

South Sumatra Swamp Improvement Project

Report Date : October, 2002

Field Survey : August, 2001

1 . Project Profile and Japan's ODA Loan



Location Map of the Project



Navigation Canal in Pulau Rimau District

1.1 Background

During REPLITA V (The 5th National Development Plan, 1989/90–1993/1994), the Government of Indonesia placed the highest priority on programs to rehabilitate and maintain the existing irrigation/drainage systems in the agricultural sector. This Project was implemented in an area of tidal swampy land in South Sumatra Province and consists of two swamp schemes -- Pulau Rimau and Air Sugihan Kiri -- covering a total area of 40,700 ha. These swamp areas were first developed from 1980 to 1982. The total number of households in the project area was around 13,200, with a total population of approximately 60,700, at the time of project appraisal.

These development schemes constructed an open drainage system, but there were virtually no structures to control the water and only a minimum of required social infrastructure. Until 1992, these projects were still in the initial stage of development; consequently, there were many constraints on the efforts of farmers to develop their agriculture. Crop productivity remained low¹⁾, and cropping intensity on the land had not reached the expected level²⁾. Possible causes included:

- (i) Deterioration of the drainage facilities and related structures of the existing schemes,
- (ii) Inadequate water control structures, and
- (iii) Lack of supporting services on credit, research work and farmers' institutions.

Given these circumstances, there was an urgent need to upgrade the existing swamp schemes and to intensify agricultural activities in order to raise the living standard of the inhabitants to a subsistence level.

¹⁾ Paddy : 1.5 to 1.6 t/ha

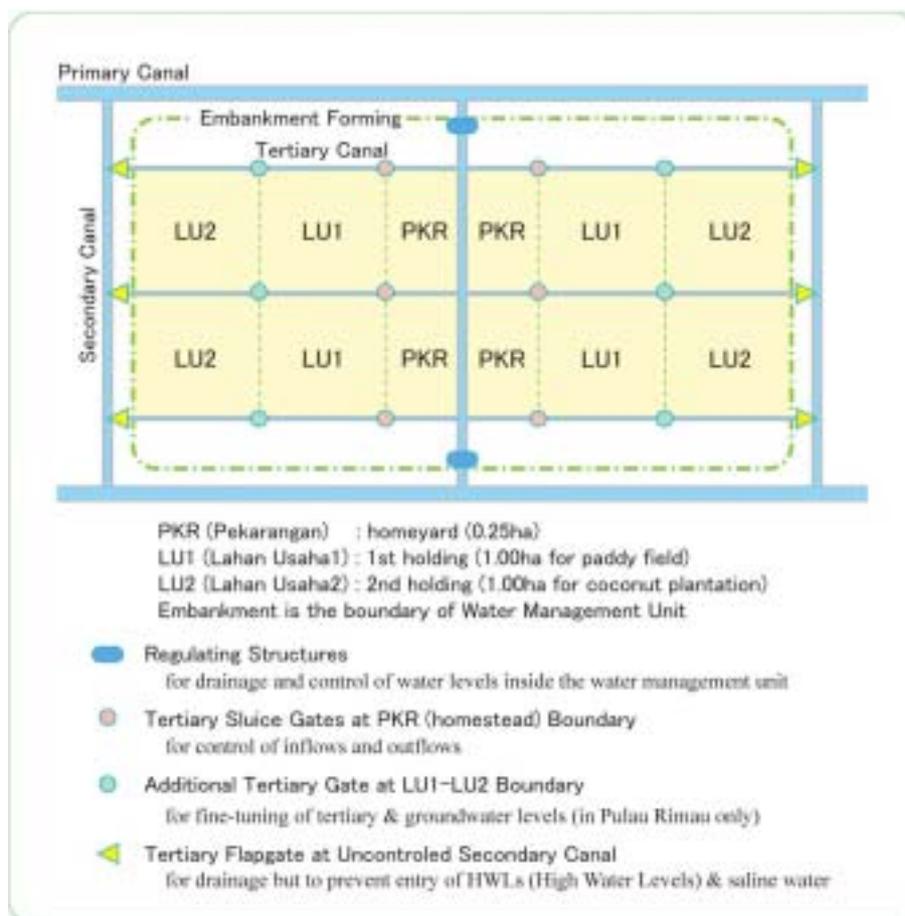
²⁾ Cropping intensity at the time of appraisal was 38% in Pulau Rimau and 91% in Air Sugihan Kiri.

