Indonesia

Ancol Drainage Improvement Project

Report Date: March 2001
Field Survey: September 2000

1. Project Profile and Japan's ODA Loan

Location Map of Project Area

Ancol Drainage Facilities

(1) Background

Jakarta has the largest population of any city in Indonesia and serves as the nation's capital, as well as its political and economic center. As of 1980 the overcrowding in the city was said to have reached the population density of 9,909 people per square kilometer. The city is situated on a plain facing Jakarta Bay on the northwest coast of Java Island. The area is a low-lying flatland (0.5~2.0m above sea level) formed into a fan shape from volcanic ash carried downstream. These geographic characteristics, along with increased outflows from the rising population, have made this region very susceptible to flooding. Jakarta is also located in the monsoon region. 60% of the average annual rainfall of about 2,000mm occurs during the four months of the rainy season from December to March. There are also short periods of heavy localized rains. During these times the drainage capacity of the rivers is often exceeded, resulting in flooding of the region.

Against the background the Indonesian government in 1973 drafted its ˋ Jakarta Drainage and Flood Control Basic Planˋ with the aim of reducing flood damage to the region surrounding the capital. Based on this plan various flood control projects have been undertaken. At the time of the appraisal for this project flood control projects[1] were underway, including West Jakarta Flood Control Project and East Jakarta Flood Control Project and gradual improvements were being made in preventing flood damage in Jakarta.

However, such flood control projects had yet to be started in the area targeted by this project. Coupled with an increase in both population and assets, the potential costs of flood damage have become much higher. Therefore, protecting this region from floods has become such an urgent and important issue.

[1] The West Jakarta Flood Control Project covers the northwest section of the city west of the Ciliwung River that cuts a north-south path through the city. The East Jakarta Flood Control Project covers the northeast section of the city east of this river.

(2) Objectives

The objective of this project was to reduce flood damage' by conducting flood control projects in the project area of northern Jakarta that frequently experiences flooding, and thereby stabilize the people's livelihood and encourage development of the region.

(3) Project Scope

The scope of this project is as explained below (see Fig. 1).

1) Construction of Flood Control Facilities

- Construction of Ancol Drainage Facilities
  Three drainage facilities each with a capacity of 5m^3/second
- Improvement of the west drainage channels in Sentiong-Sunter
  Improvements to roughly 4.4km of the channels (construct embankments, excavating, shore protection), construction of one floodgate, others

Figure 1 Location Map of the Improvement Facilities

2) Consulting Service

Assistance of bidding procedures, detailed design and construction supervision

(4) Borrower/Executing Agency

The Republic of Indonesia / Directorate General of Water Resources Development, Ministry of Housing and Infrastructure Development (former Directorate General of Water Resources Development, Ministry of Public Works)

(5) Outline of Loan Agreement

Loan Amount/Loan Disbursed Amount	¥3,128million / ¥2,379 million
Exchange of Notes/Loan Agreement	September 1991 / September 1991
Terms and Conditions	Interest rate: 2.6%, Repayment period: 30 years (10 years for grace period), General Untied (Partially untied for consulting services)
Final Disbursement Date	October 1998

2. Results and Evaluation

(1) Relevance

This project is deemed to be very urgent and necessary from the standpoint of protecting the increasing population, assets and societal base of the low flatland of capital city of Jakarta from flooding. This objective continues to be preserved as being relevant.

The part of the scope were added to this project. These included the construction of reservoirs and drainage facilities for the Sunter East III Drainage Improvement Project (Stage II), which was part of the ˋ East Jakarta Flood Control Projectˋ that also included this project. These additional projects were deemed to be relevant as they have a high priority in terms of improving flood drainage function for the northern frequently flood-striken zone of Jakarta, which includes the region covered by this project.

(2) Efficiency

The executing agency for this project was the Central Jakarta River Improvement / Drainage Project Office, which is under the Directorate General of Water Resources Development, Ministry of Housing and Infrastructure Development (former Directorate General of Water Resources Development, Ministry of Public Works). This agency had already conducted the ODA loan project ˋ West Jakarta Flood Control Projectˋ prior to this project and thus had the necessary experience and ability. There were no particular problems in terms of the system in place for implementing the project.

