

Way Jepara Irrigation System Rehabilitation Project

Report Date: January 2001

Field Survey: June 2000

1. Project Profile and Japan's ODA Loan**(1) Background****(i) History of the original project**

Since the First Five-Year Plan (1969/70 ~ 1973/74), the Indonesian government has backed its policy of encouraging migration to Lampung Province by making the increase of agricultural production and expansion of irrigated area in the region one of its key programs. The subsequent second and third Five-Year Plans pursued development of the province to build it into a supply center to provide rice and other consumption commodities to Western Java and the Jakarta area.

The "Way Jepara Irrigation Project" (referred to below as "the original project") was completed in March 1980 to irrigate a planned area of 6,651ha with the aim of increasing rice and dry field crops in the region. However, problems such as poor construction and inadequate maintenance after completion caused collapses of some irrigation facilities and leakage in some trunk canals. As a result, the irrigated area had fallen from the planned 6,651ha to only 4,500ha by 1986.

(ii) History of this project

This situation led the Indonesian government to petition in May 1987 for a project to rehabilitate the original project, which covered 6,651ha of the Way Jepara area. The "Way Jepara Irrigation System Rehabilitation Project" (referred to below as "this project") was approved in July 1988 for the provision of an ODA loan of ¥1,082 million (referred to below as "this loan").

Since the time of the appraisal, a more precise estimate had been made of the necessary rehabilitation works than the calculation included in the detailed design. Examination of the detailed design (in October 1990) led to the conclusion that without rehabilitation of the main drainage canals downstream from the site of this project, it would be impossible to develop a 938ha area of wetland within the planned 6,651ha irrigation area. As the value of the loan precluded procurement of sufficient funds, the development of the low-lying wetland was excluded from the initial implementation (of this project, using this loan), and would be left for development using a subsequent loan.

In February 1991 the Indonesian government petitioned for provision of an ODA loan to build irrigation and drainage facilities for the 938ha of low-lying wetlands in Way Jepara as an element in its Way Curup Irrigation Project. That ODA loan was to be used to fund development in the region (this portion is referred to below as this project 'subsequent loan').

Table 1 Breakdown of Funding for the Way Jepara Irrigation System Rehabilitation Project

	This project (this loan)	This project (subsequent loan)	This project
Scope covered	5,713ha	938ha	6,651ha
Loan usage	Total value of the Way Jepara Irrigation System Rehabilitation Project	A portion of the Way Curup Irrigation Project	
Project completion	October 1993	December 1996	December 1996

(2) Objectives

This project was to implement the rehabilitation and additional works of irrigation facilities constructed in the area under the original project, in order to irrigate 6,651ha (comprising 5,713ha of hills and 938ha of low-lying wetland) of land and thereby increase rice production and raise farmers' incomes.

(3) Project Scope

(i) Construction

- a) Rehabilitation works: Trunk canals (18km), secondary canals (20km), terminal waterways (4,000ha), related structures (three water intakes, four siphons), access roads (48km).
- b) Construction works: Secondary canals (12km), related structures (livestock watering points).
- c) O&M equipment: Small motorcycles, trucks etc.

(ii) Consulting service

Detailed Design, construction supervision, O&M system improvement¹

(4) Borrower/Executing Agency

Republic of Indonesia / Former Ministry of Public Works (currently Ministry of Housing and Infrastructure Development)

(5) Outline of Loan Agreement

Loan Amount/Loan Disbursed Amount	¥1,082 million / ¥1,075 million
Exchange of Notes/Loan Agreement	December 1987 / July 1988
Terms and Conditions	Interest rate: 3.0%, Repayment period: 30 years (10 years for grace period), General Untied
Final Disbursement Date	September 1993

¹ Maintenance manual revision, and technology transfer to executing agency staff, farmers' associations, local consultants and others (including OJT).

2. Results and Evaluation

This section contains observations concerning the whole of the project (6,651ha).

(1) Relevance

After the declaration of rice self-sufficiency in Indonesia in 1985, the country's rice production volume grew steadily until 1990. From the start of the 1990s, however, the damage from intermittent droughts and other factors left the growth in rice production unstable. Also, over the seven years between 1990 and 1997, the volume of rice production only grew by an average of 1.3% per year, and area under rice cultivation by 0.8% per year. These rates meant that growth in rice production could not keep pace with population growth (annual average of 1.9% between 1990 and 1997).

Therefore the increase in rice production yielded by the expansion of irrigated area is even more important to the country than it was in 1988, when this project was planned. As such, this project plan, which aimed to increase rice production by expanding irrigated area, was relevant.

