volume).

In order to verify the qualitative effects by the project (promotion of smooth and efficient logistics systems, development of regional economy), the beneficiary survey [8] was undertaken as shown below.

Results of Beneficiary Survey:

(1) Making Logistics Systems Smooth/Promotion of Efficiency

1) Increase of Ships which call at Subic Port

[8] Number of samples: total 100 (the project target site: Subic Bay Freeport Zone); drivers (28%), government employees (26%), private company employees (12%), college students (9%), housewives (8%), employees of transporting firms (7%), self-employed (5%), others (5%); male (74%), female (26%); method: interview with a Questionnaire

Table 6　Increase of Ships which call at Subic Port

| Level of Increase | Rate cognized (%) |
|---|---|
| Substantially | 17 |
| Fairly | 64 |
| A little bit | 16 |
| No change | 3 |
| Total | 100 |

About 97% of respondents of the beneficiary surveys in the project target areas cognize that the number of ship call to Subic Port has increased compared with that before the project, even though the degree of cognition varies within the group.

2）Increase of Traffic Volume (Large Cargo Trucks)

Table 7　Increase of Traffic Volume (Large Cargo Trucks)

| Level of Increase | Rate cognized (%) |
|---|---|
| Substantially | 26 |
| Fairly | 56 |
| A little bit | 15 |
| No change | 3 |
| Total | 100 |

About 97% of respondents of the beneficiary surveys cognize that the number of traffic volume (large cargo trucks) has increased compared with that before the project, among which 26% consider that the increase is “substantial”.

(2) Development of Regional Economy

1) Activation of Regional Economic Activities

Table 8　Activation of Regional Economic Activities

| Level of Activation | Rate cognized (%) |
|---|---|
| More than 51% | 14 |
| 41 - 50% | 14 |
| 31 - 40% | 17 |
| 21 - 30% | 24 |
| 11 - 20% | 26 |
| 1 - 10% | 1 |
| No change | 4 |
| Total | 100 |

About 96% of respondents of the beneficiary surveys cognize that the regional economic activities have been activated compared with those before the project. It may be due to the fact that the number of ship calls and traffic volume (large cargo trucks)

fairly increased particularly in 2014. Fourteen percent of respondents cognize that the level of activation generated is more than 50%.

2) Increase of Business Chances

Table 9 Increase of Business Chances

| Level of Increase | Rate cognized (%) |
|---|---|
| More than 51% | 11 |
| 41 - 50% | 14 |
| 31 - 40% | 14 |
| 21 - 30% | 10 |
| 11 - 20% | 16 |
| 1 - 10% | 29 |
| No change | 8 |
| Total | 100 |

Note: Business chances mean particularly those of local shops and restaurants

Regarding increase of business chances, about 37% of respondents of the beneficiary surveys cognize that the level of increase is less than 10% or no change. Persons who recognize that the level of increase is lower compared with recognition on activation of regional economic activities are mostly those running local shops and restaurants, and it seems that they cannot yet cognize the benefits to the local economy.

### 3.4 Impact

#### 3.4.1 Intended Impacts

The anticipated impact by implementation of the project was contribution to the development to the regional economy. However, as mentioned above, since the number of container ships which call at Subic Port is much lower than expected resulting in much fewer cargo handling volume at the container terminals, increase of employment opportunities has not occurred. Thus, contribution to the development of regional economies is limited. Transition of number of employees for the past 5 years in Subic Bay Freeport Zone is shown in Table 10.

Table 10 Number of Workers in Subic Bay Freeport Zone for the past 5 years

(Unit: persons)

| | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|
| Number of workers | 87,200 | 88,500 | 89,000 | 89,100 | 89,600 |

Source: Responses to the Questionnaire

The number of workers in Subic Bay Freeport Zone has slightly increased (3%) for the

past 5 years. Examining the increase by type of job, no major difference is observed in the transition of increase. Thus, contribution of the project to increase of the number of workers is considered to be limited.

Transition in the number of new employees in Subic Bay Freeport Zone for the past 5 years is shown in Table 11.

Table 11 Transition in the number of new employees in Subic Bay Freeport Zone for the past 5 years

(Unit: persons)

| | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|
| Number of new employees | 35,700 | 36,800 | 36,000 | 43,700 | 36,400 |

Source: Responses to the Questionnaire

The number of new employment (jobs) in Subic Bay Freeport Zone was constantly about 36,000 persons per year for the past five years except 2012. Since the number of employees in the Zone has been almost constant for the past five years, the new employees are likely to fill of retirees. At this moment, contribution of the project to increase of employment includes employment of about 60 regular staffs at container terminal operating firms and about 30 part-time staffs who work when container ship calls at Subic Port. As the number of regular ship calls at Subic Port increases in the future, the number of employees of the terminal operating firms and those of port business relevant firms and entities (trucking companies, brokers[9], forwarders[10]) which would newly move in will also increase.

The project secondly aimed at functioning as an alternative/supplemental port for Manila Port. Since the traffic congestion around Manila Port area has been worsened, the Government has been implementing/reviewing countermeasures for improvement (including installation of truck lanes).

Regarding contribution to development of the regional economy, the beneficiary surveys reveal the following results.

1) Increase of Employment Opportunities

9 Broker: takes care of custom documentation for export/import of trade cargoes on behalf of cargo owners.

10 Forwarder: a cargo transport operator, who is responsible for transporting cargoes entrusted by a cargo owner by using other transport modes (ship, air, railway, trucks)

Table 12 Increase of Employment Opportunities in Subic Bay Freeport Zone

| Level of Increase | Rate cognized (%) |
|---|---|
| Substantially | 23 |
| Fairly | 56 |
| A little bit | 12 |
| No change | 9 |
| Total | 100 |

About 91% of respondents of the beneficiary surveys in the project target areas cognize that employment opportunities in Subic Bay Freeport Zone have increased even though the degree of cognition varies within the group.

2) Increase of Investment by Domestic and Foreign Enterprises

Table 13 Increase of Investment to Subic Bay Freeport Zone

| Level of Increase | Rate cognized (%) |
|---|---|
| Substantially | 18 |
| Fairly | 58 |
| A little bit | 17 |
| No change | 7 |
| Total | 100 |

About 93% of respondents of the beneficiary surveys cognize that the investment to Subic Bay Freeport Zone has increased compared with that before the project even though the degree of cognition varies within the group.

3) Impact on Increase of Household Income

Table 14 Impact to Increase of Household Income

| Level of Increase | Rate cognized (%) |
|---|---|
| More than 51% | 6 |
| 41 - 50% | 20 |
| 31 - 40% | 7 |
| 21 - 30% | 18 |
| 11 - 20% | 26 |
| 1 - 10% | 6 |
| No change | 17 |
| Total | 100 |

About 83% of respondents of the beneficiary surveys in the project target areas cognize that the household income has increased compared with that before the project even though the degree of cognition varies within the group. However, 17% of respondents answered that there has been “no change”.

### 3.4.2 Other Impacts

(1) Impacts on the Natural Environment

According to the "JICA Environmental Guidelines for Consideration of Safeguard Aspects under the ODA Loan Project", the project was classified as Category A[11], taking into account the project scale, and geographical features. Thus, during the feasibility study, the Environmental Impact Assessment (EIA) was conducted and an Environmental Compliance Certificate was issued by Environment Department of SBMA.

Since it was foreseen that the toxic substance would be most likely included in the dredged soils and sand, additional environmental surveys were to be implemented by a consultant during the project implementation including the following: 1) undertaking of dissolution tests on the dredged soils and sand; 2) preparation of treatment plans based on the results of dissolution tests; and preparation of an environmental monitoring program. Moreover, an independent monitoring team which included NGOs was established in order to monitor the environmental impacts by the project, and a monitoring was to be regularly undertaken.

Although the dredging work was originally included in the rehabilitation of the existing port facilities, only repair of existing piers/wharves, repair/replacement of pier ancillary fixtures and widening of piers were undertaken. However, since dredging work (about 250,000 $m^2$) was required around the construction job site for a container terminal, an additional environmental survey was conducted. The survey results revealed no hazardous materials. The site for a container terminal was constructed by reclaiming (about 2 million $m^3$) by using borrow materials taken from Maritan Hills close to the project site. During the project implementation, an independent monitoring team which consists of Department of Environment and Natural Resources (DENR), SBMA and NGOs was established in order to monitor the environmental impacts, and a monitoring on soils and air/water quality was regularly undertaken. No major problem has been reported. During the operational stage after the project was completed, private port operation firms have examined and inspected changes of air/water quality and status of treatment of solid wastes, and they summarize the results of examination and inspection for a report to be quarterly submitted to SBMA. Currently, SBMA continues an environmental monitoring, and it reports that there is no major problem in the environmental issues.

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[11] Category A is applied to the project which can cause seriously unfavorable impacts on the environment and community).

(2) Land Acquisition and Resettlement

The project scope included rehabilitation of existing port facilities and construction of a new container terminal. Since all the new construction work was implemented within the properties owned by SBMA, land acquisition and resettlement have not occurred.

(3) Other Positive and Negative Impacts

None.

Regarding the effectiveness, although it was verified that the volume of non-container cargos handled was higher than the projected volume and thus rehabilitation of the existing port facilities has to some extent achieved its effect, the actual cargo handling volume at Subic Port including that at the new container terminal in 2014 is about 77,177 TEU, which is only 10% of the projected volume. As qualitative effects by the project, promotion of smooth and efficient logistic systems and contribution to development of regional economy were anticipated. However, the executing agency considers that appearance of expected qualitative effects by the project is limited at the ex-post evaluation stage since the actual handling volume of container cargoes is much lower than projected. With respect to "Impact", since the number of container ships which call at Subic Port is much lower than expected, resulting in much fewer cargo handling volume at the container terminals, increase of employment opportunities has not been generated. Thus, contribution to the development of regional economies is limited.

The project has achieved its objectives at a limited level. Therefore, effectiveness and impact of the project are low.

3.5 Sustainability (Rating: ②)

3.5.1 Institutional Aspects of Operation and Maintenance

The supervisory agency of the Subic Port is Subic Bay Metropolitan Authority (SBMA), and the total number of staffs is about 3,000. The Authority consists of 26 departments and other 20 offices, and Seaport Department among them is responsible for overall operation and maintenance of Subic Port. Seaport Department consists of 4 divisions with a total staff number of about 190, and is responsible for maintenance of piers and wharves rehabilitated under the project and other piers/wharves/facilities except the new Container Terminal 1 (NCT1) and Terminal 2 (NCT2). About 5 staffs in the Seaport Department are responsible for supervision of the operating firm entrusted by SBMA.

Operation of NCT1 and NCT2, which were constructed under the project, is entrusted to the following two firms under the concession agreement. The contract period for concession is 25 years, and the operating firms pay the contract amount, which includes fixed fees, rental

costs and the variable fees corresponding to the total sales to SBMA every year.

- NCT1: Subic Bay International Terminal Corp (SBITC) （A major shareholder of SBITC is International Container Terminal Services, Inc. (ICTSI) and part of shares are owned by SBMA and private enterprises）
- NCT2 : International Container Terminal Services, Inc. Subic (ICTSI, Subic)

ICTSI, which is a parent company of SBITC and ICTSI, Subic is a terminal operator ranked within the top 5 in the World, and is entrusted to operate Manila International Container Terminal, Okinawa Naha International Container Terminal and others.

Since NCT2 has not been operational due to less cargo handling volume at Subic Port after opening in October 2012, SBITC (management level staffs belong to ICTSI) operates both terminals. SBITC consists of 62 regular staffs and about 30 part-timers who work only when container ship calls at the port under General Manager. Eleven staffs out of 62 regular staffs of SBITC are administration staffs and the remaining 51 staffs are technical staffs, who are actually in charge of operation and management of terminals. Staffs are categorized into two sectors. Thirty-eight staffs are in charge of port operations and 13 are in charge of maintenance. The current organization for operation and maintenance is appropriately established and the number of staffs assigned is likely appropriate.

### 3.5.2 Technical Aspects of Operation and Maintenance

Management level staffs such as a General Manager and four Division Chiefs of Seaport Department have college degrees and qualification required to respective positions.

Among 51 technical staffs of SBITC in charge of terminal operation and maintenance of NCT1 and NCT2, 3 manager level staffs possess college degrees and qualification as a licensed engineer. Three second level staffs (Supervisors) have not necessarily a licensed engineer qualification, but have college degrees. Thus, there is no technical issues.

Terminal operation and maintenance of NCT1 and NCT2 have been undertaken according to the operational manuals such as “Rules of Terminal” and “Maintenance Manuals for each Equipment”. Main maintenance work for civil work infrastructure and gantry cranes are implemented in the following manner.

- Civil work infrastructure: Bollards and fenders are inspected every 6 months and necessary preventive work (repainting, rust removal, and replacement) is implemented.
- Gantry cranes: Lubricated weekly. Main structures are visually inspected every month. Gear box oil is changed every six months. A structured integrated test on main structure is undertaken every five years.

Inspection results of these maintenance work are also included in a quarterly financial report, which is submitted to the company headquarters quarterly. Since the cargo handling

volume is still less and thus operating hours of cranes are extremely short. No major obstacle has been reported on operation and maintenance of equipment.

Regarding the capacity building and training for SBITC management staffs, several training programs including external (e.g. “how to manage the company”) and internal on-the job training (e.g. “maintenance of cranes”) programs are regularly undertaken. To technicians such as drivers/operators of cranes, stackers and lubber-tire gantry cranes, operational training is implemented at entry to the company, and only the operators who passed the examination are provided a license.

Since engineers and technicians with qualified technical skills are assigned to SBITC, and undertakings of training and development of manuals are properly done, no particular problem is noted. Thus, there is no technical issues to sustain the effectiveness of the project.

### 3.5.3 Financial Aspects of Operation and Maintenance

The Revenue and Expenditure of the seaport operations by SBMA is shown in Table 15.

Table 15 Revenue and Expenditure of Port Operation Business by SBMA

Unit: million peso

| | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|
| Revenue | 412 | 366 | 402 | 626 | 909 |
| Expenditure | 59 | 59 | 59 | 53 | 56 |
| Income before tax | 353 | 307 | 343 | 573 | 853 |

Source: Responses to the Questionnaire

The balance sheet of revenue and expenditure by SBMA shows a profit for the past five years (2010 – 2014) since the lower expenditure has been spent. Since the cargo handling volume was almost doubled compared with that of previous year in 2014, the profit was also increased by 50%.

The Revenue and Expenditure of SBITC, which operates NCT1 is shown in Table 16.

Table 16 Revenue and Expenditure of SBITC (on NCT 1 )

Unit: US Dollar

| | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|
| Revenue | 2,787,040 | 3,015,769 | 3,432,712 | 7,210,523 |
| Expenditure | 3,802,858 | 3,996,976 | 4,517,626 | 5,483,826 |
| Income before tax | -1,015,819 | -981,207 | -1,084,914 | 1,726,697 |

Source: Responses to the Questionnaire

The balance sheet of revenue and expenditure of SBITC, which operates NCT1 shows a loss every year since operation started in April 2008 including three years between 2011 and 2013. However, since the cargo handling volume was almost doubled compared with that of previous year in 2014, the company run a profit for the first time since operation started.

The Revenue and Expenditure of ICTSI, Subic, which operates NCT2 is shown in Table 17.

Table 17 Revenue and Expenditure of ICTSI, Subic (on NCT2)

Unit: US Dollar

| | 2012 | 2013 | 2014 |
|---|---|---|---|
| Revenue | 197,871 | 420,696 | 1,197,548 |
| Expenditure | 1,218,568 | 3,834,264 | 4,044,529 |
| Income before tax | -1,020,697 | -3,413,568 | -2,846,981 |

Source: Responses to the Questionnaire

As shown in Table 17, the balance sheet of revenue and expenditure of ICTSI, Subic, which operates NCT2 shows a loss for the past 3 years (2012 – 2014) since operation started in October 2012. The container cargo volume handled at NCT1 and NCT2 is about 74,000 TEU. Considering the handling capacity of NCT1 (300,000 TEU), NCT1 is sufficient to handle the cargo. Thus, the financial status of port operation by ICTSI, Subic will continue to be negative for a while. As mentioned above, ICTSI, which is a major shareholder of SBITC and a shareholder of ICTSI, Subic is a container terminal operator ranked within the top 5 in the world delivered profits of US$172.5 million in the 2013 balance sheet.

According to the Seaport Department of SBMA, SBITC, and ICTSI, Subic, since the facilities of piers and container terminals rehabilitated/constructed under the project are still generally new, and require less maintenance expenditures. Thus, the operation/maintenance budget is likely well secured by each entity.

As discussed above, since the container cargo handling volume at NCT1 and NCT2 is substantially lower than projected (about only 10% of the projected volume as of 2014), the container operation, which is the major project component, has run a loss. (However, NCT1 runs a profit in 2014.)

SBMA, together with terminal operators, has actively undertaken attraction/promotion activities after terminals were open to operation. SBMA projected the cargo handling volume for the next six years in March 2015. The projected volume for the year of 2015 based on the past trends is 77,755 TEU. If the on-going attraction/promotion activities were successful, the newly generated/induced volume (cargos created by newly moved in enterprises, increase of number of regular ship calls, ship calls by new shipping lines) is estimated at 42,430 TEU, and the total projected volume will be 120,095 TEU (about 15% of projected volume at the planning stage). As the waiting time for loading/unloading at Manila Port becomes longer, it is expected that the number of ships which shift from Manila Port to Subic Port would increase. However, the financial status of container terminal operation at Subic Port will still remain difficult since the future cargo handling volume projected at this moment is substantially low compared with the volume projected at the planning stage.

### 3.5.4 Current Status of Operation and Maintenance

No defects/problems have been observed on infrastructure (terminals) and gantry cranes, which were constructed or installed under the project, and these have been functioning well. Seven vessels including a marine garbage collector, which were procured for operation and maintenance of Subic Port have been well utilized.

No major problems have been observed in the institutional and technical aspects of the operation and maintenance of facilities and equipment constructed/installed/procured under the project. Currently, there are also no problems in the operation and maintenance system. However, regarding the financial aspects, the financial status of container terminal operation at Subic Port will still remain difficult for a while considering the following: 1) The balance sheet of revenue and expenditure of seaport operations on NCT1 continuously shows a loss including the period of three years (2011 - 2013) since operation started in April 2008. However, the operating company runs a profit in 2014 for the first time since operation started; and 2) the balance sheet of revenue and expenditure on NCT2 shows a loss for the past 3 years (2012 – 2014) since operation started in October 2012. As the waiting time for loading/unloading at Manila Port becomes longer, it is expected that the number of ships which shift from Manila Port to Subic Port would increase. However, the financial status of container terminal operation at Subic Port will still remain difficult since the future cargo handling volume projected at this moment is substantially low compared with the volume projected at the planning stage.

Some minor problems have been observed in terms of financial status on operation and maintenance. Therefore, sustainability of the project effects is fair.

## 4. Conclusion, Lessons Learned and Recommendations

### 4.1 Conclusion

The objective of the project was to increase cargo handling capacity for the Subic Port, and facilitate and promote distribution in the Central Luzon including the Subic area by constructing a new container terminal and rehabilitating existing port facilities in the Subic Bay Freeport Zone, which is located at about 80 km north-west of Metro Manila, thereby contributing to promotion of regional economic development and to alleviation of congestion at Manila Port. The project has been highly relevant to the development plans and needs of the Philippines, as well as Japan's ODA policies. However, projection of handling cargo volume at the planning stage was overestimated, and preparation of a comprehensive plan and review for organic and effective use and operation of container terminals after the project completion was not thorough. Thus, it is considered that there

were some problems in planning a project and the approach to address issues. Its relevance is therefore considered fair. The project cost was lower than planned, but the project period was significantly longer than planned. Therefore, efficiency of the project is considered fair. Regarding the effectiveness, it was verified that the volume of non-container cargos handled was higher than the projected volume and thus rehabilitation of the existing port has to some extent achieved its effect. However, the actual cargo handling volume at Subic Port including that at the new container terminal in 2014 is about 77,177 TEU, which is only 10% of the projected volume. As qualitative effects by the project, promotion of smooth and efficient logistic systems and contribution to development of regional economy were anticipated. However, the executing agency considers that appearance of expected qualitative effects by the project is limited at the ex-post evaluation stage, since the actual handling volume of container cargoes is much lower than projected. With respect to "impact", since the number of container ship which calls at Subic Port is much lower, resulting in much fewer cargo handling volume at the container terminals, increase of employment opportunities has not taken place. Thus, contribution to the development of regional economies is limited. The project has achieved its objectives at a limited level. Therefore, effectiveness and impact of the project are low. No major problems have been observed in the institutional and technical aspects of the operation and maintenance of facilities and equipment constructed/installed/procured under the project. Currently, there are also no problems in the operation and maintenance system. However, some minor problems have been observed in terms of financial status. Therefore, sustainability of the project effects is fair.

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

## 4.2 Recommendations

### 4.2.1 Recommendations to the Executing Agency

Since the operational status has been unsuccessful after the container terminals were completed, JICA Philippine Office conducted several technical assistance and studies[12] including studies shown in the footnote in order to promote more effective utilization, and reviewed/studied countermeasures for improvement. In these studies, discussions with a number of relevant agencies and experts including SBMA, Philippine Port Authority, container terminal operators, shipping lines and truck transporters were made and analysis of data/information was undertaken. These studies also address the current status of container terminals at Subic Port, analyze the current major problems, and derive countermeasures and improvement to be made. Particularly, the recent report involves the

[12] 1) Study on Marketing for Optimizing the Utilization of Subic Port, 2012; 2) Study to Decongest Manila and Divert Container Traffic to Subic and Batangas Ports, January 2013; and 3) Expert for SBMA in Optimizing the Use of New Container Terminal (NCT1) and NCT2 in Subic Port, September 2013.

action plan to promote more utilization of Subic Container Terminal and recommends its implementation. The Action Plan includes actions to be done by 2014, and divided into 7 major items with further sub-items:

1) improvement of proposed incentive scheme for maritime stakeholders;
2) market analysis of Northern and Central Luzon cargo flow;
3) developments on the exploration of establishing Singapore and Japan links as well as China and Hong Kong links to Subic Port;
4) review of the current import procedures in Subic Port vis-à-vis Manila and also tariff rates;
5) discussions with stakeholders on having an inland container depot that is strategically located in Pampanga[13];
6) establishment of an association among maritime logistics stakeholders in Subic;
7) facilitate the agreement between SBMA and private operators on the marketing activities.

All the items recommended in the Action Plan are in the status under either "implemented" or "on-going" or "have been implemented, but to be continued", and SBMA has been proactively engaged in the promotion and attraction activities. However, in order to achieve the targeted generated/induced volume for the next 6 years (2020 is the target year), particularly, items under the "have been implemented, but to be continued" category stated in the Action Plan need to be continuously tackled. According to the projection of cargo handling volume for the next 6 years, made by SBMA in March 2015, if the on-going attraction/promotion activities were successful, the newly generated/induced volume (cargos created by newly moved in enterprises, increase of number of regular ship calls, ship calls by new shipping lines) is estimated at 42,430 TEU.

### 4.2.2 Recommendations to JICA

As a JICA technical assistance, an "Expert for SBMA in Optimizing the Use of New Container Terminal (NCT1) and NCT2 in Subic Port," was undertaken, and a SBMA Action Plan was recommended as a part of the output. The progress status of recommended actions is under either "implemented" or "on-going" or "have been implemented but to be continued. Since the current utilization of container terminals at Subic Port is low, it is suggested that JICA regularly monitors the utilization of container terminals and the implementation status of measures to improve and attract/promote ship calls of container cargo vessels, including items included in the Action Plan.

[13] Since numerous container depots are currently located in Manila, this is considered one of factors for traffic congestion in Manila. In order to help the Subic-Clark-Manila-Batangas corridor function as an integrated one, installation of depots in the inland is considered effective.

4.3 Lessons Learned

(1) Necessity of analysis and studies on policies and plans on projects relevant to the subject project, which would be a basis of projection of effectiveness appearance of the project (demand forecast and others)

Under the above mentioned "Recommendations to the Executing Agency", the Action Plan for optimizing the use of Subic Port, which could be addressed particularly by SBMA is discussed and its follow up is recommended. However, the fundamental issue was that strategies/plans for integrating and optimizing the use of three ports (Manila, Batangas, and Subic) in the Manila Capital Region in order to alleviate congestion at Manila Port under serious congestion for a long time were not formulated at the appropriate timing. However, reality is that Manila Port and Batangas Port are under the control of Philippine Port Authority under Ministry of Transport and Communications, while SBMA is directly under the President Office, and thus the two ports were under the environment where it was difficult for two authorities to have a dialogue on check/confirmation of the division of roles between ports and collaboration on future plans for improvement/rehabilitation of port facilities.

In view of the above, in the future similar port projects, at the planning/appraisal stage, policies and plans on relevant projects (including urban development project around the project site, development projects such as industrial parks, expressway/highway projects, and port development projects) aiming at optimizing the use of the subject project after the project is completed need to be analyzed and studied in detail.

(2) Necessity of establishment of plans and strategies for demand promotion by the executing agency.

At the same time, it is recommended that establishment and undertaking of plans and strategies for demand promotion (including formulation of an action plan) to be addressed by the executing agency is included as a legal covenant in the loan agreement or other official documents. In this project, in order to attract container cargo vessels to Subic Port, the following items should have been included: a) preferential /incentive schemes for maritime stakeholders; b) a market analysis of cargo flow in the project surrounding areas; c) developments of new routes linking with major foreign cities; and d) a review of import procedures, and review of tariff rates and revision.

Comparison of the Original and Actual Scope of the Project

| Item | Original | Actual |
|---|---|---|
| 1. Output<br>1) Civil Work | i) Construction of a new container terminal<br>・construction of container berths (2 berths) length 560m<br>・construction of container yard (about 30 ha)<br>・construction of an access road (a 3.6km 4-lane road)<br>・construction of buildings (a management office, 2 gates, 2 substations)<br>・construction of navigation aid facilities (27 buoys, a lighting beacon, a radar system)<br>・construction of ancillary facilities (fire extinguishing, water supply, power supply)<br><br>ii) Rehabilitation of existing port facilities<br>・Improvement of piers (expansion of piers, and dredging) | i) Construction of a new container terminal<br>・construction of container berths (2 berths) as planned<br>・construction of container yard (about 30 ha) as planned<br>・construction of an access road (a 3.1km 4-lane road) almost as planned<br>・construction of buildings (a management office, 2 gates, substations (a main and 2 substations), a warehouse) almost as planned<br>・construction of navigation aid facilities (21 buoys, 2 lighting beacons, a radar system) almost as planned<br>・construction of ancillary facilities (fire extinguishing, water supply, power supply) as planned<br><br>ii) Rehabilitation of existing port facilities<br>・Improvement of piers (rehabilitation of Marine Terminal, Boton Wharf and Nabasan Wharf and repair/replacement of existing pier fixtures) almost as planned |
| 2) Procurement of major equipment and goods | ・gantry cranes (41ton class x 4 units) for a new container terminal<br>・a tugboat<br>・an environmental monitoring boat<br>・speed boats (5 units) | ・gantry cranes (41ton class x 4 units) as planned<br>・a marine garbage collector<br>・an oil skimmer<br>・a search and rescue boat<br>・3 multi-purpose patrol boat<br>・a line handling boat |
| 3) Consulting Services | i) Basic surveys (topographic survey, soil investigation)<br>ii) Detail designs<br>iii) Preparation of bidding documents and assistance in bidding process (for procurement of civil works and a port operator)<br>iv) Construction supervision<br>v) Implementation of an additional environmental study, and<br>vi) Monitoring of compliance of conditions stipulated in the Environment Compliance Certificate and environmental management<br><br>Foreign expert: 283 M/M<br>Local experts: 286 M/M<br>Local assistants: - M/M | as planned<br><br>Foreign expert: 353 M/M<br>Local experts: 631 M/M<br>Local assistants: 988 M/M |
| 2. Project Period | August 2000 – August 2007<br>(86 months) | August 2000 – December 2009<br>(113 months) |

| | | |
|---|---|---|
| 3.Project Cost | 11,372 million yen | 13,484 million yen |
| Amount paid in Foreign currency | 7,981 million yen | 4,608 million yen |
| Amount paid in Local currency | 19,353 million yen | 18,172 million yen |
| Total | 16,450 million yen | 15,683 million yen |
| Japanese ODA loan portion | 1 Peso ＝ 2.8 yen (as of January 2000) | 1 Peso ＝ 2.12 yen (average between 2001 and 2010) |
| Exchange rate | | |

Republic of the Philippines

Ex-Post Evaluation of Japanese ODA Loan Project
ARMM Social Fund for Peace and Development Project

External Evaluator: Yasuhiro Kawabata,
Sanshu Engineering Consultant

## 0. Summary

The objective of the project was to provide the basic social services, increase job opportunities, particularly in the agricultural and fishery industries, and promote the sustainable development through accelerating employment by implementing the local community-driven small-size infrastructure development in the Autonomous Region in Muslim Mindanao (ARMM), thereby contributing to reducing poverty. Regarding the project planning and approach for the project implementation (particularly, the methodology of project management and assurance of sustainability of the project), at the appraisal stage problems and their countermeasures to be taken when the "Community-Driven Development (CDD) approach" was adopted, needed to be examined/verified in detail. However, the project has been highly relevant with the Philippine development plan and needs, as well as Japan's ODA policies. Its relevance is therefore considered high. Regarding the efficiency, although the project cost was lower than planned, the project period significantly exceeded the plan. Therefore, efficiency of the project is fair. Regarding the effectiveness, number of beneficiaries by the project was not originally estimated at the appraisal stage under the Community Development Assistance (CDA) program, which is among two components of the project, and it was merely assumed that number of targeted barangays[1] would be 200 and that number of subprojects would be 400. Number of barangays to which assistance was actually provided under the CDA component is 358 with a total of 707 subprojects, which are both about 1.8 times of the originally planned. Thus, it is considered that number of beneficiaries by the project has substantially increased. Under another component, Strategic Regional Infrastructure (SRI) program, 31 subprojects (including sectors of transport, health, education and water/sanitation) were implemented, and the project well contributes to enhancement and improvement of the basic social services. Results of the Impact Study demonstrate that the project has provided the positive impacts (improvement or enhancement was made comparing the status before the project) to access to the educational facilities (number of nursery and elementary schools per 1,000 residents) and usage rates of toilets at the barangay level and that improvement was also observed in the various sectors/aspects including income/expenditure, road conditions,

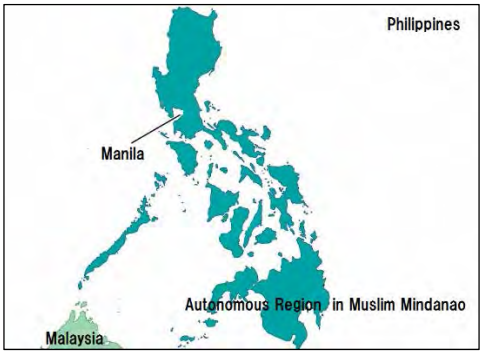
[1] Barangay is the minimum local government unit, which includes municipalities and towns.

access to markets and education/health facilities (travel time), wells/water supply system and usage ratio of toilets, security (conflict among clans), and trust to other clans and religious groups, and administrators of the central government at the household level. Number of employment created in the project targeted regions is unknown. Regarding the poverty reduction in ARMM, which was considered as a project objective (impact), since alleviation and improvement of poverty have not been quantitatively confirmed, contribution to poverty alleviation by the project is considered to be minimal. The project has to some extent achieved its objectives. Therefore, effectiveness and impact of the project are fair.

Regarding the operation and maintenance of the project, since no latest information (particularly on the amount spent for the operation and maintenance work, which is needed for examination and assessment of the financial aspects) on the CDA program, which is the main component of the project was available, it is difficult to examine the institutional, technical and financial aspects of the project. Regarding the SRI program, no problems have been observed in the institutional, technical and financial aspects. Therefore, sustainability of the project effects is fair.

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

## 1. Project Description




Project Location

Mother and Child Pavilion/Maguindanao Provincial Hospital

### 1.1 Background

Mindanao, an island in the southern Philippines is geographically close to Indonesia and Malaysia, and a number of Muslim people inhabit. It has high development potential, being endowed with abundant natural resources, vast stretches of arable land and climate suitable for farming with less typhoon attack. Between the anti-government Islamic groups/their supporting organization and the Philippine government, an armed conflict has continued for the past more than 40 years, and the security situation has been unstable. Consequently, the regional economy has been devastated and 32% of the poor households

in the Philippines reside in Mindanao. Particularly, in ARMM, which is located in the southwestern area of Mindanao and was hard-fought field, the poverty incidence among families was more than 68.8% (in 2000).

Institutional strengthening of the ARMM government as well as restoration of security, increase of income-earning opportunities, and development of economic infrastructure have been considered urgently addressed issues in order to promote the economic development in the southwestern areas of Mindanao and to enhance the living standard of inhabitants.

## 1.2 Project Outline

The objective of the project was to provide the basic social services, increase job opportunities, particularly in the agricultural and fishery industries, and promote the sustainable development through accelerating employment by implementing the local community-driven small-size infrastructure development in ARMM, thereby contributing to reducing poverty. The location of the project site is shown in Figure 1.


Figure 1 Location of Project Site

| | |
|---|---|
| Loan Approved Amount/ Disbursed Amount | 2,470 million yen/2,365 million yen |
| Exchange of Notes Date/ Loan Agreement Signing Date | March 2003/December 2003 |
| Terms and Conditions | For civil work and consulting services:<br>Interest Rate: 2.20%,<br>Repayment Period: 30 years (Grace Period: 10 years)<br>Conditions for Procurement: general untied |
| Borrower / Executing Agency(ies) | Government of the Philippines/Autonomous Region in Muslim Mindanao Social Fund Project Management Office (ARMM Social Fund PMO)/Autonomous Region in Muslim Mindanao Government |
| Final Disbursement Date | December 2012 (originally April 2011) |
| Main Contractor (Over 1 billion yen) | n/a |
| Main Consultant (Over 100 million yen) | Katahira & Engineers International (Japan) JV/Asian Consultant (Japan) /Development & Construction Center, Inc. (Philippines)/Kalasag Development Initiatives Foundation (Philippines) |
| Feasibility Studies, etc. | Feasibility Study (Philippine Government, August 2002) |
| Related Projects | Technical Assistance:<br>・ARMM Human Capacity Development Project (May 2008 - March 2013)<br>・Rice-Based Farming Technology Extension Project for the Autonomous Region in Muslim Mindanao (ARMM) (April 2012 – March 2017)<br>Other international agencies:<br>・World Bank: Special Zone of Peace and Development Social Fund Project, 1998<br>The project was cofinanced by the World Bank (WB) and Canadian International Development Agency (CIDA) |

## 2. Outline of the Evaluation Study

### 2.1 External Evaluator

Yasuhiro Kawabata, Sanshu Engineering Consultant

2.2 Duration of Evaluation Study

Duration of the Study: November 2014 – October 2015Duration of the Field Study: January 4 – 21, 2015, March 25 – April 11, 2015

2.3 Constraints during the Evaluation Study

The field study for the project was conducted by collecting data and information through analyzing responses to the questionnaire and interviews made by the local consultant, since the external evaluator could not visit ARMM and could not directly talk with the executing agency due to security reasons. Since the Project Management Office (PMO) for the project was closed by the end of May 2014[2], collection of the information was made through informal contact with the former PMO management staff by a local consultant.

## 3. Results of the Evaluation (Overall Rating: C[3])

3.1 Relevance (Rating: ③[4])

3.1.1 Relevance to the Development Plan of the Philippines

Soon after the Arroyo Administration started in January 2001, the "Mid-Term Development Plan 1999-2004" was reviewed, and a new "Mid-Term Development Plan 2001-2004" was established. Under four priority strategies (liberalization/streamlining of economy, modernization of agricultural/fishery sectors, consideration to vulnerable groups, and enhancement of political and social moral) in the Development Plan, 13 important agendas were selected: 1) stabilization of macro economy and sustainable economic development with justice; 2) creation of employment opportunities; 3) social development and human resource development; 4) protection of vulnerable groups; 5) development of agricultural and fishery industry and farming community; 6) promotion of competition of industry and services; 7) development of tourism; 8) promotion of public and private partnership; 9) dissolution of digital divide (a gap between those who have ready access to information and communication technology and those that don't); 10) correction of disparity between regions; 11) urban development; 12) security keeping/Mindanao development; and 13) improvement of governance. Regarding "12) security keeping/Mindanao development" among the agendas, needs were emphasized particularly on: i) establishment of policy framework for pursuing peace; ii) analysis of fundamental factors for conflict/obstacles for peace; and iii) establishment of strategic approach for sustainable development taking into account the forementioned two items.

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2 Source: document provided by JICA

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

4 ③: High, ② Fair, ① Low

(Source: ODA Public Relations document, ODA Individual Evaluation Reports)

Under the current “Mid-Term Development Plan 2011-2016”, the following agendas are to be addressed in order to achieve the inclusive growth: good governance, promotion of investment, infrastructure development by the PPP scheme, social security reforms, enhancement of tax collection capacity, peace building/national security and others. Regarding “peace building/national security” among the above mentioned agendas, in “Chapter 9: Peace and Security” of the Development Plan, it is stated that the government shall exert all efforts to win peace and ensure national security in order to promote national development. Of security concerns, the most pressing issue is the internal conflict in Southern Philippines, especially those with large Muslim population. In “Mindanao Strategic Development Framework (2010-2020)”, it is stated that while efforts toward resolving the conflict in Mindanao have gained initial success, the challenge now is to mobilize shared responsibilities between the government and citizenry to sustain the gains in addressing the peace situation.

At the appraisal and ex-post evaluation stages, the implementation of the project conforms to the development policies of the Philippine Government.

### 3.1.2 Relevance to the Development Needs of the Philippines

At the appraisal time, the government identified that “poverty alleviation”, “peace and security” and other agendas were national strategies, and considered that recovery of security was essential in order to promote economic development particularly in the southwestern region in Mindanao and consequently improve the living standard of people. The Poverty Incidence among Families in ARMM as of 2000 was 68.8%, and coverage of the water supply system in ARMM (1997) was 24.5%, while the national average was 65.3%.

Thus, prompt return of refugees, who evacuated from areas where the security situation had been long deteriorated due to the conflict between the government and anti-government Islam and communist groups, provision of basic social services to the poor, and increase of employment opportunities, particularly in the agricultural and fishery industries were considered essential. It is important to aim at peace in the short term and to support self-reliance of residents in the medium and long run. Thus, development of economic infrastructure focusing on the transport infrastructure for promotion of economic activities in and outside the region, and institutional strengthening/reform of the ARMM government, which is the core body for the regional development were considered issues to be urgently addressed.

At the ex-post evaluation stage, agendas to be addressed in the next three years (2013-2016) are listed in “ARMM Regional Development Plan Mid-Term Update

2013-2016":

1) Increase Poverty Incidence: According to the study made by ARMM, the Poverty Incidence in the region increased from 39.9% in 2009 to 48.7% in 2012.
2) Inadequate Infrastructure Support Facilities: Poor infrastructure affects the quality of life and often contributes to mortality and morbidity of vulnerable sectors especially women and children.
3) Inadequate Delivery of Social Services in hard to reach areas: Despite development interventions being implemented, there is still inadequate delivery of social services in far-flung areas. A number of barangays still have no Day Care Centers[5], school buildings, and Health Centers.

The project which aims at poverty alleviation by providing basic social services conforms to the development needs at the appraisal and ex-post evaluation stages.

### 3.1.3 Relevance to Japan's ODA Policy

Under "the Medium-Term Strategy for Overseas Economic Cooperation Operations" (to be applied to the period between April 2002 and March 2005), which was effective at the appraisal stage, seven sectors/fields including "more efforts to address poverty alleviation", "development of the foundation for economic growth", "assistance to environment improvement/pollution protection, and "assistance to human resource development" are listed as priority sectors/fields under the ODA loan projects, and Asia was still identified to be a priority area. Regarding "more efforts to address poverty alleviation", participation in the decision making process of the poverty groups was considered an essential factor and collaboration with NGOs needed to be made.

In the "Country Assistance Strategy for Philippines", issued in October 2002, it is stated that assistance for promotion of economic infrastructure (transport and energy sectors) development, which is a controlling factor for growth, for development of agriculture/farming villages aiming at alleviation of gaps (poverty alleviation and correction of regional gaps), and for improvement of fundamental services such as health cares and water/sanitation system targeting at the poor would be promoted. The project conforms to the basic infrastructure development aiming at the economic growth, poverty alleviation and correction of regional gaps, which are listed as priority agendas in the above mentioned two policies.

### 3.1.4 Appropriateness of Project Planning and Approach

According to the JICA relevant documents, the objective of the project was to provide

[5] Facilities where senior citizens and patients including disabled people can receive treatment and rehabilitation by attending during the day time.

the basic social services, and increase job opportunities, particularly in the agricultural and fishery industries, in ARMM, where the poverty issues have been expanding/worsened due to aftermath of blistering battle in Mindanao, thereby contributing to reducing poverty and assisting the sustainable development as well. Accordingly, the project has been highly relevant with the Philippine development plan and needs, as well as Japan's ODA policies.

In ARMM, where the project is located, there are about 2,400 barangays. The Community Development Assistance (CDA) program, which is one of project components was originally planned to be implemented in 200 barangays by JICA and in 500 barangays by the World Bank (WB). According to the Implementation Completion and Results Report (ICRR) of the World Bank, it was anticipated that implementation of any development project in ARMM would be difficult and dangerous. Furthermore, it was reported that some parts of the region remained *de facto* under the control of armed separatist groups in 2002. Thus, the Community-Driven Development (CDD) approach, in which the community people are directly engaged (Community people are mainly responsible for selection of subprojects, implementation of the projects and maintenance upon completion of the project) was considered an important strategy, and was adopted. Since the project was to be parallel-financed by WB and CIDA, it is appreciated that the CDD approach was also adopted to the CDA program, which was to be financed by JICA at appraisal.

Since the CDA program was originally planned to be implemented in 200 barangays (with a total of about 400 subprojects), two issues particularly needed to be thoroughly examined: i) difficulties of the project management by JICA including assessment and treatment of problems regarding issues on safeguard, procurement, and financial management during the project implementation; and ii) assurance at appraisal on sustainability (institutional setup for operation and maintenance, technical capacity, financial sources for operation and maintenance) of the assisted subprojects after the project was completed. Although these issues are assessed in the following evaluation sections, some problems are observed with respect to effectiveness and sustainability. The "CDD approach" was adopted to the project, which aimed at poverty alleviation and is located in the special region. However, it seemed that the planning/strategy adopting a so-called "Sector Loan[6] type", in which targeted subprojects are not identified at the

[6] A type of loans, in which targeted subprojects have not been necessarily identified at appraisal, and are to be selected based on the established criteria after a project commenced, and replacement of subprojects can be made as needed during the project implementation. In this case, during the project implementation, selected subprojects need to be assessed in terms of safeguard/procurement/financial management, and institutional arrangements/capacity (technical and financial) of the entity/organization, who would be responsible for operation and maintenance after the project was completed need to be assessed and verified.

project commencement, should have been more carefully considered.

Regarding the project planning, and approach during the project implementation (particularly on project management methodology and assurance of the project sustainability), issues and their countermeasures when the "Community-Driven Development approach" was adopted, should have been more examined/verified in detail at the appraisal stage. However, the project has been highly relevant with the Philippine development plan and needs, as well as Japan's ODA policies. Its relevance is therefore considered high.

Concrete Pathway
Malabang, Lanao del Sur

Concrete Tire Path
Tubaran, Lanao del Sur

3.2 Efficiency (Rating: ②)

3.2.1 Project Outputs

The project was parallel-cofinanced by the World Bank (WB) and Canadian International Development Agency (CIDA) and consisted of the following 4 components. Each agency was responsible for the components as shown below.

1) Community Development Assistance program: (JICA and WB): (construction and rehabilitation of roads, water supply systems, educational/medical facilities, post-harvest facilities and others)
2) Strategic Regional Infrastructure (SRI) program: (JICA and WB): (rehabilitation of roads, construction of regional centers, vocational training centers and others)
3) Peace Building: (CIDA): (educational program for peace, campaign for human rights, establishment of a peace center and others)
4) Institutional Strengthening and Assistance for Governance (ISAG): (JICA, WB, CIDA): (financial assistance to ARMM Government and Local Government Units (LGUs), and strengthening of project management capability)

Regarding CDA program, originally JICA and WB were to assist 200 barangays and

500 barangays totaling 700 barangays, respectively among 2,400 barangays. The assignment for which JICA was responsible under the Institutional Strengthening and Assistance for Governance was consulting services on subproject formulation and project supervision of the components under the JICA responsibility among both of SRI and ISAG components.