There were some delays in executing the project due to the additions of the reservoirs and drainage facilities. As a result, the construction was not finished by the planned date of March 1995, but was in fact pushed back by a little more than 3 years to July of 1998.

The final disbursed amount of ODA loan came to ¥2.4 billion, or only 75% of the planned ¥3.2 billion.

This was mainly due to changes in the exchange rate between the time of the appraisal in 1991 and the actual period for lending.

(3) Effectiveness

1) Quantitative Effects

In the evaluation of this project, an attempt to obtain quantitative data such as maximum floodwater outflows and maximum flood levels was made, but the executing agency has not prepared and maintained such information. Therefore, the effects of this project were studied from the aspect of beneficiaries based on a questionnaire survey of the project beneficiaries.

2) Questionnaire Survey of Beneficiaries

This survey, in cooperation with Directorate General of Urban Development, covered 100 households living in the region targeted by the project (N in the figure below refers to the number of respondents).

More than 90% of the respondents have lived in the target region for at least 10 years, and there were no people in the survey that had been living in the region since the completion of the project in 1998. In other words, all of the respondents have experienced the conditions before the project was completed. The survey covered the following three main areas.

(i) Flood damage conditions and awareness of the residents before and after completion of the project
(ii) Surrounding environment and awareness of the residents
(iii) Overall evaluation and additional requests

(i) and (iii) are the direct results and their evaluations by the implementation of the project, while (ii) is an assessment of indirect results. Here, (i) and (iii) are analyzed. (ii) will be described in the latter section (4) Environmental Impact.

<Flood Damage Conditions and Awareness of Residents>

Figure 2 shows experiences with flood damage before and after completion of the project. 90% of the respondents said that they had suffered some type of damage due to flooding before completion of the project, but this percentage fell sharply after the project was completed. However, even after completion of the project close to 40% said that they still experience some damage from flooding (see Fig. 2). When asked about the details of damage exclusively for those who have experienced the inundation, both before and after completion of the project, the inundated above the floor came to the top of the damages. However, after completion of the project the cases of ` houses damaged or destroyed` and ` family member killed or seriously injured` decreased (see Fig. 3).

Figure 2 Experience with Flood Damage Before and After Project Completion

Have you ever experienced inundation or other damage caused by floods? (choose one)

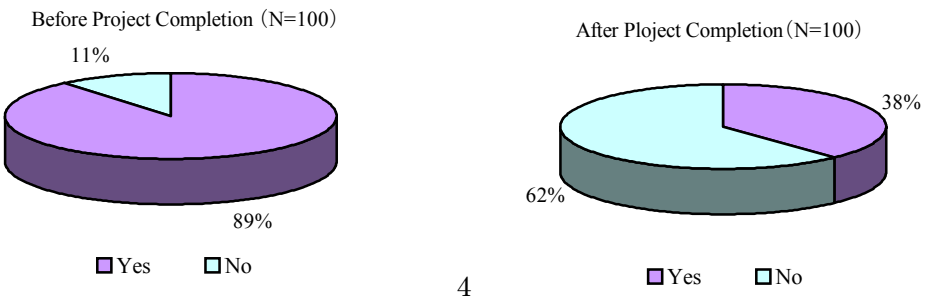
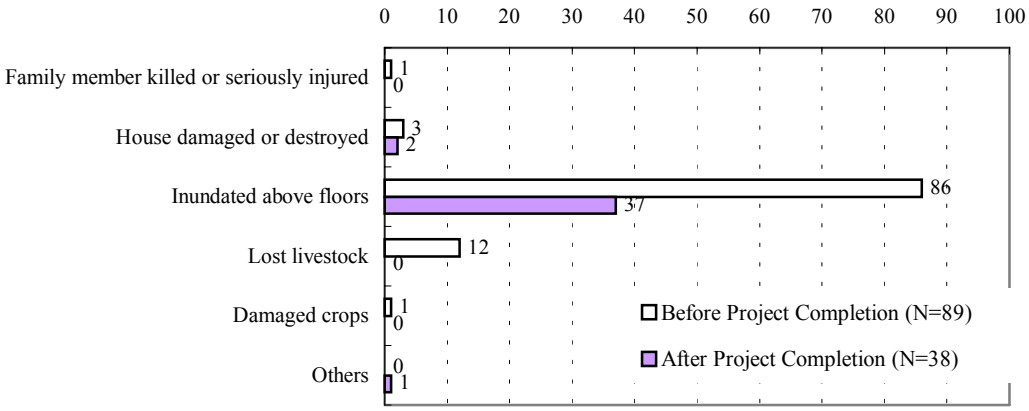