(2) Efficiency

The implementation scheme was not substantially different from that which was envisaged at the time of the appraisal. The executing agency and the project office supervised the implementation of the project appropriately, with the support of consultants. Among the civil work contracts, one of the contractors performed so badly that its contract had to be dissolved. After re-tendering, the contractor selected performed the construction with no problems. There were no notable problems with the performance of the consultants, and the evaluation field survey conducted in June 2000 reported that the training provided to improve the maintenance system was significant. Overall, the project was implemented without major problems, and the implementation schedule and project cost were largely as planned at the time of the appraisal (refer to the Comparison of Original and Actual Scope).

(3) Effectiveness

Analysis of the irrigated area, cultivated area, production volume, rice productivity and internal rates of return for the Way Jepara area confirmed the effectiveness of this project.

(i) Irrigated area

Examination of movements in irrigated area since the planning stage of the original project show a gradual but steady increase in irrigated area. At the time of the field survey, it had reached the planned value of 6,651ha, and the effectiveness of the project could be confirmed.

(ii) Cultivated area

The plan at the time of the appraisal was that the irrigated 6,651ha should be fully cultivated for rice in the rainy season, and in the dry season there should be a rice crop of 2,500ha, supplemented by maize, cassava, soybeans and other crops. At present a high proportion of the land is used to grow maize even in rainy season (approximately 30% in 1998/99). In the dry season (June), the field survey observed commercial crops such as coffee being grown in some places. Before the completion of the project (at the end of 1996), the cultivated area in the project area ranged between 4,000 and 5,000ha. In 1997, immediately after completion, there were special circumstances such as a drought, but since 1998 the total cultivated area,

including maize and rice, has reached the target.

(iii) Production volume

Relative to the cultivated area, the production volume before the completion of the project (at the end of 1996) fell short of the amount planned at the time of the appraisal, but production volume in 1998 was expected to increase substantially over previous years.

(iv) Rice productivity

According to the plan at the time of the appraisal, the harvest of rice per unit area was to reach 4.5 tons/ha in the rainy season and 3.0 tons/ha in the dry season. Productivity was high after the implementation of this project, which was achieved because the farmers received technical assistance from the executing agency which enhanced their skills, enabling them to prepare better for seedling transplantation and use agricultural chemicals and other techniques.

(v) Economic Internal Rate of Return (EIRR)

The EIRR for this project was recalculated using the same assumptions used at the time of the appraisal, yielding a result of 21.5%, a gain of 11% over the 10.5% anticipated at the time of the appraisal. The main reasons why the EIRR rose despite the increased cost of additional projects are as follows:

- (a) The unit yield improved after the implementation of the project by a larger margin than anticipated.
- (b) Although the volume of rice production did not increase, production of maize increased enormously. The price of maize is lower than that of rice, but its production costs are much lower, and therefore the increase in maize production led to growth in net profits.

(4) Impact

- (i) It was not possible to obtain data on the stable increase in farming incomes, but profits from the production of rice and maize, which are the main crops, are rising. Therefore this project appears to have contributed to an improvement in farmers' incomes in the Way Jepara area.
- (ii) The consulting services raised the abilities of engineers involved in maintenance work, in areas such as the use of appropriate equipment and materials.
- (iii) The project did not involve the relocation of any residents. Further, this project has not caused any apparent negative impacts in the fields of health, hygiene or education.
- (iv) The negative impacts on the natural environment which are commonly associated with irrigation projects, such as soil salination, have not been reported in notable levels, even after the implementation of this project.
- (v) No notable impact on systems or organizations has been reported.

(5) Sustainability

This evaluation field study was able to confirm, from the following points, that there is no notable problem with the maintenance of this project.

- [1] There is no problem with the maintenance scheme operated by the district public works department and the water users associations.
- [2] The maintenance manual updated by the consultant service employed for this project is being used appropriately.
- [3] The equipment procured for this project is largely in good operating condition.

However, some equipment had broken down or been stolen, and lack of budget prevents repair or replacement. The problem is not currently severe enough to have a major impact on the maintenance of the project, but if the effects of the project are to be maintained, a way will have to be found to secure a reliable supply of maintenance funding. Therefore the central and provincial governments should take steps to reinforce the budget of the executing agency.