The original and actual output of the project is shown in Table 1.

Table 1　Output (Original and Actual)

| | Project Scope at Appraisal Stage | Project Scope at Project Completion |
|---|---|---|
| 1) CDA | a) Non-infrastructure support: provision of training to community groups and facilitators and technical assistance<br>b) Development of small-scale infrastructure: provision of equipment and civil work for construction, improvement, and rehabilitation of social and economic infrastructure (targeting 200 barangays with a total 400 sub-projects)<br><br>Barangays targeted under the CDA program were to be selected based on the following four criteria: 1) poverty level (30%); 2) degree of conflict-affectedness (40%); 3) complementarity with other government programs (20%) and 4) Local Government Unit (LGU) commitment (10%). The, selection and prioritization of infrastructure at the community level was to be made by each barangay, and selection of infrastructure was to be made among the short listed infrastructure subprojects at the community level. The assisted amount to each barangay was in principle less than 1.5 million peso for two subprojects.<br>However, the above mentioned criteria were to be revised as needed incorporating the results of the pilot projects, and were to be defined in the operational manual, which was to be prepared under the project. | a) as planned<br><br>b) Number of actual barangays targeted: 358<br>Number of subprojects: 707<br>Direct or indirect beneficiaries: 600,000<br>Number of subprojects implemented by sector is shown as follows:<br>Agriculture: 134<br>Education: 274<br>Health: 54<br>Social development : 25<br>Transport: 139<br>Water supply and sanitation: 81<br>Total: 707<br><br>The average construction cost of a subproject is 730,000 peso (about 1.5 million yen). |
| 2) SRI | Targets: Under the guidance of the ARMM government, trans-regional infrastructure spreading over a few barangays and local government units was to be strategically developed.<br>Originally proposed subprojects included the following 31 subprojects.<br><br>・ARMM Assembly Building<br>・Kabunsuan Cultural Complex<br>・Provincial Social Welfare and | Among 33 subprojects after the program was revised, a subproject was canceled during the implementation, and a project was not approved by JICA so that only 31 subprojects have been completed. In order to optimize the use of completed subprojects, necessary equipment was additionally procured and distributed to 8 subprojects.<br>Among the originally proposed 31 subprojects, only 3 projects were completed as planned, and the |

| | | |
|---|---|---|
| | Development Center (6)<br>・Rehabilitation of Arterial Highways (national road) (8km)<br>・Concreting of rural roads (provincial road) (4.5km)<br>・Municipal Assembly Hall (7)<br>・ARMM Business Assistance Center<br>・ARMM Regional Testing Center<br>・ARMM Information Management Center (2)<br>・Provincial Integrated Health Center (2)<br>・ARMM DTI Building<br>・ARMM Cultural Center<br>・ARMM Sports Center<br>・Paving Macador Circumferential Road (25km)<br>・Provincial Training Center (2)<br>・ARMM Agrarian Justice and Library<br>・ARMM Research & Development Center | remaining subprojects were implemented after changes/replacement was made. The completed 31 subprojects are as follows:<br><br>・Road improvement/rehabilitation (4)<br>・Provincial hospital<br>・District hospitals (3)<br>・DOST-ARMM Integrated Regional Standards and Testing Laboratory<br>・DAF-ARMMIARC Training Center<br>・Mother and Child Pavilion<br>・Local Government Center (4) (The executing agency counts 4 subproject as one subproject.<br>・Causeway Wharf (2)<br>・Rehabilitation of National High School (12)<br>・Rehabilitation/improvement of ports (2)<br>・Construction of water system (2)<br>・Provincial Social Welfare Livelihood and Social Development Center<br><br>The average construction cost of subprojects is 9.88 million peso (about 20.44 million yen ) |
| Consulting Services | 1) Assistance in procurement (including detail designs of SRI subprojects)<br>2) Construction supervision<br>3) Assistance in project management<br>4) Evaluation and monitoring of project impacts<br>5) Technical assistance for promotion of participation mechanism<br>6) Environmental management<br>7) Procurement audit<br><br>Experts: 278M/M (local consultants)<br>Assistants: 104M/M | as planned<br><br>Experts: 561.25M/M<br>Assistants: 290.24M/M |

Source: documents provided by JICA, Responses to the questionnaire

Note 1: Number of subprojects actually assisted by the World Bank under CDA program was 2,777 in 1,260 barangays. (Source: World Bank Implementation Completion and Results Report)

Note 2: Number of subprojects actually assisted by the World Bank under SRI program was 13, and they included facilities related to sectors of health, education, human empowerment and social services, and port facilities. (Source: World Bank Implementation Completion and Results Report)

Number of barangays to which assistance was actually provided under the CDA program is 358 with a total of 707 subprojects, which are both about 1.8 times of the originally planned. Reasons for increase are: i) Since subprojects were not identified at the appraisal stage, cost estimates were made to the higher side; ii) During the project implementation, Japanese yen appreciated by about by 15% and saving accrued. Increase of subprojects was made taking into account the needs of the project area, and it is considered appropriate.

Regarding subprojects under the SRI program, the field condition, priority, and the project scope were reviewed after the project commenced, and 31 subprojects shown in

the box under “Project Scope at Project Completion” in the above table were implemented.

The reason for substantial changes of subprojects is replacement of subprojects due to change of project sites because of security or accessibility issues. Particularly, after Maguindanao incident[7] occurred in November 2009, subprojects, which had not yet commenced, were partially replaced. Replacement of subprojects was concurred by JICA. Moreover, replacement was made based on the results of inventory surveys of each facility and the demand analysis undertaken after the project commenced. Thus, replacement of subprojects is considered appropriate.

Local Government Center
Datu Abdullah Sangki, Maguidanao

Shariff Aguak Maguindanao High School

3.2.2 Project Inputs

3.2.2.1 Project Cost

The total estimated project cost at appraisal (assisted by three agencies) was 8,782 million yen, of which the JICA assisted portion was estimated at 3,022 million yen and the planned Japanese ODA loan was 2,470 million yen. The actual project cost of the JICA assisted portion was 2,836 million yen, of which the Japanese ODA loan was 2,365 million yen. The actual project cost was lower than planned, and is equivalent to 94% of the planned cost. However, in the local currency (peso), the planned project cost was 1,029 million peso, and the actual cost was 1,139 million peso, which is equivalent to 111% of the planned cost. (Exchange rates: at appraisal 1 US$ =119 yen, 1 peso = 2.4yen; Average during project implementation (2006 – 2012): 1 peso = 2.07 yen)

The total project cost estimated at appraisal includes the project cost assisted by three agencies. The World Bank provided additional financing of US$ 30 million (the original loan amount was US$40.6 million) in August 2010 after the project commenced, and the

[7] Incident in which in relation to Election of a Governor, 58 supporters of a candidate were allegedly kidnapped and killed by an opponent candidate group.

CDA component was substantially expanded. However, the detailed project scope and bill of quantities of the WB-financed component at appraisal and at project completion are unknown. The original amount of CIDA financing was US$7.8 million. However, the actual amount spent, and the project scope and bill of quantities at project completion are also unknown. Thus, it is not feasible to properly compare the planned and actual total project cost assisted by three agencies. Since the project was parallel-financed by three agencies, it is more reasonable to compare costs before and after the project by separating the JICA-financed component.

Table 2　Comparison of Project Cost (Planned and Actual)
(JICA-funded portion)

(unit: million yen)

| Category | Planned | | Actual | |
|---|---|---|---|---|
| | Total | | Total | |
| | Total | ODA loan | Total | ODA loan |
| ・Community Development Assistance | 1,276 | 1,276 | 1,506 | 1,339 |
| ・Strategic Regional Infrastructure | 782 | 782 | 793 | 716 |
| ・Physical contingency | 206 | 125 | - | - |
| ・Governance assistance (consulting services) | 287 | 287 | 310 | 310 |
| ・Administration | 216 | 0 | 165 | 0 |
| ・Taxes | 255 | 0 | 62 | 0 |
| Total | 3,022 | 2,470 | 2,836 | 2,365 |

Source : documents provided by JICA,
Exchange rates: at appraisal 1 US$ =119 yen, 1 peso = 2.4yen,
Average during project implementation (2006 – 2012): 1 peso = 2.07 yen
Price escalation: foreign currency 1.6%/year, local currency 5.9%/year
Physical contingency: 10%
Cost estimate made: August 2002

3.2.2.2 Project Period

The originally planned project period was from December 2003 (signing of the Loan Agreement) to December 2007 (civil work completion) with a total period of 49 months. The actual project period was from December 2003 to December 2012 (loan closing/completion of civil work) with a total period of 108 months, or equivalent to 220% of the plan. Thus, the project period was much longer than planned. (Reference only: If the total period of 15 months, by which the progress of designs and civil work for the SRI component was delayed due to deterioration of security and declaration of a state of martial law, is excluded, the project period is 93 months, or equivalent to 190% of the plan.)

Construction of the last procurement batch under CDA program commenced in

October 2011 and ended in December 2012, while construction of the last batch under SRI program commenced in January 2011 and ended in November 2012. Thus, under the implementation of the project applying "Sector Loan type", the project was continued until the loan amount was fully disbursed by the loan closing date.

Table 3 Comparison of Project Cost (Planned and Actual)

| | Planned (at L/A signing) | Actual | |
|---|---|---|---|
| Selection of consultant | October 2003 - May 2004 | December 2003 - September 2005 | |
| Consulting services | June 2004 - September 2008 | October 2005 - December 2012 | |
| Community Development Assistance (CDA) | February 2004 - September 2008 | Community Development Assistance | July 2006 - December 2012 |
| Batch 1 (40 barangays) | February 2004 - September 2005 | Batch 1 ( 18 barangays) | July 2006 - March 2009 |
| Batch 2 (60 barangays) | October 2004 - September 2006 | Batch 2 ( 68 barangays) | February 2007 - March 2009 |
| Batch 3 (60 barangays) | October 2005 - September 2007 | Batch 3 (124 barangays) | February 2008 - December 2010 |
| Batch 4 (40 barangays) | October 2006 - September 2008 | Batch 4 (116 barangays) | November 2009 - December 2011 |
| | | Batch 5 ( 32 barangays) | October 2011 - December 2012 |
| Strategic Regional Infrastructure (SRI) | November 2003 - July 2007 | Strategic Regional Infrastructure | June 2006 - December 2012 |
| Batch 1 | November 2003 - July 2005 | Batch 1 (7 subprojects) | June 2008 - June 2010 |
| Batch 2 | December 2004 - July 2006 | Batch 2 (8 subprojects) | February 2009 - February 2011 |
| Batch 3 | December 2005- July 2007 | Batch 3 (9 subprojects) | June 2010 - February 2012 |
| Total (28 subprojects) | | Batch 4 (9 subprojects) | January 2011 - November 2012 |
| | | Procurement of equipment | August 2011 - October 2012 |

Source : documents provided by JICA, ,

Note 1: Regarding the project implementation period at the planning stage, the exchange of note was planned to be signed in January 2003. However, the actual date when the exchange of note was signed, is March 28, 2003, and the loan agreement was signed on December 11, 2003.

Note 2: The project period of the SRI component includes that for designs, tendering and construction.

Main reasons for expansion of the project period are as follows:

1) Since the budget allocation to the executing agency was delayed due to financial deterioration of the Philippine Government at the commencement of the project, the process for consultant selection was delayed against the originally planned schedule by about 17 months. The contract for consulting services was approved by the Government in July 2005, and the contract was signed in September 2005.
2) Regarding the CDA program, at the commencement of the project the budget allocation was delayed. (The special account, needed for withdrawal of loans was made available only in May 2007 due to delay of budget allocation, and then the project commenced.) The originally targeted 200 barangays were increased to 358 barangays and the number of procurement batches was increased to 5 batches as well, resulting in delay of about 53 months.
3) Regarding the SRI program, approval of subprojects was delayed by about 48 months in total because of the following reasons: i) allocation of budget was delayed. (The special account, needed for withdrawal of loans and execution was made available

only in December 2007.); ii) change of institutional organization of the ARMM government; and iii) review of proposed subprojects list by the new administration.

4) Due to deterioration of security and declaration of a state of martial law, entry to the project sites by ARMM government staff, consultants and contractors was banned twice (August 2008 - July 2009, and November 2009 – February 2010) during the project period. This resulted in 15 months delay in the progress of designs and construction work for the SRI program.

The project period was delayed by 59 months because of combined reasons mentioned above.

Number of barangays to which assistance was actually provided under the CDA program is 358 with a total of 707 subprojects, which are both about 1.8 times of the originally planned. Regarding subprojects under the SRI component, the field condition, priority, and the project scope were reviewed after the project commenced, and 31 subprojects shown in the box under "Project Scope at Project Completion" in the above table were implemented.

The project cost was lower than planned, but the project period was substantially longer than planned. Therefore, efficiency of the project is considered fair.

### 3.2.3 Results of Calculations of Internal Rates of Return

Since subprojects to be undertaken under the project were not identified before the project, calculation of EIRR for the whole project was not feasible. Thus, regarding the CDA component, for which the need surveys were completed at the appraisal stage and in which potential subprojects could be easily identified, EIRRs were calculated to a limited extent[8].

1) Agricultural roads: EIRR：22%
2) Portable water supply: EIRR：30%
3) Post harvest facilities: EIRR：13%

EIRR at the ex-post evaluation for the 2,627 subprojects implemented under the CDA program financed by the World Bank is 14.5%[9].

At the appraisal stage, EIRRs for the JICA-financed subprojects were not calculated. Since relevant data on costs and benefits needed to calculate the EIRRs was not provided by the executing agency, EIRRs at the ex-post evaluation stage are not recalculated.

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8 Source: WB Project Appraisal Document

9 Source: WB's Implementation Completion and Results Report

### 3.3 Effectiveness[10] (Rating: ②)

The operational indicator established at the appraisal stage was number of beneficiaries due to improvement of access to the socioeconomic infrastructure, which was constructed/improved under the project. As effect indicators, number of employment created and improved poverty incidence were considered. Regarding the analysis/evaluation on effectiveness, number of beneficiaries due to improvement of access and number of employment created are considered to be a basic indicator, and examination on these indicators were made.

#### 3.3.1 Quantitative Effects (Operation and Effect Indicators)

(1) Beneficiaries due to improvement of access

At the appraisal stage, number of beneficiaries due to improvement of access to the socioeconomic infrastructure, which was constructed/improved under the project was considered to be an operational indicator. However, subprojects under the CDA program were not identified, and it was merely assumed that number of targeted barangays would be 200 and that number of subprojects would be 400. Thus, the baseline for the number of beneficiaries was not established. The actual numbers of beneficiaries due to improvement of access are as shown in Table 4.

Table 4 Actual Numbers of Beneficiaries due to Improvement of Access (Community Development Assistance)

| Sector of subprojects | Number of subprojects completed | Number of beneficiaries (persons) | Remarks (main impacts) |
|---|---|---|---|
| Agriculture | 134 | 21,068 | Increase in value of agricultural products |
| Education | 274 | 104,626 | Reduction of commuting time and costs by pupils, decrease of risk during commuting, boost interest to go to school |
| Health | 54 | 39,415 | Improvement of access to health care facilities with less transporting cost and shorter travel time |
| Social Development | 25 | 3,463 | Development of learning abilities and socialization for pre-school children |
| Transport | 139 | 66,679 | Improvement of access to and from school and trade centers by pupils and commuters |
| Water and Sanitation | 81 | 34,968 | Improvement of access to portable water and better sanitation practices |
| Total | 707 | 270,219 | |

Source: Responses to a Questionnaire
Note: Number of targeted barangays was 358.

Since the baseline and benchmark numbers on beneficiaries are unknown,

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

comparison with the actual number of beneficiaries is not feasible. However, since the number of actually assisted barangays is 358 and the number of subprojects implemented is 707, both resulting in 1.8 times increase of the originally planned. Thus, it is considered that number of beneficiaries by the project has substantially increased than expected.

Number of beneficiaries by the WB-assisted subprojects is about 988,500 (in the targeted 1,260 barangays with a total number of 2,777 subprojects).

As previously mentioned, number of employment created and improved poverty incidence were considered as effect indicators, and indicators were to be reviewed during the project implementation. Finally, selected indicators, and their baseline/benchmarks had to be concurred by JICA. However, whether or not the concurrence was made is unknown.

(2) Number of employment created in the project area

In the document provided by JICA, it is stated that local residents were hired as warehouseman, porter/cargo handlers, health workers, teachers and administrative staff at the newly constructed or improved facilities after the project was completed. However, actual numbers of employment are unknown.

### 3.3.2 Qualitative Effects

As a qualitative effect, enhancement of basic social services was anticipated[11].

Under the CDA program of the project, 707 subprojects (including sectors of agriculture, education, health, social development, transport and water/sanitation) in 358 barangays were implemented. Under the SRI program, 31 subprojects (including sectors of transport, health, education and water/sanitation) were implemented, and the project greatly contributes to enhancement and improvement of the basic social service (including commuting time and costs by pupils, risk during commuting, access to health care facilities with less transporting cost and shorter travel time, access to and from school and trade centers by pupils and commuters, and access to portable water and better sanitation practices)[12].

## 3.4 Impact

### 3.4.1 Intended Impacts

#### 3.4.1.1 Poverty incidence

Regarding poverty incidence, which was expected to be improved by implementation

[11] At the appraisal stage, the following three items were anticipated: 1) enhancement of basic social service; 2) enhancement of living standards of residents; and 3) poverty alleviation. Two items except the first item are considered as an impact and are to be discussed in the following section.

[12] Source: document provided by JICA

of the project, contribution of the project was examined by the following two indicators.

(1) Ratio of households, which gain less income than poverty threshold (Poverty Incidence among Families)

Table 5 Poverty Incidence among Families (estimated)

| | 2006 | 2009 | 2012 |
|---|---|---|---|
| Philippines: % | 21.0 | 20.5 | 19.7 |
| Poverty threshold (peso/year) | 13,357 | 16,871 | 18,935 |
| ARMM: % | 40.5 | 39.9 | 48.7 |
| Poverty threshold (peso/year) | 12,647 | 16,683 | 20,517 |

Source: Table 1 Full Year Official Poverty Statistics, National Statistical Coordination Board

Note: There are about 2,400 barangays under 118 municipalities in ARMM. The project covers all 118 municipalities including 1,618 barangays (358 JICA-assisted, and 1,260 WB-assisted, occupying about 67% of barangays in ARMM). Barangays, not assisted by JICA nor WB were also assisted by other donors or Philippine Government, and all the barangays were assisted by any donors or agencies.

2) Magnitude of Poor Families

Table 6 Magnitude of Poor Families (estimated)

Unit: families

| | 2006 | 2009 | 2012 |
|---|---|---|---|
| Philippines | 3,809,283 | 4,036,915 | 4,214,921 |
| ARMM | 205,834 | 212,494 | 271,355 |

Source: Table 1 in 2012 Full Year Official Poverty Statistics, National Statistical Coordination Board

Above Tables 5 and 6 show that ratio of households, which gain less income than poverty threshold (Poverty Incidence among Families) in ARMM has increased from 40.5% at commencement of the project (2006) to 48.7% at completion of the project (2012). So no improvement to poverty alleviation (numerically) has been observed despite of project implementation. Detailed analyses are needed to examine factors for increase of ratio of households, which gain less income than poverty threshold in ARMM.[13] Since alleviation and improvement of poverty have not been confirmed in

[13] The reason for increase of poor households in ARMM seems partly that the consumer price index (particularly food) in ARMM rose and the poverty threshold in ARMM went up to 20,517 peso/year, higher

terms of quantitative indicators, contribution to poverty alleviation by the project is considered to be limited.

3.4.1.2 Summary of results of the Impact Study

It was originally planned that during the implementation of the ex-post evaluation assignment, an impact study was to be simultaneously implemented and the results[14] were to be incorporated into this report. The purposes of the Impact Study were to assess rigorously the impact of the extent to which the CDA program of the project assisted by JICA on: 1) poverty alleviation of the target area (increase of income and expenditures); 2) access to public services (education and health); 3) peace building (decrease of number of conflicts occurred, enhancement of social capital such as social trust and cohesion) and 4) others, by using the statistical methodology of econometrics (Although the concrete effect indicator to measure the impact on the abovementioned "3) peace building" was not set at the stage of project planning, the impact on this aspect was also assessed as a part of the study). Under the impact study, the following two surveys were implemented targeting barangays, which were included in the JICA's "Barangay Data Base" in Maguindanao Province and Lanao Del Sur Province in ARMM.

i) Barangay Survey : collection and analysis of data on socio-economic indicators at the barangay level
ii) Household Survey : collection and analysis of data on socio-economic indicators and psychosocial indicators at the individual (household) level

Under the Impact Study, the Treatment Group in areas where JICA was in charge and the Control Group in the corresponding municipalities were subject to study and analysis. Due to the budget constraints and security reasons in the islands, the study target areas were limited to both Lanao Del Sur and Maguindanao Provinces.

(1) Sampling method

1) Barangay Survey

Barangays located in ARMM, which were included in the barangay database,

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than the national average (18,935 peso/year) even though it is also because of deterioration of security and resettlement of residents due to conflict and disaster. However, since the ratio of households, which gained less income than the poverty threshold decreased even though the poverty threshold rose on a nationwide basis, increase of rate of poor households cannot be explained only by rise of poverty threshold in ARMM due to rise of consumer price index.

14 Design and analysis of the Impact Study was undertaken by an econometrics expert, other than an external evaluator for the ex-post evaluation of the project.

which was prepared under the study[15] JICA conducted in the past, and were not subject to financing by the World Bank were targeted. Then, the JICA officer in charge conducted the sampling work. Consequently, the following barangays in the Treatment and Control Groups were selected.[16]

- Treatment Group: 231 barangays which were included in the project (Among barangays included in the Treatment Group, a barangay was excluded from the analysis due to a deficit in the data. The total sample size is 230.)
- Control Group: Among 611 barangays in which no subproject was implemented under the JICA project, and the World Bank was not involved either, 230 barangays, which have almost the same "Prioritization Scores[17]" comparing with treatment barangays within the same municipality were selected as control barangays.

2) Household Survey

From the Treatment and Control Groups targeted for the Barangay Survey, a total of 1,500 households were selected. Firstly, from 231 barangays under the Treatment Group and 230 barangays under the Control Group, 50 barangays each were randomly selected. Then, from each barangay, 15 households were randomly selected. (However, since a barangay, in which a survey was not possible due to security reasons and a corresponding barangay were excluded from the analysis and evaluation, data of 735 households each in the Treatment and Control Groups totaling 1,470 households was analyzed.[18]

(2) Results of Impact Study

Results of the Impact Study demonstrate that the project has provided the positive impacts in the aspects of access to the educational facilities and usage rates of toilettes

15 JICA Development Study Type Technical Cooperation Project, "The Study for Socio-Economic Reconstruction and Development of Conflict-Affected Area in Mindanao " (2007-2009)

16 Regarding the analytical methodology, the Difference-In-Difference (DID) method, in which the difference between the baseline and endline (this study) data in the treatment and control groups was compared, was applied.

17 Total score assessed and calculated according to the following four criteria, which are defined in the operational manual, prepared under the project: insufficient level of infrastructure (40 %); inflow of domestic displaced persons (20 %); population and ratio of families in which a women is a householder (20 %); and distance from the poblacion of the municipality and deterioration level of roads (20 %).

18 Since no baseline data by household was available at the analytical work stage, a typical Propensity Score Matching (PSM) was adopted. Analysis by the Ordinary Least Squares method in which matching at the household level is not done, was also made.

at the barangay level. Specifically, number of nurseries and elementary schools per 1,000 persons in the treatment barangays is higher than that in the control barangays by 0.2 schools, and the usage rate of toilettes in the treatment barangays is also higher by 9%. Under the household level survey, assessment was made targeting all the households and lowly-educated households (the educational level attained by a household head is lower than the elementary school graduate). As a result, improvement was also observed in the various sectors/aspects including income/expenditure, road conditions, access to markets and education/health facilities (travel time), wells/water supply system and usage rates of toilets, security (conflict among clans), and trust to other clans and religious groups, and administrators of the central government at the household level. Regarding indicators, for which results are statistically significant and sound (the result is stable under several estimating methodologies), usage rates of wells and water supply system in the treatment households are higher than those in the control households by 10%, while those of toilets are higher by 12-14%. Regarding the travel time (for one way) to each facility, the time to elementary schools and health facilities was shortened by 12-15 minutes, and that to the nearest market was shortened by about 10 minutes. Particularly, regarding accessibility to markets, ratio of households who perceive that roads have been passable through the year, and road condition has been good is higher by 12-14% and the travel cost has been reduced by 4 peso per way. The results demonstrate that the number of households in the Treatment Group, which were negatively affected by conflict among clans (Rido) for the past one year is lower than that in the Control Group by about 4%, and that the number of households in the Treatment Group, which answered that they could trust administrators of the central government is higher by about 3%.

Results of assessment on the lowly-educated households demonstrate that they are almost similar to the above mentioned results, and particularly sound and significant results were confirmed in the aspects of income and expenditures (consumption). More specifically, the income of people engaged in manufacturing, commercial/business, and other sectors in the treatment households has been increased, and consequently the total income has increased by 1,100-1,600 peso per year (about 7-10% of annual income). Regarding the expenditures (consumption), positive impacts are also observed in terms of costs for food, medical care, education and social /recreation, and consequently the total expenditures by the treatment households have been higher by 1,100-1,300 peso per year. Since the low-educated households generally tend to belong to the poor layer with low income, results above mentioned hint that the subject project has contributed to alleviation of poverty in the targeted regions. Moreover, in the lowly-educated households, the ratio of out-of-school children (to elementary school) in the treatment

households has been significantly lower by 4-5%. Thus, it is considered that the enrollment rate at elementary school has increased through improvement of access to schools and economic condition. The assessment also shows that the rate of participation to the community activities by the treatment households is higher by 3%.

Indicators and units used in the analysis under the Impact Study are as shown in Table 7.

Table 7　Main Indicators and Units used in the Analysis under the Impact Study

**Barangay Survey：**
Access to educational facilities: Number of nursery, elementary and junior high schools per 1,000 residents
Usage ratio of toilets: Ratio of households who use private or public toilets

**Household Survey：**
Income/expenditure: Income and expenditure per person
Road condition: Evaluation of road condition on five-point scale
Access to markets and educational/health facilities: Travel time (minutes) to markets, nurseries, elementary/junior high schools and health facilities
Wells/Water supply system: Are water supply system or wells used as a water resource? Or, are ponds/rivers used as a water resource? Is a water supply facility located within 250 meters from home? Is it difficult to receive water supply regularly? Assessed using the above 4 indicators (usage ratio)
Usage ratio of toilets: Usage ratio of private/public toilets
Security (conflict among clans): Damages by conflict among clans (Rido) for the past one year (damages or no damage))
Trust to other clans and religious groups: Level of trust to inside and outside of the belonged group is assessed on 4-point scale.
Trust to administrators of the central government: Trust is assessed on 4-point scale.
Health condition: Number of family members who complained of any medical problems for the past half a year. Number of persons who had fever among them, and/or number of persons who had diarrhea.
Rate of school attendance by children: Rate of out-of-school children who do not attend school even though they have reached the schooling age for each educational level.
Community activities: Ratio of experience of participation in any community groups (cooperative society of production, organization for women/youth/senior citizens) and barangay gathering.

Source: Impact Study Report,

On the other hand, impacts by the project on the health condition including number of family members who have poor physical condition were not confirmed both in all households and the lowly educated households. Since indicators on health condition are affected by various social economic factors, these are unlikely outcome indicators, which can be improved simply by building health centers and others. Results demonstrate that not only assistance by hardware aspects such as development of infrastructure made under the project, but also various activities including assistance by

soft aspects such as enlightenment activities for health care and education are essential in order to achieve the expected impacts.

### 3.4.2 Other Impacts

(1) Impacts on the natural environment

At the appraisal stage, the targeted subprojects to be undertaken were not identified. According to the "Environmental Guidelines (October 1999) ", the project was classified as Category B[19], taking into account the sector to be targeted, geographical features and project characteristics as well as the reasons mentioned below.

1) Since the CDA program is for rehabilitation of the existing facilities and development of small size infrastructure, and subprojects which would greatly affect the environment and residents are excluded at the selection process, no particular impacts would be generated.
2) Under the SRI program, subprojects which would greatly affect the environment are excluded at the selection process, and subproject would be assessed from the viewpoint of environmental aspect at the feasibility study stage, no particular impacts would be generated.

When implementing subprojects, an Initial Environmental Examination (IEE) was to be conducted as needed, and required procedures including securing Environmental Compliance Certificate (ECC) or Certificate of Non-Coverage (CNC) were to be undertaken.

Thus, no impacts to natural and social environment by implementing the project were particularly foreseen.

Since the size of each subproject under the CDA program is small, no adverse environmental impacts have generated during the project implementation. Under the SRI program, no adverse environmental impacts have generated as well. During the project implementation, required procedures for the environmental aspect including undertaking an Initial Environmental Examination (IEE), and securing Environmental Compliance Certificate (ECC) or Certificate of Non-Coverage (CNC) were properly taken as needed with an assistance by the consultant, who was employed for the project.

According to JICA Philippines Office, when the contract value per procurement is less than 500 million yen (the contract value of all subprojects is less than 500 million yen), the procurement and safeguard aspects of the subproject was reviewed/cleared at the stage of submission of a contract for the subproject by the executing agency. No

[19] Category B: Applied to the project, in which unfavorable impacts to be made to the environment and community are considered smaller compared with Category A (applied to the project, in which seriously unfavorable impacts to be made to the environment and community).

particular problems on these aspects have been reported.

(2) Land Acquisition and Resettlement

At the appraisal stage, under the new construction and improvement work for infrastructure such as roads, irrigation and water system, no resettlement was anticipated except sites where work extends beyond the current right-of-way and a small number of residents need to be resettled.

Under the CDA program, work of all the subprojects were implemented within the existing right-of-way during the project implementation, and no land acquisition nor resettlement did occur. All the subprojects under the SRI were new construction or rehabilitation/improvement within the existing right-of-way as well, and thus no land acquisition/resettlement occurred. Exception is resettlement of residents due to improvement of Lamitan Port, which involved construction of a new terminal building. Houses for 47 households and 6 small shops, which were located in the compound formally owned by Port of Lamitan were relocated to the land owned by Lamitan City, which is about 700 m away from the port. Compensation for resettlement was properly made by Lamitan City according to the Philippine local laws, and no problem has occurred. Compensation involved provision of about 80 $m^2$ land per household, compensation with the amount equivalent to the residual value of the house demolished, and assistance grant for a new house. The total compensation amount paid for resettlement was about 750,000 peso.


Water and Sanitation Facilities
Malabang, Lanao del Sur


Water System with three Faucets
Madalum, Lanao del Sur

(3) Other Positive and Negative Impacts

During the project implementation, the project addressed the poverty and gender issues, and the community-driven implementation was planned, particularly encouraging

preferential participation of women and widows at the project formation and planning stages, and incorporating the people's need.

The community-driven development approach, under which the community directly participates in the project has been applied to the CDA program, and people's need has been incorporated.

In some parts of the project targeted regions, vulnerable groups and indigenous people reside and their participation in the project was essential. It is reported that Teduray tribe who occupies about 90% in Barangay Tobak, Maguindanao showed active participation after the project commenced[20].

Number of beneficiaries by the project (CDA program) was not originally estimated, and it was merely assumed that number of targeted barangays would be 200 and that number of subprojects would be 400. However, number of barangays to which assistance was actually provided under the CDA component is 358 with a total of 707 subprojects, which are both about 1.8 times of the originally planned. Thus, it is considered that number of beneficiaries by the project has substantially increased. Under the SRI program, 31 subprojects (including sectors of transport, health, education and water/sanitation) were implemented, and the project well contributes to enhancement and improvement of the basic social service. Results of the Impact Study demonstrate that the project has provided the positive impacts (improvement or enhancement was made comparing the status before the project) to access to the educational facilities (number of nursery and elementary schools per 1,000 residents) and usage rates of toilets at the barangay level and that improvement was also observed in the various sectors/aspects including income/expenditure, road conditions, access to markets and education/health facilities (travel time), wells/water supply system and usage ratio of toilets, security (conflict among clans), and trust to other clans and religious groups, and administrators of the central government at the household level. Number of employment created in the project targeted regions is unknown.

Regarding the poverty reduction, which is the project objective, since alleviation and improvement of poverty has not been quantitatively confirmed, contribution to poverty alleviation by the project is considered to be minimal.

The project has achieved its objectives at a limited level. Therefore, effectiveness and impact of the project are fair.

### 3.5 Sustainability (Rating: ②)

#### 3.5.1 Institutional Aspects of Operation and Maintenance

[20] Source: document provided by JICA

The executing agency during the project implementation was Autonomous Region in Muslim Mindanao Social Fund (ARMM Social Fund). However, ARMM Social Fund was abolished in 2014. ARMM is now in transition to Bangsamoro Transition Authority. The authority is to be established by mid-2015 and "Bangsamoro Government" will be founded by 2016.

At the appraisal stage (2003), operation and maintenance of the CDA component was to be managed by community groups, Local Government Units (LGUs) and line agencies, and maintenance costs were to be secured by persons in charge of these entities. Organizations, which are now responsible for operation and maintenance are as shown in Table 8.

Table 8 Agencies/Offices responsible for Operation and Maintenance of Facilities under the CDA Program

| Facility | Agency/Office |
|---|---|
| School Buildings | ARMM Education Department |
| Day-Care Center | Municipal Social Welfare Office |
| Health Station | Municipal Health Office |
| Multi-purpose Center | Barangay Council |
| Water Supply System | Barangay Council, Barangay Water Supply and Sanitary Office, Regional Office, People's Organization |
| Concrete Tire Paths/Footbridges | Barangay Council |
| Warehouse/Solar Dryers | Community Groups/ People's Organization |

Source: Responses to the Questionnaire
Note 1: The project target area in ARMM includes 5 Provinces, 113 Cities, and 358 Barangays.

Operation and maintenance of the SRI program was to be managed by line agencies (e.g. Department of Agriculture, Department of Education and Department of Health), and maintenance costs were to be allocated every year as part of the government budget of ARMM. Organizations, which are now responsible for operation and maintenance are as shown in Table 9.

Table 9 Agencies/Offices responsible for Operation and Maintenance of Facilities under the SRI Program

| Facility/Project | Agency/Office |
|---|---|
| Road improvement/ rehabilitation | Department of Public Works and Highways District Office, City Engineering Office, Provincial Engineering Office, ARMM Regional Economic Zone Administration |
| Provincial Hospital | Provincial Government |
| District Hospital | ARMM Department of Health |
| DOST-ARMM Integrated Regional Standards and Testing Laboratory Center | ARMM Department of Science and Technology |
| DAF-ARMMIARC Training Center | ARMM Department of Agriculture and Food |
| Mother/Child Pavilion | Provincial Government |

| | |
|---|---|
| Local Government Center | Municipality |
| Causeway/wharves | ARMM Regional Ports Management Authority, Municipality |
| Rehabilitation of National High School | ARMM Department of Education |
| Port Rehabilitation and Improvement | ARMM Regional Ports Management Authority, Municipality |
| Water Supply Systems | Municipality, Barangay |
| Provincial Social Welfare Livelihood Development Center | Provincial Government Social Welfare Livelihood Office |

Source: Responses to the Questionnaire

Organizations and entities, which are responsible for operation and maintenance of facilities under the CDA program and those for SRI program are shown in Table 8 and in Table 9, respectively. Number of organizations and entities involved in operation and maintenance is quite numerous, and no information on the institutional setup and allocation of assigned staff of each organization and entity was provided by the executing agency. Thus, it is difficult to assess appropriateness of the institutional setup and allocation of assigned staff of relevant organizations and entities.

Thus, sustainability on the institutional aspects of operation and maintenance is considered to be fair.

### 3.5.2 Technical Aspects of Operation and Maintenance

Operation and maintenance of subprojects completed under the CDA program of the project is to be in principle undertaken by the responsible entities according to the "Operation and Maintenance Manual" for each sector, which was prepared by each community during the project implementation. Training on application of the "Operation and Maintenance Manual" to the relevant agencies/offices has been undertaken through seminar-workshops. However, the technical capacity of each agency/entity (LGU, Barangay Committee, Regional Office, People's Organization) could not be assessed due to lack of information.

Regarding operation and maintenance of 31 subprojects completed under the SRI program, responsible agencies/offices, which are technically highly qualified and have staffs who have taken professional training, have been utilizing the "Operation and Maintenance Manual", which was prepared during the project implementation. In addition, the financial management system has been strictly abided by regulations of the central government[21].

Since no information on the technical capacity and skills of organizations and entities (LGU, Barangay Council, Regional Office, People's Organization and others), responsible for the CDA program was provided by the executing agency, it is difficult to assess appropriateness of the technical capacity and skills. However, regarding the SRI

[21] Source: document provided by JICA

program, staffs in charge are technically highly qualified and the “Operation and Maintenance Manual” has been utilized. The financial management system has been also strictly abided, and no problem has been reported.

Since no information on the technical capacity for operation and maintenance of the CDA program is available, sustainability on the technical aspects of operation and maintenance is considered to be fair.

### 3.5.3 Financial Aspects of Operation and Maintenance

Since the scope of subprojects under the CDA program is small (the average construction cost is 730,000 peso or about 1.5 million Japanese yen), cost for operation and maintenance was to be in principle borne by each responsible agency/office as shown in Table 8. It is reported that community groups and people’s organizations, which hardly raise funds, can request the subsidy for the cost required for the operation and maintenance work based on the “Operation and Maintenance Manual” to the Barangay/Municipal Office.

In the document provided by JICA, the operational status of 707 subprojects constructed/improved under the CDA program as of the end of 2012 is shown. The operational status by year of completion of work is shown in Table 10.

Table 10 Operational Status of Subprojects under the CDA Program

Unit: subprojects

| Year of completion of work | | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|---|---|
| Years of operation as of 2012 | | 5 | 4 | 3 | 2 | 1 | Commencement of operation |
| Operational status | Functional | 37 (80.4%) | 107 (85.6%) | 172 (85.1%) | 218 (90.5%) | 16 (84.2%) | 74 (100%) |
| | Semi-functional | 1 | 10 | 4 | 11 | 0 | 0 |
| | Non-functional | 6 | 5 | 10 | 4 | 3 | 0 |
| | No updates/ Not validated | 2 | 3 | 15 | 8 | 0 | 0 |
| | Privately used | 0 | 0 | 1 | 0 | 0 | 0 |
| | Total | 46 | 125 | 202 | 241 | 19 | 74 |

Note: Numbers in ( ) show the ratio of subprojects “under operational” among all the subprojects for each year.

Table 10 shows that about 80% of subprojects, which were completed 5 years ago are

still functional even in 5 years after completion and that about 85% of subprojects, which were completed within the past 4 years have been functional. It seemed that entities including LGUs, Barangays and People's Organizations, responsible for operation and maintenance have spent the appropriate maintenance budget taking into account the operational status shown in the above table. However, the actual amount spent for the operation and maintenance work per year after the project completion is unknown.

Under the above mentioned Impact Study, interview surveys on the operational status and usage frequency of facilities under the CDA program were made against the barangay captains of the Treatment Group in both target Lanao del Sur and Maguindanao provinces. Responses covered 487 facilities.

Table 11 Operational Status and Usage Frequency of Infrastructure Facilities

Unit: subprojects

| Type of Infrastructure Facilities | Operation Status: good Usage Frequency: High | good medium | good low | poor non-functional | Total |
|---|---|---|---|---|---|
| Agriculture | 133 | 20 | 0 | 1 | 154 |
| Multi-purpose Hall | 83 | 32 | 6 | 3 | 124 |
| Roads/Bridges (Transport) | 51 | 4 | 0 | 1 | 56 |
| Schools/Education | 51 | 2 | 1 | 1 | 55 |
| Water Supply (Water Supply and Sewage) | 22 | 11 | 5 | 8 | 46 |
| Health/Medical Services | 21 | 2 | 0 | 1 | 24 |
| Public Toilets (Water Supply and Sewage) | 12 | 5 | 0 | 1 | 18 |
| Others | 9 | 0 | 0 | 1 | 10 |
| Total | 382 (78.4%) | 76 (15.6%) | 12 (2.5) | 17 (3.5) | 487 (100.0) |

Table 11 demonstrates that 94% (78.4 + 15.6) of all the facilities still keep good condition and are well utilized. However, although two facilities including community centers and water supply system have no problems in the facility itself, it is reported that there are 29 facilities (6% of all the facilities), which have not been utilized nor operational due to breakdown. The main reasons are: breakdown of equipment and lack of power supply regarding the water supply system; and the facility has been used for private purpose in case of community center.[22]

JICA conducted an Ex-Post Monitoring Study, focusing on part of subprojects implemented in Maguindanao, Lanao del Sur, Basilan and Tawi-Tawi from May to October 2014 by entrusting the study to a local consulting firm. Subprojects, assessed

[22] Source: Impact Survey Report, March 2016

under the study include 58 under the CDA component (subprojects which were classified as “not functional” or “no updates” at the project completion in December 2012 were mainly selected as samples) and 29 under the SRI component (about 95% of the SRI component). Assessment was made by evaluating the status at the project completion (2012), the status as of ex-post monitoring (2014), and prospects for sustainability. Assessment results of subject subprojects under the SRI program are shown in Table 12.

Table 12 Assessment Results of Subprojects under the SRI Program

| Status as of ex-post monitoring (2014) | | | Prospects for sustainability | | |
|---|---|---|---|---|---|
| Status | Subprojects | % | Prospect | Subprojects | % |
| Fully functional | 8 | 28 | High | 12 | 41 |
| Functional | 17 | 59 | Moderate | 11 | 38 |
| Limited functional | 4 | 13 | Low | 6 | 21 |
| Total | 29 | | | 29 | |

Note 1: “Status” indicates whether or not it is functional at this moment.
Note 2: “Prospect” is evaluated in terms of combined organization/financial, political, and technical aspects.
Note 3: “Functional” means the operational status with some minor problems (e.g. allocation of operational staff is insufficient)
Note 4: “Limited functional” means the status in which a subproject is partly underutilized for its intended purposes (e.g. A main component has not been utilized. Some parts of facilities need urgent repairs. Structural defects have been found. A road is still not connected to the main road.)

As shown in Table 12, the operational status of sample-selected subprojects at this moment indicates that 87% of subprojects are either “fully functional” or “functional”, and 79% of subprojects are considered either “high” or “moderate” in terms of sustainability. The document provided by JICA states that the SRIs have shown to have a more dynamic operation and maintenance structure and that this is shown in the ability of the SRI management to generate more supporting funds from other sectors in the community, from Municipal/Provincial LGUs and even from national government agencies. However, the actual amount spent for maintenance work per year after the project completion is unknown.

As mentioned above, regarding the CDA program in ARMM, about 80% of subprojects, which were completed 5 years ago are still functional even in 5 years after completion and that about 85% of subprojects, which were completed within the past 4 years have been functional. It is reported that 94% of facilities located in both Lanao del Sur and Maguindanao provinces, which are targets under the Impact Study have good

conditions and have been utilized at the time when the survey was implemented. It seems that entities including LGUs, Barangays and People's Organizations, responsible for operation and maintenance have spent the appropriate maintenance budget taking into account the operational status shown in the above table. However, the actual amount spent for the operation and maintenance work per year after the project completion is unknown. Regarding the SRI program, the operational status of sample-selected subprojects at this moment indicates that 87% of subprojects are either "fully functional" or "functional", and 79% of subprojects are considered either "high" or "moderate" in terms of sustainability. This fact supports that the SRI management secures funds appropriately from other sectors in the community, from Municipal/Provincial LGUs and even from national government agencies.

### 3.5.4 Current Status of Operation and Maintenance

Status of subprojects under the CDA program as of project completion (December 2012) is shown in Table 13.

Table 13 Status of Subprojects under the CDA Program

| Status | Subprojects | % |
|---|---|---|
| Functional | 624 | 88.3 |
| Semi-functional | 26 | 3.7 |
| Not functional | 28 | 4.0 |
| No updates/ not validated | 28 | 4.0 |
| Privately used | 1 | 0 |
| Total | 707 | |

Source: document provided by JICA
Note: "Semi-functional" means the status in which a subproject is not necessarily utilized for its intended purposes.