Figure 3 Details of Damage

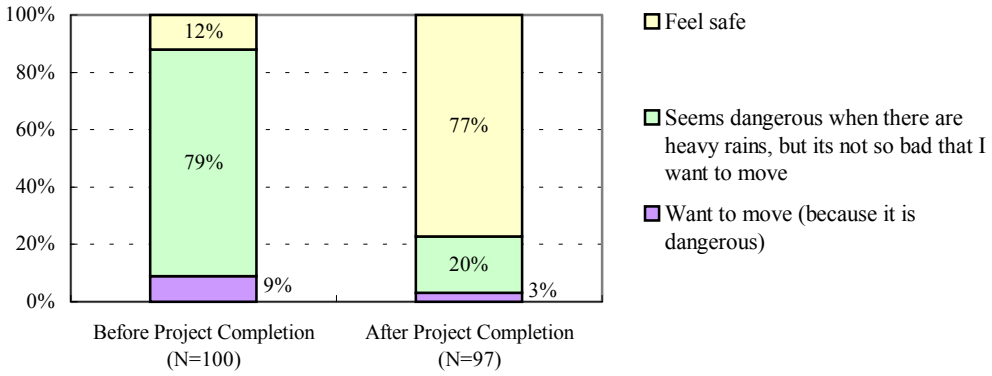
What types of damage caused by floods have you experienced? (multiple answers allowed)



The percentage of those who have the felt that flood-striken situation was ` dangerous` and they ` want to move to a different location` was around 90% before completion of the project, but was just over 20% after the project was finished (see Figure 4).

Figure 4 Awareness on Safety of Region Involving Flooding

How do you feel the safety of region involving flooding? (choose 1 of the following three options)

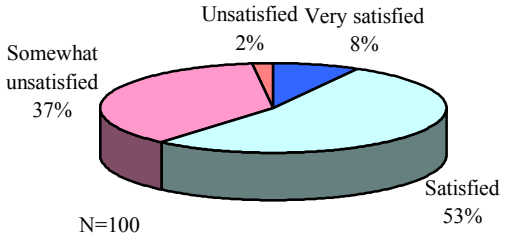


<Overall Assessment and Additional Requests>

More than 60% of the respondents said that they were ` very satisfied` or ` satisfied` with the project as it lessened the amount of damage from flooding and improved the level of safety in the region. A little less than 40% of the respondents said that they were ` somewhat unsatisfied` and ` unsatisfied` with the results of the project. Still, overall more people were satisfied with the project than unsatisfied (see Fig. 5).

Figure 5 Overall Assessment

What is your degree of satisfaction with the results of this project? (choose one)