1.2 Objectives

To raise the living standards of farmers in the existing swamp scheme areas by increasing farm income and contributing to self-sufficiency in food production through the rehabilitation and improvement of the existing infrastructures, including the drainage system in South Sumatra Province. Specifically, the Project aimed to:

- i) Improve the existing drainage facilities in order to increase the paddy yield on the first holding, LU1, and the coconut yield on the second holding, LU2 (see Figure 1),
- ii) Practice efficient on-farm water management and train farmers for the purpose of improving their farming practices, and
- iii) Improve basic social infrastructure such as farm roads and domestic water supply facilities.

Figure 1 : Water Management Scheme of the Project³⁾



³⁾ This figure schematically illustrates the water management concept of the Project. There are differences in layout between Pulau Rimau and Air Sugihan Kiri due to differences in original canal layouts and block sizes, but the concept remains the same. The project was planned to control tidal conditions to allow for efficient drainage. Essentially, the idea is to keep the canal water surface and ground water at optimum levels by allowing excess water in each unit to be discharged through a network of primary, secondary and tertiary canals during the falling tide, while controlling the rate of drainage and preventing ingress of water during the rising tide (unless required for irrigation) with the adequate placement and operation of water regulating gates.

1.3 Project Scope

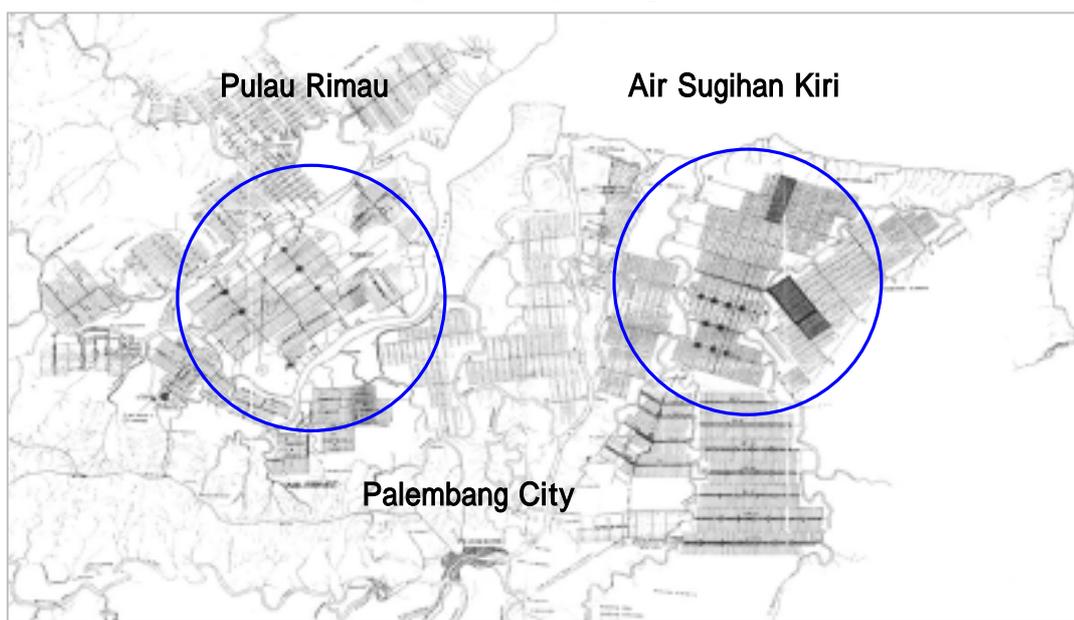
1.3.1 Total Project

South Sumatra Swamp Improvement Project (SSSIP) is one component of a larger plan aimed at improving infrastructure (SSSIP) and developing agriculture (SSSTCDP-South Sumatra Small holder Tree Crops Development Project). SSSIP was implemented by the Directorate General of Water Resources, Ministry of Settlement and Regional Infrastructure, and funded by Japanese ODA loan, while SSSTCDP was implemented by the Directorate General of Food Crops and Horticulture, Ministry of Agriculture, with the financial assistance of the IFAD (International Fund for Agricultural Development).

1.3.2 Project Scope of SSSIP

The SSSIP project area is located in the low-lying delta of the greater Musi River system in South Sumatra Province. It consists of the existing swamp development schemes of Pulau Rimau, located about 60km north-west of Palembang, and Air Sugihan Kiri, located 55km north-east of Palembang. The gross project area is 40,700 ha, of which 22,600 ha are in Pulau Rimau and 18,100 ha are in Air Sugihan.