As shown in Table 13, at the project completion, 92% of all the subprojects were functional (including semi functional) and the outcome of the project has been achieved. However, the operational status at this moment, which is two years after project completion is not known since enough information is not available[23].

On the other hand, all the subprojects (100%) under the SRI program were functional at the project completion (December 2012). Even in two years after the project completion (2014), 87% of subprojects are either "fully functional" or "functional".

[23] By mid-January 2015, the local consultant team visited 13 barangays and inspected the project sites. However, since a crash involving death of 44 policemen took place on January 25, 2015 in Mamasapano, Maguindanao, the security in the project sites was extremely worsened, and thus the field inspection, which was scheduled for later days was cancelled by recommendation of the executing agency.

(Even the remaining 13% of subprojects have been functional with some limitation.) Thus, it is considered that subprojects have been appropriately operated/maintained.

Regarding the operation and maintenance of the project, since no latest information (particularly on the amount spent for the operation and maintenance work, which is needed for examination and assessment of the financial aspects) on the CDA, which is the main component of the project was not available, it is difficult to examine the institutional, technical and financial aspects of the project. Regarding the SRI, no problems have been observed in the institutional, technical and financial aspects. Therefore, sustainability of the project effects is fair.

## 4. Conclusion, Lessons Learned and Recommendations

### 4.1 Conclusion

The objective of the project was to provide the basic social services, increase job opportunities, particularly in the agricultural and fishery industries, and promote the sustainable development through accelerating employment by implementing the local community-driven small-size infrastructure development in the Autonomous Region in Muslim Mindanao (ARMM), thereby contributing to reducing poverty. Regarding the project planning and approach for the project implementation (particularly, the methodology of project management and assurance of sustainability of the project), at the appraisal stage problems and their countermeasures to be taken when the "Community-Driven Development (CDD) approach" was adopted, needed to be examined/verified in detail. However, the project has been highly relevant with the Philippine development plan and needs, as well as Japan's ODA policies. Its relevance is therefore considered high. Regarding the efficiency, although the project cost was lower than planned, the project period significantly exceeded the plan. Therefore, efficiency of the project is fair. Regarding the effectiveness, number of beneficiaries by the project was not originally estimated at the appraisal stage under the Community Development Assistance (CDA) program, which is among two components of the project, and it was merely assumed that number of targeted barangays would be 200 and that number of subprojects would be 400. Number of barangays to which assistance was actually provided under the CDA component is 358 with a total of 707 subprojects, which are both about 1.8 times of the originally planned. Thus, it is considered that number of beneficiaries by the project has substantially increased. Under another component, Strategic Regional Infrastructure (SRI) program, 31 subprojects (including sectors of transport, health, education and water/sanitation) were implemented, and the project well contributes to enhancement and improvement of the basic social services. Results of the Impact Study demonstrate that the project has provided the positive impacts

(improvement or enhancement was made comparing the status before the project) to access to the educational facilities (number of nursery and elementary schools per 1,000 residents) and usage rates of toilets at the barangay level and that improvement was also observed in the various sectors/aspects including income/expenditure, road conditions, access to markets and education/health facilities (travel time), wells/water supply system and usage ratio of toilets, security (conflict among clans), and trust to other clans and religious groups, and administrators of the central government at the household level. Number of employment created in the project targeted regions is unknown. Regarding the poverty reduction in ARMM, which was considered as a project impact, since alleviation and improvement of poverty have not been quantitatively confirmed, contribution to poverty alleviation by the project is considered to be minimal. The project has to some extent achieved its objectives. Therefore, effectiveness and impact of the project are fair.

Regarding the operation and maintenance of the project, since no latest information (particularly on the amount spent for the operation and maintenance work, which is needed for examination and assessment of the financial aspects) on the CDA program, which is the main component of the project was available, it is difficult to examine the institutional, technical and financial aspects of the project. Regarding the SRI program, no problems have been observed in the institutional, technical and financial aspects. Therefore, sustainability of the project effects is fair.

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

## 4.2 Recommendations

### 4.2.1 Recommendations to the Executing Agency

Regarding the CDA program, organizations and entities, responsible for operation and maintenance involve quite a number of LGUs, Community Groups and People's Organization, and targeted subprojects also cover even 6 sectors. Thus, it is difficult to provide recommendations common to all the relevant organizations and entities. Regarding the SRI program, it is recommended that agencies/offices responsible for operation and maintenance of each subproject continue to allocate appropriate budget for maintenance.

### 4.2.2 Recommendations to JICA

Regarding the CDA program, it is recommended that appropriateness of adoption of the CDD approach, problems and points to be improved when applied to the similar projects in future are examined/verified by selecting study targets more scientifically and increasing number of survey target samples (about 30% of subprojects since the executing agencies involve LGUs, Community Groups and People's Organization, and targeted

subprojects also cover even 6 sectors.) in order to more objectively assess/verify results of application of the CDD approach.

### 4.3 Lessons Learned

Appropriateness of project implementation by “Sector Loan type”

In the project implementation of a small scale infrastructure development project in the conflict area applying the CDD approach and so-called “Sector Loan type”, complication/difficulty of the portfolio management of a project by a lender during the project implementation, and verification/assurance of sustainability after the project completion (institutional setup for operation and maintenance, technical capacity and financing/sources) are major issues to be considered (at appraisal). Under the SRI, which was implemented simultaneously with the CDA program, target subprojects were identified to some extent at the commencement of the project (Although changes were made during the project implementation, a feasibility report for each subproject was also submitted). Thus, sustainability of the project was assured to some extent since agencies and offices, which have higher technical capacity in the field and staffs who took professional training, are responsible for maintenance. Thus, it is recommended that a so-called “Project Loan”, which was applied to the SRI program, and in which target subprojects can be identified, and its sustainability after the project completion can be also examined/assessed at appraisal, needs to be considered to the future similar projects.

Comparison of the Original and Actual Scope of the Project

| Item | Original | Actual |
|---|---|---|
| 1. Output<br>1) Community Development Assistance (CDA) | 1) Non-infrastructure support: provision of training to community groups and facilitators and technical assistance<br>2) Development of small-scale infrastructure: provision of equipment and civil work for construction, improvement, and rehabilitation of social and economic infrastructure (targeting 200 barangays with a total 400 sub-projects) | 1) as planned<br><br>2) Number of actual barangays targeted: 358,<br>Number of subprojects: 707<br>Direct or indirect beneficiaries: 600,000<br>Number of subprojects implemented by sector is shown as follows:<br>Agriculture: 134<br>Education: 274<br>Health: 54<br>Social development : 25<br>Transport: 139<br>Water supply and sanitation: 81<br>Total: 707<br><br>The average construction cost of subprojects is 730,000 peso (about 1.5 million yen). |
| 2) Strategic Regional Infrastructure (SRI) | Under the guidance of the ARMM government, trans-regional infrastructure spreading over a few barangays and local government units was to be strategically developed.<br><br>Originally proposed subprojects included the following 31 subprojects.<br><br>・ARMM Assembly Building<br>・Kabunsuan Cultural Complex<br>・Provincial Social Welfare and Development Center (6)<br>・Rehabilitation of Arterial Highways (national road) (8km)<br>・Concreting of rural roads (provincial road) (4.5km)<br>・Municipal Assembly Hall (7)<br>・ARMM Business Assistance Center<br>・ARMM Regional Testing Center<br>・ARMM Information Management Center (2)<br>・Provincial Integrated Health Center (2)<br>・ARMM DTI Building<br>・ARMM Cultural Center<br>・ARMM Sports Center<br>・Paving Macador Circumferential Road (25km)<br>・Provincial Training Center (2)<br>・ARMM Agrarian Justice and Library<br>・ARMM Research & Development Center | Among the originally proposed 31 subprojects, only 3 projects were completed as planned, and the remaining subprojects were implemented after changes/replacement was made. The completed 31 subprojects are as follows:<br><br>・Road improvement/rehabilitation (4)<br>・Provincial hospital<br>・District hospitals (3)<br>・DOST-ARMM Integrated Regional Standards and Testing Laboratory<br>・DAF-ARMMIARC Training Center<br>・Mother and Child Pavilion<br>・Local Government Center (4) (The executing agency counts 4 subproject as one subproject.)<br>・Causeway Wharf (2)<br>・Rehabilitation of National High School (12)<br>・Rehabilitation/improvement of ports (2)<br>・Construction of water system (2)<br>・Provincial Social Welfare Livelihood and Social Development Center<br><br>The average construction cost of subprojects is 9.88 million peso (about 20.44 million yen ) |
| 3) Consulting Services | 1) Assistance in procurement (including detail designs of SRI subprojects)<br>2) Construction supervision<br>3) Assistance in project management | as planned |

| | | |
|---|---|---|
| | 4) Evaluation and monitoring of project impacts<br>5) Technical assistance for promotion of participation mechanism<br>6) Environmental management<br>7) Procurement audit<br><br>Experts: 278 M/M (only local consultants)<br>Assistants: 104 M/M | Experts: 561.25 M/M<br>Assistants: 290.24 M/M |
| 2. Project Period | December 2003 – December 2007<br>(49 months) | December 2003 – December 2012<br>(108 months) |
| 3. Project Cost<br>Amount paid in Foreign currency<br>Amount paid in Local currency<br>Total<br>Japanese ODA loan portion<br>Exchange rate | <br>unknown<br><br>unknown<br><br>3,022 million yen<br>2,470 million yen<br>1 Peso = 2.4 yen<br>(as of August 2002) | <br>unknown<br><br>unknown<br><br>2,836 million yen<br>2,365 million yen<br>1 Peso = 2.07 yen<br>(average between 2006 and 2012) |

Republic of the Philippines

Ex-Post Evaluation of Japanese ODA Loan

"KAMANAVA Area Flood Control & Drainage System Improvement Project"

External Evaluator: Akemi Serizawa, Sanshu Engineering Consultant

## 0. Summary

The objective of this project was to improve flood control and drainage systems in KAMANAVA area, Metro Manila by constructing or rehabilitating flood control facilities including a polder dike, river walls, pumping stations, flood gates, control gates, a navigation gate and drainage channels and by procuring hydrological and meteorological observation instruments, thereby contributing to the reduction of floods and improvement of living conditions and environmental health as well as economic development in the area.

This project has been highly relevant with the Philippines' development plan and development needs, as well as with Japan's ODA policies. Therefore its relevance is high. While the project outputs were produced as planned, both the project cost and project period significantly exceeded the plan. Therefore, efficiency of the project is low. This project has reduced floods to a certain extent and produced impacts such as the improvement of living conditions in the project target area, development of regional economy, improvement of waste management and enhanced awareness of residents about flood control. In total, effectiveness and impact of the project are high as it has largely achieved its objectives. No major problems have been observed in the institutional, technical and financial aspects of the operation and maintenance system of the Department of Public Works and Highways (DPWH), which is currently responsible for the operation and maintenance of the project facilities, and those of Metro Manila Development Authority (MMDA), the organization to which the project facilities will be transferred in the second half of 2015 or in 2016. Therefore, the sustainability of the project effects is high.

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

## 1. Project Description


Project location

Pumping station constructed by this project

### 1.1 Background

The Philippines experiences frequent floods due to typhoons and heavy rains. Back in 1999 when this project was designed, annual death from floods was about 800 on average and the economic loss was about 0.4% of its Gross National Product (GNP). The target area of this project is in the basin of Malabon River and Tullahan River and located in the cities of Kalookan, Malabon and Navotas in Metro Manila. These three cities and neighboring Valenzuela City are called KAMANAVA. The project target area is only 0-1.5 meters above sea level and particularly prone to flooding. It was urgently sought to take measures to reduce floods in the area.

### 1.2 Project Outline

The objective of this project was to improve flood control and drainage systems in KAMANAVA area, Metro Manila by constructing or rehabilitating flood control facilities including a polder dike, river walls, pumping stations, flood gates, control gates, a navigation gate and drainage channels and by procuring hydrological and meteorological observation instruments, thereby contributing to the reduction of floods and improvement of living conditions as well as economic development in the area.

The project site is shown in Figure 1 and 2 below.

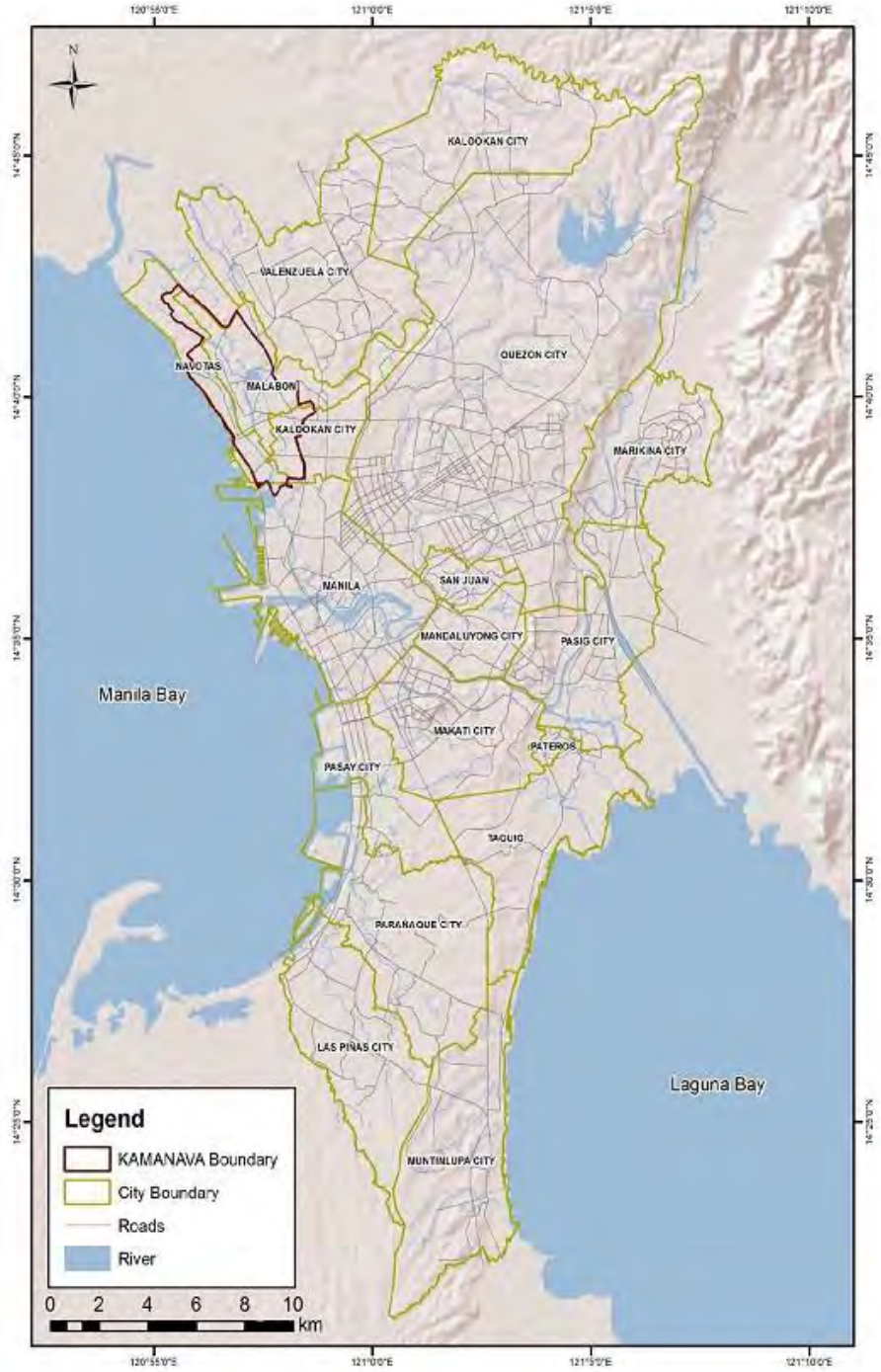



Figure 1. Project site[1]
(Source: JICA documents)

[1] "KAMANAVA Boundary" of the maps of Figure 1 and Figure 2 means the target area of this project and not KAMANAVA area in the usual sense.

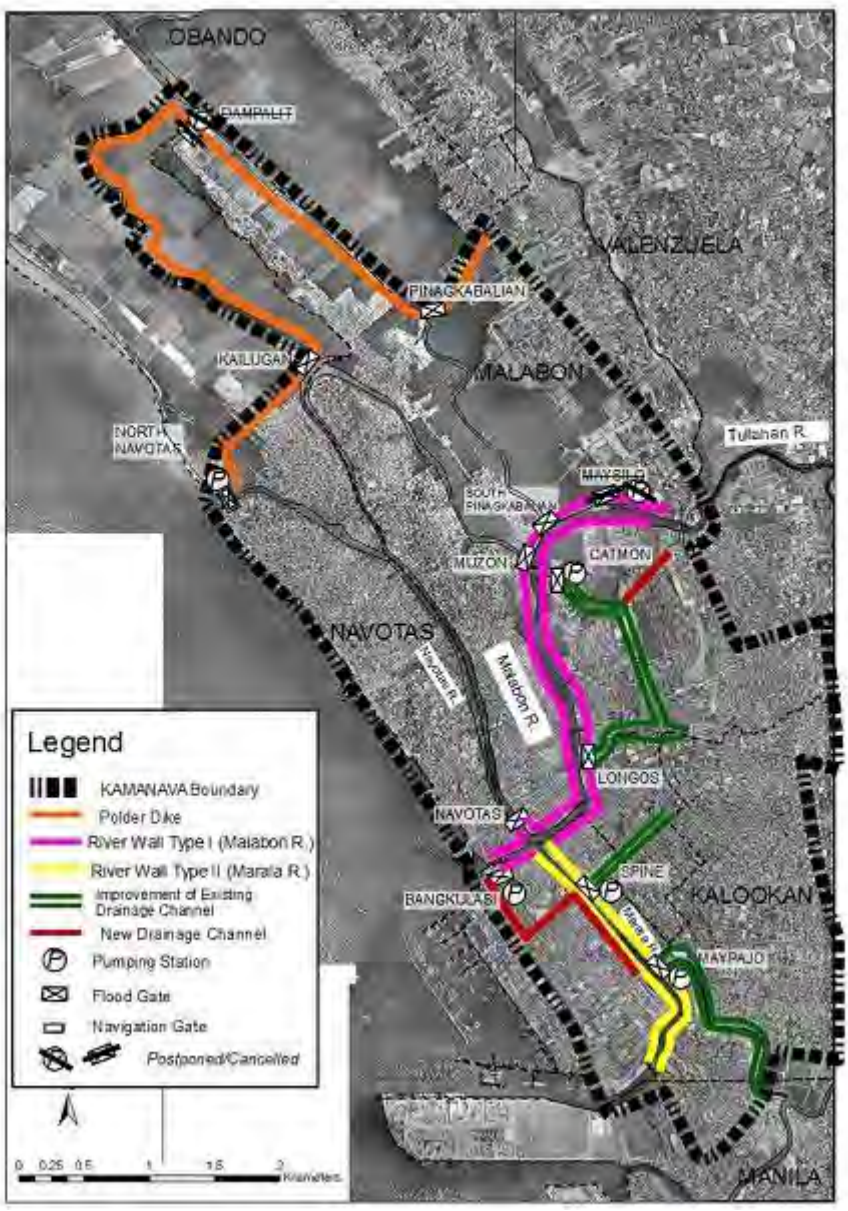



Figure 2. Project site
(Source: JICA documents)

| | |
|---|---|
| Loan Approved Amount/ Disbursed Amount | 8,929 million yen / 8,786 million yen |
| Exchange of Notes Date/ Loan Agreement Signing Date | April 2000 / April 2000 |
| Terms and Conditions | Interest rate 1.0% (0.75% for consulting services)<br>Repayment period 40 years<br>(Grace period 10 years)<br>Conditions for procurement: Tied<br>(Special Terms for Economic Partnerships (STEP)) |

| | |
|---|---|
| Borrower / Executing Agencies | The Government of the Republic of the Philippines / Department of Public Works and Highways (DPWH) |
| Final Disbursement Date | September 2009 |
| Main Contractor (Over 1 billion yen) | Nishimatsu Construction Co., Ltd. (Japan) |
| Main Consultant (Over 100 million yen) | CTI Engineering Co., Ltd. (Japan) / Nippon Koei Co., Ltd. (Japan) / Philkoei International Incorporated (Philippines) / Pertconsult (Philippines) / Woodfields Consultants, Incorporated (Philippines) |
| Feasibility Studies, etc. | F/S "Study on Flood Control Planning in Metro Manila"(1988-1990)<br>Special Assistance for Project Sustainability (SAPS) for KAMANAVA Area Flood Control and Drainage System Improvement Project (2014) |
| Related Projects | JICA technical cooperation:<br>Expert on flood control (DPWH)<br>Study on Flood Control Planning in Metro Manila (1990)<br>The Project for Enhancement of Capabilities in Flood Control and Sabo Engineering of the Department of Public Works and Highways (2000-2005)<br>Strengthening the Flood Management Function of DPWH (2005-2010)<br>JICA loan projects:<br>Pasig River Flood Warning System Project (1983)<br>Flood Control and Drainage Project in Metro Manila (II) (1987)<br>Metro Manila - West Manggahan Flood Control Project (1996)<br>Pasig Marikina River Improvement Project (I) (1999), (II) (2007), (III) (2012)<br>Special Assistance for Project Sustainability (SAPS) for KAMANAVA Area Flood Control and Drainage System Improvement Project (2014)<br>International Organizations:<br>World Bank: Flood management master plan for Metro Manila and surrounding areas |

## 2. Outline of the Evaluation Study

2.1 External Evaluator

Akemi Serizawa, Sanshu Engineering Consultant

2.2 Duration of Evaluation Study

Duration of the Study: October 2014 - October 2015

Duration of the Field Study: January 4-23 and April 5-23, 2015

## 3. Results of the Evaluation (Overall Rating: B[2])

### 3.1 Relevance (Rating: ③[3])

#### 3.1.1 Relevance to the Development Plan of the Philippines

The Medium Term Philippine Development Plan 1999-2004 that was valid at appraisal of this project stated that the central government and Local Government Units (LGUs) needed to construct flood control facilities, promote waste management and adequate operation of existing drainage facilities in order to reduce floods in Metro Manila.

The Philippine Development Plan 2011-2016 at the time of ex-post evaluation aims to reduce floods by maintaining watersheds and providing efficient and adequate infrastructure. Its four strategies to reduce floods are as follows:

・Prioritize the construction of flood control facilities in highly vulnerable areas.

・Apply Climate Change Adaptation (CCA) and Disaster Risk Reduction Management (DRRM) strategies in the planning and design of flood control facilities.

・Develop a mechanism to expedite immediate financing for the rehabilitation of flood control facilities.

・Increase local government and community participation.

From the above, at appraisal and at ex-post evaluation, the implementation of the project conforms to the development policies of the Philippines.

#### 3.1.2 Relevance to the Development Needs of the Philippines

The Philippines experiences frequent floods due to typhoons and heavy rains. At appraisal of this project, annual death from floods was about 800 on average and the economic loss was about 0.4% of its GNP. Metro Manila is in low and flat land and is frequently inundated due to high tide or overflow of the rivers. The target area of this project in the basin of Malabon River and Tullahan River, located in the area called KAMANAVA, is particularly prone to flooding because it is only 0-1.5 meters above sea level. It was urgently sought to take measures against floods in the area (source: JICA documents).

According to DPWH, among 29 major typhoons and heavy rains experienced in the Philippines since 2001, ten events flooded Metro Manila as shown in Table 1.

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

[3] ③: High, ② Fair, ① Low

Table 1. Typhoons and heavy rains which affected Metro Manila

(The losses/damages are about the whole nation)

| Month/year | Financial losses (million pesos) | Human suffering (person) |
|---|---|---|
| 11/2004 | 2,226 | 42 dead, 77 injured, 34 missing |
| 9/2006 | 3,973 | 184 dead., 536 injured, 47 missing |
| 6/2009 | 137 | 10 dead, 6 injured, 5 missing |
| 9/2009 (Typhoon Ondoy) | 41,000 | 464 dead, 529 injured, 37 missing |
| 7/2010 | 478 | 102 dead, 91 injured, 46 missing |
| 6/2011 | 647 | 12 dead, 18 missing |
| 7/2012 | 404 | 51 dead, 6 missing |
| 8/2012 | 3,056 | 109 dead, 14 injured, 14 missing |
| 8/2013 | 3,056 | 109 dead, 14 injured, 4 missing |
| 9/2014 | 144 | 10 dead、7 injured |

(Source: DPWH's answer to the questionnaire)

Among the events listed above, Typhoon Ondoy in September 2009 and the monsoon in August 2012 caused massive floods in KAMANAVA (the details of losses/damages in the project target area are shown in the section of Effectiveness). According to the Philippine Development Plan 2011-2016, Metro Manila is the seventh most susceptible to flooding among all provinces in the Philippines according to the percentage of flood-prone area, since 33.2% of its land area is flood-prone.

From the above, at appraisal and ex-post evaluation, the project area is very vulnerable to flooding. This project is in line with the development needs of the Philippines at the time of appraisal and ex-post evaluation.

3.1.3 Relevance to Japan's ODA Policy

The high-level mission of the Government of Japan on economic and technical cooperation sent to the Philippines in March 1999 chose disaster prevention including flood management as one of the priority areas of assistance. Japan's Country Assistance Policy for the Philippines at appraisal also prioritized environment conservation and disaster prevention in the disaster-prone areas. Therefore, this project conformed to Japan's assistance policies for the Philippines at appraisal.

This project has been highly relevant with the Philippines' development plan and development needs, as well as with Japan's ODA policies. Therefore its relevance is high.

3.2 Efficiency (Rating: ①)

3.2.1 Project Outputs

3.2.1.1 Civil works and procurement of equipment

Identification of the project components to be evaluated in the ex-post evaluation

Four activities were identified as "related activities" of this project to be carried out by the Philippines. They were 1) dredging of Malabon river bed, 2) raising bridges, 3) improvement of secondary and tertiary drainage channels and 4) solid waste management. They were not included in the cost calculation of this project and it was not clear whether they had to be evaluated as a part of it. JICA documents at appraisal mentioned that "the secondary and tertiary drainage channels have to be improved by LGUs in coordination with this project so that this project can produce the expected outcomes. Illegal waste disposal should be controlled so that the drainage channels of this project can keep functioning", and that "some bridges on Malabon River are not high enough and they might prevent safe flow of flood water from upstream. JICA requested DPWH to raise the bridges as the work is not covered by JICA funding."[4] The study of "Special Assistance for Project Sustainability (SAPS) for KAMANAVA Area Flood Control and Drainage System Improvement Project" in 2014 confirmed that JICA and DPWH had agreed through the discussions and the detailed design before the commencement of this project that these "related activities" were prerequisite for achievement of the project objectives and to sustain project outcomes. In this ex-post evaluation, it was examined through the review of the documents at appraisal and interviews of the persons involved in the project whether the "related activities" were indispensable for the achievement of the project objectives and whether they should be included in the project components to be evaluated. The conclusion is that the portions to be evaluated should be only those funded by JICA and the "relevant activities" of the Philippines are not included. The reasons are as follows:

According to the DPWH staff and Japanese consultants involved in this project and the JICA flood control expert dispatched to DPWH, this project were originally designed as one of the prioritized "drainage improvement" projects in the target area following the JICA Study on Flood Control Planning in Metro Manila (1988-1990). "Drainage improvement" aims at rapid drainage of flood water caused mainly by inland water (heavy rains in the area). This project had "drainage improvement" components such as construction and rehabilitation of drainage channels and construction of pumping stations. These "drainage improvement" facilities were designed based on the rainfall with a 10-year return period in the project target area. In addition to the drainage improvement, the project also had "flood control" components such as polder dike, elevation of river walls and construction of flood gates and a navigation gate to protect the target area from floods by external water, which means high tide and overflow of rivers due to heavy rains in the upstream. These "flood control" facilities were designed based on the one-day or two-day rainfall with a 30-year return period in

[4] This document did not mention about dredging of riverbed.

the upstream. The “relevant activities” by the Philippines were designed in order to reinforce both “drainage improvement” and “flood control” in addition to the expected protection by this project against rainfall with a 10-year return period in the project target area (drainage improvement) and one-day or two-day rainfall with a 30-year return period in the upstream (flood control). Improvement of secondary and tertiary drainage channels is a part of “drainage improvement” to reduce the incidence of localized inundations and to shorten the time for the flood water to drain. The scope of the improvement of secondary and tertiary drainage channels was not identified either at appraisal or ex-post evaluation, and the LGUs are supposed to design and implement it. This activity is to reinforce drainage improvement in addition to what this project provided. The dredging of Malabon River and raising bridges are a part of “flood control” to increase the volume of river flow. Therefore, these three “relevant activities” are to provide additional drainage improvement and flood control capacity to the protection provided by this project. Waste management, including garbage collection from rivers and awareness raising activities for the communities about waste disposal, aims at maintaining appropriate functioning of the flood gates, pumping stations and drainage channels. It is difficult to evaluate waste management as one of the project outputs in the ex-post evaluation as it is daily and continuous maintenance activities and its scope and degree of work are not fixed. The LGUs in the project target area are not able to fully control the garbage because many of them are from upstream or the sea (LGUs’ waste management activities are mentioned in detail in the section of Sustainability). In conclusion, these four “relevant activities” by the Philippine are not included in the project components to be evaluated.

(1) Civil works

The civil work components had minor modifications from the original plan during the detailed design, and were completed accordingly. The revisions were mainly about the size of the facilities to conform to the actual physical condition of the project target area as shown in Table 2, and were relevant. Some works originally funded by this project were incomplete at the expiry of the loan period in September 2008, and DPWH continued the work with their own funding until they were complete in January 2012.

Table 2. Civil works (plan and actual) funded by the JICA loan

| | Original design at appraisal | Revised plan after detailed design | Completed portions as of expiry of loan period (September 2008) | Completion (January 2012) | Reasons for revision |
|---|---|---|---|---|---|
| Polder Dike | 8.0 km | 8.6 km | 3.4km completed | 8.6 km (as planned) | Based on the detailed design, the polder dike |

| | | | | | |
|---|---|---|---|---|---|
| | | | | The balance was complete by the local contractors by January 2012. | was extended to include the northwest part of the project target area. |
| River Walls Raisings | 12.4 km | 10.5km (Malabon River 6.6km, Malala River 3.9km) | Those along Malala River were complete. Those along Malabon River were partially complete. | 10.5km (as planned)<br><br>The remaining parts were completed by the local contractors by January 2012. | Based on the detailed design, the length was reduced as some areas already had appropriate river walls or had sufficient altitude. |
| Navigation lock / Navigation gate (Navotas River North) | 1 navigation lock (Boats can pass even during the high tide) | 1 navigation gate (Boats can pass only during low tide) | Complete | 1 navigation gate (as planned) | Boat users and DPWH agreed on the navigation gate. Boats can pass the navigation gate only during low tide (closed during high tide). Therefore navigation gate is more effective for flood control than the navigation lock. |
| Pumping station without flood gates incorporated with navigation lock (Navotas River North) | 1 (next to the navigation lock) | 1 (next to the navigation gate) | Complete | 1 (next to the navigation gate) (as planned) | |
| Independent flood gates | 6 | 6 | Complete | 6 (as planned) | |
| Control gates | 2 | 0 | None | None | They were cancelled because it was confirmed by the detailed design that there were no major development plans in the area, and that the polder dike and the existing control gates could provide sufficient protection. |
| Pumping station with ancillary flood gates | 6 | 4 | Complete | 4 (as planned) | Two pumping stations were cancelled as the control gates above were cancelled. |
| Rehabilitation of existing drainage channels | 6.4 km | 5.6 km | Incomplete | 5.6 km (as planned) Completed by the Philippine funding | Based on the detailed design, distance was reduced. |
| Construction of drainage channels | 1.8 km | 2.1 km | Complete | 2.1 km (as planned) | Based on the detailed design, distance was increased. |

(Source: JICA documents)

Flood gate of a pumping station constructed by the project

Flood gate constructed by the project

Pumping station constructed by the project

Waste processing machine in a pumping station constructed by the project

The plan and actual implementation of the "relevant activities" by the Philippines are shown in Table 3. Raising bridges is complete about two among four, and the remaining are under construction or under preparation as of the ex-post evaluation. The scope of other activities is not fixed and the works are ongoing.

Table 3. "Relevant activities" funded by the Philippine (plan and actual)

| | Plan | Status as of April 2015 | Cost (not included in the cost of this JICA-funded project) |
|---|---|---|---|
| Raising bridges (DPWH) | Bangkulasi<br>Tonsuya<br>Lambingan<br>Tenejeros | Bangkulasi: under preparation of design<br>Tonsuya: under construction<br>Lambingan: completed in 2014<br>Tenejeros: reinforcement was complete in 2014 | Approximately 43million pesos |
| Secondary and tertiary drainage channels (cities) | Scope of work is not fixed | Partially implemented | No information available |
| Waste management (cities) | Scope of work is not fixed | Being implemented by the relevant cities | Budget of waste management of Malabon City: 95 million pesos per year<br>Budget of waste |

| | | | |
|---|---|---|---|
| | | | management of Navotas City: 19.2 million pesos per year |
| Dredging of Malabon River (DPWH) | Scope of work is not fixed | DPWH is to dredge 2.86km of the river in 2015 using the budget of 2014. The remaining parts are under examination and to be dredged in 2015 or after, using the budget of 2015. | Budget of 2014: 202 million pesos Budget of 2015: 124 million pesos |

(Source: JICA documents. DPWH answer to the questionnaire and interviews about current status)

In the project target area, the following flood control activities were carried out using the Philippines' funds without direct relationship with this project (source: JICA documents).

・Raising of river walls (from 12.6m to 13.5m above sea level for 2,954m length in total along Malabon River), construction of banks of Catmon Creek (1,800m in total), improvement of Longos Creek (36.6m) and U-shape open channels of concrete (64.4m). They were designed after the major flood in 2012 and constructed in 2013.

・Installation of 39 pumps in Navotas City

・Construction of river walls (13.5m above sea level) along Meycauayan River, stretching to 3.2km in total

・Construction of river walls (13.5m above sea level) along Palasan and Meycauayan Rivers, stretching to 9.0km in total

・Exfoliation of sludge of Meycauayan River

・Rehabilitation of river walls along Meycauayan River

・Construction of dikes around Navotas City (500m)

(2) Procurement of equipment

The following equipment was procured as planned:

・Hydrological and meteorological observation instruments

・Dust removal equipment for pumping stations

3.2.1.2 Consulting services

Consulting services as follows were carried out as planned:

・Basic study of topography and soils, and review of the basic design of flood control facilities

・Detailed design of flood control facilities

・Assistance for bidding

・Environmental management including monitoring of observation of Environmental Compliance Certificate and supervision of contractors

・Assistance for report preparation on resettlement and land acquisition and for the

activities about livelihood of resettled persons

3.2.1.3 External monitoring of resettlement and land acquisition

External monitoring of the following was carried out as planned:

・Monitoring of resettlement and land acquisition processes by DPWH

・Monitoring of social and economic conditions of the resettled persons and of related activities by the relevant governmental agencies

・Advice for the relevant governmental agencies

(Source: JICA documents)

3.2.2 Project Inputs

3.2.2.1 Project Cost

The project cost was significantly higher than planned. The planned project cost was 11,786 million yen. The actual project cost was 17,858 million yen in total, which was 152% of the plan.

Table 4. Project cost

(Unit: million yen)

| | Planned | | | | | | Actual | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Foreign currency | | Local currency | | Total | | Foreign currency | | Local currency | | Total | |
| | Total | JICA loan | Total | JICA loan | Total | JICA loan | Total | JICA loan | Total | JICA loan | Total | JICA loan |
| Civil works and procurement of equipment | 5,863 | 5,863 | 1,281 | 1,281 | 7,144 | 7,144 | 4,987 | 4,987 | 5,468 | 2,670 | 10,455 | 7,657 |
| Contingencies | 586 | 586 | 128 | 128 | 714 | 714 | - | - | - | - | - | - |
| Consulting services | 714 | 714 | 357 | 357 | 1,071 | 1,071 | 799 | 799 | 445 | 321 | 1,244 | 1,120 |
| Land acquisition and compensation | 0 | 0 | 2,576 | 0 | 2,576 | 0 | 0 | 0 | 2,977 | 0 | 2,977 | 0 |
| Administration cost | 0 | 0 | 242 | 0 | 242 | 0 | 0 | 0 | 477 | 0 | 477 | 0 |
| Tax | 0 | 0 | 39 | 0 | 39 | 0 | 0 | 0 | 2,696 | 0 | 2,696 | 0 |
| Service charges | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 9 | 0 | 0 | 9 | 9 |
| Total | 7,163 | 7,163 | 4,623 | 1,766 | 11,786 | 8,929 | 5,795 | 5,795 | 12,063 | 2,991 | 17,858 | 8,786 |

(Source: JICA documents)

At appraisal: US$1=JPY114、Philippines Peso1=JPY3

Price escalation: 1.2% per year for foreign currency and 1.2% per year for local currency

Contingencies: 10% per year

Cost calculation: August 1999

Average exchange rate in the project implementation period (from January 2000 to January 2012): Philippines Peso1=JPY2.16

The total project cost includes the cost for the portions which were not complete at the expiry of loan period in 2009 and were completed by the funding of the Philippines. They were remaining parts of the polder dike and elevation of river walls as well as rehabilitation of drainage channels. All costs of the civil works and procurement of

equipment were to be funded by this project in the original plan, but 2,798 million yen were funded by the Philippines to cover these remaining works[5]. According to DPWH, while the land acquisition process finished physically, final cost of land acquisition is not fixed because some land owners took legal action demanding increase of compensation based on the increase of land price and the process would take several years. The figures in Table 4 and Table 13 (land acquisition) were estimate as of the ex-post evaluation, and therefore the final project cost might increase.

The reasons for the increase of the project cost were as follows[6].

- Cost for civil works increased due to price escalation during the extended project period. Because of the expiry of loan period in September 2008 and the change of contractors to finish the incomplete works, extra cost was incurred for the installation and removal of the construction machines compared to the case that the same contractor completed all works. The reason for the change of contractors was that the works by the international contractor was delayed and its contract finished with some incomplete portions (it is explained in the section of Project Period below). The portions that would not be complete by the end of contract were excluded from the contract of the international contractor one year before its termination. Therefore, the revised contract was totally accomplished.
- The flood in September 2009 damaged some facilities of this project. The local contractors repaired them and it led to the increase of the project cost. Exact cost for these repairs is not known because their account did not separate repair and construction costs.

#### 3.2.2.2 Project Period

The project period was significantly longer than planned. The original project period was from April 2000 (L/A[7]) to December 2006 (completion of civil works) of 81 months in total. The actual project period was from April 2000 (L/A) to January 2012 (completion of civil works) of 142 months in total, which was 175% of the plan.

Table 5. Project Period

| | Plan | Actual |
|---|---|---|
| Selection of consultant | November 1999-October 2000 | November 1999-October 2000 |
| Detailed design | November 2000-October 2001 | November 2000-October 2001 |

[5] Actual cost for the civil works and procurement of equipment was 5,468 million yen, among which 2,670 million yen was funded by the Japanese loan. The balance was funded by the Philippines.
[6] From JICA documents, DPWH's response to the questionnaire and interviews.
[7] Resettlement of informal settlers and land acquisition had started before L/A and the relevant cost was also included in the project cost. L/A is defined as the commencement of this project as other ex-post evaluations because exact commencement dates of resettlement and land acquisition are not known.

| | | |
|---|---|---|
| Tendering | November 2001-October 2002 | November 2001-June 2003 |
| Civil works | (Whole process)<br>November 2002-April 2006 | (Whole process)<br>June 2003-January 2012 |
| Contract 1 (international contractor) | | June 2003-September 2008 |
| Contract 2 (local contractor) | | February-August 2009 |
| Contract 3 (local contactor) | | May-October 2010 |
| Contract 4 (local contactor) | | September 2011-January 2012 |
| Procurement of equipment | May 2003-July 2005 | May 2003-July 2005 |
| Resettlement of informal settlers | -December 1999 | -January 2000[8] |
| Land acquisition | -October 2001 | Physical acquisition was complete, but the compensation was not complete as of April 2015. |
| Supervision of works and technical assistance | February-August 2000,<br>November 2002-December 2006 | June 2003-December 2009 |
| External monitoring | Every August between 2000-2004 | Three times between 2000-2004 |

(Source: JICA documents)

The reasons for the delay were as follows according to JICA documents:

- Tendering was delayed for eight months because DPWH needed long period for Pre-Qualification of contractors and confirmation of bidding criteria.
- While the resettlement of informal settlers had almost been complete when the project started, new informal settlers came in during the delay of the tendering process. It took time for DPWH to make decision on the resettlement of the new settlers and to obtain budget, and some civil works started late as a result.
- The civil works were to be carried out by one international contractor during the period between June 2003 and June 2007. They were delayed as there were problems such as not being able to prevent fishing boats from entering into the construction sites and difficulty in relocation of electricity and water supply facilities, and it took time to agree with the local communities on these matters. The contract with the international contractor was extended until September 2008, which was the original expiry date of the Japanese loan. This contract was revised in June 2007 to cancel the portions that were difficult to complete by September 2008. After the end of this contract, three local contractors completed the remaining

[8] The situation of informal settlers was examined in 1997. The persons to be resettled were identified by February 1998, and DPWH and LGUs agreed on the resettlement and support activities in November 1998. Resettlement was complete by January 2000 (JICA documents).

portions. In July 2008, the expiry of loan period was extended for 12 months until September 2009.

3.2.3 Results of Calculations of Internal Rates of Return

The Economic Internal Rate of Return (EIRR) calculated at appraisal was 10.8%. The conditions for the calculation were as follows:

Cost: Construction and rehabilitation cost and operation and maintenance cost of flood control facilities.
Benefit: Estimated reduction of losses/damages due to floods (30-year return period) and benefit on the community by the improvement of living conditions
Project life: 30 years
The construction and rehabilitation cost would to be incurred from the first year to the eighth year of the project life.
The operation and maintenance cost would be incurred from the sixth year, and annual operation and maintenance cost would be 22.5 million pesos from the eighth year.
The benefit would be produced from the second year, and annual benefit would be 330.3 million pesos from the fifth year.
(Source: JICA documents)

After the project completion, DPWH re-calculated EIRR as 16.1% taking the delay of construction and price escalation into account, without obtaining actual data of benefits.

・The project was complete in January 2012.
・The construction and rehabilitation cost was incurred for 13 years between 1998 and 2010.
・The annual operation and maintenance cost was estimated as 21 million pesos from 2009 to 2029. 742 million pesos would be needed in 2013 for a large repair and regular operation and maintenance. The annual operation and maintenance cost would be 31.6 million pesos after that.
・The benefit would be produced in 2009 (11th year of the project life) and would increase every year. The annual benefit would be 1,442.3 million pesos from 2011. The expected benefit would be larger than the calculation at appraisal because of price escalation.
・Project life: 45 years, based on the service life of the facilities.
(Source: JICA documents)

The EIRR calculated at project completion (16.1%) was higher than that at appraisal (10.8%) because of the increased benefits due to price escalation during the extended construction period. It is not possible to calculate exact EIRR because actual data of benefits are not available.

The project outputs were produced as planned. Both the project cost and project period significantly exceeded the plan. Therefore, efficiency of the project is low.

3.3 Effectiveness[9] (Rating: ③)

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

### 3.3.1 Quantitative Effects (Operation and Effect Indicators)

No indicators were set at appraisal to measure the reduction of floods.

#### 3.3.1.1 Operation Indicators

No operation indicators were set. In order to give some ideas on the number of beneficiaries, Table 6 shows the population data of the cities in the project target area, which is composed of seven drainage areas. The cities and drainage areas are not necessarily the same, and there are no population data per drainage area. The maximum number of beneficiaries is around 1.2 million.

Table 6. Population of the cities in the project target area

| City | Area (ha) | Population (persons) | | |
|---|---|---|---|---|
| | | 2000 | 2007 | 2010 |
| Kalookan | 5,580 | 1,177,604 | 1,378,856 | 1,489,040 |
| Southern Kalookan | 1,370 | (included in Kalookan above) | 570,665 | 578,851 |
| Malabon | 1,976 | 338,856 | 363,681 | 353,337 |
| Navotas | 894 | 230,403 | 245,344 | 249,131 |

(Source: DPWH's response to the questionnaire)

Note: The table above separates Kalookan and Southern Kalookan because Southern Kalookan is an enclave surrounded by other cities and the target drainage areas of this project were located only in Southern Kalookan.