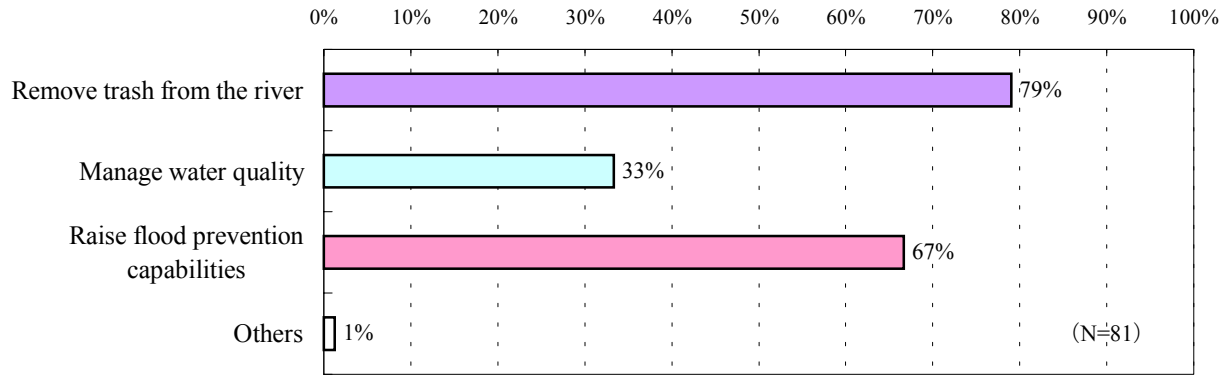


This result is believed to be due to the fact that around 40% of the residents still suffered from ` inundation above floors` even after completion of the project.

The final question asked the residents if they had any additional requests. The results are shown in Figure 6. 80% said ` trash removal` , 70% said ` further improve the flood prevention capabilities` and 30% said ` improve the management of water quality` . This indicated that there are other requests growing toward environmental concerns such as trash removal and water quality in addition to flood prevention capabilities.

Figure 6 Additional Requests for this Project

Which of the following would you like to see implemented? (multiple answers allowed)



3) Recalculation of Economic Internal Rate of Return (EIRR)

The recalculation of EIRR was impossible due to the inability to gain quantitative data.

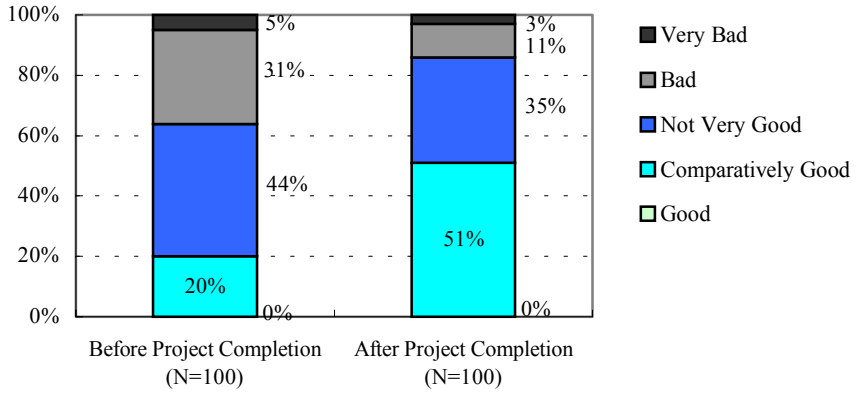
(4) Impact

1) Impact on Environment

The aforementioned questionnaire survey of beneficiaries also asked the respondents to grade the quality of the water in the river and drainage channels, using a 5-rank scale, so that changes to the water environment before and after completion of the project could be understood. None of the respondents described the water quality as ` good` , but those describing it as ` comparatively good` increased from 20% before completion of the project to 51% after completion. This suggests that the implementation of the project resulted in some improvement to the water quality. Still, half of the respondents described the water quality as ` not very good` (see Figure 7).

Figure 7 Assessment of the Water Quality

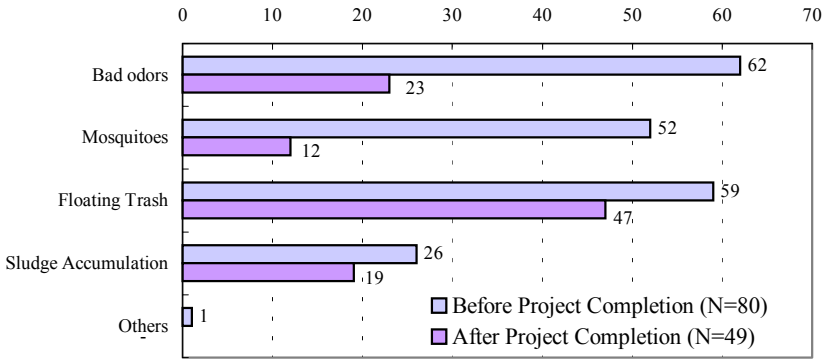
How would you assess the quality of the water in the river and drainage channels? (5-rank scale)



Those who did not respond ` comparatively good` in the above question were asked what aspect of the water quality they found to be unsatisfactory. The situation regarding bad odors, mosquitoes, trash and the accumulation of sludge improved following the completion of the project. However, the degree of improvement for trash and sludge was comparatively small. This is because there is the concern that the accumulation of trash and sludge in the river and drainage channels will lower their abilities to discharge floodwater.