Primary Channel Gate

Comparison of Original and Actual Scope

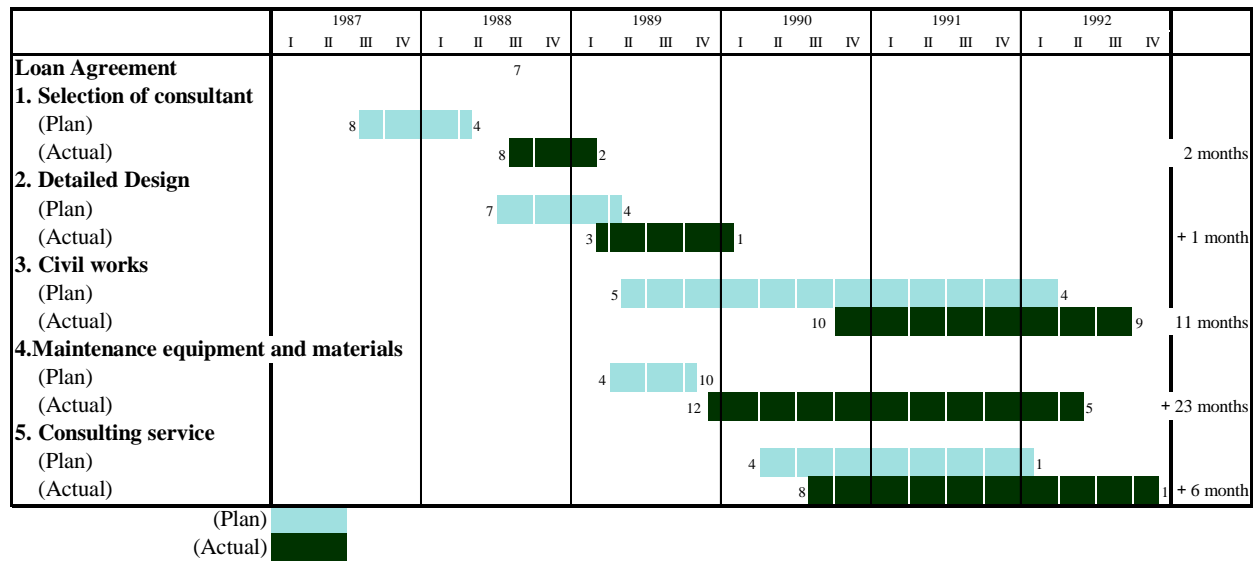
Project Scope

Item	Plan	Actual	Difference
Civil Works			
Rehabilitation works			
Irrigation canal	38 km	68.25 km	+30.25 km
Primary canal	18 km	26.30 km	+8.30 km
Secondary canal	20 km	41.95 km	+21.95 km
Structures			
Water intake	3	3	-
Trunk canal	30	76	+46
Secondary canal	35	85	+50
Maintenance road	48 km	76.4 km	+28.4 km
Terminal waterway	4,000 ha	4,000 ha	-
Additional works			
Secondary canal	12 km	15 km	+3 km
Secondary canal structures	44	42	2
Structures for measurement	113	75	38
Trunk canal	13	12	1
Secondary canal	100	63	37
Collecting canal, sodding	15 km	26 km	+11 km
Trunk canal	9 km	0 km	9 km
Secondary canal	6 km	26 km	+20 km
Livestock canal	25	7	18
Trunk canal	12	5	7
Secondary canal	13	2	11
Laundry steps	50	68	+18
Trunk canal	20	38	+18
Secondary canal	30	33	+3
Office (O&M)	4	4	-
Gate house	16	15	1
Maintenance equipment			
Weather station	1	1	-
Current meter	10	1	9
Average hydrograph recorder	5	1	4
Generator (20kva)	3	3	-
Portable concrete mixer	2	3	+1
Pick-up truck	2	1	1
Motorcycle	10	10	-
Consulting service			
Pro (A) (M/M)	50	60	+10
Pro (B) (M/M)	80	109	+29
Total (M/M)	130	169	+39

Source: Executing agency's materials.

Note There is some discrepancy in project scope between the actual construction and the plan at the time of the appraisal, but when the detailed design was produced in October 1990, the cost estimate for the rehabilitation works was calculated with more precision than it was at the appraisal stage. The construction was largely carried out in line with the detailed design and appears to have been relevant.

Implementation Schedule



Source: Prepared from executing agency's materials.

Project Cost

Foreign currency: ¥1million, Local currency: Rp. million

Item	Plan (at the time of appraisal)		Actual		Difference	
	Foreign currency	Local currency	Foreign currency	Local currency	Foreign currency	Local currency
Civil Works	498	2,507	562	3,811	+64	+1,304
Maintenance equipment and materials	-	115	-	124	-	+9
Consulting Service	210	230	196	479	14	+249
Land acquisition cost	-	84	-	127	-	+43
Management cost	-	750	-	311	-	439
Contingency ^(Note)	50	883	-	-	-	-
Total	758	4,039	758	4,852	0	+813

Source: Executing agency's materials

[Exchange rate] At the time of appraisal (July 1987): ¥ 1 = Rp. 11.3

Actual: ¥1 = Rp. 13.9 (Weighted average value rate of the time of disbursement)

Note: The contingencies were allocated to other items and used, thus actual values were included in each item and calculated.