The cities have following project target drainage areas.

Southern Kalookan: Spine, Maypajo

Malabon: Catmon, Spine, North Navotas, Dampalit, S.Pinagkabalian

Navotas: Bangkulasi, North Navotas

#### 3.3.1.2 Effect Indicators

While no indicators to measure the achievement of project objective (reduction of floods) were set at appraisal, the SAPS study in 2014 confirmed that JICA and DPWH had agreed on the project targets as follows as recorded in the minutes of discussions dated October 20, 1999.

(a) Protect the area from high tide and riverbank overflows in extreme weather events where tide level is at or below the highest observed as at the planning stage and river flows are at or below the estimated flood flow with a 30 year return period[10].

[10] Rainfalls of return periods were assumed as follows at the detailed design in 2001 (JICA documents).

| | Two-day rainfall (mm/2days) | One-hour rainfall (mm/hour) |
|---|---|---|
| 500 years | 750.6 | 131.4 |
| 100 years | 601.4 | 109.8 |
| 50 years | 536.8 | 100.5 |
| 30 years | 489.0 | 93.6 |
| 20 years | 450.8 | 88.1 |
| 10 years | 384.2 | 78.4 |
| 5 years | 314.8 | 68.4 |
| 2 years | 210.0 | 53.3 |

| |
|---|
| (b) Decrease the affected area of the inland flooding (inundation) from 90% (the baseline value at appraisal) of the area to less than 15% during a 10-year rainfall/flood event with water depths exceeding 20 cm.<br>(c) Reduce the flood damages by 500 million Pesos in every year.<br>The "target year" for the above planning was year 2020. |

The project facilities were designed as follows in 2001 based on the above assumptions:

| | |
|---|---|
| High tide | Highest observed: 1.625m above the Mean Sea Level (MSL)<br>= DPWH Datum 12.10m |
| River flow | Rainfall: 30-year return period (two-day rainfall in the upstream of Tullahan and Malabon Rivers: 489.0mm/2days)<br>River flow: between 290$m^3$/s and 450 $m^3$/s (varying from place to place) |
| Inundation | 10-year return period (one-hour rainfall in the project target area: 78.4mm) |

(Source: JICA documents)

As there were no indicators set at appraisal, the following indicators were examined for the ex-post evaluation based on the agreement between JICA and DPWH mentioned above.

(1) Reduction of inundated areas

According to DPWH and the cities in the project target area, KAMANAVA were flooded three times after the commencement of this project. They were Typhoon Ondoy in September 2009, the monsoon (habagat) in August 2012 and the heavy rains in September 2014. During Typhoon Ondoy, most part of the project target area was inundated because the tide and river flow from the upstream exceeded the assumptions at the facility design while the rainfalls in the project target area did not exceed the assumption of 10-year return period. During the monsoon in August 2012, most part of the project target area was inundated because the rainfalls in the project target area, tide and river flow from the upstream exceeded the assumptions at the facility design. These were two major flood events (detailed data are shown in (5) With-Without analysis by SAPS study). By the heavy rains in September 2014 during which the one-hour rainfall exceeded the 10-year return period in the project target area, some places were inundated in the depth between 6cm and 50cm, which was not as serious as the other two events. There is no evidence to show that flooding did not occur in other times, because the losses/damages are not examined when the residents do not report the incidence. However, it can be concluded that the losses/damages were likely to be none or minor in other weather events as there were no reports on incidence.

The first target in the JICA-DPWH minute (a) "Protect the area from high tide and

riverbank overflows in extreme weather events where tide level is at or below the highest observed as at the planning stage and river flows are at or below the estimated flood flow with a 30-year return period" was achieved because the area were not flooded by high tide or overflow from the rivers except for the two major events (Ondoy and the monsoon August 2012) which exceeded the assumptions of facility design. The flood by the heavy rains in September 2014 was due to inland flooding caused by the rainfalls in the target area that exceeded the assumption at facility design (the second target in the JICA-DPWH minute (b)), and does not contradict with the achievement of target (a).

Regarding the target (b) "Decrease the affected area of the inland flooding (inundation) from 90% of the area to less than 15% during a 10-year rainfall/flood event with water depths exceeding 20 cm", it was assumed that 84% of the total surface of the project target area (1,472.1ha out of1,750.5ha) was flood-prone before the project started, and the flood-prone areas would be reduced only to 10.7% (187.6ha) by the contribution of the project facilities (Table 7). However, the reduction of flood-prone areas could not be confirmed due to lack of actual data. No systematic examination is carried out after floods to classify flooded areas according to flood depth, while ad-hoc interviews with the affected people and observation of inundated houses have taken place after major flood events.

Table 7. Expected reduction of flooded areas

(Unit: ha)

| | | Without this project | | | | With this project (expectations) | | | |
|---|---|---|---|---|---|---|---|---|---|
| Drainage area | Whole area | No flood | Flood of 0-0.5m | 0.5-1m | 1m or more | No flood | Flood of 0-0.5m | 0.5-1m | 1m or more |
| Bangkulasi | 75.4 | 16.9 | 23.7 | 34.8 | 0.0 | 68.3 | 7.1 | 0.0 | 0.0 |
| Catmon | 355.5 | 160.3 | 21.5 | 92.4 | 81.3 | 326.6 | 28.9 | 0.0 | 0.0 |
| Spine | 173.1 | 42.5 | 69.0 | 61.2 | 0.4 | 156.7 | 16.4 | 0.0 | 0.0 |
| Maypajo | 241.2 | 50.2 | 95.4 | 95.6 | 0.0 | 227.9 | 13.3 | 0.0 | 0.0 |
| North Navotas | 417.6 | 8.5 | 107.4 | 193.0 | 108.7 | 380.3 | 37.3 | 0.0 | 0.0 |
| Dampalit | 233.1 | 0.0 | 0.0 | 38.4 | 194.7 | 188.0 | 45.1 | 0.0 | 0.0 |
| S.Pinagkabalian | 254.6 | 0.0 | 0.0 | 66.3 | 188.3 | 215.1 | 39.5 | 0.0 | 0.0 |
| Total | 1,750.5 | 278.4 | 317.0 | 581.7 | 573.4 | 1,562.9 | 187.6 | 0.0 | 0.0 |

(Source: JICA documents)

(2) Average duration of inundation

Such data were not available. However, staff of Malabon City stated that currently it takes only several hours for flood water to drain while it used to take about three days before the completion of this project.

(3) Number of flooded houses

DPWH provided data on losses/damages by city caused by major weather events (shown from Table 8 to Table 11). Due to lack of sufficient data, it is not possible to examine the relationship between the scale of the events and number of flooded houses or to capture the contribution of this project to the reduction of losses/damages.

(4) Financial losses/damages by flood

DPWH reported that this project contributed to the reduction of financial losses/damages by flood by at least 500 million pesos per year, but without sources of calculation. It is not possible to confirm it as the data shown in Table 8 to Table 11 are not sufficient.

From the above, there were no data of these indicators such as reduction of flooded areas, average time of inundation, number of flooded houses and financial losses/damages by flood. Therefore, it is not possible to show the contribution of this project to the reduction of losses/damages by flood.

Table 8. Losses/damages in the project target area by Typhoon Ondoy, September 2009

| | Number of people affected | | | Number of damaged houses | | Financial losses/damages (million pesos) |
|---|---|---|---|---|---|---|
| | Barangay[11] | Number of household | Number of people | Totally damaged | Partially damaged | |
| Kalookan | 23 | 18,116 | 90,580 | 0 | 0 | No data |
| Malabon | 11 | 1,381 | 8,736 | 159 | 0 | No data |
| Navotas | 3 | 62 | 355 | 6,748 | 85 | No data |
| Metro Manila | No data | No data | No data | No data | No data | 1,128 |

Table 9. Losses/damages in the project target area by the monsoon in August 2012

| | Number of people affected | | | Number of damaged houses | | Financial losses/damages (million pesos) |
|---|---|---|---|---|---|---|
| | Barangay | Number of household | Number of people | Totally damaged | Partially damaged | |
| Kalookan | 13 | 5,371 | 26,761 | No data | No data | No data |
| Malabon | 18 | 4,613 | 20,474 | No data | No data | No data |
| Navotas | 12 | 1,630 | 7,698 | No data | No data | No data |
| Metro Manila | No data | No data | No data | No data | No data | 412 |

[11] Barangay is the smallest local government unit in the Philippines. It is under a City or Municipality.

Table 10. Losses/damages in the project target area by the heavy rains in August 2013 (rainfall: 30mm/hour, 290 mm/day)

| | Number of people affected | | | Number of damaged houses | | Financial losses/damages (million pesos) |
|---|---|---|---|---|---|---|
| | Barangay | Number of household | Number of people | Totally damaged | Partially damaged | |
| Kalookan | 9 | 5,162 | 25,171 | 0 | 0 | No data |
| Malabon | 17 | 7,631 | 35,406 | 0 | 0 | No data |
| Navotas | 2 | 86 | 365 | 0 | 0 | No data |
| Metro Manila | No data | No data | No data | No data | No data | No data |

Table 11. Losses/damages in the project target area by the heavy rains in September 2014 (rainfall: 84.6 mm/hour, 688.7mm/day)

| | Number of people affected | | | Number of damaged houses | | Financial losses/damages (million pesos) |
|---|---|---|---|---|---|---|
| | Barangay | Number of household | Number of people | Totally damaged | Partially damaged | |
| Kalookan | No data | 1,886 | 10,969 | No data | No data | No data |
| Malabon | No data | 936 | 3,582 | No data | No data | No data |
| Navotas | No data | 33 | 142 | No data | No data | No data |
| Metro Manila | No data | No data | No data | No data | No data | No data |

Seven barangays in Malabon city were flooded with depth between 6cm and 50cm.
(Source: DPWH's response to the questionnaire)

(5) With-Without analysis by SAPS study

Because the project target area was flooded by the monsoon in August 2012 despite of the facilities of this project, the residents were skeptical about the effects of the project. JICA carried out a SAPS study from October 2013 to January 2014 in order to show the effects of the project to the residents. The methodology of the study was with-without analysis to compare the possible losses/damages in these two major events "with" and "without" the facilities of this project. The results of the study are shown below.

Flood by Typhoon Ondoy, September 2009 (September 23-30, 2009)

Situation in the project target area

This project had completed the polder dike, and partially completed the raising of river walls (some parts were elevated up to 12.6m). Dredging had not been implemented.

- Rainfall in the project target area: 371.9mm (two-day rainfall between midnight of September 25-26 and midnight of September 27-28, 2009) (approximately equal to rainfall of 10-year return period)
- Tide: +12.2m (September 27, 2009). It exceeded DPWH Datum 12.1m.
- River flow from the basin of Tullahan River: 600 $m^3/s$, capacity of Malabon River: 100 $m^3/s$-600 $m^3/s$. They exceeded the river flow of 30 year return period of the two rivers (290 $m^3/s$-450 $m^3/s$, varying place to place).

Most part of the project target area was flooded because the tide and river flow exceeded the assumptions at facility design while the rainfall in the area was within the

assumed 10-year return period. The SAPS study concluded that in six drainage areas among seven, the volume of flood was 20%-80% lower by the effects of the polder dike, river walls, flood gates and pumping stations constructed or rehabilitated by the project compared to the hypothetical situation without these facilities. The river walls had been elevated up to 12.6m and protected effectively the downstream of Malabon River and the area along Malala River from the high tide of 12.2m. The polder dike also protected some of the project target area from flooding, but its northern section was flooded because some parts of the polder dike were lower than 12.6m.


Navotas City in monsoon, August 3, 2012
(Source: Inquirer)

Malabon City in monsoon, August 7, 2012
(Source: Reuters/Stringer)

Flood by monsoon in August 2012 (August 1-8, 2012)

Situation in the project target area

This project was complete.

・Rainfall in the project target area: 737.5 mm (two-day rainfall between 17hours of August 6, and 17 hours of August 8, 2012) (approximately equal to rainfall of 500-year return period)

・Tide: +12.65 m (August 2, 2012). It exceeded DPWH Datum 12.1m.

・River flow from the basin of Tullahan River: 600 $m^3/s$, capacity of Malabon River: 350 $m^3/s$-600 $m^3/s$. They exceeded the river flow of 30 year return period of the two rivers (290 $m^3/s$-450 $m^3/s$, varying place to place).

Most part of the project target area was flooded because the rainfall, river flow and tide exceeded the assumptions at facility design. However, the SAPS study concluded that the volume of flood was 10%-80% lower by the effects of the polder dike, river walls, flood gates and pumping stations constructed or rehabilitated by the project compared to the hypothetical situation without these facilities. It also estimated that the average flood volume was reduced by 68% in the project target area, and the project delayed reaching of the flood water to the dangerous elevations by one day at most.

Some areas were protected from flood by the river walls and polder dike. However, the river walls were 12.6m above sea level and could not prevent the tide of 12.65m

from entering into the area. As some parts of the polder dike were lower than 12.6m, three parts of the walls were destroyed and allowed flood water to overflow (source: JICA documents).

From the results of With-Without analysis of the SAPS study, it can be confirmed that the floods were reduced to a certain extent even though the scale of events exceeded the assumptions at the facility design. The Philippine also has implemented flood control projects using their own funding, which also have contributed to the reduction of floods.

(6) Beneficiary surveys

Beneficiary surveys were carried out in Malabon and Navotas Cities, which were the main target LGUs of this project. One hundred persons in total, 50 from each city[12], participated in the surveys.

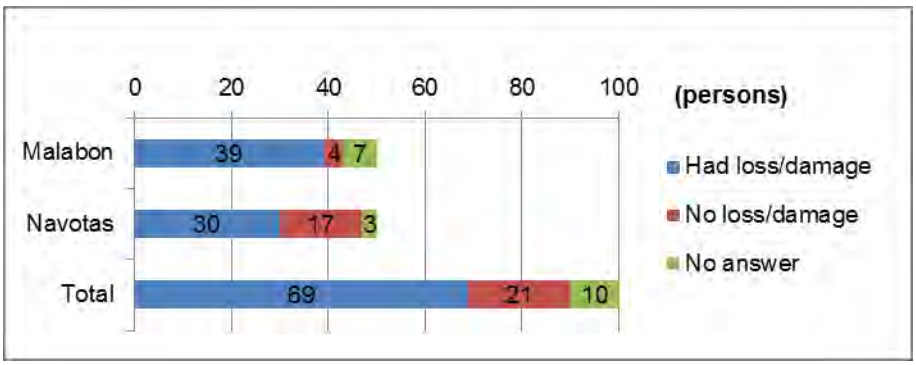



Figure 3. Losses/damages by flood by Typhoon Ondoy, September 2009

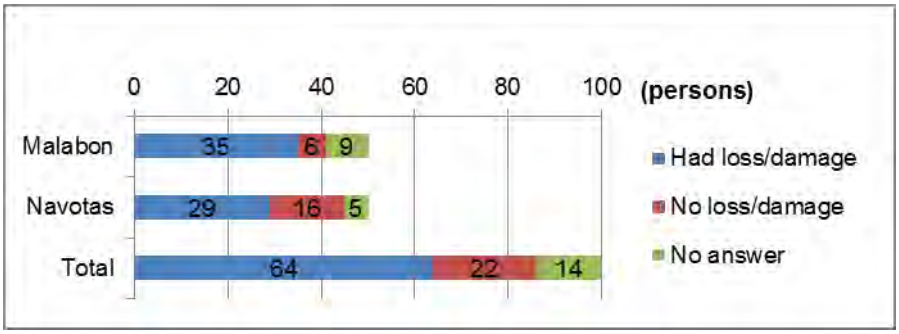



Figure 4. Losses/damages by flood by monsoon in August 2012

[12] The respondents were 50 from Malabon (men 17, women 29, unknown 4), and 50 from Navotas (men 34, women 10, unknown 6).

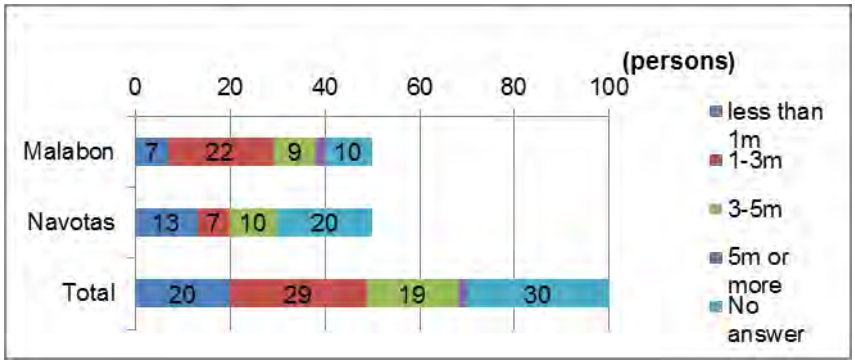



Figure 5. Inundation by Typhoon Ondoy in September 2009

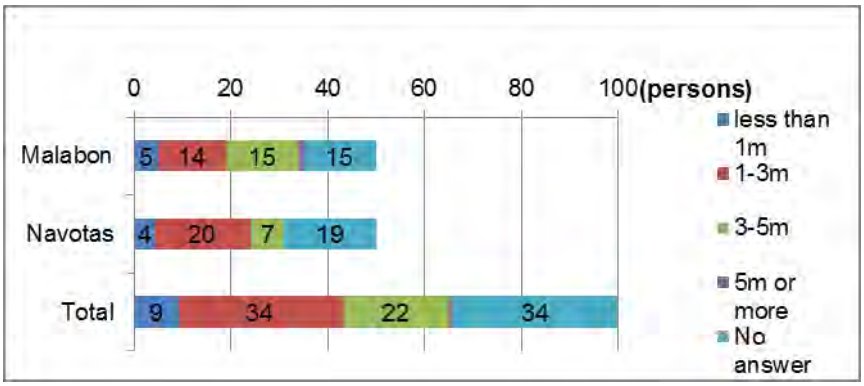



Figure 6. Inundation by monsoon in August 2012

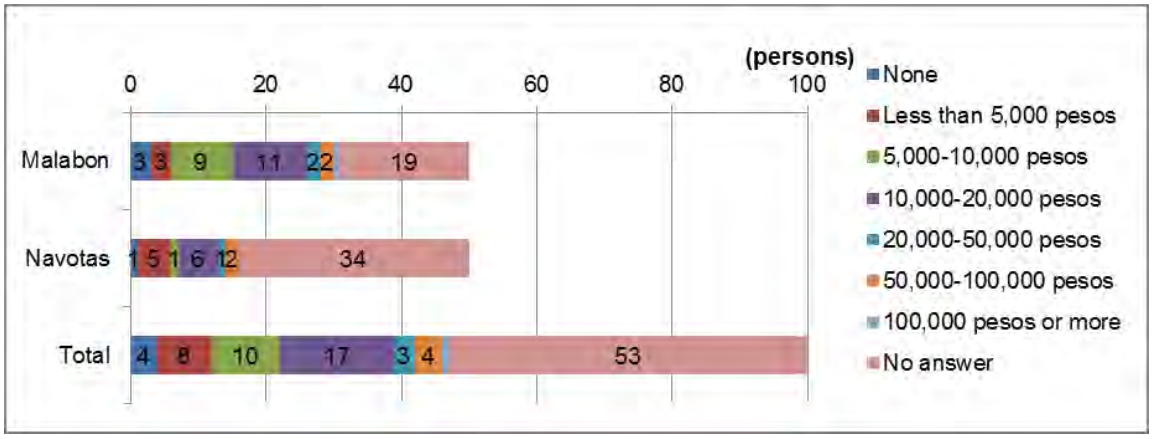



Figure 7. Financial losses/damages by Typhoon Ondoy in September 2009

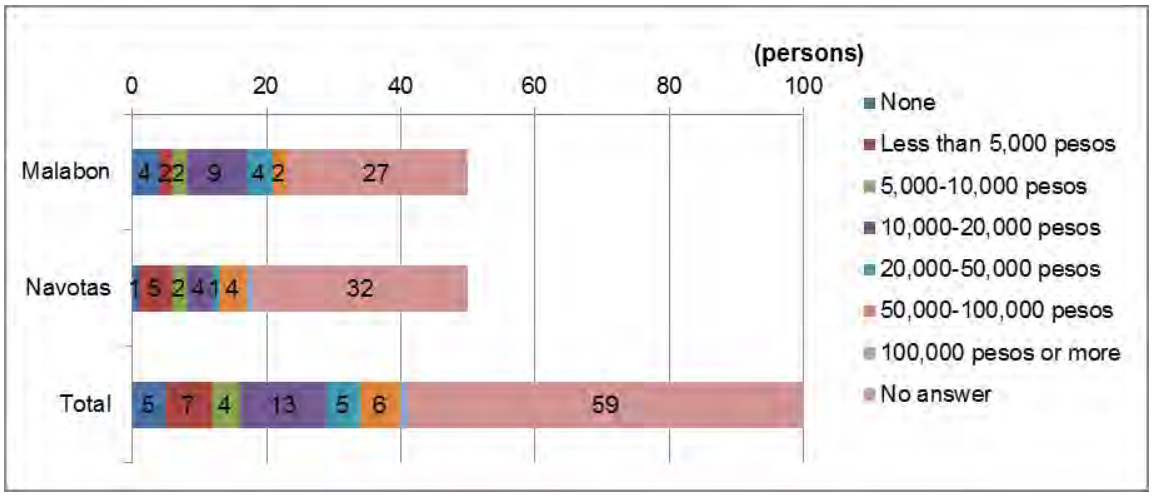



Figure 8. Financial losses/damages by monsoon in August 2012

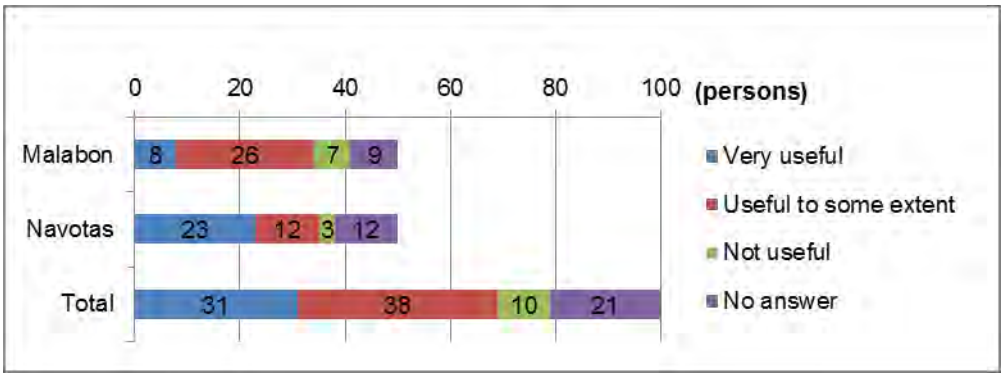



Figure 9. Observation whether the flood control facilities constructed/rehabilitated by this project were useful for the reduction of flood

There were no significant differences between the two events in 2009 and 2012 regarding the losses/damages by flood, inundation and financial losses/damages as shown in Table 3-Table 9. However, it can be concluded that the project facilities, which had been completed before the monsoon in August 2012, contributed to the reduction of losses/damages by flood to a certain extent because the scale of the event was larger in August 2012 than that in September 2009.

About 70% of the participants in the beneficiary surveys felt that the flood control facilities of this project contributed to the reduction of floods to a large or certain extent. Many chose “to a certain extent” because they were likely to be aware of the other flood control activities and of the fact that flood could never be zero despite of the facilities. The respondents in Navotas tended to be more positive than those in Malabon, the reason of which could be that Navotas is located downstream and the residents might be more conscious about the effect of the project facilities on the reduction of floods than Malabon residents.

3.3.1.3 Other effects (qualitative effects, etc.)

According to the results of the beneficiary surveys, about 40-50% of the respondents were aware of the improvement of the safety in the areas, landscape, waste management and community participation in flood control activities.

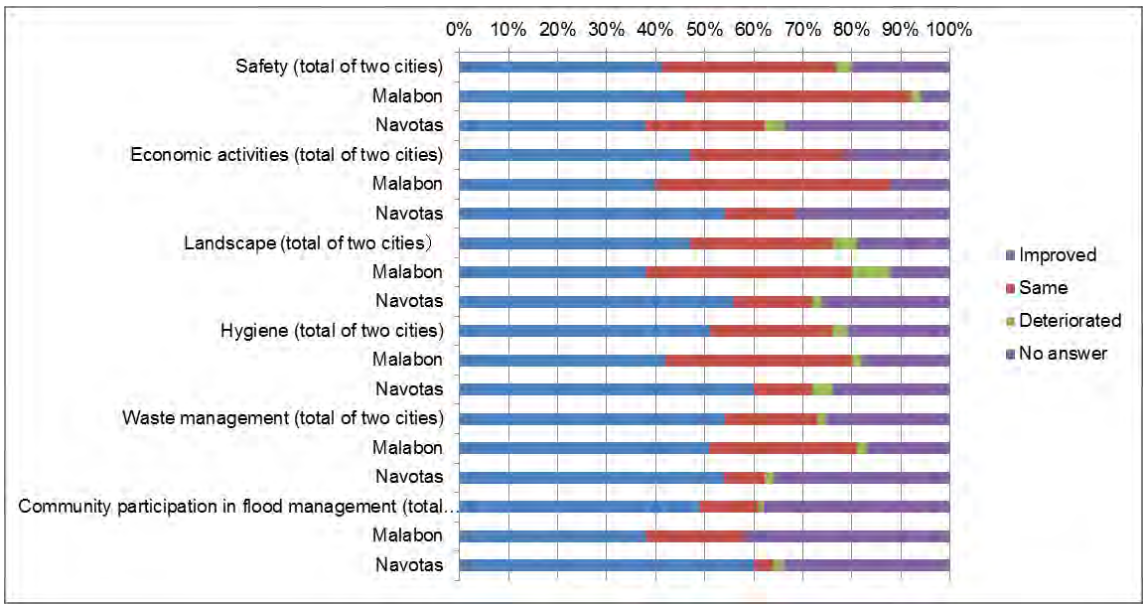



Figure 10. Improvements brought about by this project

From the above, effectiveness of this project is high. Flood did not occur or was minor during the weather events of the scale below the assumptions at the facility design. In addition, the project facilities contributed to the reduction of floods to a certain extent even in the major weather events exceeding the assumptions at the facility design compared to the hypothetical situation without these facilities.

3.4 Impacts

3.4.1 Intended Impacts

(1) Improvement of living conditions

According to the results of the beneficiary surveys above, about 40-50% of the respondents were aware of the improvement of hygiene status, waste management and landscape.

(2) Development of regional economy

According to DPWH's response to the questionnaire, people in the project target area are more willing to participate in the economic activities and investment as well as in the

development of residential areas compared to the period before the project. As the project target area is in downtown of Metro Manila where many houses and shops are congested, there are no large development projects. Nonetheless, people feel safer to operate businesses as the flood risks were reduced. About 40-50% of respondents in the beneficiary surveys feel that economic activities are more active in the area than before.

### 3.4.2 Other Impacts

(1) Impacts on the natural environment

At appraisal, this project was classified as Category B of "JBIC Guidelines for Confirmation of Environmental and Social Considerations" (April 2002), as its potential adverse environmental impact was not considered serious. Initial Environmental Examination (IEE) was carried out, and the Department of Environment and Natural Resources issued an Environmental Compliance Certificate of the Philippines.

To avoid negative impacts on environment, following actions were planned and implemented (source: JICA documents, DPWH).

- Removal of trees were minimized and trees were replanted in nearby vacant public lands. Some areas in the pumping stations were landscaped.
- In order to prevent noise, sound absorbent materials were provided. Traffic was eased by using service roads. Roadways and construction sites were sprinkled with water during dry seasons.
- In order to prevent water pollution due to reduced exchange of water by the construction of the polder dike, sluice gates were incorporated to promote exchange of water.
- Construction debris and dredged materials were properly disposed. After the completion of dredging, dredging sites were closed quickly and adequately.
- In order to minimize smokes from heating up of diesel engines, operation of the pumping stations were performed only in intense rains. Smoke vents were installed high enough to prevent smokes from affecting people. Sound-deadening materials were installed to reduce noise from the pumping stations.
- Temporarily removed facilities such as water supply, sewerage, roads, electric power and telephone lines were restored to their original positions after construction works without reduction of scale or level of services.

According to DPWH and the project target cities, the volume of waste in and around the rivers and channels were reduced because the waste management was strengthened and there were less illegal disposal of waste after the relocation of informal settlers. However, waste keeps arriving from the sea or upstream. The waste management

activities of the project target cities are described in detail in the section of Sustainability.

No specific negative impacts on environment were observed. Only one respondent to the beneficiary surveys pointed out the noise from the flood control facilities.

(2) Land Acquisition and Resettlement

Resettlement

DPWH relocated all identified informal settlers (6,206 households) by January 2000 in accordance with the laws and regulations of the Philippines to the three sites prepared by the government[13]. According to JICA documents, however, some of these persons returned and new informal settlers were identified since then, and the number of households to be resettled increased to 7,200 by April 2000 (at L/A), including those who had once been resettled. DPWH developed the "comprehensive resettlement follow-up plan" on May 2001. Skill training for resettled persons was conducted by NGOs in the areas such as sewing to enhance their employability in consideration of main industries in the relocation sites and the skills and educational attainment of the resettled persons.

The consultants employed by DPWH conducted surveys of resettled persons three times during the project period. The result of the last survey in May-June 2004 was shown in Table 12. The surveyed persons were 22.5 years old on average, less than one third of them had completed secondary education or above, and many of them were unskilled workers. Many of them felt that housing conditions, environment and peace and order of life had improved after relocation. On the other hand, they were negative about the access to transport and other facilities as well as about level of income after relocation. The reasons were as follows:

- The relocation sites were far from the workplaces in Metro Manila. People had to pay more for transportation.
- Employment opportunities in the relocated sites were limited. There were factories such as sewing plants, but academic qualifications and skills of the resettled persons limited their options. The majority of them were in the early twenties with children, and could not allocate enough time for work.
- For self-employed, the market size and number of customers were smaller in the relocated sites than in Metro Manila.
- If they were given lands only, they had to pay for construction of houses. The payment was large even in cases of lease contracts.

[13] They were Pabahay2000, Towerville and North Hill, which were all outside of the project target area.

DPWH had lost contact with the resettled persons by the time of ex-post evaluation and it did not know their current situations.

Table 12. Perceptions of resettled persons
(comparison before and after relocation)

(Unit: %)

| | Better | Same | Worse |
|---|---|---|---|
| Housing | 79.6 | 6.7 | 13.8 |
| Water supply | 37.8 | 30.4 | 31.8 |
| Electricity | 29.3 | 38.2 | 32.4 |
| Transport | 12.4 | 12.4 | 75.3 |
| Access to schools | 36.0 | 26.9 | 37.1 |
| Access to health facilities | 8.7 | 39.8 | 51.6 |
| Peace and order | 74.7 | 12.4 | 12.9 |
| Income | 7.8 | 19.1 | 73.1 |
| Quality of environment | 94.2 | 3.3 | 2.4 |
| Quantity and quality of foods | 11.6 | 34.0 | 54.4 |
| Health situation | 35.8 | 51.6 | 12.7 |

(Source: Socio-economic survey of Project Affected Persons, 2004)
One hundred fifty household per site were surveyed (may-June 2004).

Land acquisition

According to DPWH, land acquisition was implemented in accordance with the laws and regulations and physically completed. There was no problem in acquisition itself or its process. However, the final compensation is not fixed because some land owners took legal actions demanding increase of compensation based on the increase of land price and the process would take several years. The figures in Table 13 were estimate as of the ex-post evaluation (the actual project cost of Table 4 in section 3.2.2.1 “Project Cost” is based on this amount).

Table 13. Cost of land acquisition and compensation

| | | Cost of land acquisition and compensation |
|---|---|---|
| Land acquisition | 288 lots[14] | 248,270.96 pesos per lot x 288 = 71,502,037 pesos |
| Compensation | 495 houses | 21,632.61 pesos per house x 495 = 10,708,144 pesos |

(Source: DPWH’s response to the questionnaire)

(3) Other positive and negative impacts

The social survey in the SAPS study (implemented in November 2013) found out that 76% of respondents were willing to participate in the activities to improve flood control

[14] The land acquisition process for all 288 lots was complete physically by April 2015. Compensation was also complete for 176 lots, but the remaining 112 lots received partial payment. All 495 houses received compensation (interview of DPWH).

in the project target area. Also at the ex-post evaluation, they were active in flood control activities (other than construction or rehabilitation of flood control facilities) such as awareness raising in prevention of waste disposal into the rivers (source: DPWH's response to the questionnaire).

This project has reduced floods to a certain extent, and produced impacts such as improvement of living conditions in the project target area, development of regional economy, improvement of waste management and enhanced awareness of residents about flood control. In total, effectiveness and impact of the project are high as it has largely achieved its objectives.

3.5 Sustainability (Rating: ③)

3.5.1 Institutional Aspects of Operation and Maintenance

DPWH Unified Project Management Office-Flood Control Management Cluster (UPMO-FCMC) is responsible for the operation and maintenance of the facilities of this project. The unit has four teams consisting of several engineers, and each team is responsible for several projects. The team responsible for the operation and maintenance of the facilities of this project has six engineers. The pumping stations and flood gates are operated and maintained by the National Capital Region-Pumping Stations and Floodgates Division (NCR-PSFGD) of DPWH. The pumping stations and flood gates are functioning for 24 hours by the operators working at three shifts (eight hours each), with about three persons in one shift.

Metro Manila Development Authority (MMDA) was created by Republic Act No. 7924 in 1994 and mandated to plan and implement flood control policies and strategies in Metro Manila. According to this Act, the facilities of this project should also be under MMDA. Therefore, on July 2002, DPWH and MMDA agreed on the transfer of the project facilities from DPWH and MMDA. However, DPWH continued to be the executing agency until the project completion based on the agreement of this project. According to DPWH and MMDA, the project facilities will be transferred from DPWH to MMDA in the second half of 2015 or in 2016, and the first discussion took place in February 2015. They are going to continue discussions on transfer including preparation of inventory of the facilities and equipment. In MMDA, the Flood Control and Sewerage Management Office (FCSMO) will be responsible for the operation and maintenance of the project facilities. The mandate of MMDA-FCSMO is to prevent flooding in Metro Manila and ensure all roads to be passable any time (source: DPWH's response to the questionnaire). MMDA-FCSMO manages 54 pumping stations in Metro Mania and has 13 staff, 139 pumping station operators and 215 workers. When the project facilities are

transferred from DPWH, all DPWH operators working there (about 30 persons) would also be transferred to MMDA. The pumping stations of MMDA are also functioning for 24 hours by the operators working at three shifts (eight hours each), with two or three persons in one shift (source: interview of MMDA).

From the above, no major problems were observed in the institutional aspects of DPWH in the operation and maintenance of the project facilities, as well as those of MMDA.

### 3.5.2 Technical Aspects of Operation and Maintenance

DPWH UPMO-FCMC has about 90 staff and it has operated flood control projects for long years even before the commencement of this project. There is no problem in the number and skill levels of the staff. UPMO-FCMC has conducted training for the operation and maintenance staff, including one-week instruction session by the project contractor during the project period on operation of facilities and troubleshooting training for four days after the completion of the project. DPWH uses operation and maintenance manuals of the pumping stations and flood gates (source: JICA documents, DPWH's response to the questionnaire).

There is no problem with the skill levels of MMDA's operation and maintenance staff as they operate its existing flood control facilities without particular troubles.

### 3.5.3 Financial Aspects of Operation and Maintenance

DPWH's budget is shown in Table 14. Its whole and flood control budgets both have increased.

Table 14. Budget of DPWH

(Unit: billion pesos)

| | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|
| Roads | 68.0 | 78.1 | 100.9 | 129.4 | 170.4 |
| Flood control | 11.3 | 10.8 | 15.9 | 33.6 | 45.9 |
| Others | 11.3 | 10.6 | 27.6 | 27.9 | 57.7 |
| Total | 90.7 | 99.5 | 144.3 | 190.9 | 273.9 |

(Source: DPWH documents)

DPWH's budget for operation and maintenance of the project facilities is shown in Table 15. From 2011 to 2013, the annual budget was 40 million pesos (20 million pesos each for operation and maintenance), and the expenditures were almost within the budget. The budget of 2014 was increased to 70 million pesos (35 million pesos each for operation and maintenance), and the expenditure was within the budget. The budget of 2015 largely increased compared to those of the previous years. The budget of 2016 is

50 million pesos, which is about a half of the 2015 budget, expecting the transfer of the facilities to MMDA.

Table 15. DPWH budget and expenditure for operation and maintenance of the project facilities

(Unit: million pesos)

| | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
|---|---|---|---|---|---|---|
| Budget | 40.0 | 40.0 | 40.0 | 70.0 | 100.0 | 50.0 |
| Expenditure | 54.6 | 72.0 | 40.0 | 70.0 | - | - |
| (Operation) | 18.0 | 19.3 | 18.0 | 22.0 | - | - |
| (Maintenance) | 36.6 | 52.7 | 22.0 | 48.0 | - | - |

(Source: JICA documents, interviews of DPWH)

MMDA is planning to allocate 100 million pesos for operation and maintenance of the facilities of this project in 2016 after they are transferred from DPWH. This budget is likely to be sufficient in view of the actual expenditures in the past years and the 2015 budget of DPWH. MMDA's annual budget for operation and maintenance of its existing pumping stations is about 250-300 million pesos, which does not include cost for expanding capacities of the pumping stations or the operation and maintenance budget of the facilities of this project.

From the above, no particular problem is observed about the financial aspects of operation and maintenance.

### 3.5.4 Current Status of Operation and Maintenance

DPWH

The facilities of this project are functioning without major problems. Some spare parts are available only in Japan, but DPWH has experienced no problem to purchase them.

According to their interviews and response to the questionnaire, the following items were broken and repaired:

- Navigation gate: the link rods were found broken in February 2011, and replaced by the temporary spare parts in March 2012 while waiting for the authentic parts. They were finally replaced by the authentic link rods in July 2013 at about 32 million pesos[15]. The navigation gate was not functioning as of January 2015 for the maintenance dredging work. The dredging was to be complete and the navigation gate was to resume operation by the rainy season when the gate needs to open and close frequently.
- Catmon pumping station: the generator was broken due to continuous use. Four

[15] Commission on Audit Report, Pilot Audit 1: KAMANAVA Flood Control Project (2013)

backup generators were installed in 2014 at about 30 million pesos.

MMDA

Three among four pumping stations in West Manggahan (Taguig City, Metro Manila) constructed by a JICA loan project and transferred from DPWH to MMDA were visited during this ex-post evaluation. All three pumping stations are functioning without major problem. MMDA plans to enhance the capacity of all three, and allocated budget of about 420 million pesos to install new pumps and generators.

MMDA's pumping station
West Manggahan

Pumps in a MMDA's pumping station,
West Manggahan

MMDA's flood gate, West Manggahan

MMDA's waste processing machine,
West Manggahan

LGU

Malabon City is active in flood control as it is considered prerequisite for the development of the city. It has about 60 pumping stations including those constructed by this project. The city constructed 29 among these 60 pumping stations. Its annual operation and maintenance budget of the flood control facilities is about 20 million

pesos. The city receives about 400 million pesos per year from the central government for flood control, including funding from development partners. The city is implementing flood control projects formulated by the World Bank's masterplan project and is to rehabilitate its existing pumping stations. The flood control facilities in Navotas City, including those constructed by this project, are also functioning without major problems. According to the interview with Navotas City, it is planning to construct 42 additional small pumping stations by its own funding.

Regarding waste management, both cities have installed garbage traps in the rivers and major channels. As garbage from upstream still comes in, the cities requested upstream LGUs to reduce waste disposal into the rivers. Also, based on the resolution of the Supreme Court dated February 15, 2011 for the improvement of environment in and around Manila Bay[16], MMDA continues relocation of informal settlers along the rivers and channels in cooperation with LGUs in the area. Malabon and Navotas have installed garbage collection points in the cities and implemented the antilittering ordinance (source: JICA documents). Malabon City collects garbage three times a week, and raises awareness in the community through the waste management campaigns at schools and clean barangay contests. Malabon City's annual budget for waste management is about 95 million pesos. According to the interview with Navotas City, it cleans the rivers and channels once or twice per month. It has a 10-year Solid Waste Management Plan (2007-), and its budget for the year 2014 was 19.2 million pesos.

From the above, no major problems were observed about the current situations of the facilities constructed by this project as well as the facilities operated by MMDA to which the project facilities will be transferred. Malabon and Navotas Cities continue flood control and waste management activities by their own funding, and there is no problem about the sustainability of these activities.

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

## 4. Conclusions, Recommendations and Lessons Learned

### 4.1 Conclusions

The objective of this project was to improve flood control and drainage systems in

16 http://www.law.pace.edu/sites/default/files/IJIEA/PhilippineSupremeCourt_2-15-2011_per_recommendation_of_Manila_Bay_Advisory_Committee.pdf

KAMANAVA area, Metro Manila by constructing or rehabilitating flood control facilities including a polder dike, river walls, pumping stations, flood gates, control gates, a navigation gate and drainage channels and by procuring hydrological and meteorological observation instruments, thereby contributing to the reduction of floods and improvement of living conditions and environmental health as well as economic development in the area.

This project has been highly relevant with the Philippines' development plan and development needs, as well as with Japan's ODA policies. Therefore its relevance is high. While the project outputs were produced as planned, both the project cost and project period significantly exceeded the plan. Therefore, efficiency of the project is low. This project has reduced floods to a certain extent and produced impacts such as the improvement of living conditions in the project target area, development of regional economy, improvement of waste management and enhanced awareness of residents about flood control. In total, effectiveness and impact of the project are high as it has largely achieved its objectives. No major problems have been observed in the institutional, technical and financial aspects of the operation and maintenance system of DPWH, which is currently responsible for the operation and maintenance of the project facilities, and those of MMDA, the organization to which the project facilities will be transferred in the second half of 2015 or in 2016. Therefore, the 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 Agencies

None.

#### 4.2.2 Recommendations to JICA

None.

### 4.3 Lessons learned

Flood control facilities could reduce floods, but they are not able to alleviate floods completely. However, the residents tend to expect the facilities to make the area flood-free. When the project target area was flooded in the recent major weather events, some people were skeptical about the effects of the project facilities as they had expected more. The SAPS study showed the flood control effects to the residents and they were convinced. In the design phase of flood control projects, it would be necessary to explain to the target populations about the expected degree of reduction of floods and the assumptions at the facility design (such as scale of rainfalls) and the fact that the flood

could be effectively controlled in coordination with other flood control activities by the relevant stakeholders such as LGUs.

Comparison of the Original and Actual Scope of the Project

| Item | Original | Actual |
|---|---|---|
| 1. Project Outputs | | As planned with slight modification from the original plan as a result of the detailed design. |
| Civil engineering | ・Polder Dike: 8.0km<br>・River Walls Raisings: 12.4km<br>・Navigation lock: 1<br>・Pumping stations without flood gates incorporated with navigation lock: 1<br>・Independent flood gates: 6<br>・Control gates: 2<br>・Pumping stations with ancillary flood gates: 6<br>・Rehabilitation of existing drainage channels: 6.4km<br>・Construction of drainage channels: 1.8km | ・Polder Dike: 8.6km<br>・River Walls Raisings: 10.5km<br>・Navigation gate 1: (replaced Navigation lock)<br>・Pumping stations without flood gates incorporated with navigation gate: 1<br>・Independent flood gates: 6<br>・Pumping stations with ancillary flood gates: 4 (two were cancelled together with the cancellation of control gates)<br>・Rehabilitation of existing drainage channels: 5.6km<br>・Construction of drainage channels: 2.1km |
| Procurement of equipment | ・Hydrological and meteorological observation instruments<br>・Dust removal equipment for pumping stations | As planned. |
| Consulting services | ・Basic study of topography and soils and review of basic design of flood control facilities<br>・Detailed design of flood control facilities<br>・Assistance for bidding<br>・Environmental management including monitoring of observation of Environmental Compliance Certificate and supervision of contractors<br>・Assistance for development of report on resettlement and land acquisition and for livelihood of resettled persons | As planned. |
| External monitoring of resettlement and land acquisition | ・Monitoring of resettlement and land acquisition processes by the executing agency<br>・Monitoring of social and economic conditions of the resettled persons and of related activities by the relevant governmental agencies<br>・Advice for the relevant governmental agencies | As planned. |
| 2. Project Period | April 2000 – December 2006<br>(81 months) | April 2000 – January 2012<br>(142 months) |
| 3. Project Cost<br>Amount paid in Foreign currency<br>Amount paid in Local currency<br>Total<br><br>Japanese ODA loan portion<br>Exchange rate | <br>7,163 million yen<br><br>4,623 million yen<br>(1,541 million Philippine pesos)<br>11,786 million yen<br><br>8,929 million yen<br><br>1 Philippine pesos=3 yen<br>(As of August 1999) | <br>5,795million yen<br><br>12,063 million yen<br>(5,585 million Philippine pesos)<br>17,858 million yen<br><br>8,786 million yen<br><br>1 Philippine pesos=2.16yen<br>(Average between April 2000 and January 2012) |

Republic of the Philippines

Ex-Post Evaluation of Japanese ODA Loan Project

"Malitubog-Maridagao Irrigation Project"

External Evaluator: Kyoko Okamura, Sanshu Engineering Consultant

## 0. Summary

The Malitubog-Maridagao Irrigation Project was implemented through a yen-loan assistance scheme, signed between the Governments of Japan and the Philippines in 1990, with an objective to increase and stabilize agricultural production in the central region of Mindanao Island via the construction of irrigation facilities, thereby contributing to the alleviation of poverty by improving the incomes of local farmers.