Figure 8 Reasons for the Poor Assessment of Water Quality

Why did you judge the water quality to be not very good, bad or very bad? (multiple answers allowed)



2) Impact on Society

Repairs to the Sentiong-Sunter West Drainage Channels resulted in the relocation of residents living along the channel (110 households for an area of about 1.8ha). However, the executing agency reported that this did not bring about any notable social problems.

(5) Sustainability

1) Operation and Maintenance

As of August 2000 the operation and maintenance of the drainage equipment and floodgates were turned over to the Jakarta Special City Government Public Works Department, Maintenance Division (which has approximately 60 staff and 4 are assigned to the drainage equipment). However, the range of maintenance operations has been limited by the financial difficulties facing the municipal government, and in fact, it has been little more than removing trash and sludge from the drainage channels. When the drainage facilities and equipment need to be repaired or replaced, the municipal government submits a request to the central government's Directorate General of Urban City Development, Ministry of Housing and Infrastructure Development and then the Directorate General provides the necessary budget.

The responsibility of the operation and maintenance for this project has been formally transferred from the central government to the local government. However, due to the financial difficulties at the local level, the central government is basically to provide special financial assistance for these operations. Still, it is hard to say that an adequate budget is being provided.

2) Current State of the Facilities

A visit to the project area in Jakarta City and an inspection to the Ancol Drainage Facilities and the repaired Sentiong-Sunter West Drainage Channel were made in August 2000.

One of the three pumps at the drainage facility was broken, and the motor to the external trash catching screen was also unoperable, thus this equipment could not be used. However, officials with the local government said that repairs were underway and all equipment would be up and running.

In the Sentiong-Sunter West Drainage Channel, the floating trash and accumulated soil were conspicuous and odors were also awful. The local government is responsible for maintaining these facilities, but the cleaning activities have not been done satisfactorily due to the insufficient budget. Currently the cleaning activities are made on a voluntary basis by local residents once a year or so, but this is still insufficient. Trash floating and deposited at the bottom of the channels can hamper the drainage functions and therefore it is desired that they should be properly cleaned and removed

3) Sustainability

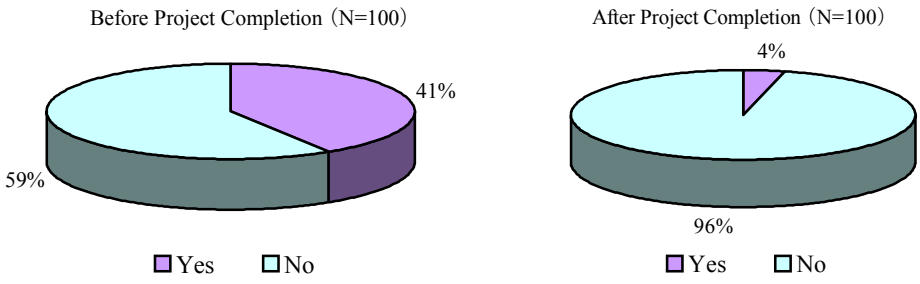
There are no quantitative indicators for measuring the effects brought about by this project, but the questionnaire survey results of beneficiaries made clear that the safety for the region greatly improved and overall satisfaction of the beneficiaries were comparatively high. When considering the sustainability of the effects of this project, one is the issue of how best to provide maintenance of the facilities despite the financial difficulties of the local government and another issue is the lifestyle of dumping daily trash in the drainage canals and flood ways by residents living upstream.