The project has been highly relevant to the development plans and needs of the Philippines, as well as Japan's ODA policies. However, all the project activities had to be suspended for about six years from 1993 to 2000 due to extraordinary deterioration of the peace and order situation in the project area. Considering the fact that a possibility of worsening security situation was already stated as a concern in the appraisal document, there should have been concrete measures included in the loan agreement as much as possible to mitigate negative impacts of such circumstances. For example, the selection of project sites and the decision on the project scale/coverage could have been based on a more careful assessment of the security situation and prospects. The project could have also included some components to be locally managed by the executing agency in the case where the security situation would not allow JICA and external consultants to engage in project activities on site. Upon the resumption of the project in 2000, the project plan was revised to be completed in 2003. Following the revised plan, the yen-loan components were completed in 2003 as scheduled while the activities funded by the Philippines Government continued until 2014. Insufficient funding and delayed budget allocations/releases to the field level were identified as major reasons for such a significant delay. If there had been more careful project plans and approaches to address such administrative constraints arising during the project period, the significant delay by additional 11 years could have been avoided or at least shortened. Therefore its relevance is fair. In terms of the project implementation aspects, the total project cost was greater than planned even though the outputs remained the same as planned. The project period was also significantly longer than the planned. Therefore, efficiency of the project is low. With regard to the effectiveness, most of the operation and effect indicators, as far as available data is assessed, showed continuous improvements. Several qualitative effects were also reported by the executing agency, including spill-over effects on mobility and transportation of goods/commodities, access to basic social services, employment opportunities, and peace and order situations. The beneficiary survey conducted as part of the ex-post evaluation also showed local

residents' overall satisfaction with the project as well as their positive perceptions regarding benefits brought by the project. Positive impacts on 'women in development (WID)' aspects were also found in the survey. There have been no major reports regarding negative impacts on natural environment. On the other hand, project impacts on poverty reduction in the target area, which is the most important impact indicator, could not be analyzed due to non-availability of relevant quantitative data. Therefore, effectiveness and impact of the project are fair. No major problems have been observed in the institutional and technical aspects of the operation and maintenance of facilities and equipment constructed/procured under the project. There are also no major issues in the current status of the operation and maintenance. While the financial status of the Maridagao River Irrigation System office, which is responsible for day-to-day operation and maintenance activities of the constructed facilities, has been in deficit, there is a prospect of improvements in the near future owing to successful attempts to increase the irrigation service fee collection through pilot activities. Therefore, sustainability of the project effects is fair.

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

## 1. Project Description

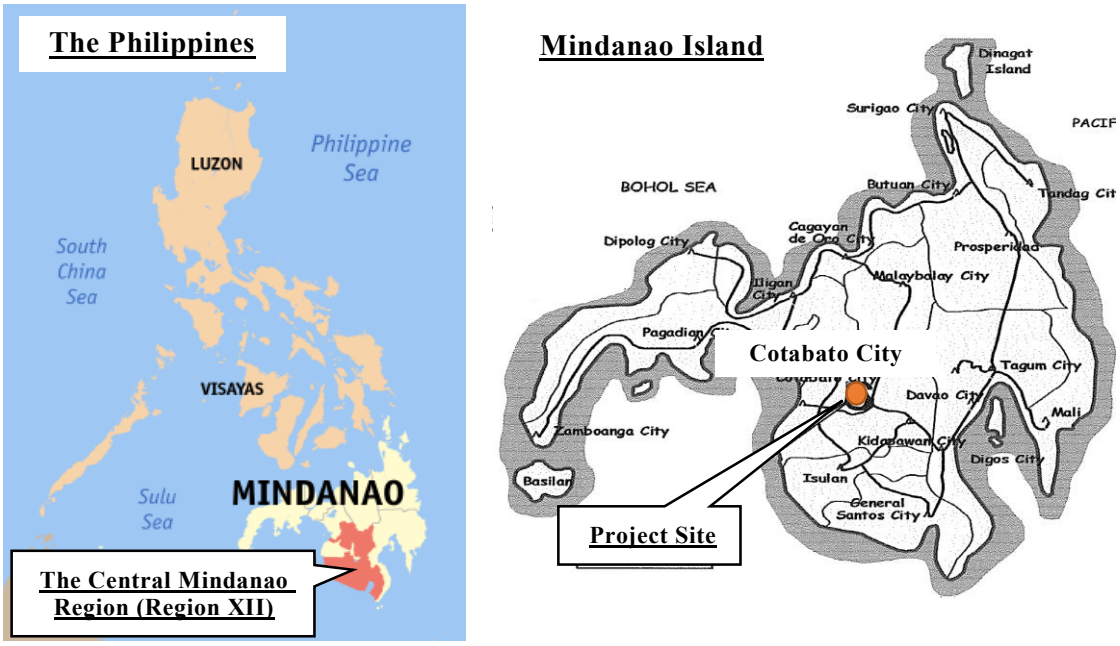
### 1.1 Background

Mindanao Island located in the southern part of the Philippines is said to have a tremendous potential in agricultural development due to its richness in natural and water resources, large arable land, and suitable climate for agriculture. The Islands is however still under development mainly due to prolonged internal conflicts and unstable peace and order situations, as well as inadequate use of land. The Central Mindanao Region (so-called Region XII) had been among the regions with particularly high poverty levels. From the time of the loan appraisal, sustainable improvements in agricultural productivity and reduced regional disparities in farmers' income and employment have been placed a special priority in the Philippine Government's development agenda. In particular, the government identified the development of irrigation systems to contribute towards regional economic development and poverty reduction as one of the most urgent agendas in the Central Mindanao Region where infrastructures were largely under development.

### 1.2 Project Outline

The objective of the project is to increase and stabilize agricultural production in the central region of Mindanao Island via the construction of irrigation facilities, thereby contributing to the alleviation of poverty by improving the incomes of local farmers. The

project is a yen-loan assistance designed to construct irrigation systems in the Malitubog and Maridagao areas along the Pulangi River, located mostly in the Central Mindanao Region, while the part of it also extends to the Autonomous Region in Muslim Mindanao (ARMM). The location of the project site is shown in Figure 1.




Source: JICA documents.

Figure 1: Location of the Project Site

| | |
|---|---|
| Loan Approved Amount/<br>Disbursed Amount | 4,867 million yen /<br>4,561 million yen |
| Exchange of Notes Date/<br>Loan Agreement Signing Date | October 1989 /<br>February 1990 |
| Terms and Conditions | Interest Rate 2.7%<br>Repayment Period: 30 years<br>(Grace Period: 10 years)<br>Conditions for Procurement: General Untied |
| Borrower /<br>Executing Agency | The Government of the Republic of the Philippines/<br>National Irrigation Administration (NIA) |
| Final Disbursement Date | May 1998 (original)<br>May 2001 (after the first revision)<br>May 2003 (after the second revision) |
| Main Contractor<br>(Over 1 billion yen) | Shinsung Corp. (Republic of Korea), China Electric Power Technology Import and Export Corp. (China) |
| Main Consultant<br>(Over 100 million yen) | Sanyu Consultants Inc. (Japan) |
| Feasibility Studies, etc. | • Feasibility Study (Asian Development Bank, June 1986)<br>• Special Assistance for Project Sustainability (SAPS) for Malitubog Maridagao Irrigation Project (MMIP) (JICA/NIA, June 2011) |
| Related Projects | Agricultural Extension Support in Malitubog-Maridagao Irrigation Project I (MMIP-I) (Technical Cooperation Project for ODA Loan)[1] |

## 2. Outline of the Evaluation Study

### 2.1 External Evaluator

Kyoko Okamura, Sanshu Engineering Consultant[2]

### 2.2 Duration of Evaluation Study

Duration of the Study: November 2014 – December 2015

Duration of the Field Study: January 4 – 10, 2015; March 29 – April 4, 2015

## 3. Results of the Evaluation (Overall Rating: D[3])

### 3.1 Relevance (Rating: ②[4])

[1] The Agricultural Extension Support in Malitubog-Maridagao Irrigation Project I (MMIP-I) is a Technical Cooperation Project for ODA Loan implemented by the Department of Agriculture-Agricultural Training Institute (DoA-ATI) in the period between December 2013 and December 2016. It aims to improve rice productivity by adopting appropriate agricultural systems in the target area located within the Malitubog-Maridagao Irrigation Project I (MMIP-I).

[2] The evaluator participated in the Sanshu Engineering Consultant's evaluation team from the Global Link Management, Inc.

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

[4] ③: High, ② Fair, ① Low

### 3.1.1 Relevance to the Development Plan of the Philippines

The Medium-Term Philippine Development Plan (1987-1992) developed in 1986 stipulates that the national development objectives consist of the following: 1) the alleviation of poverty, 2) the generation of more productive employment, 3) the promotion of equity and social justice, and 4) the attainment of sustainable economic growth. Increased income and employment opportunities in rural areas was emphasized in order to expand domestic market demands, savings, and investments, with an aim to build a mechanism for sustainable economic development. Also from the perspectives of balanced development and effective use of the national land, rural development was one of the national agendas. In rural areas with high poverty levels, including Mindanao Island, development of infrastructures such as irrigation systems and farm roads was placed a high priority in order to activate farming villages, to expand employment opportunities and to improve life standards. In the agricultural sector, the national objectives included 1) achieving self-sufficiency in rice to pace with population increase, 2) solving regional disparities in supply-demand balance of rice, and 3) expanding irrigations for production of cereals other than rice. In addition to increasing farmers' income and contributing towards regional development, the aim of the agricultural sector was to promote sustainable and independent management of irrigation services by forming farmers' associations.

At the time of the ex-post evaluation, the major strategy of the country's development is "the inclusive growth of the economy by extending employment generation into the poor, drawing the majority into the economic and social mainstream, and continuously reducing mass poverty", as stated in the Medium-Term Philippine Development Plan 2011-2016. In order to realize the inclusive growth, the Plan promotes strengthening of governance, investment promotion, infrastructure development through public-private partnerships (PPP) including rural irrigation systems, social welfare reform, enhancement of taxation, and peace-building and security. Its agricultural sector Plan also states that development of irrigation systems is an important measure to increase agricultural productivity and income, which has a high priority. According to the National Irrigation Administration (NIA), the major issues in the Central Mindanao Region were a low rate of irrigation development and poor maintenance of irrigation facilities. To address these issues, NIA's six-year plan between 2012 and 2017 identified the following priority areas: to fast track the construction and rehabilitation of irrigation facilities; and to continue implementing the Irrigation Management Transfer (IMT) scheme of the National Irrigation System (NIS) to qualified and capable Irrigators' Associations (IAs).

As shown above, at both appraisal and the ex-post evaluation, the implementation of the project conforms to the development policies of the Philippine Government.

### 3.1.2 Relevance to the Development Needs of the Philippines

At the time of appraisal, an irrigation development rate of the Central Mindanao was reported to be only 31.6% (959,000 ha of irrigable land vs. 303,000 ha of actually irrigated land), much lower than the national average of 46.5% at the time, despite its advantages in climate and water resources as well as its vast land suitable for agriculture. The major reasons listed in the appraisal included ineffective use of land and undeveloped irrigation infrastructures due to unstable peace and order situations. The appraisal also identified low quality of agricultural commodities produced in the Malitubog-Maridagao area because of low investments in agriculture and under-development of irrigation/drainage systems. Therefore, increase in agricultural productivity by developing irrigation systems was a top priority to advance poverty reduction in the area[5].

At the time of the ex-post evaluation, the irrigation rate of the Central Mindanao Region remained 41.7%, still lower than the national average of 55.6%[6]. Mindanao Island has recently been hit by repeated abnormal weather conditions due to climate change. While the agricultural sector in general has an issue of low productivity/profitability, especially of small-scale farmers, the Central Mindanao Region, having more than 50% of its working population engaging in agriculture and contributing to the majority of the food production in Mindanao, tends to be hard-hit by El Nino and drought. For example, the drought of 1992 – 1993, in relation to El Nino, caused damages on approximately 38,000 ha of land producing rice in the Central Mindanao, which resulted in economic loss of about 1.2 billion pesos[7]. Furthermore, the region is behind the national socio-economic development due to prolonged conflicts. The Central Mindanao Region's population rate below the poverty threshold was 38% in 2012, much greater than the national average of 22%. It is also the second highest after ARMM among the fourteen regions[8] existing in the country.

To summarize, the Central Mindanao Region still has a high rate of poverty and is behind in terms of socio-economic development. While there is a great potential in the agricultural sector, the agricultural productivity was still low at the ex-post evaluation. Developing irrigation infrastructures and thus improving agricultural productivity remains to be an important agenda for the region. Therefore the project conforms to the development needs of the Philippine Government.

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5 Based on documents provided by JICA.

6 From NIA's report in 2013 (http://www.nia.gov.ph/updates/statusofirrigationdevelopment.pdf).

7 Jose, AM. et al., 1999. "A Study on the Impact of Climate Variability/Change on Water Resources in the Philippines", *Journal of Philippine Development,* 47(16).

8 The Philippines can be geographically divided into Luzon, Visayas and Mindanao. Each area consists of three to seven administrative Regions, totaling fourteen Regions in the country. The Central Mindanao Region (also called Region XII) is a part of Mindanao Island, occupying 7.5% of the national land with 4.5% of the national population.

### 3.1.3 Relevance to Japan's ODA Policy

In 1989, Japan supported a meeting of the Consultative Group for the Philippines held in Tokyo. In this milestone meeting, the Multilateral Assistance Initiative for the Philippines was successfully launched. In addition to its contribution as a host country of the meeting, Japan also announced a large ODA contribution as an active donor in the amount of approximately 115 billion yen, which was the 16th yen loan assistance to the Philippines. Japan's major ODA policy at the time was called the Fourth Medium-Term Target of ODA (1988-1992), whose central focus was to enlarge the total amount of the ODA. After Japan became the world's largest ODA donor in 1989, however, it had turned its focus on improving the quality of ODA. In this context the ODA Charter[9] was formulated in 1992 based on the Japan's basic aid philosophy formulated for the first time. The Charter committed to promoting sound economic development of recipient countries through meeting the basic human needs (BHN) and developing socio-economic infrastructures and emergency humanitarian aid[10]. It also pointed out the importance of redressing the gap between the rich and the poor and the gap among various regions in developing countries[11]. The Charter identified Asia as the priority region of its assistance. Therefore, the project had an adequate degree of conformity to Japan's ODA policy.

### 3.1.4 Appropriateness of Project Planning and Approach

The project, which had the Exchange of Notes signed in 1989, had to be suspended in 1993 due to the deteriorating security situation. Although resumption of the project activities was attempted several times from 1994 through 1995, the security situation did not improve, resulting in the removal of the contractors from the project sites and eventually mutual termination of the contract for the major civil work components. The Overseas Economic Cooperation Fund (OECF), the then funding agency on Japan side that is now renamed/merged into JICA, requested peace and order assurance in the project area as a condition for the project resumption. In response, the Philippines Government took several measures, such as deployment of military forces and dialogues between the government/military officials and representatives from anti-government groups. As a result the condition was finally met and the project activities were resumed in 2000, after six years from the suspension.

In 1998, NIA and the National Economic and Development Authority (NEDA) conducted a situation assessment to provide a basis for the revised project plans, which was

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9 The ODA Charter of 1992 is generally called the "Original ODA Charter", as opposed to the "New ODA Charter" which is a revised version launched in 2003.

10 Ministry of Foreign Affairs of Japan website (http://www.mofa.go.jp/policy/oda/summary/1999/ref1.html), last accessed in October 2015.

11 Ibid.

approved by the Investment Coordination Committee (ICC) of NEDA. After the resumption, the disbursement of the yen loan was completed in May 2003 while it took additional 11 years for the Philippines Government to finish the activities funded by their own budgets in 2014. At the project resumption in 2000, suspended activities were repackaged, and the government conducted new bidding processes combining international and local procurement processes. Nonetheless, the project completion was significantly delayed mainly due to shortage of budgets and frequent delays in fund allocations/releases, which hampered construction work as per the schedules, particularly affecting small-scale contractors[12].

At the time of the project appraisal, there were obvious factors that supported concerns about future security situations in the region. When the Moro National Liberation Front (MNLF) agreed with the government to establish ARMM as an autonomous region within the country in 1987, the Moro Islamic Liberation Front (MILF), which was separated from MNLF in 1984, took a decision to continue its armed struggle to establish an independent nation. The project was nonetheless started as a symbolic measure to bring benefits of development for the poor and conflict affected people of Mindanao and to contribute to peace building in the area. It is however noteworthy that the appraisal document only contained one proposed measure to address potentially negative effects of the security situation, which was to set the project period slightly longer than ordinary cases. Considering that the armed conflict mainly led by MILF was still continuing on the ground, both governments should have built a consensus on necessary approaches and concrete measures to be taken in the case of security deterioration. In the first place, the selection of project sites and scale could have been based on a more careful assessment of the security and political situations of Mindanao. Furthermore there should have been consideration of strategic approaches to mitigate negative impacts on the project if the security situation was worsened. For example, considerations of components that could be managed by the executing agency even when JICA staff/external consultants were not allowed to assist on site; and incorporation of activities that could bring tangible peace dividends to local fighters from early stages of the project.

On the other hand, it is also important to examine factors that affected the further delay in the implementation of activities funded by the Philippines Government after the resumption of the project in 2000. In addition to some sporadic security-related problems, a shortage of funds and frequent delays in budget allocations/releases have been identified as the major reasons for the delay[13]. In accordance with the situation assessment conducted by NIA and NEDA in 1998, NIA revised detailed schedules and reformulated project

[12] Based on documents provided by the executing agency.

[13] Based on documents provided by and interviews conducted with the executing agency.

approaches to complete all the activities within four years, i.e. in 2003, which was approved by ICC of NEDA and OECF. In the revised plan, the activities not completed were repackaged, and contractors were reselected through a combination of international and local bidding. In order to complete the project activities within the given timeframe and budgets, it incorporated several measures, such as[14]:

1) to select locally-based Muslim contractors or their joint ventures with other contractors,
2) to implement specific measures to impose stringent requirements for specific time-bound completion of the contracts by engaging an adequate number of project consultants to monitor and supervise progress of the work,
3) to use Local Minor Contracts for small contract packages in order to promote participation of qualified local inhabitants in areas where right-of-way acquisition problems exist[15],
4) to consider effecting payments for small local contractors directly at the field level through the Special Account Procedures in order to expedite the project completion, and
5) to ensure independence of consultants' supervisory work by making them report directly to the NIA Central Office, instead of the Project Management Office in the field.

Despite these measures, the completion of the activities covered under the Government of the Philippines, which was planned to be in 2003, was realized only in the end of 2014. In terms of the yen loan components, on the other hand, the scope of work was reduced in the revised plan. The disbursements were also expedited and completed in 2003 as per the plan. According to the executing agency, such a significant delay seen in the activities covered by the Philippine Government's fund was caused mainly by shortage of funds and/or frequent delays in fund allocations/releases, which prohibited contractors from following the work schedules, especially affecting small contractors without sufficient working capital who could not maintain their activities because of the delayed payments[16]. There was also an opinion that the fiscal austerity policy under the Arroyo Administration[17] might also have

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[14] Based on documents provided by JICA.

[15] Direct involvement of local residents was thought to be one way to solve the right-of-way acquisition problems. Therefore the use of Local Minor Contracts for small packages was introduced in order to provide opportunities for qualified local contractors to participate in bidding processes.

[16] Based on documents provided by the executing agency.

[17] Because of the increasing fiscal deficits and current account deficits since the 1980s, the Government of the Philippines had to rely on IMF's support and debt rescheduling under the Paris Club agreement. Therefore the second Arroyo Administration started in 2004 committed to achieving a balanced budget at the central government level by 2010. A series of measures taken along this commitment, including expenditure cuts and tax reform policies, is generally called "financial austerity policy" or "fiscal consolidation policy" (Tanimura, 2012. "Fiscal Consolidation Policy under the Arroyo Administration: Its Impact and Challenges

contributed to the delay. The data on the project expenditures by year show that the yearly expenditures from 2000 to 2005 was between 7% and 21% of the total project expenditures (on average 10% a year), while it stood at 2%, none, and 1.6% in 2006, 2007 and 2008, respectively. Although further analysis is needed to derive a conclusion from this data, there is an indication of some effects as far as the period between 2006 and 2008 is concerned. Nonetheless, 11 years of delay cannot be explained by the fiscal austerity alone, and the project expenditure levels were too low even before 2006. In order to fulfill the agreed schedules, or at least to minimize the delay to one or two years, instead of 11 additional years, the revised plan should have been based on more realistic views on the situations, including the capacities of the small domestic contractors. Also considering the importance of completing the entire project and making the irrigation facilities fully available to the population, there should have been more stringent measures to overcome such administrative issues as delayed fund allocations/releases.

In summary, the project has been relevant with the Philippine development plan and needs, as well as Japan's ODA policies. However, there were some shortfalls in the project plan which did not incorporate concrete measures to be taken in the case of worsening security situations, which was already expressed as a concern at the time of appraisal. Furthermore, when the project plan was revised at the resumption of the project activities after the six years of suspension, it should have been more carefully formulated and strictly followed afterwards in order to prevent further delays. Therefore its relevance is fair.

### 3.2 Efficiency (Rating: ①)

#### 3.2.1 Project Outputs

Table 1 below shows the Project Outputs comparing the planned vs. actual volumes/designs.

Ahead" in *Asian Studies*, 58(3)). Because of no yen loan requests made by the Philippine Government under the fiscal austerity policy, no new yen loan projects were agreed from the fiscal year 2003 to 2005. It is also reported that some of the ongoing yen loan projects were also faced with delays (The Government of Japan, 2008. *Country Assistance Program for the Republic of the Philippines* [the original Japanese-language version was released in 2007]). However since there was no evidence showing a strong association between the fiscal austerity and the reduced expenditures of the Malitubog-Maridagao Irrigation Project from 2006 to 2008, the passage above only points out a possibility of a certain level of contribution.

Table 1: Comparison of Project Outputs (Planned and Actual)

| | Planned Outputs at Appraisal | Actual Outputs at Completion |
|---|---|---|
| Civil Work | 1. Diversion Works<br>1.1 Dam: 1 unit<br>1.2 Gated Spillway: 8 units<br>➢ A baffled block apron type of spillway to be used (for energy dissipation)<br>1.3 Sluiceway: 2 units<br>➢ Sill elevation: 25m<br><br>1.4 Intake Gates: 3 units<br>1.5 Reservoir: 1,460km$^2$<br><br>2. Bridge/Flume Structure: length 100m; width 6m<br><br>3. Irrigation Canals/Laterals: total length 144.4km<br><br>4. Drainage Canals/Laterals: total length 9.6km<br><br>5. Project Facilities<br>➢ Irrigation System Office (1 unit)<br>➢ Water Management Center (2 units)<br>➢ Water Management Station (19 units)<br>➢ Gatekeeper Quarter (7 units)<br><br>6. Pilot Demonstration Farm<br>➢ Training Center: 2 units<br>➢ Storage Area: 2 units<br>➢ Pump Building: 4 units<br>➢ Access Road: 14km | 1. Diversion Works<br>1.1 Dam: 1 unit<br>1.2 Gated Spillway: as planned<br>➢ Introduced a conventional stilling basin at the end of the gated spillway.<br>1.3 Sluiceway: 2 units<br>➢ Lowered to elevation 22m (from technical point of view)<br>➢ Added concrete phasing (to avoid scouring)<br>➢ Changed from sluice slide gates to double lift wheel gates<br>1.4 Intake Gates: 3 units<br>1.5 Reservoir: as planned<br><br>2. Bridge/Flume Structure: as planned<br><br>3. Irrigation Canals/Laterals: total length 169.6km<br>➢ Side slopes modified<br>➢ Introduced lateral spillway/wasteway<br>➢ Expanded the width of the roadway from 4m to 6m<br><br>4. Drainage Canals/Laterals: as planned<br><br>5. Project Facilities<br>➢ Irrigation System Office/Farmers Center (1 unit)<br>➢ Farmers Center (1 unit)<br>➢ Pilot Demo Farm Office (1 unit)<br>➢ Watermasters' Quarters (8 units)<br><br>6. Pilot Demonstration Farm<br>➢ Training Center: as planned<br>➢ Storage Area: as planned<br>➢ Pump Building: as planned<br>➢ Access Road: as planned<br><br>7. Additional Output: 10 units of centrifugal pumps with 980 m lined canal (added and funded by the Philippines Government as an |

| | | |
|---|---|---|
| | | emergency measure to restore security)<br><br>**Service Area:**<br>Maridagao Area: 5,562 ha<br>Upper Malitubog Area: 1,611 ha |
| | **Service Area:**<br>Maridagao Area: 6,625 ha<br>Upper Malitubog Area: 4,215 ha | |
| Procurement of Equipment and goods | ➢ Construction equipment<br>➢ Pilot farms and office equipment<br>➢ Operation and management equipment | As planned. |
| Consulting Services | ➢ Detailed design works for the phase 2 target areas (Lower Malitubog and Pagalungan areas)<br>➢ Support for bidding processes<br>➢ Supervision of construction work in the Phase I target areas (Upper Malitubog and Maridagao areas)<br>➢ Support for the management of pilot farm activities<br>➢ Overseas training<br><br>Foreign experts: 331M/M<br>Local experts: 280M/M | As planned in terms of the foreign experts.<br><br>Foreign experts: 331M/M<br>Local experts: no information available |

Source: Based on documents from JICA/the executing agency/interviews with the executing agency staff.

Photo 1: Maridagao Diversion Dam
[at the ex-post evaluation]

Photo 2: Diversion Canal leading to the Diversion Dam
[at the ex-post evaluation]

Photo 3: Sluice Gate (double lift)
[at the ex-post evaluation]

Photo 4: Outlet of the Sluice Gate
[at the ex-post evaluation]

At the time of evaluation, it was pointed out that the total service area of the project, especially of the Upper Malitubog Area, was slightly reduced. This was mainly due to deduction of non-irrigatable lands, such as swamp areas, land too high in elevation, or some plots of land to be used for canals/roads. These are all technical adjustments that could not be determined in detail at the time of appraisal. There are also minor changes in work specifications due to technical reasons identified during the detailed designing process. Therefore these changes appear to be relevant. Changes in the project facilities reflect the perspective of promoting irrigated agriculture more effectively in the target area, which was discussed and determined in the course of the project implementation[18]. The procurement of equipment and goods was done through international bidding processes as planned. Consulting services by foreign experts were provided as per the TOR. It was however not possible to obtain reliable information about the actual inputs made by local experts[19].

### 3.2.2 Project Inputs

3.2.2.1 Project Cost

The estimated project cost at appraisal was 6,489 million yen, of which the Japanese ODA loan was 4,867 million yen. The actual project cost was 7,984 million yen, of which the Japanese ODA loan was 4,561 million yen. The actual project cost was greater than the planned, and is equivalent to 123% of the planned cost. The major reason for the excess was the increased administrative costs associated with the activities covered by the Philippine Government due to the prolonged project period, as described below[20].

3.2.2.2 Project Period

[18] Based on interviews with the executing agency staff.

[19] Neither JICA documents nor the response to the questionnaire addressed to NIA could provide relevant information. The interviews with the executing agency staff could not clarify this point either.

[20] Based on interviews with the executing agency.

The originally planned project period was from February 1990 (signing of the Loan Agreement) to May 1996 (civil work completion) with a total period of 76 months. The actual duration of the project was from February 1990 (signing of the Loan Agreement) to December 2014 (civil work completion), which totaled 299 months. The actual project period was significantly longer than the planned, and is equivalent to 393% of the planned period.

Table 2: Comparison of Project Period (Planned and Actual)[21]

| Item | Plan (at the L/A signing) | Actual |
|---|---|---|
| Selection of Consultants | 4th Term 1989 – 3rd Term 1990 | 1st Term 1990－April 1991 |
| Consulting Services | July 1990 – March 1996 | April 1991－April 2003 |
| Land Acquisition | 4th Term 1989－3rd Term 1992 | 1st Term 1990－4th Term 2003 |
| Procurement of Equipment/ Goods | 4th Term 1989－3rd Term 1995 | 4th Quarter 1990－4th Term 2004 |
| Civil Work | 2nd Term 1991－2nd Term 1996 | 2nd Quarter 1991－4th Term 2014 |

Source: JICA documents and interviews with the executing agency.

The most apparent factor that affected the project duration was the armed conflict between the government force and MILF between 1993 and 1995[22], during which the project activities were suspended for the period of six years and a month. Even after deducting the suspension period, however, the project still took 128 months more than the planned, i.e. 249% longer than the planned period.

One of the major reasons for the delay was the right of way problems that the project was faced with since the beginning of the project, such as multiple claimants to a single plot of land, non-titled land, and unknown address of landowners. In order to address this issue, a committee was formed to assess problems, to help identify rightful owners of land, and to assist document processing for payments and claims related to compensation. Another reason that significantly contributed to the prolonged project period was a shortage of funds and delays in allocation/release of funds. For example, there were times when the weather was cooperative (i.e. during the dry season, much earthwork and construction activities were supposed to be done) but funds were not available; or funds became

[21] The information provided by the executing agency was expressed in 'term/year', instead of 'month/year'. Therefore most of the items in the table are written in the same manner, except for Consulting Services and the ending of the Selection of Consultants that had more detailed information in their report.

[22] After the project was suspended in December 1993, the contract with the Shinsung Corporation for the major civil work was mutually terminated in 1995 because the security situation did not improve. The remaining activities were repackaged, granted to new contractors and resumed in January 2000.

available after the wet season had already started. There were mismatches between NIA headquarters' action and available resources at the field level, i.e. Sub Allotment Advice was often issued by the NIA Central Office when there was no cash available at the field level, and vice versa. This caused problems, throughout the project period, on local contractors without sufficient capital as well as labor contractors who could not sustain their work without timely payments[23]. More carefully planned and timely allotment and release of funds would have enabled contractors to pursue their work more efficiently.

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

The Economic Internal Rate of Return (EIRR) of the project calculated at the appraisal stage was 18.4% (calculated as part of the feasibility study conducted by ADB), while that calculated at the ex-post evaluation was 17.9% (calculated by the executing agency). However, the EIRR estimated by ADB in their feasibility study of 1986 included the Lower Malitubog Area which was not covered under the Japan-funded Malitubog-Maridagao Irrigation Project and thus not included in the EIRR calculation basis at the ex-post evaluation[24]. Since the data used for ADB's calculation in 1986 is not available, it is not feasible to deduct the Lower Malitubog Area and re-calculate the EIRR of the appraisal stage. On the other hand, adding the Lower Malitubog Area to the EIRR at the ex-post evaluation is not possible either, because the government's own project in the Lower Malitubog Area has not been completed yet. Therefore, comparing the two EIRR values that are based on the two different target areas do not provide meaningful information for analysis.

Overall, both the project cost and project period significantly exceeded the plan. Therefore, efficiency of the project is low.

## 3.3Effectiveness[25] (Rating: ②)

### 3.3.1 Quantitative Effects (Operation and Effect Indicators)

At the time of appraisal, neither operation nor effect indicators were set for this project. Therefore this section examines the effectiveness of the project based on a set of indicators proposed at the mid-term review in 2004. The proposed indicators are as follows:

- Operation Indicators:
  - Firm-Up Service Area (ha)

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[23] Based on documents provided by and interviews with the executing agency.

[24] The present project, aiming to construct irrigation facilities along the Pulangi River of the Central Mindanao Region, originally consisted of two phases: Phase 1 covering the Upper Malitubog and Maridagao Areas; and Phase 2 covering the Lower Malitubog and Pagalungan Areas. The detailed designing was included in the Phase 1 while the actual construction work in those areas was part of the Phase 2 plan.

[25] Sub-rating for Effectiveness is to be combined with consideration of Impact.

- Irrigated Area (ha)
- Benefited/Planted Area (ha)
- Cropping Intensity (%)
- Irrigation Service Fee Collection Efficiency (%)

➢ Effect Indicators:

- Volume of Production per Commodity [rice] (ton)
- Volume of Production Classified with Commodity [rice] per ha (ton/ha)
- Gross Income from Agriculture per Beneficiary (peso)

(1) Firm-Up Service Area, Irrigated Area, Benefited/Planted Area, Cropping Intensity[26]

Table 3: Firm-Up Service Area (ha), Irrigated Area (ha), Benefited/Planted Area (ha), Cropping Intensity (%) in the Target Area of the Malitubog-Maridagao Irrigation Project (2005 – 2014)

| | | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Firm-Up Service Area (ha) | | | | | | | | | | | |
| Planned | | 7,173 | 7,173 | 7,173 | 7,173 | 7,173 | 7,173 | 7,173 | 7,173 | 7,173 | 7,173 |
| Actual | | 5,562 | 5,562 | 5,562 | 5,562 | 5,562 | 5,562 | 5,562 | 4,027 | 4,027 | 7,173 |
| Irrigated Area (ha) | | | | | | | | | | | |
| Wet Season | Planned | 3,006 | 3,000 | 3,000 | 3,085 | 4,004 | 3,869 | 3,560 | 3,482 | 3,650 | 4,304 |
| | Actual | 1,817 | 2,247 | 2,249 | 2,508 | 3,548 | 3,415 | 2,771 | 1,400 | 3,831 | 4,369 |
| Dry Season | Planned | 2,641 | 2,700 | 2,700 | 4,190 | 3,829 | 3,869 | 3,560 | 3,482 | 3,650 | 4,304 |
| | Actual | 1,520 | 2,109 | 2,050 | 3,400 | 3,829 | 3,069 | 3,383 | 2,896 | 3,274 | 3,688 |
| Benefited/Planted Area (ha) | | | | | | | | | | | |
| Wet Season | Planned | 3,006 | 3,000 | 3,000 | 3,085 | 4,004 | 3,869 | 3,560 | 3,482 | 3,650 | 4,304 |
| | Actual | 1,299 | 1,980 | 1,941 | 1,875 | 2,285 | 3,088 | 2,311 | 1,213 | 2,612 | 4,192 |
| Dry Season | Planned | 2,641 | 2,700 | 2,700 | 4,190 | 3,829 | 3,869 | 3,560 | 3,482 | 3,650 | 4,304 |
| | Actual | 893 | 1,324 | 1,744 | 1,815 | 2,997 | 2,646 | 2,608 | 2,454 | 2,529 | 3,514 |
| Cropping Intensity (%)* | | | | | | | | | | | |
| Total (actual) | | 60 | 78 | 77 | 106 | 133 | 117 | 153 | 107 | 176 | 144 |
| Wet Season (actual) | | - | - | - | - | - | 61 | 69 | 35 | 95 | 78 |
| Dry Season (actual) | | - | - | - | - | - | 55 | 84 | 72 | 82 | 65 |

Source: Response to the questionnaire addressed to the executing agency (February 2015); Information provided by the executing agency.

Note 1: The cropping intensity is estimated separately for wet and dry seasons and expressed as a percentage for each season (with a maximum of 100% for each). As the 'Total' cropping intensity is a sum of the two seasons' percentages, it can exceed 100% (up to 200%).

Note 2: " - " in the table means no available data.

[26] The indicator names reflect what is used by the executing agency as much as possible, and thus may slightly differ from those of the proposed indicators in the mid-term review. The following are the indicator definitions provided by the executing agency with slight modifications made by the evaluator:

- Firm-Up Service Area (FUSA): The net service area of an irrigation system where converted areas and permanently non-restorable areas were deducted from the service area.
- Irrigated Area: The area within the operational area of the FUSA of an irrigation system served during the respective cropping seasons (e.g. wet and dry seasons).
- Benefited/Planted Area: The actual portion of the irrigated area of an irrigation system that is planted with crops during the respective cropping seasons (e.g. wet and dry seasons).
- Cropping Intensity: The ratio of the Benefited/Planted Area to the FUSA of an irrigation system.

The planned amount of the Firm-Up Service Area (FUSA) was 7,173 ha, revised at the time of the project resumption in 2000. As shown in Table 3, FUSA reached 5,562 ha in 2005, equivalent to 78% of the planned amount. Although it was reduced in 2012 and 2013, the reduction was attributed to major rehabilitation needed for some of the already constructed and utilized parts of the irrigation system. In 2014, the rehabilitation was completed and the FUSA reached 100% of the planned.

In terms of Irrigated Area and Cropping Intensity, achievements were assessed against government plans for each fiscal year[27] since the project did not set target values at appraisal.

With regard to the Irrigated Area in wet seasons, the plans have been continuously met since 2013. In dry seasons, on the other hand, they are only slightly in short of the planned values; for example it achieved 90% in 2013 and 86% in 2014.

Benefited/Planted Area in 2013 stood at 72% and 69% of the government plans in wet and dry seasons, respectively. They have however reached 97% and 82% in wet and dry seasons of 2014. There were two major reasons for the relatively large gaps between plans and actual achievements up to 2013: 1) crop damages due to weather conditions; and 2) calculation of the Irrigated Area indicator excluding farmers who were exempted from the irrigation service fee Collection because of low harvesting in a particular season[28, 29]. These factors are now being addressed in various efforts to improve agricultural productivity in the area, such as the Japan-funded Yen Loan attached Technical Cooperation project.

Cropping Intensity had neither project targets at appraisal nor government plans. In terms of the actual achievements, there is a notable increase from 60% in 2005 to 176% and 144% in 2013 and 2014, respectively (these figures refer to the total Cropping Intensity of wet and dry seasons, and thus can exceed 100%). By looking at the time trend, however, there are fluctuations by year, which is due to such reasons as flooding, pest insects, and the fact that the most suitable varieties were not selected by farmers. In order to further improve the cropping intensity, stabilization of drainage functions throughout the irrigated area and promotion of high-yielding varieties are being considered[30].

(2) Irrigation Service Fee Collection

For irrigation service fee collection, a target value was not determined at appraisal. As shown in Table 4, the collection fee in 2014 was 42% and 30% in wet and dry seasons

[27] Based on documents provided by NIA's local branch for the Region XII.

[28] When farmers are considered "low harvesting" because their output goes below 40 Cavans (Cavans is a unit of volume used in the Philippines. 40 Cavans is about 50kg of rough rice), there is a system in place to exempt them from paying the irrigation service fee. In such cases, the areas planted by those "low-harvesting" farmers are also deducted from the total Benefited/Planted Area.

[29] From interviews with the executing agency.

[30] From interviews with the executing agency and the Department of Agriculture – Agricultural Training Institute (DoA-ATI).

respectively. These rates correspond to 60% and 43% of the government planned 70% level[31]. Major factors affecting the low achievements include: 1) the presence of farmers who were exempted from the irrigation service fee collection system (refer to the section 3.3.1 (1)); 2) inefficiency of the collection system in which a limited number of personnel visit farmers house to house; and 3) insufficient understanding among farmers that the Irrigation Service Fee was necessary to maintain the irrigation facilities they benefit from. In order to effectively address these issues, JICA has been supporting the Technical Cooperation Project for ODA Loan, titled "Agricultural Extension Support in Malitubog-Maridagao Irrigation Project I (MMIP-I)". The project includes the following components:

- Training and technical support for farmers to improve agricultural productivity through the Pilot Demonstration Farm (PDF);
- Farm Production Input Assistance (FPIA) to improve agricultural management through a zero-interest lending scheme for farm production inputs from Irrigators' Associations to their members; and
- Development of a manual to extend PDF and FPIA schemes to other IAs.

Furthermore, NIA has reached an agreement to transfer the authority of irrigation service fee collection to 14 IAs that are already under IMT contracts with the government, out of the 16 IAs existing in the project area. There is a system in which if the Irrigation Fee Collection Efficiency of any IAs exceeds 51%, it can utilize the surplus as their incentives. Therefore by transferring the authority to the Associations, in addition to the provision of technical support described above, the government hopes to significantly improve the irrigation service fee collection efficiency of the target area[32].

Table 4: Irrigation Service Fee Collection Efficiency in the Target Area of the Malitubog-Maridagao Irrigation Project (2011 – 2014)

(%)

| | | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|
| Plan (both wet and dry seasons) | | 70.0 | 70.0 | 70.0 | 70.0 |
| Actual | Wet Season | 37.3 | 19.9 | 32.1 | 42.0 |
| | Dry Season | 29.3 | 25.8 | 6.0 | 30.3 |

Sources: Documents provided by JICA/executing agency, and interviews with the executing agency

[31] Documents provided by the DoA-ATI.
[32] Information provided by JICA.

(3) Volume of Production per Commodity [rice], Volume of Production Classified with Commodity [rice] per hectare, Gross Income from Agriculture per Beneficiary[33]

In terms of the three effect indicators proposed at the time of the project mid-term review, namely "Volume of Production per Commodity [rice]", "Volume of Production Classified with Commodity [rice] per hectare", and "Gross Income from Agriculture per Beneficiary", there are neither target values set at appraisal nor government plans as available information.

For the Volume of Production per Commodity [rice] indicator, data on the project target area was not available[34]. Although the government data is available at the provincial level, the project area only accounts for a very small part of the two provinces they belong to (namely North Cotabato and Maguindanao Provinces). Nonetheless, the provincial-level data was used to capture some time trends only for reference purposes. The data on the two provinces show that the rice production has increased from 287,541 tons in 1990, to 656,925 tons in 2000, and then to 916,563 tons in 2014. As in Table 5, the yearly data from 2011 to 2014 also indicate a largely incremental trend although there are some fluctuations.

Table 5: Volume of Production per Commodity [rice] in the North Cotabato and Maguindanao Provinces (covering the entire project areas of the Malitubog-Maridagao Irrigation Project I) (1990 – 2014)

(ton)

| | 1990 | 2000 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|
| North Cotabato Province (actual) | 174,104 | 415,366 | 481,006 | 494,052 | 525,675 | 530,029 |
| Maguindanao Province (actual) | 113,437 | 241,559 | 398,097 | 348,123 | 414,060 | 386,534 |
| Total of the Two Provinces | 287,541 | 656,925 | 879,103 | 842,175 | 939,735 | 916,563 |

Source: Based on the Philippine Statistics Authority's database.

As shown in Table 6 below, the Volume of Production Classified with Commodity [rice] per hectare in the project area increased from 3.2 tons/ha in 2005 to 4 tons/ha in 2010. According to the Department of Agriculture, Agricultural Training Institute (DoA-ATI), their data from 2013 to 2014 shows as much as 80% increase from 3.1 tons/ha in 2013 to 5.6 tons/ha in 2014. The same table also shows that the Gross Income from Agriculture per Beneficiary increased from 52,476 pesos in 2013 to 93,683 pesos in 2014 (data before 2013

[33] Only the data on rice production was used because at the time of the evaluation the agricultural sector in the project area focused only on rice production. According to DoA-ATI, other crops would be introduced in the future.

[34] Appropriate data was not available from any of the following information sources, including JICA documents, responses to the questionnaire addressed to the executing agency, interviews with the executing agency, and follow-up communications.

was not available from the same information source). From the increments seen in these indicators, it can be said that the productivity in terms of rice production in the area has improved in the past few years.

Table 6: Volume of Production Classified with Commodity [rice] per hectare (2005 – 2014) and Gross Income from Agriculture per Beneficiary (2013-2014) in the Target Area of the Malitubog-Maridagao Irrigation Project I

| | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|
| Volume of Production Classified with Commodity [rice] per hectare (ton/ha) - Actual | 3.2 | 3.5 | 3.5 | 3.7 | 3.0 | 4.0 | 3.1 | 5.6 |
| Gross Income from Agriculture per Beneficiary (peso) - Actual | - | - | - | - | - | - | 52,476 | 93,683 |

Source: Data from 2005 to 2010 were extracted from JICA's "Special Assistance for Project Sustainability (SAPS) for Malitubog Maridagao Irrigation Project (MMIP): Agriculture Sector" prepared by the Sanyu Consultants, Inc. (2011); data from 2013 to 2014 were provided by DoA-ATI.
Note: " – " indicates no available data.

Combining the three effect indicators above, the Volume of Production Classified with Commodity [rice] per hectare and the Gross Income from Agriculture per Beneficiary indicate relatively large improvements in the past few years while the Volume of Production [rice] has only increased at a slower pace from 2011 to 2014. It is important to note that while the data on the former two were from the project's target area (7,173 hectares), the latter was assessed at the provincial level by using the data from the two concerned provinces, namely North Cotabato and Maguindanao Provinces, totaling 1.15 million hectares (the project's target area only accounts for 0.6% of the two provinces). Therefore they do not provide convincing evidence to show an association between these two sets of indicators.

Another constraint was that neither target values set by the project nor government plans for achievements were available for any of the indicators analyzed above. Therefore degrees of achievements against target values were not assessed. In terms of the Volume of Production Classified with Commodity [rice] per hectare, the past agricultural pilot testing has achieved 4.1 ton/ha. Base on this, it was said that the project could aim at reaching 5.0 ton/ha in the target area[35]. Compared to this level, 5.6 ton/ha reported by DoA-ATI in 2014 indicates an even greater achievement.

[35] JICA, 2011. *Special Assistance for Project Sustainability (SAPS) for Malitubog Maridagao Irrigation Project (MMIP): Agriculture Sector*, prepared by the Sanyu Consultants, Inc.

### 3.3.2 Qualitative Effects

In this sub-section, qualitative effects of the project were assessed by extracting available information from the documents provided by the executing agency and from the beneficiary survey conducted by the evaluation team as part of the present ex-post evaluation[36].

Benefits from Socio-Economic Perspectives[37]:

(1) Improved mobility and transportation of goods/commodities
- Faster and easier travel due to the construction of irrigation roads
- Increased volume of transportation in the area

(2) Increased access to basic social services
- A larger number of children going to school due to the farm roads constructed along lateral canals[38]
- Increased access to and provision of health services
- Increased supply of portable water
- Increased access to local Department of Social Welfare and Development offices, which enabled local residents to receive their services more easily

(3) Increased employment opportunities
- Greater employment opportunities for local residents in the construction of the dam and other irrigation facilities

(4) Contributing effects to peace and order
- Security measures in place through the installation of military camps in the area
- Reduced motivations and time for local residents to be involved in clan/tribal conflicts and banditry due to increased opportunities for agricultural work as well as increased access to income sources and livelihood services

Based on the beneficiary survey, all respondents demonstrated positive attitudes in terms of benefits of the project (also see Figures 2 – 5 below):

- In response to the question, "Do you think that the project increased your farm land covered by the irrigation?", 100% answered "Yes" ('increased substantially' or 'fairly')", of which 57% answered 'increased substantially' (Figure 2).

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[36] The evaluation team conducted a beneficiary survey with an aim to obtain information about major effects of the project in the target area through structured interviews with local residents, including farmers, using a questionnaire. Respondents were selected by a random sampling of local residents in the project area. As a result, 111 respondents, including 82 males and 29 females, provided information.

[37] From the response to the questionnaire addressed to the executing agency.

[38] It is reported that the construction of farm roads along lateral canals contributed to the improved access to social infrastructures such as schools and health clinics.

- In response to the question, "Are you satisfied with the constructed irrigation system and related facilities in your community?", 100% answered "Yes" ('highly satisfied' or 'satisfied'), of which 31% answered 'highly satisfied' (Figure 3).
- In terms of the quantity of water available for farming, all respondents answered "It is better" than the situation before the construction of the irrigation system and the related facilities (Figure 4).
- In terms of the stability of water supply for farming, all respondents answered "It is better" than the situation before the construction of the irrigation system and the related facilities (Figure 5).

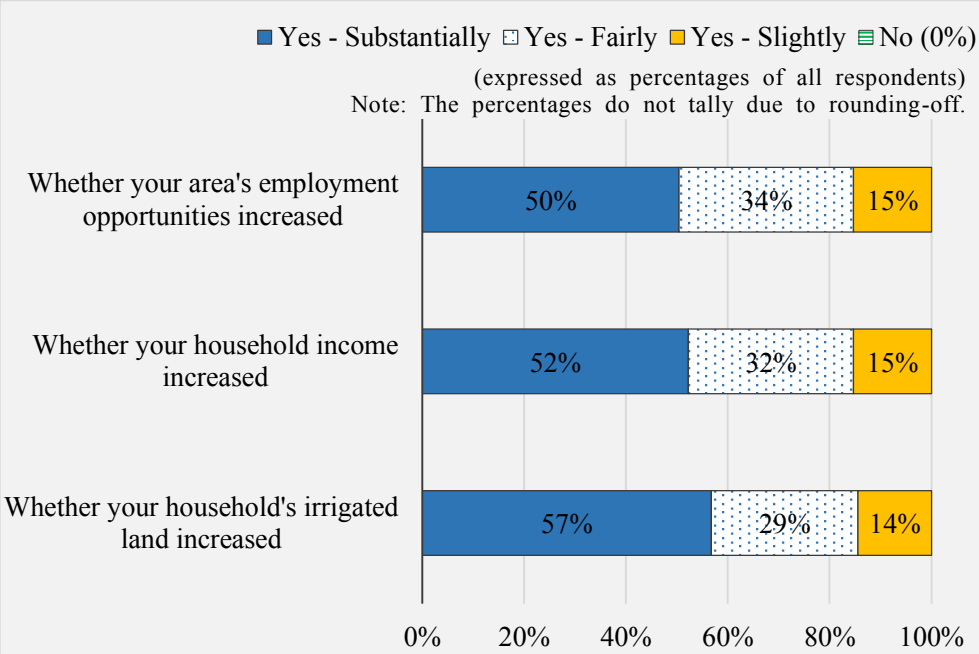


Figure 2: Benefits from the Project (from the Beneficiary Survey)

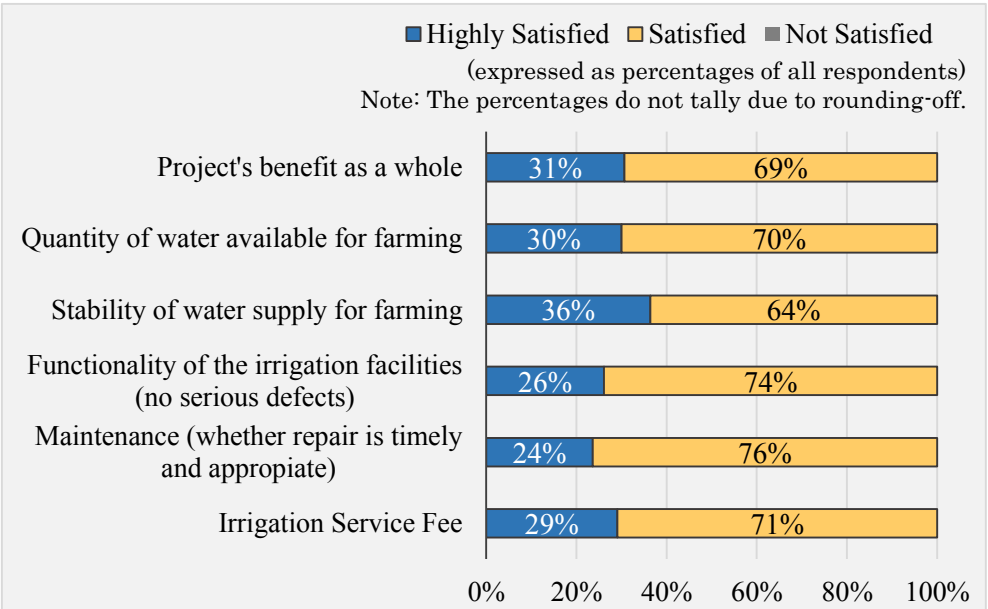


Figure 3: Satisfaction with the Irrigation Facilities Constructed by the Project, from the Beneficiary Survey

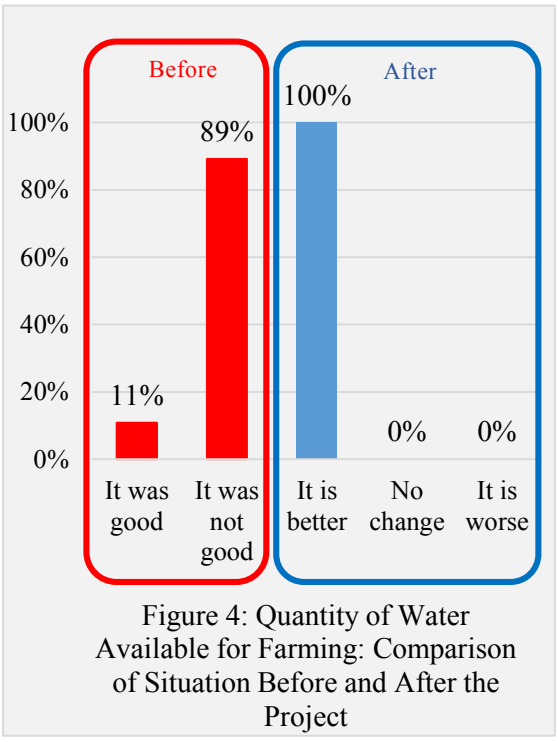


Figure 4: Quantity of Water Available for Farming: Comparison of Situation Before and After the Project

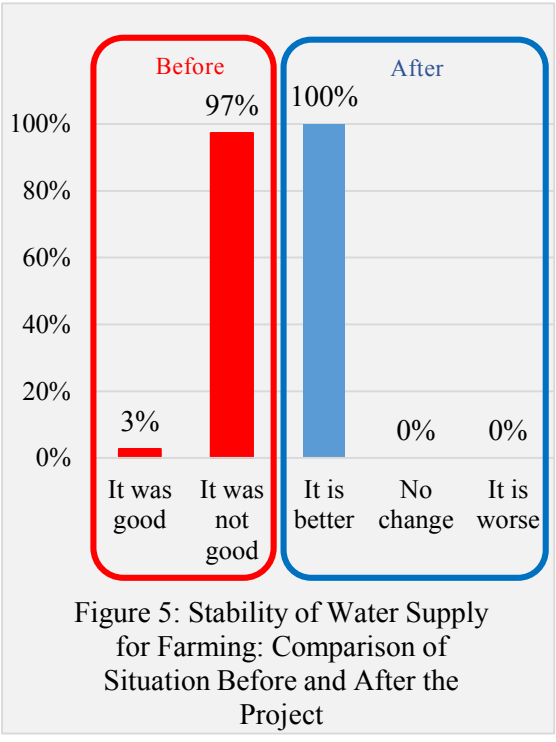


Figure 5: Stability of Water Supply for Farming: Comparison of Situation Before and After the Project

Overall, the results of the beneficiary survey imply that the local residents' level of satisfaction with the project is high, and they perceive benefits brought by the project in

various socio-economic dimensions, such as agriculture, household income, employment opportunities, and so on.

### 3.4 Impacts

#### 3.4.1 Intended Impacts

The main intended impact of the project was the reduction in poverty and contribution to the development of the local economy. In order to assess the impact, the ex-post evaluation attempted to analyze the proportion of households under the Poverty Threshold, the employment rate and the average annual household income of the locality. However appropriate data to quantitatively analyze the impact and derive causality/associations with the project was not available. In other words, the only available data on the above-mentioned indicators were at the level of the Central Mindanao Region, which is too broad to derive meaningful conclusions on the project impact. Therefore, the analyses shown below are only for reference purposes.

Table 7: Level of Poverty in the Central Mindanao Region (Region XII): Data from 1991, 2006, 2009 and 2012

| | Region XII | | | |
|---|---|---|---|---|
| | 1991 | 2006 | 2009 | 2012 |
| Poverty Threshold (peso) | 6,272 | 13,319 | 16,405 | 18,737 |
| Proportion of the Population below the Poverty Threshold (%)* | 47.4 | 31.2 | 30.8 | 37.1 |
| Average Annual Household Income (peso) | - | - | 154,000 | 165,000 |
| Employment Rate (%) | - | 96.4 | - | 96.0 |

Source: Philippine Statistics Authority
Note 1: The regional level data on the Proportion of the Population below the Poverty Threshold is estimated every three years in the Philippines.
Note2: " – " means no available data.

The proportion of the population in the Central Mindanao Region that are below the poverty threshold was 47.4% at the start of the project in 1991. This was reduced to 37.1% in 2012 when the project was almost completed. This change is equivalent to the average annual reduction of 0.5 percentage points that is in fact the same as that of the national level (at the national level, it was reduced from 29.7% in 1991 to 19.1% in 2012, which is equivalent to 0.5 percentage points reduction annually). Therefore, this data cannot lead to a conclusion that the project contributed to the reduced proportion of the population below the poverty threshold in the region.

The average annual household income increased from 154,000 pesos in 2009 to 165,000 pesos in 2012 while the proportion of the population below the Poverty Threshold during the same period also increased. This seemingly contradicting phenomenon can be

explained by the following factors: 1) since the project was only completed in the end of 2014, the Benefited/Planted area between 2009 and 2012 remained around 50% of the Firm-Up Service Area, and the total cropping intensity (of wet and dry seasons) also stood between 107% and 153%; and 2) the Poverty Threshold in the region was raised from 13,319 pesos per year in 2003 to 18,737 pesos per year in 2012 due mainly to the sharp increase in the consumer price index (especially food items). In terms of the employment rates, there have been no major changes.

The beneficiary survey was also conducted as part of the evaluation to supplement results of quantitative analyses and provide qualitative information about beneficiaries' perceptions. The results of the beneficiary survey revealed the following impacts perceived by the respondents[39]:

- All respondents answered "Yes" ('increased substantially' or 'fairly') to the question, "Do you think the project increased your household's income or not?", of which 52% answered 'increased substantially' (see Figure 2 in 3.3.2)
- All respondents answered "Yes" ('increased substantially' or 'fairly') to the question, "Do you think the project increased employment opportunities in your area or not?", of which 51% answered 'increased substantially' (see Figure 2 in 3.3.2)

It is important to note that these results of the beneficiary survey do not directly reflect the reduction in poverty in the locality, which is the definition of the intended impact of the project. It can however imply that at least project beneficiaries perceive the benefits of the project on household income and employment opportunities in their area.

Among government officials involved in the Technical Cooperation Project for ODA Loan, titled "Agricultural Extension Support in Malitubog-Maridagao Irrigation Project I (MMIP-I)" which is implemented within the target area of the Malitubog-Maridagao Irrigation Project, there is a common perception that a synergistic effect of the two projects have contributed to improving the agricultural productivity and the stability of the local area. According to them, a combination of irrigation water supply and technical support for agricultural management improved agricultural productivity, which in turn made local residents recognize benefits of engaging themselves in livelihood activities instead of armed

[39] In terms of the indicators on household income and employment opportunities, the data was disaggregated by status of land ownership. A greater proportion of respondents who do not own land (N=9) answered "significantly increased", compared to those who own land (N=102). No respondents without own land answered "slightly increased". It seems that the project made greater impacts on household income and employment opportunities among the landless, compared to the land owners, but the denominators are too small to derive any meaningful analysis.

resistance and banditries. Furthermore, the two projects appear to have contributed to improving local perceptions towards the government[40].

### 3.4.2 Other Impacts

(1) Impacts on the Natural Environment

At the time of appraisal, the Environmental Impact Assessment (EIA) was conducted in accordance with the Philippine Environmental Policy. EIA concluded that the project was not expected to produce significantly negative impacts on the natural environment. Therefore there have been neither additional environmental assessments nor periodic environmental monitoring by external observers. EIA at appraisal indicated the possibilities of slight alteration of the existing natural land farm and soil due to earthmoving and construction of irrigation ditches as well as slight reduction of the surface water quantity in the area due to diversion of water into irrigation ditches (while it was expected to increase groundwater resources). At the time of the ex-post evaluation, no serious impacts have been reported. Additionally, the appraisal document pointed out the presence of schistosomiasis, a water-borne disease, in the area, but there have been no reports to highlight negative impacts of the project on the disease prevalence[41].

(2) Land Acquisition and Resettlement

The project was, by nature, expected to cause submergence of some residential/farm areas due to the diversion work and to necessitate land acquisition for the construction of irrigation/drainage facilities. At appraisal, potential submersion area was estimated as 70.7ha while acquisition of 802ha of land was also expected. The actual land areas for submersion and acquisition was 483ha and 130ha, respectively.

In terms of the land acquisition, the project encountered several issues related to the right of way, such as multiple land claimants, untitled land plots, no information about landowners' address, and settlement on compensation amounts. The Philippine government solved these issues by providing assistance in the identification of rightful landowners and processing of compensations[42].

(3) Other Positive and Negative Impacts

[40] From an interview with an ATI official.
[41] Based on documents provided by the executing agency and interviews with them.
[42] Ibid.

At appraisal, some indirect impacts from the perspective of Women in Development (WID)[43] were expected, which was assessed in the Beneficiary Survey. The survey included 29 female respondents (26%) out of 111.

In terms of women's workload (including both amount and quality of work), all respondents, including both male and female, answered that there had been positive impacts brought by the project, such as:

- the water supply made it more convenient to wash clothes, cook and bathe;
- the project reduced women's time spent on agricultural work, which can be used for household work, child-raring and/or business activities; and
- the project reduced amount of women's workload, which enabled them to spare some time for resting (women were suffering from heavy workloads by assisting farming in addition to their full responsibilities in household work and child-raring).

The Survey results indicate that local residents are aware of the positive impacts brought by the project on women's needs.

In summary, most of the operation and effect indicators, as far as available data is assessed, showed continuous improvements. Several qualitative effects were also reported by the executing agency, including spill-over effects on mobility and transportation of goods/commodities, access to basic social services, employment opportunities, and peace and order. Some impact-level effects were also observed; for example a beneficiary survey showed local residents' overall satisfaction with the project as well as their positive perceptions regarding benefits brought by the project; and positive impacts from 'WID' perspectives were also found. There have been no major reports regarding negative impacts on natural environment. On the other hand, an analysis on project impacts on poverty reduction in the target area, which is the most important impact indicator, could not be performed due to non-availability of appropriate quantitative data.

Therefore, the effectiveness and impact of the project are considered fair.

### 3.5 Sustainability (Rating: ②)

#### 3.5.1 Institutional Aspects of Operation and Maintenance

[43] Women in Development (WID) is defined as an approach that calls for greater attention to women in development policy and practice, and promotes participation of women as not only a beneficiary but also an actor in the development process in order to promote socio-economic development more effectively. Therefore this approach emphasizes the need to integrate women in development by meeting women's practical needs.

Operation and Maintenance (O&M) of government irrigation facilities is normally managed by the Irrigation Superintendent appointed under the Regional Irrigation Manager of NIA. The Superintendent is responsible for the management of such activities as planning, programming, monitoring and evaluation, and care and maintenance of NIA properties in the region. The Engineering Division is responsible for planning, programming, scheduling and implementation of the maintenance activities, in coordination with the Administrative and Equipment Management Divisions, under the supervision of the Superintendent.

O&M of the irrigation facilities constructed by the project is performed by the Cotabato Irrigation Management Office (CIMO) and its Maridagao River Irrigation System (MRIS) office under the supervision of the NIA Region XII. Table 8 shows the current staffing structure and appointment status of the MRIS office.

Table 8: Staffing Structure and Appointment Status of the Maridagao River Irrigation System (MRIS) Office (as of January 2015)

(person)

| Title | Major Responsibilities | Plan | Appointed |
|---|---|---|---|
| Principal Engineer | Direct supervision of the implementation and O&M | 1 | 1 |
| Senior Engineer | Assistance in supervisory activities | 1 | 1 |
| Senior Irrigators Development Officer | Training/capacity building, strengthening of Irrigators' Associations | 1 | 1 |
| Senior Water Resources Facilities Technician | Maintenance of machinery and other mechanical equipment | 4 | 4 |
| Collection Representative | Collection of irrigation service fees, developing plans and strategies to improve collection rates | 1 | 1 |
| Plant Electrician | O&M of plant electrical system | 1 | 1 |
| Heavy Equipment Operator | Operation of heavy equipment | 1 | 1 |
| Accounting Processor | Accounting | 1 | 1 |
| Industrial Security Guard | Safeguarding of properties, facilities and compounds | 4 | 4 |
| Driver Mechanic | Mechanic maintenance and driving service | 1 | 1 |
| Water Resources Facilities Operator | Operation of gates to regulate amount of water to store/needed | 3 | 3 |
| Utility Worker | Office maintenance | 1 | 1 |
| Data Encoder | Organization of documents | 1 | 1 |
| TOTAL | | 21 | 21 |

Source: Response to the questionnaire addressed to the executing agency.

In terms of the appointment status at the time of evaluation, all the 21 positions were filled as planned. The executing agency did not report any significant O&M constraints due to shortages in staff.

It is reported that routine (day-to-day) and monthly inspections based on a pre-set maintenance items are conducted in order to identify probable problems as early as possible. Once probable problems are identified, they are immediately reported and addressed in order to prevent further deterioration and to ensure optimum sustainable performance of the irrigation system[44].

Therefore there are no issues regarding the institutional aspects of the operation and maintenance.

### 3.5.2 Technical Aspects of Operation and Maintenance

According to the executing agency, hiring and retrenchment of personnel is done based on the Qualification Standard Manual set forth by the Philippine Government's Civil Service Commission, which guides recruitment of personnel with a particular job designation. NIA's personnel evaluation procedures, incentive measures, and disciplines and rules are also respected.

Employees are provided with various opportunities to improve their technical capacities and promote professional development through seminars, workshops and on-the-job training. Staff training provided during the past few years are listed in Table 9 below.

[44] Base on the document provided by the executing agency.

Table 9: Staff Training

| Trainer | Subject | Year/Period | No. of Trainees |
|---|---|---|---|
| NIA | Duties, functions and responsibilities of O&M | 2009/3 days | 35 |
| | IMT Implementation Guidelines | 2010/3 days | 45 |
| | Establishment of organizational vision mission and objective | 2013/ 3 days | 40 |
| NIA MRIS | Leadership, duties and responsibilities of IA leader | 2010/3 days | 65 |
| | | 2011/3 days | 55 |
| | Preparation of O&M plans | 2010/3 days | 60 |
| | | 2012/3 days | 45 |
| | IMT Implementation Guidelines (IMT model contracts, performance evaluation) | 2010/2 days | 65 |
| | | 2013/2 days | 278 |
| | | 2014/2 days | 260 |
| | Financial planning and control | 2011/2 days | 60 |
| | | 2013/2 days | 48 |
| | Irrigation service fee collection plan | 2014/1 day | 18 |
| ATI | Islamic values | 2014/4 days | 40 |
| | Preparation of training proposals, simple accounting and book-keeping | 2014/2 days | 40 |
| | Trouble shooting of small engines | 2014/2 days | 20 |
| | Palaycheck methodology[45] | 2014/season long | 540 |
| | Palay cultural management practices | 2014/season long | 33 |
| Department of Agriculture, Region XII | Palaycheck methodology | 2014/7 days | 350 |

Source: Response to the questionnaire addressed to the executing agency.
Note: Some training included farmers.

MRIS has its own O&M Manual that consists of the following three volumes: Volume I – Main System; Volume II – Diversion Dam Operation and Maintenance; and Volume III – Annexes. The Manual provides sound and appropriate guidance for operating and maintaining the irrigation system. There have been no reported issues related to usefulness and actual usage of the manual.

As shown above, the Government of the Philippines has provided a wide range of training courses in order to ensure technical standards for O&M activities, including not only O&M related subjects but also financial planning/management, organization of IAs,

[45] It is a methodology developed in Australia and adopted in the Philippines, which aims at increasing farmers' capacity to recognize and implement desirable management practices throughout processes of rice crop management from land preparation to harvest. It provides recommended technology and action, the reason why the recommendations should be followed, and the expected output of correct application of the recommendations.

collection of irrigation service fees and agricultural techniques. Some training courses, such as 'Preparation of O&M plans' and 'Financial planning and control', were repeated year after year, indicating that strengthening of the management capacities is considered important. Therefore, there are no problems observed in technical aspects of the operation and management.

### 3.5.3 Financial Aspects of Operation and Maintenance

Of the O&M costs for the facilities constructed by the project, day-to-day operation and maintenance activities are covered under the CIMO and MRIS budgets while the NIA Central Office has a budget framework to finance major maintenance and rehabilitation as needed[46].

The financial status of CIMO and MRIS are shown in Tables 10 and 11 respectively.

Table 10: Revenue and Expenditure of CIMO

(peso)

| | Revenue | Expenditure | Balance |
|---|---|---|---|
| 2009 | 68,184,392 | 39,430,150 | 28,754,243 |
| 2010 | 65,404,350 | 39,793,262 | 25,611,088 |
| 2011 | 76,278,455 | 49,045,548 | 27,232,906 |
| 2012 | 104,090,512 | 52,596,858 | 51,493,654 |
| 2013 | 104,546,278 | 56,255,794 | 48,290,484 |

Source: Response to the questionnaire addressed to the executing agency.

Table 11: Revenue and Expenditure of MRIS

(peso)

| | Revenue | Expenditure | Balance |
|---|---|---|---|
| 2009 | 1,711,627 | 4,990,133 | -3,278,506 |
| 2010 | 3,995,787 | 5,562,301 | -1,566,514 |
| 2011 | 3,586,248 | 6,393,372 | -2,807,125 |
| 2012 | 2,152,568 | 7,217,806 | -5,065,238 |
| 2013 | 1,814,764 | 7,152,963 | -5,338,198 |

Source: Response to the questionnaire addressed to the executing agency.

As shown in Table 11, the revenue-expenditure balance of the MRIS office has been in deficit since 2009. It is indicated that the deficits are created because of the stagnation in the revenue collection while the expenditure has been continuously increased. This is presumably due to the fact that daily operation and maintenance costs are supposedly increasing as some parts of the irrigation facilities are completed and made available for use. On the other hand, Table 10 shows that the balance of the CIMO has been in surplus. At the time of evaluation, CIMO was supplementing MRIS' budgets for daily operation and

[46] From the interviews with NIA and CIMO staff.

maintenance activities while major rehabilitation was financed from NIA's maintenance and rehabilitation funds[47].

According to NIA, the irrigation service fee collection efficiencies in 2014 were 42% and 30% in wet and dry seasons respectively, which are significantly below the government target of 70%. According to CIMO's estimate, at least 60% needs to be achieved in order for MRIS to turn its financial deficit into surplus. Therefore it is considered critical to encourage farmers to pay the fees and to improve/maintain agricultural productivity. As already stated above, the JICA-funded Technical Cooperation Project for ODA Loan (Agricultural Extension Support in Malitubog-Maridagao Irrigation Project I from 2013 to 2016) provides such services as:

1) agricultural technology training through pilot demo farms (including techniques to address climate change effects),
2) guidance for farmers regarding how to sustain irrigation facilities through IAs, and
3) dialogues with farmers to strengthen ownership of irrigation facilities.

As a result, four out of seven IAs supported by the Technical Cooperation project achieved almost 100% of the irrigation service fee collection efficiency as of April 2015. This is reportedly due to heightened recognition that their own efforts to sustain the irrigation facilities is important. As the significant progress has been seen in these four IAs that have been supported since the beginning of the Technical Cooperation project, similar effects can be expected in the remaining three IAs that are currently undergoing the same set of activities. Furthermore, the Technical Cooperation project has only covered seven out of the sixteen IAs existing in the MMIP target area. The Department of Agriculture already made an official plan[48] and approved the allocation of their own funds to expand the same approach to the remaining nine IAs by 2018[49]. Therefore it is highly possible that the irrigation service fee collection will improve in the entire target area of the MMIP in the near future.

Combining the continuation of financial supplementation mechanisms from CIMO and the NIA Central Office and the prospect of improving the irrigation service fee collection in the near future, there are minor problems observed in financial aspects of the operation and management.

### 3.5.4 Current Status of Operation and Maintenance

There have been no major problems reported in terms of the actual O&M status of the irrigation facilities constructed by the project. According to the assessment by the executing

[47] From the interviews with the executing agency.
[48] From the interviews with the executing agency.
[49] Documents provided by JICA.

agency, CIMO/MRIS have been following the agreed O&M procedures, including implementation of monthly inspections and immediate follow-up actions as needed, since 2004 when the O&M responsibilities were transferred from the Project Management Office to them[50]. In the Beneficiary Survey, all respondents were satisfied with the maintenance of the irrigation facilities (see Figure 3 under 3.3.2). Field observation during the ex-post evaluation did not find any serious problems either.

The above-mentioned SAPS (2011) pointed out that some parts of the already constructed irrigation facilities needed rehabilitation, and that NIA had already secured 300 million pesos to undertake the rehabilitation work. At the time of evaluation, it was confirmed that the major rehabilitation work was done from 2012 to 2013, and that the rehabilitated facilities were again made available for use in 2014.

Therefore there is no problem seen in terms of the current status of O&M.

In summary, there are no problems identified in terms of the institutional and technical aspects as well as the current status of O&M. Although some minor problems have been observed in terms of the financial aspect, it is expected to be resolved in the near future. Therefore, sustainability of the project effects is fair.

## 4. Conclusion, Lessons Learned and Recommendations

### 4.1 Conclusions

The Malitubog-Maridagao Irrigation Project was implemented through a yen-loan assistance scheme, signed between the Governments of Japan and the Philippines in 1990, with an objective to increase and stabilize agricultural production in the central region of Mindanao Island via the construction of irrigation facilities, thereby contributing to the alleviation of poverty by improving the incomes of local farmers.

The project has been highly relevant to the development plans and needs of the Philippines, as well as Japan's ODA policies. However, all the project activities had to be suspended for about six years from 1993 to 2000 due to extraordinary deterioration of the peace and order situation in the project area. Considering the fact that a possibility of worsening security situation was already stated as a concern in the appraisal document, there should have been concrete measures included in the loan agreement as much as possible to mitigate negative impacts of such circumstances. For example, the selection of project sites and the decision on the project scale/coverage could have been based on a more careful assessment of the security situation and prospects. The project could have also included some components to be locally managed by the executing agency in the case where the

[50] Documents provided by the executing agency.

security situation would not allow JICA and external consultants to engage in project activities on site. Upon the resumption of the project in 2000, the project plan was revised to be completed in 2003. Following the revised plan, the yen-loan components were completed in 2003 as scheduled while the activities funded by the Philippines Government continued until 2014. Insufficient funding and delayed budget allocations/releases to the field level were identified as major reasons for such a significant delay. If there had been more careful project plans and approaches to address such administrative constraints arising during the project period, the significant delay by additional 11 years could have been avoided or at least shortened. Therefore its relevance is fair. In terms of the project implementation aspects, the total project cost was greater than planned even though the outputs remained the same as planned. The project period was also significantly longer than the planned. Therefore, efficiency of the project is low. With regard to the effectiveness, most of the operation and effect indicators, as far as available data is assessed, showed continuous improvements. Several qualitative effects were also reported by the executing agency, including spill-over effects on mobility and transportation of goods/commodities, access to basic social services, employment opportunities, and peace and order situations. The beneficiary survey conducted as part of the ex-post evaluation also showed local residents' overall satisfaction with the project as well as their positive perceptions regarding benefits brought by the project. Positive impacts on 'women in development (WID)' aspects were also found in the survey. There have been no major reports regarding negative impacts on natural environment. On the other hand, project impacts on poverty reduction in the target area, which is the most important impact indicator, could not be analyzed due to non-availability of relevant quantitative data. Therefore, effectiveness and impact of the project are fair. No major problems have been observed in the institutional and technical aspects of the operation and maintenance of facilities and equipment constructed/procured under the project. There are also no major issues in the current status of the operation and maintenance. While the financial status of the Maridagao River Irrigation System office, which is responsible for day-to-day operation and maintenance activities of the constructed facilities, has been in deficit, there is a prospect of improvements in the near future owing to successful attempts to increase the irrigation service fee collection through pilot activities. Therefore, sustainability of the project effects is fair.

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

## 4.2 Recommendations

### 4.2.1 Recommendations to the Executing Agency

It appears that the Malitubog-Maridagao Irrigation Project has a high possibility of bringing benefits to the people of the Central Mindanao Region which still has a high poverty

level despite the great agricultural potentials. Yet how to sustain the project effects remains to be an issue. Overcoming the current financial deficits of MRIS is identified as a particularly urgent matter to be addressed. In order for farmers to continue benefiting from the project, appropriate and sustainable O&M of the irrigation facilities is inevitable. If farmers encounter a problem of not receiving the benefits from the facilities, their ownership of and active participation in the O&M activities will be hampered, which would in turn exacerbate the financial deficits. It is critical to continue strengthening IAs' organizational capacities and improving the irrigation service fee collection. It has become evident that the approaches taken in the Technical Cooperation Project for ODA Loan, titled Agricultural Extension Support in Malitubog-Maridagao Irrigation Project I, are successful in improving the irrigation service fee collection rate significantly. It is noted that the Department of Agriculture has already made an official plan and approved budgets up to 2018 to expand the same approaches to the uncovered IAs within the MMIP target area. In order to ensure the same level of effects without intensive external support, it is recommended to carefully extract experiences gained and lessons learned in the Technical Cooperation project. Such knowledge should then be fully integrated in every aspects of the expansion processes. Furthermore, it is important to pay a particular attention to sustainability after the expansion, especially in terms of maintaining a high level of irrigation service fee collection and motivation of IA members to actively participate in O&M. Continuous monitoring, not only ensuring coverage but focusing more on quality of activities (such as engagement with farmers and quality of training), is therefore highly recommended.

### 4.2.2 Recommendations to JICA

As already stated above, the Technical Cooperation Project for ODA Loan seems to be providing an answer to a question, "how to sustain positive effects produce by the Malitubog-Maridagao Irrigation Project". The key is to ensure the same level of intensity and quality of activities in the entire area covered by MMIP. When the JICA's project is completed and the activities are expanded to a wider area under the government's plans/budgets, JICA should make a recommendation to the government on the importance of rigorous monitoring with focus on the quality of activities, including continuous dialogues with IA members and quality of training/capacity building activities.

It is also worth considering additional JICA assistance to extract and compile effective approaches, intended achievements and lessons learned in the YLTA project into a guideline/implementation manual which should then be tested in other areas for wider applications.

Lastly the key issue seems to be sustainability. Sustainability, however, seems to have various dimensions, such as how to sustain increased agricultural productivity and income,

participation level of Irrigators' Associations, collection of irrigation service fees, and farmers' ownership on irrigation facilities. It is therefore recommended to conduct a sustainability assessment to propose concrete strategies to be taken up by the government when similar activities are expanded to other areas.

### 4.3 Lessons Learned

(1) Appropriate Planning and Approaches for Infrastructure Projects in Insecure Areas

Infrastructure projects, such as the Malitubog-Maridagao Irrigation Project, can significantly contribute to socio-economic development and mitigation of poverty/disparities that are often sources of instability in many conflict-prone areas of developing countries. However, such projects require extremely careful planning and approaches when they are implemented in areas where peace and order is not stabilized yet (e.g. when anti-government groups remain active in armed resistance). As such, target areas and scope/scale of the project need to be carefully determined based on not only a thorough assessment of the present situation but also analyses of potential developments/deterioration that might affect the project implementation. For example, large-scale infrastructure projects are highly visible and harder to protect if it is targeted in anti-government activities. It also takes a long time for large-scale infrastructures to be completed and thus perceived as a tangible benefit by the general population including those engaged in anti-government forces. Therefore it is generally recommended that a project start with a smaller-scale and quick-impact activities to bring peace dividends into local people's hands from early stages, which can then be expanded to a larger-scale infrastructure building[51].

If a large-scale infrastructure is considered necessary and justifiable even under unstable conditions, however, concrete measures to mitigate potentially negative effects on the project in the case of deteriorating security situations are necessary. For example, it is worth considering inclusion of components that can be implemented locally without direct involvement of JICA and external consultants on site, and/or that can bring tangible benefits to local residents, including armed groups, at early stages of the project[52]. These measures should be discussed thoroughly to reach a consensus with the recipient government at the time of appraisal in order to ensure prompt actions to be taken when the need arises. Furthermore, it is of a great importance to encourage the recipient government to establish a mechanism to continuously monitor, report and analyze security situations and to promptly take security measures when a sign of deterioration is observed (e.g. deployment/expansion of security force in the area). In other words, if project plans and approaches do not explicitly

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[51] United States Institute of Peace, 2008. *Special Report: Conflict-Sensitive Approach to Infrastructure Development*.

[52] Ibid.

include such special measures and mechanisms, it would run a high risk of not achieving intended objectives of the project by facing a long period of suspension, the possibility of termination, and/or incurrence of extra costs to overcome such extraordinary situations.

(2) Utilization of Technical Cooperation to Complement Irrigation Development Projects through Strengthening Irrigation Service Users' Capacity/Ownership and Building of Social Foundation

Sustaining positive effects of irrigation infrastructures generally becomes possible not only when necessary agricultural water is supplied to the area. It also has to be supported by local residents who understand the benefits of the irrigation facilities and thus will be motivated to sustain them. Especially in areas where socio-economic development still lags behind, it is important to contribute to building a social foundation that would enable local residents to effectively utilize and maintain irrigation facilities for their livelihood. The Malitubog-Maridagao Irrigation Project has been supported by its Technical Cooperation Project for ODA Loan, titled "Agricultural Extension Support in Malitubog-Maridagao Irrigation Project I", which seems successful in improving agricultural productivity, strengthening Irrigators' Associations, and building farmers' ownership of the irrigation facilities. As demonstrated above, Technical Cooperation projects can yield a great value as a complementary measure to maximize development impacts of irrigation projects if they are strategically implemented to strengthen capacities of local residents and help them utilize and maintain public goods for their shared prosperity.

Comparison of the Original and Actual Scope of the Project

| Item | Original | Actual |
|---|---|---|
| **1. <u>Output</u>**<br>**1) Civil Work** | 1. Diversion Dam: 1 unit<br>2. Gated Spillway: 8 units<br>3. Sluiceway: 2 units<br>4. Intake Gate: 3 units<br>5. Reservoir: 1,460km$^2$<br>6. Bridge/Flume Structure: length 100m; width 6m<br>7. Irrigation Canals/Laterals: total length 169.6km<br>8. Drainage Canals/Laterals: total length 9.6km<br>9. Project Facilities<br>➢ Irrigation System Office (1 unit)<br>➢ Water Management Center (2 units)<br>➢ Water Management Station (19 units)<br>➢ Gatekeeper Quarter (7 units)<br>10. Pilot Demonstration Farm<br>➢ Training Center: 2 units<br>➢ Storage Area: 2 units<br>➢ Pump Building: 4 units<br>➢ Access Road: 14km<br><br>**Service Area:**<br>Maridagao Area: 6,625 ha<br>Upper Malitubog Area: 4,215 ha | 1. Diversion Dam: 1 unit<br>2. Gated Spillway: 8 units<br>3. Sluiceway: 2 units<br>4. Intake Gate: 3 units<br>5. Reservoir: 1,460km$^2$<br>6. Bridge/Flume Structure: length 100m; width 6m<br>7. Irrigation Canals/Laterals: total length 169.6km<br>8. Drainage Canals/Laterals: total length 9.6km<br>9. Project Facilities<br>➢ Irrigation System Office/Farmers Center: 1 unit<br>➢ Farmers Center: 1 unit<br>➢ Pilot Demo Farm Office: 1 unit<br>➢ Watermasters' Quarter: 8 units<br>10. Pilot Demonstration Farm<br>➢ Training Center: 2 units<br>➢ Storage Area: 2 units<br>➢ Pump Building: 4 units<br>➢ Access Road: 14km<br>11. Additional Output: 10 units of centrifugal pumps with 980m lined canal (added and funded by the Philippines Government as an emergency measure to restore security)<br>**Service Area:**<br>Maridagao Area: 5,562 ha<br>Upper Malitubog Area: 1,611 ha |
| **2) Procurement of Equipment and goods** | ➢ Construction equipment<br>➢ Pilot farms and office equipment<br>➢ Operation and maintenance equipment | ➢ As planned. |
| **3) Consulting Services** | ➢ Detailed design works for the phase 2 target areas (Lower Malitubog and Pagalungan areas)<br>➢ Support for bidding processes<br>➢ Supervision of construction work in the Phase I target areas (Upper Malitubog and Maridagao areas)<br>➢ Support for the management of pilot farm activities<br>➢ Overseas training<br><br>Foreign experts: 331M/M<br>Local experts: 280M/M | As planned in terms of the foreign experts.<br><br>Foreign experts: 331M/M<br>Local experts: no information available |
| **2. <u>Project Period</u>** | February 1990 – May 1996<br>(76 months) | February 1990 – December 2014<br>(299 months) |

| | | |
|---|---|---|
| **3. <u>Project Cost</u>** | | |
| Amount paid in foreign currency | 3,047 million yen | 4,561 million yen |
| Amount paid in local currency | 3,442 million yen | 3,422 million yen |
| Total | 6,489 million yen | 7,984 million yen |
| Japanese ODA loan portion | 4,867 million yen | 4,561 million yen |
| Exchange rate | 1 peso = 6.2 yen (as of June 1989) | 1 peso = 2.78 yen (Average between 1990 and 2011) |

Republic of the Philippines

Ex-Post Evaluation of Japanese ODA Loan

"Rural Water Supply and Sanitation Project (V)"

External Evaluator: Akemi Serizawa, Sanshu Engineering Consultant

## 0. Summary

The objectives of this project were to provide safe, adequate and easily accessible water supply and sanitation services in the six provinces (Ilocos Sur, Nueva Vizcaya, Occidental Mindoro, Oriental Mindoro, Palawan and Zambales) by construction of water supply and sanitation facilities, capacity development of Local Governmental Units (LGUs)[1] in operation of water and sanitation services and by organizing and training communities in operation and maintenance of facilities, and thereby contributing to the improvement of living conditions.

The project has been highly relevant to the country's development plans and development needs, as well as Japan's ODA policy. However, the needs of the level I water supply facilities (common wells) were declined after the project started, and some municipalities with weak financial capability dropped out of the project because they could not secure funding for their share of the project cost even if they needed level I facilities. Some LGUs opted to use their own funds, not loan, to finance water supply projects to simplify the processes. As a consequence, the number of constructed facilities was far below the original plan. Also, the functioning rate of the facilities at the time of ex-post evaluation was only 70-80% despite that they included relatively new facilities constructed or repaired between 2012 and 2014 in Ilocos Sur. Some facilities are not functioning due to the problems of water quality or dried-up wells and due to other nearby facilities which reduced the needs of the facilities constructed by this project. Thus it could be concluded that the project had problems in its design and could not respond to the evolving needs during the project period. Therefore, the relevance is fair. Taking the reduction of outputs into account, both the project cost and project period significantly exceeded the plan. Therefore, the efficiency of the project is low. Regarding effectiveness, while the numbers of constructed and functioning facilities are far below the plan and the scale of project benefit is limited, the functioning facilities have sufficient number of beneficiaries and access to water supply and sanitation services was improved. Also, there were impacts such as the reduction of workload to fetch water, improvement of hygiene status, and enhancement of LGUs' capacity in management of water supply and sanitation services. Therefore, this project has to some extent achieved its objectives and its effectiveness and impact are fair. The functioning facilities have no problem in

[1] LGUs include regions, provinces, cities, municipalities and barangays. Barangay is the smallest administrative division under a city or municipality.

institutional and technical aspects in terms of operation and maintenance. As there are minor problems such as the functioning status of the facilities and the financial aspects, the sustainability of this project effects is fair.

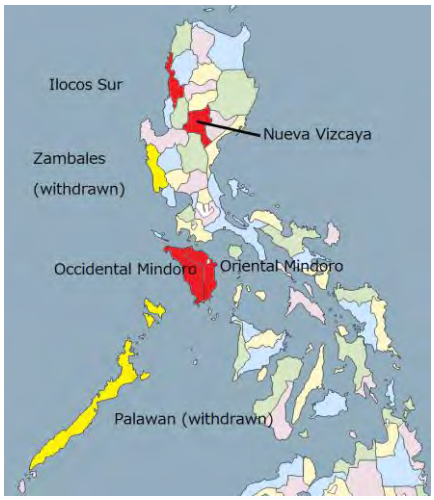
In the light of above, this project is evaluated to be unsatisfactory.