In view of the ongoing decentralization of power throughout Indonesia, there is a possibility that maintenance budget will be changed for the better when this administrative budget leads to more money being allotted to the local governments. Both the central and local governments must understand the importance of maintaining the existing facilities, and it is needless to say that a proper budget, with an eye on sustainability, must be provided.

The respondents to the questionnaire survey were asked about their behavior in regards to dumping of trash. Before the completion of the project 40 % of the respondents said that they threw trash into the river, but this fell to below 5% after the project was finished (see Fig. 9).

Figure 9 Throwing Trash into the River

Do you ever throw trash into the river or drainage channels? (select one)



After completion of the project the local residents were more aware of the fact that accumulated trash could retard drainage performance and thus said that they have stopped or will try to stop throwing trash into the river or drainage channels. These residents were also asked about what efforts have they made to help in the maintenance of these facilities. Most said that they volunteer to help with the trash removal. However, there is still trash coming from residents living further upstream. Therefore, getting the residents living in the target area for the project to stop dumping trash into the river will not become a final solution. Efforts will also be needed to change the behaviors of residents living in areas not directly affected by this project. The trash problem is both a living environment problem and an obstacle to flood prevention efforts. Therefore, it is necessary to address this issue and look for solutions from the aspect of the entire region, and not just the area targeted by this project.

Comparison of Original and Actual Scope

Item	Plan	Actual
①Project Scope		
1. Civil works		
(1) Package 1		
(i) Ancol Drainage Facilities	(Main Specifications) Area of drainage region: 560ha 25-year flood measures Designed drainage amount: 30m^3/s (natural drainage) Pump capacity 15m^3/s (5m^3/s x 3 pumps)	Same as left (This was increased to 635ha.)
(ii) Shortcut of Sentiong drainage channel	-	(261m)
(iii) Sentiong closing dyke	-	(65m)
(2) Package 2 Sentiong-Sunter West Drainage Channel	Target area: 1,750ha 25-year flood measures Designed drainage amount 10~30 m^3/s Length of drainage channels: 4,439m	Same as left
(3) Package 3 Sunter East III Drainage Improvement (Stage 2)	-	190ha Construction of regulating pondage Construction of drainage facilities
2. Consulting service		
(i) Period	4.5 years	4.8 years
(ii) Man/Day	364 M/M	511 M/M
②Implementation Schedule		
(1) Exchange of Notes	Aug. 1991	Sep. 1991
(2) Selection of consultant	Jun. 1991 ~ May 1992	Oct. 1991 ~ Jul 1992
(3) Land acquisition	Apr. 1992 ~ Mar. 1993	
(4) Selection of contractor		
・ Prior appraisal	Jun. 1992 ~ Nov. 1992	-
・ Bidding		
- Package 1	Jan. 1993 ~ Sep. 1994	Feb. 1994 ~ Sep. 1994
- Package 2	Jan. 1993 ~ Sep. 1994	Feb. 1994 ~ Aug. 1994
- Package 3	-	Aug. 1996 ~ Dec. 1996
・ Appraisal		
- Package 1	Jul. 1993 ~ Nov. 1994	Sep. 1994 ~ Oct. 1994
- Package 2	Jul. 1993 ~ Nov. 1994	Aug. 1994 ~ Sep. 1994
- Package 3	-	Dec. 1996
(5) Construction works		
・ Package 1	Oct. 1993 ~ May 1996	Nov. 1994 ~ Mar. 1998
・ Package 2	Apr. 1994 ~ Mar. 1995	Oct. 1994 ~ Sep. 1996
・ Package 3	-	Dec. 1996 ~ Jul. 1998
(6) Consulting service		
・ Ancol	Jun. 1992 ~ May 1996	Sep. 1992 ~ Jul. 1998
・ Eastern Jakarta	-	Nov. 1995 ~ Jul. 1998
③Project Cost		
Foreign currency	¥1,679 million	¥831 million
Local currency	¥2,002 million	N.A.
Total	¥3,681 million	N.A.
ODA loan portion	¥3,128 million	¥2,379 million
Exchange rate	1Rp.＝¥0.068 (Apr. 1991)	(Oct. 1998)