## 1. Project Description

### 1.1 Background

The proportion of population served by water supply systems (population who have access to water supply systems among the population of the administrative unit) in the rural areas of the Philippines was 87%, and that of the six project target provinces was only 53% in 1998. The quality of available water was not necessarily adequate for drinking. The rest of the population relied on the natural sources of water such as rivers, ponds and rain water. Sanitation facilities were not adequate especially in the community premises such as schools.

Water supply and sanitation services were decentralized to the LGUs by the Local Government Code of 1991. Their management capacity, as well as community participation, needed to be strengthened.




Project locations

Water supply facility of this project
Magsaysay, Occidental Mindoro

### 1.2 Project Outline

The objectives of this project were to provide safe, adequate and easily accessible water supply and sanitation services in the six provinces (Ilocos Sur, Nueva Vizcaya, Occidental Mindoro, Oriental Mindoro, Palawan and Zambales) by construction of water supply and sanitation facilities, capacity development of LGUs in operation of water and sanitation services and by organizing and training communities in operation and

maintenance of facilities, and thereby contributing to the improvement of living conditions.

Zambales withdrew from the project in 2000 after the Loan Agreement (L/A) and before starting the main project activities, and Palawan also withdrew in 2003 after procurement of equipment. Therefore, the final project target provinces were four[2].

| | |
|---|---|
| Loan Approved Amount/ Disbursed Amount | 951million yen /456million yen |
| Exchange of Notes Date/ Loan Agreement Signing Date | December 1999 / December 1999 |
| Terms and Conditions | Construction and equipment:<br>Interest rate: 1.3%, Repayment period: 30 years (Grace period: 10 years), General untied<br>Consulting services and NGO assistance:<br>Interest rate: 0.75%, Repayment period: 40 years (Grace period: 10 years), Bilateral tied |
| Borrower / Executing Agencies | The Government of the Republic of the Philippines / Department of the Interior and Local Government: DILG |
| Final Disbursement Date | March 2007 |
| Main Contractor (Over 1 billion yen) | N/A |
| Main Consultant (Over 100 million yen) | Nippon Jogesuido Sekkei Co., Ltd. (Japan) / Cest, Incorporated (Philippines) / Test Consultants, Incorporated (Philippines) (JV) |
| Feasibility Studies, etc. | Master plan for Palawan Province (UNDP, January 1994)<br>Master plan for other five provinces (JICA, February 1996) |
| Related Projects | JICA Technical Cooperation:<br>Study on the Provincial Water Supply, Sewerage and Sanitation Sector Plan (1994-1996)<br>Study on Provincial Water Supply, Sewerage and Sanitation Sector Plans for Visayas and Mindanao (1998-2000)<br>Small Water Districts Improvement Project (2005-2012)<br>JICA loan projects:<br>Local Water Supply Development Project (1977)<br>Local Water Supply Development Project (II) (1980)<br>Local Water Supply Development Project (III) (1986)<br>Special Assistance for Project Sustainability (SAPS) for Local Water Supply Development Project (III) (1997)<br>Rural Water Supply and Sanitation Project (IV) (1989)<br>JICA Grant Aid projects:<br>Pilot rural environmental sanitation project (1984)<br>Project for Emergency Rehabilitation for Typhoon-damaged Water Supply System in Leyte (1993, 1994)<br>Project for Rural Water Supply and Improvement of Sanitary |

[2] DILG confirmed that they officially agreed with JICA about the withdrawal of Zambales on December 8, 2000 and about Palawan on January 16, 2003.

| | |
|---|---|
| | Facilities (1995, 1996)<br>International organizations, etc.:<br>World Bank: Water Supply, Sewerage and Sanitation Project (1999)<br>ADB: Rural Water Supply and Sanitation Project (1996)<br>UNDP: Master plan for Palawan Province (UNDP, January 1994) |

## 2. Outline of the Evaluation Study

2.1 External Evaluator

Akemi Serizawa, Sanshu Engineering Consultant

2.2 Duration of Evaluation Study

Duration of the Study: October 2014 - October 2015

Duration of the Field Study: January 4-23 and April 5-23, 2015

## 3. Results of the Evaluation (Overall Rating: D[3])

3.1 Relevance (Rating: ②[4])

3.1.1 Relevance to the Development Plan of the Philippines

The Philippine Mid-Term Development Plan 1999-2004 at the time of appraisal aimed to improve the proportion of population with access to water supply systems in the rural areas in the whole country to 93% by 2004.

One of the goals of the Philippine Development Plan 2011-2016 at the time of ex-post evaluation is to improve access to quality and adequate infrastructure and services by accelerating installation of water supply and sanitation facilities. The Plan has common targets with the Millennium Development Goals (MDG) to be achieved by 2015 as follows:

- To increase the proportion of population with access to potable water (water supply level I and II[5]): 82.9% in 2007 → target value (same as MDG) 86.6%
- To increase the proportion of population with access to level III water supply facilities: 35% in 2005 → no target value
- To improve the proportion of population with access to basic sanitation facilities (households with sanitary toilets) : 76% in 2008 → target value (same as MDG) 83.8%

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

[4] ③: High, ② Fair, ① Low

[5] Levels of water supply systems (definitions by NEDA Board Resolution No. 12, Series of 1995)

Level I (point source): a protected well or developed spring system without a distribution system. A facility is supposed to provide water to about 15 households within a 250m radius from the facility. Level I is mainly for rural areas with small population density.

Level II (communal faucet system or stand post): a system composed of a source, reservoir, distribution system and communal faucets. A facility is supposed to provide water to about 4-6 households within a 25m radius from the facility.

Level III (waterworks system or individual household connections): a system composed of a source, reservoir, piped distribution system and household taps.

The Philippine Water Supply Sector Roadmap 2010 by the National Economic Development Authority (NEDA), the national water supply sector policy, aims to "halve, by 2015, the proportion of the population without sustainable access to safe drinking water", which is the same target as MDG, and to attain universal (100%) access by 2025. The Philippine Sustainable Sanitation Roadmap by the Department of Health and NEDA, the national sanitation sector policy, also aims to "halve, by 2015, the proportion of the population without sustainable access to basic sanitation", which is also same as MDG, and to attain universal access to safe and adequate sanitary facilities by 2028.

The Department of the Interior and Local Government (DILG), the executing agency of this project, explains that, while the needs of level I facilities have always been high, the demands for level II and III facilities started increasing around 2002. The government has gradually been providing level II and III facilities since then as a response to the changing needs. According to DILG, the advantages of level II and III facilities compared to level I are that the former are more convenient for users and easier to ensure sustainability of operation and maintenance because they are managed by and under the responsibility of the municipalities, barangays or water service providers, while the latter are managed by the community. At the same time, DILG confirms the consistent needs of level I facilities because only level I is still feasible in some parts in rural areas due to geographical and other conditions.

The President's Priority Program on Water (2005-2010) provided grant assistance to install water supply facilities to 546 waterless municipalities[6] in total[7]. Continuing its effort, DILG and the Department of Health are implementing a water supply program for rural areas called SALINTUBIG (SAGANA AT LIGTAS NA TUBIG SA LAHAT = supply of potable water) since 2011. It aims to provide sustainable water supply in waterless 455 municipalities and 1,353 barangays by assisting construction of level II or III facilities basically and also level I where other levels are not feasible. SALINTUBIG assists LGUs and water supply service providers in finance and capacity development. The government is also implementing the Bottom-up Budgeting (BuB) program since 2013. It assists construction of water supply facilities of the levels the LGUs want (level I or II) while it also covers other sectors than water and sanitation[8].

From the above, this project conforms to the development policies of the Philippines both at appraisal and ex-post evaluation as it aims to provide quality water supply and

[6] Waterless municipalities are defined as municipalities with less than 50% service coverage.
[7] MDGF Achievement Fund (2011) "Review of Programming Policies of the Presidents Priority Program on Water (P3W)"
http://www.ombudsman.gov.ph/UNDP4/wp-content/uploads/2013/02/s-Priority-Program-on-Water.pdf
[8] Source: questionnaire responses from DILG and provinces.

sanitation services.

### 3.1.2 Relevance to the Development Needs of the Philippines

At appraisal of this project, the proportion of population with access to water supply systems in the rural areas in the six target provinces (Ilocos Sur (IS in the tables below), Nueva Vizcaya (NV), Occidental Mindoro (OCM), Oriental Mindoro (ORM), Palawan (P) and Zambales (Z)) was only 53% in average, and sanitation facilities were not sufficiently provided. Most water supply facilities were level I and water quality was not necessarily good. People without access to water supply systems relied on rivers, ponds or rainwater. Community premises such as schools did not have sufficient adequate toilets. Back in the time of appraisal, it was appropriate to construct level I water supply facilities and school toilets in the corner of schoolyard because it was physically difficult to install water pipes or electric cables for level II or III facilities or classroom toilets in remote rural areas.

As shown in Table 1 and 2, data of access to water supply and sanitation facilities in the rural areas of the project target provinces were not fully available[9]. Still, the needs of these facilities exist both at appraisal and ex-post evaluation. In 2013, the proportion of population with access to water supply facilities was 83.8% and that of sanitation was 92.2%[10] in the whole country. While both had improved, a gap remains to attain universal access in about ten years.

Table 1.Proportion of population with access to water supply facilities

| | 1999 (rural areas) | | | Most recent data (rural areas) | | | |
|---|---|---|---|---|---|---|---|
| | Level I | Level III | Total | Level I | Level II & III | Total | Year of data |
| IS | 70.1% | 4.8% | 74.9% | 49.05% | 6.57% | 55.62% | 2014 |
| NV | 62.2% | 5.0% | 67.2% | No data | No data | 91% | 2014 |
| OCM | 41.1% | 8.6% | 49.7% | No data | No data | No data | |
| ORM | 60.8% | 11.5% | 72.3% | 56% | 44% | 100% | 2013 |
| P | 27.5% | 8.9% | 36.4% | (N/A) | (N/A) | (N/A) | |
| Z | 55.2% | 9.9% | 65.1% | (N/A) | (N/A) | (N/A) | |
| All target provinces | 53.3% | 8.3% | 61.6% | No data | No data | No data | |

(Source: JICA documents for the data of 1999. Questionnaire responses from the project target provinces for the most recent data)

Table 2. Proportion of households with access to sanitation facilities

| Province | 1999 (rural areas) | Most recent data (rural areas) | Year of data |
|---|---|---|---|
| IS | 95.4% | 78.30% | 2010 |
| NV | 76.2% | No data | |
| OCM | 57.1% | No data | |
| ORM | 48.4% | No data | |

(Source: JICA documents for the data of 1999. Questionnaire responses from the project target provinces for the most recent data)

[9] It is likely that the provinces do not collect data only for the rural areas.
[10] Philippine Statistics Authority, MDG watch (March 2015)

From the above, the needs of water supply and sanitation facilities exist in rural areas both at appraisal and ex-post evaluation. However, the number of constructed facilities by this project was far below the original plan as stated in the section "3.2 Efficiency". Also, as explained in the section "3.3.1 Quantitative Effects" in Effectiveness, while the functioning rate of the public toilets is high, that of water supply facilities and school toilets are only 70-80% despite that they include relatively new facilities in Ilocos Sur. Therefore, the needs of level I water supply facilities and toilets in the schoolyard at the time of ex-post evaluation are lower than estimated at appraisal.

Water supply facility of this project
Calintaan, Occidental Mindoro

School toilets of this project
Burgos, Ilocos Sur


School toilets, Ilocos Sur

School toilet, Ilocos Sur

3.1.3 Relevance to Japan's ODA Policy

Japan International Cooperation Agency (JICA) developed the Medium-Term Strategy for Overseas Economic Cooperation Operations in December 1999, based on the general policies of the Government of Japan. Reduction of poverty and regional disparity was one of its priority areas. This project was in line with this Strategy as it aimed at the

improvement of water supply and sanitation services in the rural areas.

### 3.1.4 Relevance of Project Planning and Approach

As explained in the section "3.2 Efficiency", the number of constructed facilities was far below the original plan: it was only 17.6% of the plan for the six provinces (15.7% for water supply and 42.9% for sanitation) and 24.5% of the plan for the four provinces (21.7% for water supply and 64.9% for sanitation). Also, as stated in the section "3.3.1 Quantitative Effects" of Effectiveness, the functioning rate was 70% for water supply and 81% for sanitation.

The reasons for having substantial decrease of the number of constructed facilities and many non-functioning facilities would be that: 1) the needs of level I water supply facilities were not thoroughly examined; 2) water quality of the water supply facilities was not thoroughly examined; 3) the feasibility of the cost-sharing plan was not thoroughly examined; and 4) the project did not sufficiently respond to the changing needs. All of them were issues after the commencement of the project.

The needs of the level I water supply facilities (above 1) were confirmed at appraisal in 1999 based on the Provincial Water Supply and Sanitation Plans of 1996. Taking the situation of the project target areas into account back in that time, it was appropriate for the project to provide level I facilities. However, during the long period between the project planning and its completion, more convenient level II/III water supply facilities became common as a response to the changing needs in many areas. DILG and the project target provinces explained in the interviews that, while the shift to level II and III started around 2002, this project did not consider these levels because the executing agency and JICA had agreed that the scope of this project was level I facilities. The project actually constructed only level I facilities after confirming that the LGUs and communities accepted level I. Another reason for not including level II was that it was not realistic for many sites because the project target municipalities of Class 5-6 (two lowest tiers among six according to the income level of LGUs) could not shoulder their share of the project cost (explained below) since level II would need higher construction cost and electricity. Also, it took time to check status of many project sites (around 2,500 in total) as their situation continued changing during this process. At the same time, considering the possibility of future upgrading of facilities from level I to II, DILG developed manuals for upgrading[11] and designed the wells so that they could be upgraded to level II later. Some facilities were actually upgraded to level II as explained in the section of Sustainability, and it has contributed to a certain extent to keep the functioning rate of the facilities not too low at the time of ex-post evaluation. Regarding

[11] "BWSA Community Organizing, O and M and the Upgrading of Water Supply Systems' Manual"

the water quality (above 2), while the consultants examined it during the detailed design, the final selection of the location of the facilities and the depth of the wells were made by the barangays or other relevant parties in some sites. Water quality of those wells was not fully examined and could have led to problems. DILG and the target provinces also reported about cases in which the water quality deteriorated due to intrusion of seawater to the groundwater or other reasons, which were not foreseen at the stage of project design. Cost-sharing (above 3) was based on the NEDA-Investment Coordination Committee Financing Policy. This project to construct level I water supply facilities targeted municipalities of Class 5-6, and DILG and the municipalities were to share 50% of the project cost each[12]. Some municipalities and sites dropped out of the project because these Class 5-6 municipalities had small budget and could not secure sufficient funding for their share. NEDA did not consider the reduction of municipalities' share because this project was a pilot project of the above mentioned policy that required LGUs to shoulder proper share of the cost of development projects. Some municipalities might have chosen other programs such as the President's Priority Program on Water (2005-2010) mentioned above as it did not require LGUs to share the project cost, and dropped out of the JICA project.

Regarding the response to the changing needs (above 4), it was not possible to foresee the shift to level II back in the time of appraisal. Also, it was very difficult to respond quickly to the change of the local situations since around 2002 because this project had many candidate sites. In addition, it was understandable that the scope of the project was limited to level I facilities and it strictly followed the cost-sharing policy. However, as a consequence, the sites that no longer needed level I facilities and municipalities with weak financial capability in very remote areas that actually needed level I backed out of this project. Taking the situations during the project into account, it was understandable that the project strictly followed the cost-sharing policy and limited the project scope to level I facilities. However, the project should have responded to the changing situations during the project period and should have considered options such as inclusion of level II facilities, reduction of municipalities' share of the project cost, or inclusion of municipalities of higher income classes than Class 5-6 as far as the physical conditions of the project sites and the cost had allowed.

【Summary of Relevance】

This project has been highly relevant with the Philippines' development plans and development needs, as well as with Japan's ODA policies. However, the needs of level I water supply facilities declined after the project started, and some target municipalities

[12] JICA documents

with real needs of level I facilities but without sufficient financial capability dropped out of the project because they could not shoulder their share of the project cost. The number of constructed water supply and sanitation facilities was much lower than the original plan because of these reasons. The functioning rate of the facilities was only 70-80% at the time of ex-post evaluation despite that they included relatively new ones that were constructed between 2012 and 2014. It is because some facilities were no longer utilized due to problems of water quality or dried-up sources of water, or due to declined needs of these facilities because of other available water supply or sanitation facilities. This could be attributed to the problems of the project design which could not respond flexibly to the cost-sharing issue of the municipalities and the levels of water supply facilities during the project period. In conclusion, the relevance of this project is fair.

<Column: Local water supply services >

Water supply services are basically under the responsibility of the municipalities. They select levels of water supply facilities, secure funding for the construction of facilities, coordinate with DILG, province and barangays, and coordinate and contract with water service suppliers.

At national level, the Water Supply and Sanitation Project Management Office (WSS-PMO) of DILG is responsible for the supervision of water supply services and capacity development. The Provincial DILGs provide technical support to the municipalities. The municipalities identify the needs, plan water supply programs and implement them. They receive technical and financial assistance from the Provincial DILG and donors as required. They also coordinate with the barangays and communities.

The water supply facilities are operated and maintained as follows, depending on the levels of facilities:

Level I: Barangay Water and Sanitation Association (BWSA) is primarily responsible for the operation and maintenance of level I facilities after the construction. BWSA collects user fees and use them for operation and maintenance. However, many facilities do not have BWSAs, and they are managed by the municipalities, barangays or individual users. User fees are not collected in many places, and when the facilities need repair, funding comes from the budget of municipalities, barangays, or from contributions from the users. The users know the condition of the facilities. When the facilities need repair, the users take initiatives to secure funding, and negotiate with the municipality, barangay or other users as necessary, regardless of the situation of BWSAs.

Level II: Municipalities or barangays operate and maintain the facilities.

Level III: Municipalities contract with water supply service providers, called Water Districts, and agree on the service areas and user fee scales (usually quantity-based using the meter).

LGUs grasp the situations of local water supply services and coordinate with relevant actors.

3.2 Efficiency (Rating: ①)

3.2.1 Project Outputs

The outputs of this project are civil works, procurement of equipment, consulting services and NGO assistance.

3.2.1.1 Civil works and procurement of equipment

Construction of water supply and sanitation facilities

The initial plan at appraisal and actual outputs for the four provinces (Ilocos Sur, Nueva Vizcaya, Occidental Mindoro and Oriental Mindoro) were compared in the ex-post evaluation, according to the method of JICA ex-post evaluation. The actual outputs were based on the situation as of April 2015 at the time of ex-post evaluation[13]. Zambales withdrew from the project in 2000 after L/A and before the commencement of the main project activities, and Palawan withdrew in 2003 after the procurement of equipment. They could not shoulder their share of the project cost. As water supply and sanitation were no longer the priority in Palawan after the project appraisal, it could not continue the project. DILG considered using the budget of the two provinces for other target provinces, and some were finally used in Occidental Mindoro[14]. The project outputs (plan and actual) are shown in Tables 3, 4 and 5.

The number of constructed facilities by April 2015 was 424 in total (352 water supply facilities and 72 sanitation facilities). It was 24.5% of the original plan of the four provinces (21.7% for water supply and 64.9% for sanitation).

Table 3. Number of water supply and sanitation facilities (initial plan at appraisal and actual)

| | Water supply facilities | Sanitation facilities | Total |
|---|---|---|---|
| Plan at appraisal (6 provinces) | 2,312 | 168 | 2,480 |
| Plan at appraisal (4 provinces) | 1,619 | 111 | 1,730 |
| Facilities completed by April 2015 (*Note) | 352 (21.7% of the plan for 4 provinces) | 72 (64.9% of the plan for 4 provinces) | 424 (24.5% of the plan for 4 provinces) |
| Final target number | 364 (22.5% of the plan for 4 provinces) | 72 (64.9% of the plan for 4 provinces) | 436 (25.2% of the plan for 4 provinces) |

(Source: JICA documents)

(*) Note: All facilities in IS, OCM and ORM are complete. The 12 remaining water supply facilities in NV will be constructed.

[13] Nueva Vizcaya has already secured budget from the province for the incomplete facilities (4 million pesos). They are to be constructed (source: questionnaire response from the province). They were excluded from the outputs as of April 2015, at the ex-post evaluation.

[14] Questionnaire response from DILG

Table4. Number of water supply facilities (initial plan at appraisal and actual)

| | Initial plan at appraisal (1999) | | | | | Facilities completed before the loan expiry date (2007) | | | Facilities completed after the loan expiry and those to be constructed (as of April 2015) | | Facilities completed by April 2015 and the final target number (* Note) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Deep well (DW) | Shallow well (SW) | Dug well | Spring (SP) | Total | DW | SW | Total | DW | SP | DW | SW and SP | Total |
| IS | 589 | 0 | 0 | 0 | 589 | 64 | 6 | 70 | 33 (*1) | 0 | 97 | 6 | 103 (17.5% of the plan) |
| NV | 350 | 0 | 0 | 0 | 350 | 6 | 3 | 9 | 0 | 3 (*2) | 6 + 9 (to be constructed) = 15 | SW 3 + SP 3 (to be constructed) = 6 | 9 (2.6% of the plan) + 12 (to be constructed) = 21 |
| OCM | 146 | 116 | 0 | 0 | 262 | 79 | 95 | 174 | 0 | 0 | 79 | 95 | 174 (66.4% of the plan) |
| ORM | 312 | 106 | 0 | 0 | 418 | 55 | 11 | 66 | 0 | 0 | 55 | 11 | 66 (15.8% of the plan) |
| Total (4 provinces) | 1,397 | 222 | 0 | 0 | 1,619 | 204 | 115 | 319 | 42 | 3 | 237 + 9 (to be constructed) = 246 | SW 115 + SP 3 (to be constructed) = 118 | 352 (22.5% of the plan) + 12 (to be constructed) = 364 |

(Source: JICA documents, responses to the questionnaire)

Note: The final target number of facilities was fixed by January 2008 for IS, OCM and ORM. NV was planning to construct 32 more facilities as of 2007, but 20 were cancelled after that and 12 are now to be constructed as of April 2015.

(*1) completed. (*2) under preparation

Table 5. Number of sanitation facilities (initial plan at appraisal and actual)

| | Initial plan at appraisal (1999) | | | Facilities completed before the loan expiry date (2007) | | | Facilities completed after the loan expiry (as of April 2015) | | Final target numbers | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | School | Public | Total | School | Public | Total | School | Public | School | Public | Total |
| IS | 41 | 3 | 44 | 10 | 1 | 11 | 10 | 0 | 20 | 1 | 21 (47.7% of the plan) |
| NV | 20 | 5 | 25 | 0 | 0 | 0 | 3 | 1 | 3 | 1 | 4 (16.0% of the plan) |
| OCM | 8 | 4 | 12 | 35 | 7 | 42 | 0 | 0 | 35 | 7 | 42 (350% of the plan) |
| ORM | 26 | 4 | 30 | 4 | 1 | 5 | 0 | 0 | 4 | 1 | 5 (16.7% of the plan) |
| Total (4 provinces) | 95 | 16 | 111 | 49 | 9 | 58 | 13 | 1 | 62 | 10 | 72 (64.9% of the plan) |

(Source: JICA documents, questionnaire responses)

The selection criteria of the project sites were as follows:

| | |
|---|---|
| Water supply | Basic conditions: Groundwater is the only source of water. The community accepts level I facility. Sources of water with sufficient quantity and quality are available.<br>Other conditions: Situation of water borne diseases. Sources of water accessible by balling machines. Coverage of water supply facilities in the community. Income levels of the households and community. Willingness of the community to take responsibility for operation and maintenance, participate in training in operation and maintenance, pay user fees, and nominate counterparts. |
| Sanitation | School toilets (target: 40 pupils per unit): Large number of pupils per unit. Active PTAs. School's willingness to shoulder cost and labor for operation and maintenance.<br>Public toilets (one facility each for public locations such as markets and bus terminals): No public toilets. Municipality's willingness to shoulder cost and labor for operation and maintenance. Existing groups such as market venders' groups who are willing to operate and maintain the toilets. |

(Source: JICA documents)

The final target number of the facilities was officially approved by NEDA and DILG and concurred by JICA. The reasons for the large discrepancy of the numbers of water supply and sanitation facilities between the initial plan and actual were as follows[15]:

・The demand was estimated at the project appraisal based on the Provincial Water Supply and Sanitation Plans of 1996. Some sites included in this plan no longer needed the JICA project when the construction started in 2003 because they already had facilities by other funding. The actual demand had considerably decreased by that time.

・This project targeted municipalities of Class 5-6. They had weak financial capability, and some could not shoulder their share (50%) of the project cost and dropped out of this project. Some LGUs opted to use their own funds, not loan, to finance water supply projects to simplify the processes.

・Due to the changes of the political situation (local elections took place in 2001, 2004 and 2007), water supply and sanitation were no longer priority sectors in some LGUs.

・The site selection criteria were strictly applied. Technical conditions (location of facility was not too far from the source of water, etc.) and financial capability (the municipality needed to share 50% of the project cost) were closely examined. Candidate sites that did not meet the requirement were excluded.

・The unit costs for construction was higher than those at project appraisal. As the bid prices for procurement exceeded the predetermined prices by 20-30%, the number of facilities to be constructed became smaller than the plan. The actual unit costs for construction escalated during years after the appraisal. The increase was also because

[15] JICA documents

the facility design was slightly changed from the original in order to make them women-friendly, to prolong their service life and to make the maintenance easier.

Procurement of equipment

There were discrepancies between the plan and actual procured equipment as shown Table 6, the reasons for which were as follows:

・Zambales withdrew from the project before the procurement of equipment[16].

・Bid announcements for the procurement of well rehabilitation machines and maintenance tools were made five times since 2000. However, they were in vain because of the reasons such as small predetermined prices, no bidders some time, and unsuccessful negotiations with the bidders in other times. In order to encourage bidding, the project took measures such as modification of the payment system, increase of predetermined prices and modification of specification of equipment, all of which did not lead to contracts.

Table 6. Procurement of equipment (plan and actual)

(Unit: Well rehabilitation equipment and vehicle=unit, maintenance tools and water quality testing kits=set)

| | Plan | | | | Actual | | | |
|---|---|---|---|---|---|---|---|---|
| | Well rehabilitation equipment | Vehicle | Maintenance tools | Water quality testing kits | Well rehabilitation equipment | Vehicle | Maintenance tools | Water quality testing kits |
| IS | 1 | 1 | 28 | 28 | 0 | 1 | 0 | 28 |
| NV | 1 | 1 | 11 | 11 | 0 | 1 | 0 | 11 |
| OCM | 1 | 1 | 6 | 6 | 0 | 1 | 0 | 6 |
| ORM | 1 | 1 | 6 | 6 | 0 | 1 | 0 | 6 |
| P | 1 | 1 | 11 | 11 | 0 | 1 | 0 | 10 |
| Total (5 provinces) (Note) | 5 | 5 | 62 | 62 | 0 (0%) | 5 (100%) | 0 (0%) | 61 (98%) |
| Z | 1 | 1 | 6 | 6 | 0 | 0 | 0 | 0 |
| Total (6 provinces) (Note) | 6 | 6 | 68 | 68 | 0 (0%) | 5 (83%) | 0 (0%) | 61 (90%) |

(Source: JICA documents)

(Note): The numbers in the brackets are percentage of actual compared to the plan.

3.2.1.2 NGO assistance

The NGOs provided assistance in community organizing and skills training as planned. The details of their activities were as follows:

・To confirm the communities' willingness through discussions with them at the site selection stage to participate in the project in operation and maintenance and to pay user fees.

[16] Palawan procured the vehicle and water quality testing kits before its withdrawal from the project in 2003.

・To conduct gender training and develop measures to ensure that the project would benefit both men and women (participation of both sexes from the planning stage, involvement of both sexes in the design of the facilities to make them user-friendly for both, participation of women in BWSAs, etc.)

・To organize BWSAs, and to conduct training of existing groups such as PTAs and market vendors' groups in maintenance of sanitation facilities.

・To conduct health and hygiene education (promotion of hand washing etc.)

The NGOs in charge of each target province conducted community organizing and BWSA training. The umbrella NGO supervised their activities in all project target provinces. The provinces confirmed that the engagement of the NGOs in these activities was useful because the LGUs lacked expertise and experience in these topics. As the facilities were constructed long after the community training, however, some communities had lost willingness to participate by the start of civil works.

#### 3.2.1.3 Consulting services

Consulting services included detailed design, review of tender documents, assistance in evaluation of tendering, supervision of construction works, training of DILG, LGUs and NGOs, assistance in organizing BWSAs, and environment-related activities (supervision and assistance in design of the facilities and development of tender documents so that they could comply with the environmental standard during the detailed design; assistance in tendering; monitoring during construction and installation works and advice of countermeasures: and transfer of skills to the executing agency to continue environmental monitoring after the project completion). These activities were implemented mostly as planned. According to DILG, skills were not sufficiently transferred in construction works because the consultants sometimes worked only by themselves without involvement of the executing agency. This problem, however, did not prolong the project period or increase the project cost.

### 3.2.2 Project Inputs

#### 3.2.2.1 Project Cost

The original project cost for the six provinces was 2,088 million yen for 2,480 facilities. The number of constructed facilities was 424, which was 17.1% of the original target number. Therefore, the planned project cost calculated based on the number of constructed facilities would be 357 million yen as shown in Table 7. Ilocos Sur and Nueva Vizcaya constructed some facilities by their own funding after the loan expiry period. The total actual project cost including these additional facilities but

excluding the incomplete facilities in Nueva Vizcaya was 963 million yen[17]. It largely exceeded (270%) the planned project cost for the number of constructed facilities (357 million yen, as explained above).

Table 7. Project cost

(Unit: million yen. Figures in the brackets: million pesos)

| | Plan (As of 1999. Estimated for the project completion in 2004) | | | | | | Actual (As of ex-post evaluation in April 2015. The facilities completed by IS and NV by their own funding are included. Incomplete facilities of NV are excluded.) (Note 1) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Foreign currency | | Local currency | | Total | | Foreign currency | | Local currency | | Total | |
| | Total | Loan portion | Total | Loan portion | Total | Loan portion | Total | Loan portion | Total | Loan portion | Total | Loan portion |
| Water supply and sanitation facilities | 0 | 0 | 1,246 | 452 | 1,246 | 452 | | | | | | |
| ***＊(cost calculated by the percentage of completed facilities among original target numbers)*** | ***0*** | ***0*** | ***213*** | ***77*** | ***213*** | ***77*** | 0 | 0 | 360 (134) | 116 (43) | 360 (134) | 116 (43) |
| Equipment | 0 | 0 | 19 | 19 | 19 | 19 | | | | | | |
| ***＊*** | ***0*** | ***0*** | ***3*** | ***3*** | ***3*** | ***3*** | 0 | 0 | 11 (4) | 11 (4) | 11 (4) | 11 (4) |
| Consulting Services | 93 | 93 | 253 | 253 | 346 | 346 | | | | | | |
| ***＊*** | ***16*** | ***16*** | ***43*** | ***43*** | ***59*** | ***59*** | 132 (49) | 132 (49) | 226 (84) | 226 (84) | 358 (133) | 358 (133) |
| NGO assistance | 0 | 0 | 86 | 86 | 86 | 86 | | | | | | |
| ***＊*** | ***0*** | ***0*** | ***15*** | ***15*** | ***15*** | ***15*** | 0 | 0 | 35 (13) | 35 (13) | 35 (13) | 35 (13) |
| Contingency | 0 | 0 | 127 | 48 | 127 | 48 | | | | | | |
| ***＊*** | ***0*** | ***0*** | ***22*** | ***8*** | ***22*** | ***8*** | - | - | - | - | - | - |
| Administration cost | 0 | 0 | 88 | 0 | 88 | 0 | | | | | | |
| ***＊*** | ***0*** | ***0*** | ***15*** | ***0*** | ***15*** | ***0*** | 0 | 0 | 151 (56) | 0 | 151 (56) | 0 |
| Land acquisition | 0 | 0 | 37 | 0 | 37 | 0 | | | | | | |
| ***＊*** | ***0*** | ***0*** | ***6*** | ***0*** | ***6*** | ***0*** | 0 | 0 | 0 | 0 | 0 | 0 |
| Tax | 0 | 0 | 139 | 0 | 139 | 0 | | | | | | |
| ***＊*** | ***0*** | ***0*** | ***24*** | ***0*** | ***24*** | ***0*** | 0 | 0 | 48 (18) | 0 | 48 (18) | 0 |
| Total | 93 | 93 | 1,995 | 858 | 2,088 | 951 | | | | | | |
| ***＊*** | ***16*** | ***16*** | ***341*** | ***147*** | ***357 (119)*** | ***163*** | 132 (49) | 132 (49) | 831 (309) | 387 (144) | 963 (358) | 519 (193) |

(Source: JICA documents)

At appraisal: Exchange rate: US$1=JPY121, Philippines Peso 1 = JPY3. Price escalation: 2% per year for foreign currency and 2% per year for local currency. Contingency: 5% per year. Cost calculation: January 1999.

Actual: Philippines peso 1 = JPY2.69 (average during the project period). The actual cost is based on pesos, and the equivalents in yen were calculated using this exchange rate.

[17] According to DILG, the actual cost for the construction of facilities as of January 2008 was 97 million pesos (approximately 261 million yen). Ilocos Sur constructed 33 water supply facilities and 10 school toilets by their own funding of 20 million pesos (approximately 54 million yen). Nueva Vizcaya constructed 4 school toilets also by their own funding of 17 million pesos (approximately 46 million yen). The total of above is 134 million pesos (approximately 360 million yen). Nueva Vizcaya has already budgeted 20 million pesos (54 million yen) for 12 incomplete water supply facilities.

The comparison between the plan and actual costs per item is as follows:

・The actual cost to construct water supply and sanitation facilities was 360 million yen. It largely exceeded (169%) the planned cost calculated based on the number of constructed facilities (213 million yen). The reasons for the increase were delay of the construction works as well as slight changes in facility design to make them women-friendly, to prolong the service life and to make maintenance works easier, which increased the unit costs[18].

・The actual cost for the procurement of equipment was 11 million yen. It was smaller than the original plan for the six provinces due to the reduction of procured equipment. The reduction of number of facilities did not affect it (as explained in the section "3.2.1.1 Civil Works and procurement of equipment"). Price escalation did not affect it as well because the equipment was procured in the early stage of the project. The above mentioned 11 million yen exceeded the planned cost for the equipment proportioned by the number of the constructed facilities (3 million yen out of 19 million yen in the original plan).

・The actual cost of consulting services was 358 million yen and exceeded the planned cost proportioned by the number of the constructed facilities (59 million yen). The reasons for the increase are likely that the large part of the cost of consulting services was fixed expenses, and that the total personnel cost (technical cost) increased along with the delay of the construction works.

・The actual cost of NGO assistance was 35 million yen and exceeded the planned cost proportioned by the number of the constructed facilities (15 million yen). The reasons for the increase are likely that the large part of this cost was fixed expenses, and that the total personnel cost (technical cost) increased due to the extension of the contracts with the NGOs along with the delay of the construction works.

・According to DILG, all acquired lands incurred no compensation. Therefore, cost of land acquisition was not included in the actual project cost.

[18] The unit construction costs at appraisal of the project (1999) were as follows: 0.156 million pesos for a deep well, 0.070 million pesos for a shallow well, 0.334 million pesos for a school toilet and 0.357 million pesos for a public toilet. The total of the unit costs for the constructed facilities is 69 million pesos (=208 million yen at the exchange rate at appraisal: 1 peso=3 yen). The figure in Table 7 (213 million yen) is slightly different from this (208 million yen) because 213 million yen was calculated based on the proportion of the number of constructed facilities among the original target number without taking the different types of facilities into account. The unit construction costs at the expiry of loan period (2008) were as follows: 0.401 million pesos for a deep well, 0.155 million pesos for a shallow well, 0.399 million pesos for a school toilet and 0.383 million pesos for a public toilet (source: JICA documents). The actual construction cost based on these unit costs is 141 million pesos (=380 million yen at the average exchange rate during the project period: 1 peso=2.69 yen). This 380 million yen is also slightly different from the figure in Table 7 (360 million yen) provided from DILG. This is because of the difference of unit costs and exchange rates depending on the timing of construction of each unit.

3.2.2.2 Project Period

The planned project period was 60 months from December 1999 (L/A) to November 2004 (completion of civil works)[19]. The actual project period is not fixed yet because Nueva Vizcaya has incomplete facilities as of the ex-post evaluation. If the ex-post evaluation (April 2015) is considered as the project completion for the descriptive purpose of the evaluation, the project period (185 months) largely exceeded the plan (308%)[20].

Table 8. Comparison of project period (plan and actual)

| | Plan | Actual |
|---|---|---|
| Preliminary activities (project briefing and orientation to the relevant organizations, execution of Memorandum of Agreement, Hiring of consultants) | August – November 1999 | October 1999 – April 2001 |
| Consulting services | January 2000 – November 2004 | January 2001 – March 2007 |
| LGU training | January – December 2000 | March 2001 – January 2007 |
| Feasibility study and Detailed Design | January – December 2000 | March 2001 – May 2005 |
| Submission of disbursement request JICA | March 2000 | September 2003 |
| Procurement of vehicles and water quality testing kits | May 2000 – June 2001 | October 2000 – August 2001 |
| Procurement of water supply and sanitation facilities | January – September 2000 | December 2001 – November 2006 |
| Selection and procurement of NGOs | April 2000 – December 2003 | January – July 2000<br>May – September 2006 |
| Community development activities | April 2001 – November 2004 | August 2001 – March 2007 |
| Construction of water supply and sanitation facilities | February 2001 – November 2004 | February 2003 – May 2007 |
| BWSA training | February 2001 – November 2004 | August 2001 – March 2007 |
| Monitoring and evaluation | July 2001 – December 2004 | March 2001 – September 2007 |
| Winding up period | (Not planned) | April – September 2007 |

(Source: JICA documents)

The main reasons for the extension of the project period were as follows[21]:

・The operation plan of the project was revised as some LGUs could not shoulder their share of the project cost and dropped out of the project. As a consequence, the main part of the project (procurement and construction of facilities) started in 2003, later than the original plan.

・JICA procurement guidelines had different rules from those of the LGUs of the Philippines regarding the procurement style and the bidding advertisement. The project provided assistance in procurement, but the procurement of construction equipment for the water supply and sanitation facilities was delayed because the staff of LGUs was

[19] The completion of this project was defined as "the completion of civil works and BWSA training."
[20] Occidental Mindoro and Oriental Mindoro had completed construction by the loan expiry period.
[21] JICA documents

not accustomed to procurement of JICA projects. Some members of the Bid and Award Committee, responsible for the procurement process, changed after the local elections in 2004, which led to the delay in the process.

・Each project target province was supposed to contract with one contractor for the construction of all facilities. However, the provinces needed to separate the contract to several batches because it was unrealistic to make only one contractor to cover all project sites as it took long period to choose the sites and LGUs had problems in securing funding. There were more workloads for the selection of the contractors than anticipated, and the selection process delayed.

・The LGUs nominated staff in charge of this project, but they were usually busy for other works and lacked expertise. It led to the delay of tendering administration.

・The contractors were small or medium local enterprises and often had shortage of funding or staff. It led to the delay of the construction works.

Two provinces could not complete the construction by the end of the loan expiry period for the following reasons:

・In Ilocos Sur, the original work period of the procurement batch 1 was ten months from February to December 2003. However, many constructed facilities had faults and needed doing-over, and the construction also delayed. The province ended the contract in April 2005. The remaining parts were advertised as batch 2, but it remained less than one year when the province contracted with a different enterprise. Even after this, the province was not able to prepare full budget for the construction of remaining facilities as planned.

・Nueva Vizcaya could not secure sufficient funding during the project period. The number of engineers was not sufficient and it was difficult for them to implement the project as planned.

### 3.2.3 Results of Calculations of Internal Rates of Return

At appraisal, neither Financial Internal Rate of Return (FIRR) nor Economic Internal Rate of Return (EIRR) was calculated for this project because it was difficult to grasp its economic effects quantitatively. It was also difficult at the ex-post evaluation to calculate Internal Rates of Return of this project because no data to calculate benefits were provided.

【Summary of Efficiency】

The actual project cost largely exceeded the plan (270%) calculated in proportion of the number of constructed facilities. The increase of the cost was due to price escalation

during the project period as well as the large portion of the fixed charges among items such as consulting services. The actual project period was 185 months if the ex-post evaluation (April 2015) was considered as the project completion and significantly exceeded the plan (308%). From the above, both the project cost and project period significantly exceeded the plan. Therefore, efficiency of the project is low.

3.3 Effectiveness[22] (Rating ②)

No operation or effect indicators were set at project appraisal to measure the achievement of project objectives: "to provide safe, adequate and easily accessible water supply and sanitation services and thereby to contribute to the improvement of living conditions."

3.3.1 Quantitative Effects (Operation and Effect Indicators)

3.3.1.1 Operation Indicators

No indicators were fixed at the project appraisal. In order to measure its effects in the ex-post evaluation, "functioning status of the facilities" and "number of beneficiaries" were examined comparing the original assumptions and the accrual data[23].

(1) Functioning status of the facilities

Table 9 below shows that about 70% of the water supply facilities and about 80% of the sanitation facilities constructed by this project were functioning as of the ex-post evaluation. The rest of them were not functioning and not utilized due to the problems in water quality (existence of iron, intrusion of seawater, smells), dried-up wells, or existence of other sources of water that made the repair of the project facilities unnecessary even if repair is feasible. Where the project facilities are not utilized, the community is most likely to have access to other sources of water because people cannot live without drinking water.

As explained in the section of Sustainability, the functioning status of facilities depends on whether the community needs them or not. Therefore it is not basically related to the financial or technical problems or whether BWSAs are active or not. Ilocos Sur has higher functioning rate of the water supply facilities than other provinces, which is probably because this province has more waterless remote areas

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

[23] Water supply programs usually use "population served" as one of the operation indicators. It can be grasped from the number of households (number of contracts) connected to the water supply systems. Since this project constructed common wells without physical connections to the houses and there are no contracts, the number of beneficiaries was obtained from the project target provinces.

with strong needs of the level I water supply facilities, and because many facilities are relatively new as they were constructed or repaired recently between 2012 and 2014.

Regarding the sanitation facilities, the public toilets such as those in the markets have high functioning rate and this confirms the needs of this type of facility. In schools, the demand for the classroom toilets has increased since around 2012 instead of the toilets in the schoolyard like those constructed by this project[24]. Many of the school toilets constructed by this project are not usually utilized and are open only for events even if they have no problem in terms of function. In some schools, only classes without classroom toilets use the toilets in the schoolyard.

Table 9. Number and percentage of functioning water supply and sanitation facilities (as of March 2015)

| | Water supply facilities | | Sanitation facilities | |
|---|---|---|---|---|
| | Number of constructed facilities | Functioning facilities | Number of constructed facilities | Functioning facilities |
| IS | 103 | 85 (Percentage of functioning facilities (same in below): 83%) | 21 (School 20, Public 1) | 21 (School 20, Public 1) (Percentage of functioning facilities (same in below): 100%) |
| NV | 9 | 3 (33%) | 4 (School 3, Public 1) | 4 (School 3, Public 1) (100%) |
| OCM | 174 | 118 (68%) | 42 (School 36, Public 6) | 31 (School 26, Public 5) (74%) |
| ORM | 66 | 40 (60%) | 5 (School 4, Public 1) | 2 (School 1, Public 1) (40%) |
| Total | 352 | 247 (70%) | 72 (School 62, Public 10) | 58 (School 50, Public 8) (81%. School 81%, Public 80%) |

(Source: JICA documents, response to the questionnaire, interviews)

(2) Number of beneficiaries

The above indicator (1) examined whether the facilities were functioning or not. The "number of beneficiaries" shows whether each functioning facility is utilized by sufficient number of people as anticipated, that is to say, whether the facilities are underutilized or not. At appraisal, the total estimated number of beneficiaries was 34,680 households for the water supply facilities, 10,640 persons for the school toilets and 4,000 persons for the public toilets. According to the target provinces, the total actual number of beneficiaries was 7,800 households for the water supply facilities, which is significantly below the plan. There were about 17,000 beneficiaries for the

[24] The classroom toilets are inside the classroom. They are handy for the younger pupils as they are accessible anytime needed. Some schools also have toilets in the corridors like in Japan.

school toilets and about 6,000 for the public toilets, both of which exceeded the plan.

Table 10. Number of beneficiaries

| | | Plan (1999) | | | Actual (2015) (constructed facilities only) | | |
|---|---|---|---|---|---|---|---|
| | | Water supply facilities | School toilets | Public toilets | Water supply facilities | School toilets | Public toilets |
| Number of facilities | | 2,312 | 133 | 35 | 352 (15% of the plan) | 62 (47% of the plan) | 10 (26% of the plan) |
| Number of functioning facilities | | | | | 247 (11% of the plan. 70% of the constructed facilities) | 50 (38% of the plan. 81% of the constructed facilities) | 8 (23% of the plan. 80% of the constructed facilities) |
| Number of beneficiaries | IS | No data of details | | | Approx. 2,000 households (HH) and pupils at school etc. | 4,390 persons | 300 persons |
| | NV | | | | 3429 persons (Approx. 400HH) | 1,477 persons | 100 persons |
| | OCM | | | | Approx. 4,000HH and pupils at school etc. | 12,099 persons | 5,757 persons |
| | ORM | | | | Approx. 1,400HH and pupils at school etc. | 3,045 persons | 100 persons |
| | **Total** | 34,680 HH | 10,640 persons | 4,000 persons | Approx.7,800HH and pupils at school etc. (22% of the plan) | Approx. 21,000 persons (197% of the plan) | Approx. 6,000 persons (per day) (150% of the plan) |
| **Number of estimate number of beneficiaries of the functioning facilities** ("number of beneficiaries above" x "percentage of functioning facilities among the planned or constructed facilities") | | Approx. 3,800HH (34,680 HH x 247 / 2,312 facilities) | Approx. 4,000 persons (10,640 persons x 50 / 133 facilities) | Approx. 900 persons (4,000 persons x 8 / 35 facilities) | Approx. 5,500HH and pupils at school etc. (7,800HH x 247 / 352 facilities) (145% of the figure in the left column) (=22HH per facility) | Approx. 17,000 persons (21,000 persons x 50 / 62 facilities) (425% of the figure in the left column) | Approx. 4,800 persons (6,000 persons x 8 /10 facilities) (533% of the figure in the left column) |

(Source: JICA documents, questionnaire response)
Number of beneficiaries was calculated at appraisal as follows:
Water supply facilities: 15 households per facility. School toilets: estimated based on the actual number of pupils and teachers of the target schools. Public toilets: estimated based on the number of clients and workers of the markets, etc.

Table 10 shows the estimate number of total beneficiaries proportioned by the number of functioning facilities. These figures (actual as of ex-post evaluation) for both water supply and sanitation facilities exceed the plan. For the water supply facilities, the plan was 3,800 households and the actual (estimate) was 5,500 households. For the sanitation facilities, the plan for the school toilets was 4,000 persons and the actual (estimate) was 17,000 persons, and the plan for the public toilets was 900 persons and the actual (estimate) was 4,800 persons. The increase of the beneficiaries of the water supply facilities for the number of functioning ones was

because the calculation at appraisal assumed that a facility would cater to 15 households, but many facilities actually are utilized by about 20 to 30 households each. There are also likely to be more pupils at schools and people in the markets than estimated at appraisal. From the above, while the total number of beneficiaries is much smaller than the estimate at appraisal, each facility has sufficient number of beneficiaries. Therefore, it can be concluded that this indicator has achieved the target.

3.3.1.2 Effect Indicators

No effect indicators were set at appraisal. The ex-post evaluation examined the proportion of population with access to water supply and sanitation facilities in the four project target provinces in order to know the status of service provision by this project.

In the rural areas of the target provinces, the proportion of population with access to water supply facilities is sufficiently high. It was 91% in Nueva Vizcaya and 100% in Oriental Mindoro according to the most recent data in 2013 and 2014 as shown in Table 1 in the section of Relevance. While there are no data about Occidental Mindoro, it is assumed that the situation is close to Oriental Mindoro and is likely to have almost achieved universal access. The proportion of population with access to water supply facilities of all levels in the rural areas of Ilocos Sur was 56% and lower than the total of the proportion of population with access to level I and level III facilities in 1999 (75%), the reason for which is not known. Table 2 shows that the proportion of population with access to sanitation facilities in the rural areas. It was 78% in Ilocos Sur and also lower than the data in 1999 (95%), the reason of which is also unknown. While there were no data about the proportion of population with access to sanitation facilities only in rural areas in other target provinces, it can be assumed that the situation would be similar to that in Ilocos Sur according to the observation during the field study of the ex-post evaluation, and therefore the coverage in other provinces would also be similar.

The data above do not sufficiently show that the access to the water supply and sanitation services have been improved in the project target provinces. However, as the project beneficiaries using the functioning facilities are 100% covered by the water supply and sanitation services, this objective at the project appraisal was achieved.

3.3.1.3 Other effects (qualitative effects, etc.)

The reported cases of water borne diseases were zero in Ilocos Sur, Occidental Mindoro and Oriental Mindoro according to their reports in 2013[25]. Nueva Vizcaya had

[25] Reliability of data is questioned since there are no previous data and the data for the three provinces (0 reported cases) are very different from those of Nueva Vizcaya. Therefore, these data are not analyzed for

552 cases in 2007 but only 396 in 2012. According to the province, Nueva Vizcaya is mountainous and water contamination in the upstream could cause water borne diseases in the downstream. Thanks to the water supply facilities, access to safe drinking water has improved to a certain extent.

From the above, access to water supply services in the rural areas has sufficiently improved in Nueva Vizcaya and Occidental Mindoro, but there were no data to show the improvement in Oriental Mindoro and Ilocos Sur. There were no data to show the improvement of access of sanitation services in rural areas in the four provinces. Therefore, the available data cannot sufficiently show the improvement of access to water supply and sanitation services. Still, each facility constructed by this project offers sufficient access to the water supply and sanitation services, which is proved by the number of beneficiaries.

## 3.4 Impacts

### 3.4.1 Intended Impacts

This project aimed at the "improvement of living conditions" as its impact. The ex-post evaluation conducted beneficiary surveys to examine it.

#### (1) Improvement of living conditions

Beneficiary surveys were conducted in Occidental Mindoro and Ilocos Sur[26]. The participants in the surveys are shown in Table 11.

Table 11. Details of Beneficiary survey respondents

Water supply facilities (unit: person)

| | | OCM | IS | Total |
|---|---|---|---|---|
| Sex | Male | 29 | 38 | 67 |
| | Female | 42 | 41 | 83 |
| | No answer | 9 | 1 | 10 |
| Whether using the facility or not | Using | 59 | 73 | 132 |
| | Not using | 13 | 7 | 20 |
| | No answer | 8 | 0 | 8 |
| BWSA | Member | 13 | 65 | 78 |
| | Non member | 22 | 2 | 24 |
| | No answer | 45 | 13 | 58 |

Sanitation facilities (unit: person)

| | | OCM | IS | Total |
|---|---|---|---|---|
| Sex | Male | 4 | 4 | 8 |
| | Female | 16 | 16 | 32 |
| | No answer | 0 | 0 | 0 |
| Whether using the facility or not | Using | 9 | 18 | 27 |
| | Not using | 11 | 2 | 13 |
| | No answer | 0 | 0 | 0 |
| Operation and maintenance | Involved | 9 | 6 | 15 |
| | Not involved | 11 | 4 | 15 |
| | No answer | 0 | 10 | 10 |

the ex-post evaluation.

[26] The respondents were 200 persons in total (100 from each). Each province had 80 respondents for water supply and 20 for sanitation, which made 160 for water supply and 40 for sanitation in total. The surveys were conducted in Calintaan and Magsaysay in Occidental Mindoro, as well as in Bantay, Banayoyo and Santa in Ilocos Sur. The municipalities were selected through the discussion with the provinces according to the criteria such as functioning status of the facilities, whether the BWSAs are active or not, and the access to the municipalities.

Regarding the water supply facilities, about 70% of the respondents in the two provinces are satisfied with the quantity and quality of water, convenience, and the status of operation and maintenance. In Ilocos Sur, about 80% are satisfied probably because its remote areas still have high demand for level I water supply facilities. In Occidental Mindoro, only about 50% are satisfied probably because people expect level II and level III facilities according to the province[27]. Figure 3 shows that the majority of the respondents think that there are some positive impacts from the water supply facilities such as the reduction of workload to fetch water and the improvement of hygiene status.

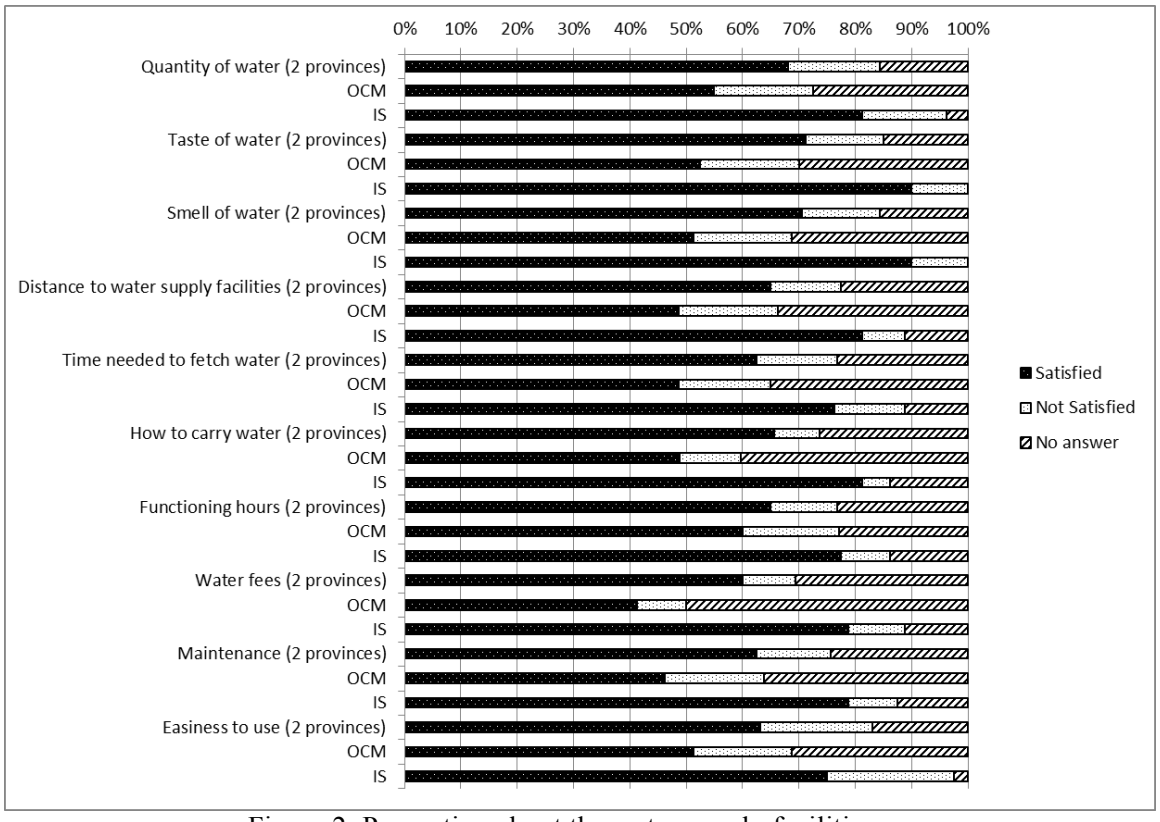



Figure 2. Perception about the water supply facilities
(percentage among the total (160) respondents)

[27] In Occidental Mindoro, 33 out of 80 respondents use other sources of water (individual connection (level III): 12 persons, other wells (level I or II): 7, other communal sources (level I or II): 8, others (buying water in bottles or containers): 6. In Ilocos Sur, 41 out of 80 respondents use other sources of water (individual connection (level III): 14, other wells (level I or II): 10, other communal sources (level I or II): 11, others buying water in bottles or containers): 6.

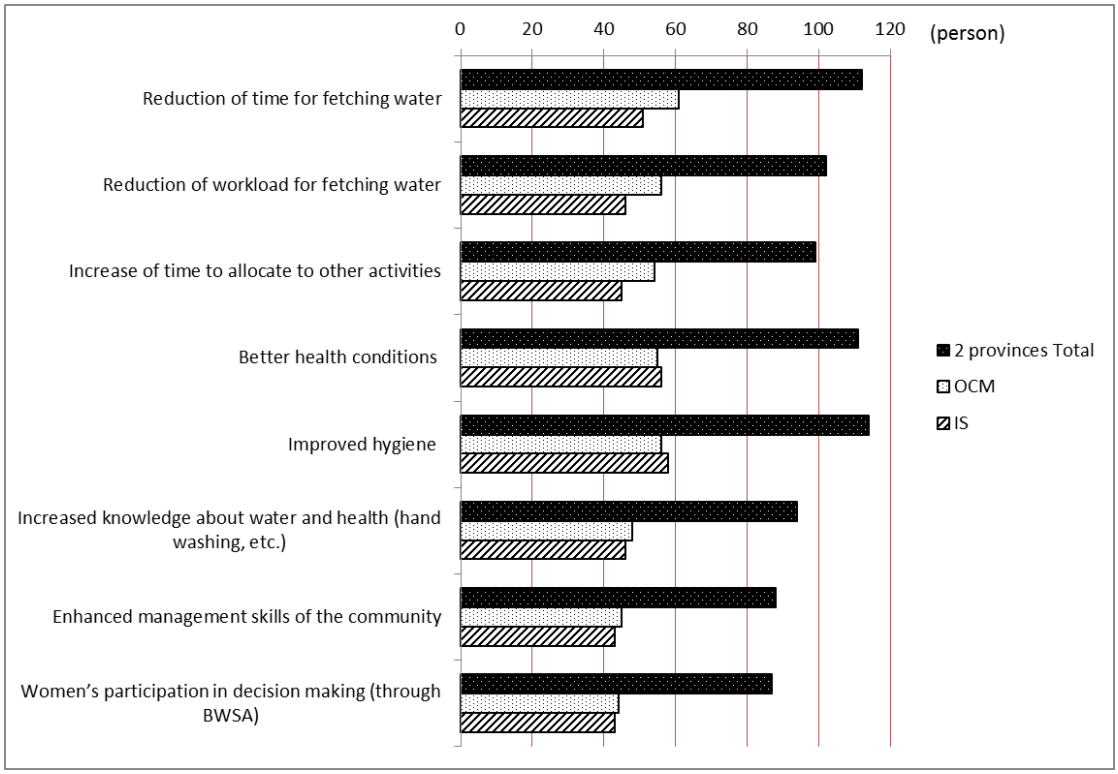



Figure 3. Impacts of the water supply facilities

Regarding the sanitation facilities, Figure 4 shows that about 60% of the respondents in the two provinces are satisfied with the convenience, cleanliness and status of operation and maintenance. While about 90% of the respondents are satisfied in Ilocos Sur, only about 40% are satisfied in Occidental Mindoro. According to the executing agency, this is because Occidental Mindoro has more convenient facilities than Ilocos Sur with many remote areas. Figure 5 shows that the majority of the respondents are positive about the improvement of hygiene status thanks to the sanitation facilities.

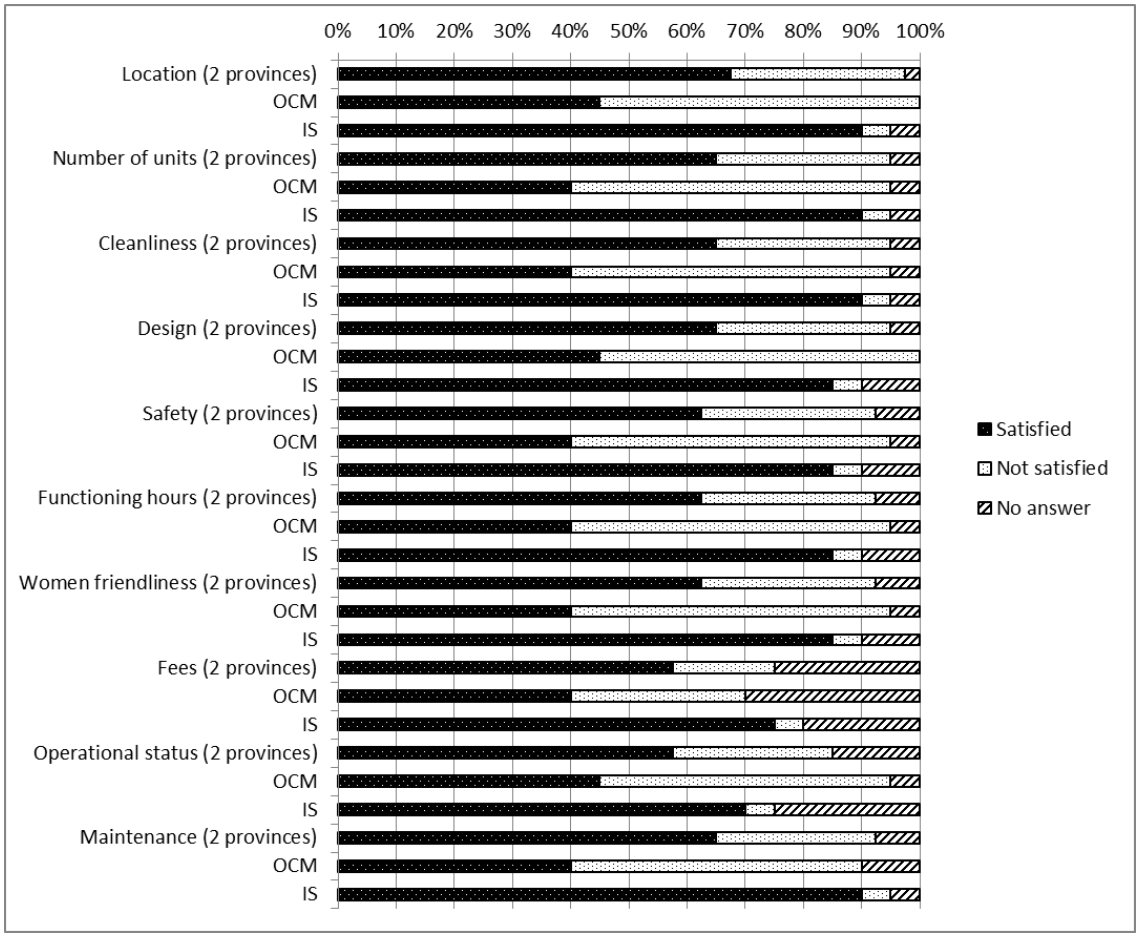



Figure 4. Perception about the sanitation facilities
(percentage among the total (40) respondents)

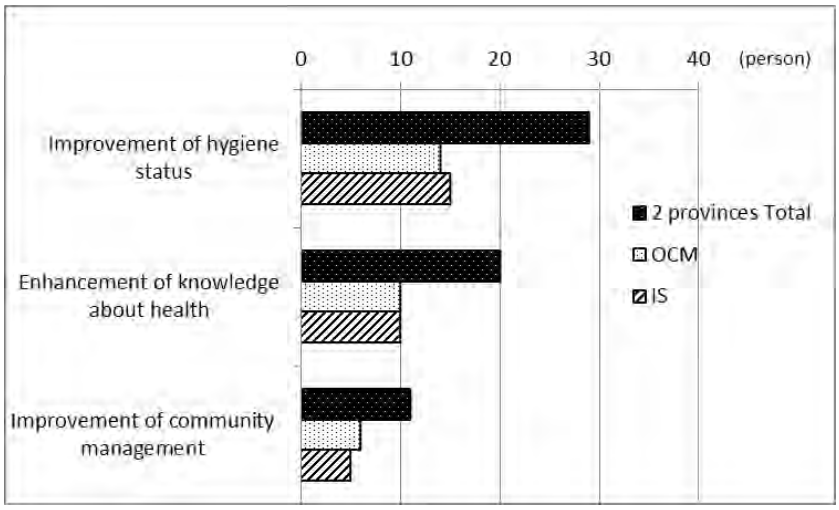



Figure 5. Impacts of the sanitation facilities

### 3.4.2 Other Impacts

(1) Impacts on the natural environment

According to the questionnaire responses and interviews of DILG and the project target provinces, Occidental Mindoro experienced reduction of groundwater in some sites and remedied the problem by moving the facilities to other places. No other specific negative impacts on natural environment were observed such as excessive use of groundwater or its contamination caused by the wastewater from the toilets. The toilets have less risks of environmental pollution than before because excrement are flushed with adequate amount of water. Some communities have set up rules not to cause environmental pollution such as prohibition of washing clothes or bodies around the water supply facilities.

(2) Land Acquisition and Resettlement

According to the questionnaire responses and interviews of DILG and the project target provinces, the lands were acquired without compensation and there was no resettlement[28]. No information was available about the total surface of the acquired lands.

(3) Other positive and negative impacts

Enhancement of management capacity of water supply and sanitation services

・Community: About a half of the respondents of the beneficiary surveys consider that the communities' capacity to manage water supply facilities was enhanced. Even where BWSA is not active, some users are involved in operation and maintenance of the facility to a certain extent as long as it is functioning. Less respondents consider that the communities' capacity to manage sanitation facilities was strengthened than water supply. It could be because the sanitation facilities in general are operated and maintained by the schools or LGUs, and the community is less involved.

・LGU: The capacity of municipalities and barangays in operation and maintenance of water supply and sanitation facilities were enhanced as long as the facilities are functioning. At the provincial level, the management capacity of Ilocos Sur, including monitoring, was enhanced as the remaining facilities were recently completed. It was not possible to confirm the enhancement of management capacity in other three provinces at the provincial level because they are not much involved in the operation and maintenance of the facilities.

Women's empowerment

Figure 3 shows that many respondents of the beneficiary surveys think that women

[28] Some residents offered a corner of their premises for the water supply facilities (wells). There were no needs to relocate people.

were empowered through this project. Many women are active as BWSA leaders and most users of the water supply facilities are women. This project promoted their participation from the formulation stage of BWSAs, and women are active BWSA members. At the same time, women in the Philippines have always been visible in the public sphere and the majority of staff in charge of water and sanitation programs in DILG and provinces, including engineers, are women. Women are active and visible in the project target areas as well as in the related agencies as they have always been in the Philippines, therefore it is not considered as an impact of this project.

【Summary of Effectiveness and Impact】

Each of the facilities constructed by this project has sufficient number of beneficiaries and improved the access to water supply and sanitation services as long as the facilities are functioning. Since the number of constructed facilities was much lower than the original plan, however, the total number of beneficiaries as of the ex-post evaluation was also much lower than the original estimate. Since the scale of the benefit has been limited, the effect of the project was moderate. There were impacts of this project such as the reduction of workload to fetch water, improvement of hygiene status, and enhancement of operation and management capacity of the communities and LGUs to a certain extent where the facilities are functioning.

From the above, the project has to some extent achieved its objectives. Therefore effectiveness and impact of the project are fair.

3.5 Sustainability (Rating: ②)

3.5.1 Institutional Aspects of Operation and Maintenance

(1) Central level

The Republic Act No. 6716 in March 1989 stipulated that the Department of Public Works and Highways (DPWH) was responsible for the construction of wells in barangays and that BWSAs were responsible for the operation and maintenance of the facilities. The Local Government Code in 1991, which promoted decentralization, transferred water supply and sanitation services to the LGUs, and assigned DILG the supervising role of these services replacing DPWH. DILG's Water Supply and Sanitation Project Management Office (WSS-PMO), which executed this project, is responsible for the supervision of water supply and sanitation services and LGUs' capacity development in management of these services.

(2) Provincial level

At the appraisal of this project, the Provincial Water Supply Units (PWSUs),

composed of the Provincial Planning Development Offices and other sections, were supposed to be responsible for the planning, monitoring and evaluation, and training of municipalities in water supply services.

At the ex-post evaluation, Ilocos Sur's structure centered on PWSU is close to the original plan at appraisal as shown in Table 12. PWSU of Ilocos Sur actively monitors the facilities and supervises BWSAs as they completed the construction of facilities relatively recently. Other three provinces basically have similar structure as shown in Table 13 about Nueva Vizcaya, but their PWSUs are not active and have no designated staff practically. However, once the facilities were constructed and as long as they are functioning, PWSUs do not have to provide financial and technical assistance in most cases because the facilities can be repaired by the municipalities, barangays or users by funding secured by them. Therefore, inactive PWSUs do not pose serious problems.

Table 12. Operation and maintenance structure of water supply and sanitation, Ilocos Sur

| | |
|---|---|
| Regional DILG (Water and Sanitation Section) | Supervision and monitoring of construction of facilities. Checking the conformity to the design standard. Checking the function, quality and number of facilities. |
| Provincial DILG (Water and Sanitation Section) | Same activities as the Regional DILG. Community organizing, capacity development, technical assistance, building partnerships, preparation of reports, and helping the provincial government. |
| Provincial Planning and Development Section | Management of water supply and sanitation services in the province. |
| Provincial Water Supply Unit (PWSU) | Implementation of water supply and sanitation services, provision of assistance to municipalities and barangays. Monitoring of facilities. |
| Municipal Planning and Development Section | Planning of water supply and sanitation services in the municipality. |
| Municipal Sector Liaison Office | Provision of assistance to barangays (BWSAs) in operation and maintenance of facilities. Monitoring of situations. Provision of assistance to the communities in the quarterly water testing in quality and quantity. |

(Source: Questionnaire response of Province)

Table 13. Operation and maintenance structure of water supply and sanitation, Nueva Vizcaya

| | |
|---|---|
| Provincial Planning and Development Section | Coordination of infrastructure programs in the province. No staff are in charge of operation and maintenance of water supply facilities. |
| PWSU | Supervision and management of programs. Technical assistance, training, monitoring and reporting.<br>It seldom provides technical training to the beneficiaries because the facilities are simple and can be maintained by the municipalities, barangays and users. No staff are in charge of the operation and maintenance of water supply facilities. |
| Municipal Planning and Development Section | Participation in the community organizing activities |
| Municipal Sector Liaison Office | Participation in the community organizing activities |
| Health office | Prevention of water-borne diseases. |

(Source: Questionnaire response of Province)
Note: This represents other three provinces except for Ilocos Sur.

(3) Municipality, barangay and facility levels

In the facility design and construction stage, the municipalities were supposed to establish the Municipal Sector Liaison Teams (MSLTs), main member of which was the Municipal Planning and Development Section. The MSLTs were to be responsible for the selection of project sites, community organizing and supervision of construction works. In the operation and maintenance stage, the parties responsible for the operation and maintenance of facilities were supposed to be BWSAs for the water supply facilities, the municipalities for the public toilets and schools with PTAs for the school toilets.

At the ex-post evaluation, some water supply facilities are operated and maintained by the BWSAs, and others are operated and maintained by either of municipalities, barangays or individual users where BWSAs are not active. If BWSAs are active, they collect user fees (many facilities are free of charge, however), manage the facilities and arrange repairs. If BWSAs are not active, user fees are not collected. If users notice any problems with the facilities, they ask for contributions from other users or request budget to the municipalities or barangays for repair. The school toilets are managed by the schools or PTAs. Most public toilets are managed by the municipalities. Table 14 shows the standard operation and management structure in the project target provinces.

Table 14. Operation and management structure of water supply and sanitation facilities

| | |
|---|---|
| Water supply | BWSA: There are eight to ten members. President, Vice-President, secretary, treasurer, fee collector and repairer, etc. are selected.<br>If BWSA is not active, facilities are operated and maintained by the municipality, barangay or users. |
| School toilets | School heads, principal teachers, representatives of PTAs and pupils.<br>Pupils do daily cleaning. Toilets are repaired by the school budget or contribution from the PTA. |
| Public toilets | Municipalities manage public toilets. Municipalities nominate the persons in charge of cleaning and operation and maintenance. The user fees are used for cleaning and minor repairs. Major repairs and utility (electricity and water) are usually paid from the budget of municipalities. |

(Source: Questionnaire responses from DILG and the provinces)

Other water supply service providers outside of the public structure are Water Districts, which provides level III water supply (individual connections) mainly in the urban areas. They contract with the municipalities and agree on the service areas and tariffs. Tariffs are usually based on the meter. There are also many water stands selling drinking water. Some municipalities and barangays provide level I or II water supply services by their own initiative.

From the above, the water supply and sanitation facilities constructed by this project, as long as they are functioning, have no serious problems at the ex-post evaluation in the

institutional aspects of operation and maintenance because the municipalities, barangays and individual users manage the facilities, repair them by sufficient funding and skills so that people can continue using them even if PWSUs or BWSAs are not active as assumed at appraisal.

3.5.2 Technical Aspects of Operation and Maintenance

(1) Provincial level

Under this project, the target provinces and municipalities were trained in several technical topics such as planning of water supply services, operation and maintenance, construction of water supply facilities, supervision and organizational development. However, some trained staff already left the positions due to personnel changes[29]。

As the operation and maintenance of the project facilities do not need high technical levels, however, the municipalities and barangays have no problem to manage them. Therefore, the low retention rate of the staff and the technical level of the provinces do not pose problems on the operation and maintenance of the facilities. Basically, BWSAs need to be appropriately managed to ensure the sustainability of the facilities[30], and the provinces are supposed to supervise them in account management and to ensure transparency[31]. The three provinces excluding Ilocos Sur have limited skills and experiences in this topic.

(2) Municipality, barangay and facility levels

Since many active BWSAs are in the remote areas, the ex-post evaluation mission could only meet the limited BWSA members during its field study. Some BWSAs in Ilocos Sur, which have always been active since the completion of construction in 2007, have collected user fees and keep records appropriately. Even if BWSAs are not active, the municipalities, barangays or users can repair the facilities. Therefore, there would be few cases that facilities are left without repair due to technical problems.

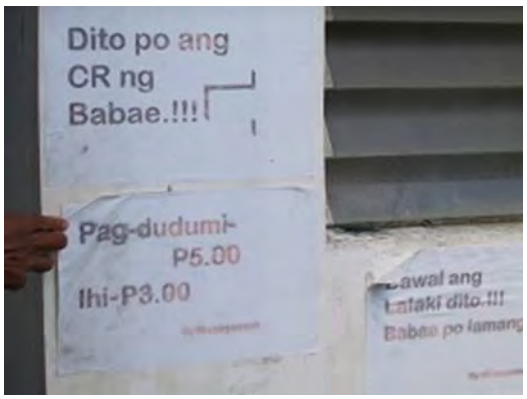
From the above, there are no serious problems in technical aspects of operation and maintenance of the functioning facilities. However, there are small challenges in the capacity of the provinces in assistance to BWSAs in its “soft” aspects.

[29] In Ilocos Sur, two out of 10 PWSU staff members were trained under this project and have work experiences for 14 years. They monitor constructed facilities and supervise BWSAs. It is different from other three provinces.

[30] During the field visit of the ex-post evaluation, there were no cases that the facilities were not repaired and therefore not functioning due to BWSAs’ problems in its organizational management. However, such negative cases might also exist.

[31] DILG developed these manuals for the staff in the provincial level to supervise BWSAs: “BWSA Community Organizing, O and M and the Upgrading of Water Supply Systems’ Manual”, “O & M Guide for Water and Sanitation Facilities”, and “Manual on simplified accounting systems and procedures for BWSA”

Public toilet in the market in Baco, Oriental Mindoro




User fees of public toilets in the market of Baco, Oriental Mindoro

### 3.5.3 Financial Aspects of Operation and Maintenance

The central government does not contribute funding to the operation and maintenance of the facilities. The financial and accounting arrangement of the operation and maintenance of facilities is complete at the provincial level and below. Therefore, the financial aspects of these levels were examined at the ex-post evaluation.

Except for Ilocos Sur, the provinces do not contribute funding to operation and maintenance of the facilities. Municipalities, barangays or individual users make financial contributions and repair the facilities when needed. The cost for operation and maintenance of facilities is funded as follows:

| | |
|---|---|
| Water supply facilities | BWSAs, if they are active, collect user fees (about 20 pesos per month per household) and use them for repairs. The user fees are small and not a burden for most users. At the same time, even if some users missed payment, it does not affect operation and maintenance because the fees are small.<br>If BWSAs are not active, facilities are usually free of charge. When the facilities need repair, the users request budget to the municipalities or barangays, or ask for contribution from the fellow users. |
| School toilets | Schools budget and PTAs contribute funding to repair and cleaning materials. |
| Public toilets | User fees are collected (3 to 5 pesos). The collected fees are used to purchase cleaning materials or to pay salary of the cleaners. Utility (electricity and water) and cost of major repairs are paid by the municipalities. |

LGUs staff consider that the current operation and maintenance budget is sufficient in general. Ilocos Sur, different from other three provinces, repaired 23 water supply facilities among 70 constructed by 2007 using the provincial budget of about 1.8 million pesos at the same timing as the construction of the remaining facilities between 2012 and 2014. Ilocos Sur confirmed the willingness of the communities to utilize the facilities before the repair.

Table 15 and 16 are examples of the financial records of water supply and sanitation facilities obtained during the ex-post evaluation. Table 15 shows that this water supply facility was repaired every three years using funding from the barangay, and that the balance of the account has a surplus. Table 16 shows that this public toilet was repaired every year and the repair cost was covered only by the user fees.

Table 15. Financial record of BWSA of water supply facility in Namalangan, Santa, Ilocos Sur

(The facility was constructed by 2007 and is functioning. The BWSA is active)

(Unit: peso)

| | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|
| Income | | | | |
| - from municipality | 0 | 0 | 0 | 0 |
| - user fees | 2,520 | 2,520 | 3,060 | 3,060 |
| - from barangay | 1,200 | 0 | 0 | 4,500 |
| Income Total | 3,720 | 2,520 | 3,060 | 7,560 |
| Expenditure | | | | |
| - repair | 350 | 0 | 0 | 1,200 |
| - spare parts | 900 | 0 | 0 | 3,700 |
| Expenditure Total | 1,250 | 0 | 0 | 4,900 |
| Balance | 2,470 | 2,520 | 3,060 | 2,660 |

(Source: Questionnaire response from the province)

(Note): The BWSA collected 15 pesos per month per household as of February 2015. Uncollected user fees were 180 pesos. They deposit collected fees to the bank account and keep record of every transaction. They do not employ staff.

Table 16. Financial record of a public toilet in Santo Domingo, Ilocos Sur

(Unit: peso)

| | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|
| Income | | | | |
| - from municipality | 0 | 0 | 0 | 0 |
| - user fees | 45,625 (125/day) | 73,000 (200/day) | 91,250 (250/day) | 91,250 (250/day) |
| Income Total | 45,625 | 73,000 | 91,250 | 91,250 |
| Expenditure | | | | |
| - repair | 1,200 | 2,500 | 4,600 | 5,200 |
| - spare parts | 2,850 | 3,050 | 10,700 (toilet bowl) | 13,621 (urinal) |
| - cleaning | 9,855 | 11,350 | 12,000 | 12,000 |
| - salary of cleaners | 27,375 (75/day) | 54,750 (150/day) | 62,050 (170/day) | 62,050 (170/day) |
| Expenditure Total | 41,280 | 71,650 | 89,350 | 92,871 |
| Balance | 4,345 | 1,350 | 1,900 | -1,621 |

(Source: questionnaire response from the province)

(Note): The user fees are two pesos for urinal and 5 pesos for closet. The cleaners collect user fees and keep them. The salary of the cleaners and expenses for the cleaning and repair are paid from the collected user fees.

Some examples of actual repair cost are that about 60 pesos for the replacement of gaskets of a hand pump and about 7,000 pesos for the replacement of parts of a hand pump. An example of contributions from the users is that about 20 households paid 300 pesos each for the replacement of parts of a hand pump, which made about 6,000 to 7,000 pesos in total. All project target provinces reported similar examples with the

same price ranges. As shown in the Footnote 32, some water supply facilities in the compound of barangay offices or in private premises were upgraded to level II by the contribution from the barangays or the users[32].

From the above, there were no serious problems in the financial aspects of operation and maintenance of the functioning facilities. However, since sufficient information were not available to examine the financial status of the target provinces other than Ilocos Sur, it is concluded that there are minor problems regarding the sustainability of the project effects.

### 3.5.4 Current Status of Operation and Maintenance

The operation and maintenance status of the functioning water supply facilities have no problems as they are utilized and repaired appropriately. Table 17 shows the current status of the water supply facilities of this project and BWSAs. The percentage of functioning facilities of the four provinces is 70%, and that of active BWSAs is 32%. Ilocos Sur has higher percentage for both and raised the average. The high functioning and active rate of Ilocos Sur is probably because they have more waterless areas, they recently completed the remaining facilities as of 2007, and the provincial structure responsible for operation and maintenance of water supply and sanitation facilities is more active than other provinces as explained in the section of institutional aspects. There are two types of hand pumps: one is Jetmatic type and another is more simple Malawi type[33], and most sites of this project use Jetmatic type. Ilocos Sur has installed Malawi type for the easy operation and maintenance, which is one of the reasons for their better functioning rate than other provinces.

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[32] ・The water contains iron and is not appropriate for drinking. One of the users who has the facility in his premise installed iron removal equipment, pipes and a tap at around 5,000 pesos by his own funding and upgraded it to level II. He allows the neighbors to use it for free of charge. He pays 500 pesos for occasional exchange of filters. The water is not good for drinking even with the iron removal equipment, and the water is used for other purposes. He fetches drinking water from a nearby level I facility.
・A barangay upgraded a water supply facility to level II in the compound of the barangay office by its funding of 37,000 pesos, installing an electric pump and pipes. Its annual operation and maintenance cost is about 20,000 pesos.

[33] Both are names commonly known in the Philippines. The Malawi type hand pump is called Afridev type in general.

Table 17. Functioning status of the water supply facilities and status of BWSAs (2013)

| | Water supply facilities | | BWSA | |
|---|---|---|---|---|
| | Total number | Functioning | Total number | Active |
| IS | 103 | 85 (83%) | 103 | 56 (54%) |
| NV | 9 | 3 (33%) | 9 | 2 (22%) |
| OCM | 174 | 118 (68%) | 67 | 11 (16%) |
| ORM | 66 | 40 (60%) | 66 | 10 (15%) |
| Total | 352 | 247 (70%) | 245 | 79 (32%) |

(Source: JICA documents)

The status of a facility and that of its BWSA do not necessarily correspond each other. Some facilities are functioning even if the BWSA is not active[34]. As explained above, functioning water supply facilities are repaired by the funding of the LGUs or the contributions from the users if BWSAs are not active. If the community needs the facility, it is technically and financially possible for them to repair it. Therefore, non-functioning facilities mean that the community does not need them. The ex-post evaluation examined only the current status of the functioning facilities for this reason.

Hand pump (Jetmatic type)

Hand pump (Malawi type)

Regarding the sanitation facilities, the public toilets are well and properly utilized. Many school toilets have no problem in function, but are usually closed and open only for the events. Similarly to the water supply facilities, non-functioning sanitation facilities mean that the community does not need them. Therefore, the ex-post evaluation examined only the current status of the functioning facilities.

Among the procured equipment of this project, the vehicle of Nueva Vizcaya is fully

[34] Occidental Mindoro, Oriental Mindoro and Ilocos Sur recently took measures to reactivate inactive BWSAs. Thirty-eight BWSAs were reactivated. BWSA Sustainability Plan was developed for LGUs.

utilized. That in Ilocos Sur was utilized until 2014, but out of order as of the ex-post evaluation. The vehicles in other two provinces are no longer used but are not decommissioned. The water quality testing kits are no longer used.

From the above, there are no serious problems in the current status of operation and maintenance of the functioning facilities.

【Summary of Sustainability】

Some minor problems have been observed in terms of functioning status of the facilities and financial aspects, but the functioning facilities have no problems in the institutional and technical aspects. Therefore the sustainability of the project effects is fair.

## 4. Conclusions, Recommendations and Lessons Learned

### 4.1 Conclusions

The objectives of this project were to provide safe, adequate and easily accessible water supply and sanitation services in the six provinces by construction of water supply and sanitation facilities, capacity development of LGUs in operation of water and sanitation services and by organizing and training communities in operation and maintenance of facilities, and thereby contributing to the improvement of living conditions.

The project has been highly relevant to the country's development plans and development needs, as well as Japan's ODA policy. However, the needs of the level I water supply facilities (common wells) were declined after the project started, and some municipalities with weak financial capability dropped out of the project because they could not secure funding for their share of the project cost even if they needed level I facilities. Some LGUs opted to use their own funds, not loan, to finance water supply projects to simplify the processes. As a consequence, the number of constructed facilities was far below the original plan. Also, the functioning rate of the facilities at the time of ex-post evaluation was only 70-80% despite that they included relatively new facilities constructed or repaired between 2012 and 2014 in Ilocos Sur. Some facilities are not functioning due to the problems of water quality or dried-up wells and due to other nearby facilities which reduced the needs of the facilities constructed by this project. Thus it could be concluded that the project had problems in its design and could not respond to the evolving needs during the project period. Therefore, the relevance is fair. Taking the reduction of outputs into account, both the project cost and project period significantly exceeded the plan. Therefore, the efficiency of the project is low. Regarding effectiveness, while the numbers of constructed and functioning facilities are far below the plan and the

scale of project benefit is limited, the functioning facilities have sufficient number of beneficiaries and access to water supply and sanitation services was improved. Also, there were impacts such as the reduction of workload to fetch water, improvement of hygiene status, and enhancement of LGUs' capacity in management of water supply and sanitation services. Therefore, this project has to some extent achieved its objectives and its effectiveness and impact are fair. The functioning facilities have no problem in institutional and technical aspects in terms of operation and maintenance. As there are minor problems such as the functioning status of the facilities and the financial aspects, the sustainability of this project effects is fair.

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

### 4.2 Recommendations

#### 4.2.1 Recommendations to the Executing Agencies

None.

#### 4.2.2 Recommendations to JICA

None.

### 4.3 Lessons learned

1. Necessity to modify the project design appropriately to respond to the change of needs during the project period

During 10 to 20 years since the planning of this project, the choices of the water supply facilities have been widened in the rural areas in the Philippines, including individual wells and level III facilities operated by the water districts. This project provided only level I facilities and did not consider other levels. Because it respected the cost sharing policy to require LGUs to shoulder 50% of the project cost, some municipalities which wanted level I facilities but could not secure funding dropped out of the project. As a consequence, the number of constructed facilities was far below the original plan, and the functioning rate of the facilities at the time of ex-post evaluation was not high.

In the similar project in the future, it would be desirable to be able to modify the project design flexibly to respond to the evolving needs during the project period, such as the change of the levels of water supply facilities and the reduction of share of the project cost shouldered by the target local administrative units. This project experienced withdrawal of some target provinces and candidate sites as a result of changing needs. It means that the project was partially cancelled or its scope was modified. If similar projects confirms that needs are no longer there during the project period, it would be advisable to cancel or scale down the project.

2. To coincide the timing of community training in operation and maintenance with the construction of facilities

The facilities were constructed much later than the community training to establish BWSAs, and some people had lost willingness to participate when the construction started. It is desirable to coincide the timing of community training with the construction of facilities.

Comparison of the Original and Actual Scope of the Project

| Item | Original | Actual |
|---|---|---|
| 1. Project Outputs<br><br>Construction of water supply and sanitation facilities | (6 provinces)<br>Water supply 2,312,<br>Sanitation 168,<br>Total 2,480<br><br>(4 provinces)<br>Water supply 1,619,<br>Sanitation 111,<br>Total 1,730 | (4 provinces)<br>Water supply 352,<br>Sanitation 72,<br>Total 424<br><br>The 12 remaining water supply facilities in Nueva Vizcaya will be constructed later. |
| NGO assistance | Assistance in community development and skills training<br>To confirm communities' interest and commitment to the project through discussion at the stage of site selection.<br>To conduct gender training and to develop strategies to make sure that both men and women benefit.<br>To organize BWSAs and groups to manage sanitation facilities such as school PTAs and market vender groups.<br>To conduct health and hygiene education. | As planned. |
| Consulting services | Detailed design, review of tender documents, assistance in evaluation of tender documents, supervision of construction, training of DILG, LGUs and NGOs, assistance in community development, environment-related work | As planned. |
| 2. Project Period | December 1999 – November 2004<br>(60 months) | December 1999 – April 2015 (ex-post evaluation)<br>(185 months) |
| 3. Project Cost<br>Amount paid in Foreign currency | 93 million yen | 132 million yen |
| Amount paid in Local currency | 1,995 million yen<br>(665 million Philippine pesos) | 831 million yen<br>(309 million Philippine pesos) |
| Total | 2,088 million yen | 963 million yen |
| Japanese ODA loan portion | 951 million yen | 519 million yen |
| Exchange rate | 1 Philippine peso = 3 yen<br>(As of January 1999) | 1 Philippine peso = 2.69 yen<br>(Average between December 1999 and April 2015) |