Figure 2: Project Map



The SSSIP consists of the following components:

- (a) Review and study of existing swamp development schemes,
- (b) Detailed design of project infrastructures and facilities,
- (c) Implementation of rehabilitation and improvement of drainage system,
- (d) Implementation of rehabilitation and improvement of transportation facilities,
- (e) Implementation and improvement of domestic water supply facilities,
- (f) Provision of facilities and equipment for O&M, and
- (g) Consulting services for the above.

1.4 Borrower / Executing Agency

The Government of the Republic of Indonesia / Directorate General of Water Resources

Development (DGWRD), Ministry of Settlement and Regional Infrastructure

Project implementation unit at the site is Kanwil DOR (Regional Office of Directorate of Swamp) in Palembang.

1.5 Outline of Loan Agreement

Loan Amount	5,577 million yen
Loan Disbursed Amount	4,426 million yen
Exchange of Notes	September, 1992
Loan Agreement	October, 1992
Terms and Conditions	
-Interest Rate	2.6 % p.a.
-Repayment Period (Grace Period)	30 years (10 years)
-Procurement	General Untied
Final Disbursement Date	November, 1999

2 . Results and Evaluation

2.1 Relevance

Development of the Project areas had been planned in stages. The first stage consisted of developing main and secondary canals. This component was executed from 1980 to 1982, and involved approximately 13,200 families, most of which had migrated from Java Island. However, crop productivity remained low due to poor infrastructure. The second stage, funded by a Japan ODA loan, aimed to upgrade the completed facilities and enhance tertiary canals and on-farm irrigation facilities. The construction works commenced in 1994 and were completed in 1999.

Currently, the Project is in the third stage; improvements in the irrigation scheme and land use management are still needed to reach the original performance targets. These efforts remain consistent with the Central Government policy for continuously developing swamp areas with the objectives of 1) enhancing farmers living standards by increasing agricultural produce and 2) improving self-sufficiency in production of food crops.

2.2 Efficiency

2.2.1 Project Scope

During the construction stage, changes/modifications in the project scope were occasionally necessary, primarily to cope with actual site conditions and to maximize the water management scheme, drainage capacity and related factors, to the extent possible within the available budget. These changes and/or additional works required revisions of the construction needed for many of the work items.⁴⁾

2.2.2 Implementation Schedule

Project implementation, originally scheduled for completion by March 1998, was actually completed in July, 1999. This delay was to the result of design changes and of incorporating additional construction works from ICB contract packages I, V, VI and VII into the final stage of the original schedule.

2.2.3 Project Cost

Despite the additional works and scheduling delays in the implementation stage, the total Project cost stayed within the original estimate (4,466 million Yen expenditure against an original estimate of 6,562 million Yen), representing a cost under-run of around 32%. Total disbursement of Japan's ODA loan was 4,426 million yen, which was also below the original estimate of 5,577 million Yen.

As for the foreign and local currency portions, the former increased as a result of the additional works in the ICB Packages; the latter portion, conversely, was reduced to 70% of the original amount (see Table 1).

⁴⁾ There are a total of 12 contract packages for construction work, namely Packages I to XII, of which Package I, V, VI and VII are under International Competitive Bidding (ICB) procedures, and the remainder are administered under Local Competitive Bidding (LCB) procedures.

Table 1 : Comparison of Original and Actual Foreign/Local Currency

	Original	Actual
Foreign Currency	2,166 million yen	3,732 million yen
Local Currency	68,691 million Rp.	47,710 million Rp.

2.3 Effectiveness

2.3.1 Agricultural Performance

Project performance in terms of Cropping Area, Crop Yield and Production is summarized as follows:

1) Cropping Area

Table 2 shows figures representing the planned and actual performance of major crops in the respective cropping areas of Pulau Rimau and Air Sugihan Kiri.

Table 2 : Cropping Area (ha)

Pulau Rimau	Actual (1)					Planned (2)	Performance Ratio (3)
	1996/1997	1997/1998	1998/1999	1999/2000	2000/2001		
Paddy	2,720	3,108 (1.14)	4,912 (1.58)	5,860 (1.19)	6,160 (1.05)	8,192	75%
Palawija(maize)	2,242	2,352 (1.05)	3,458 (1.47)	3,720 (1.08)	4,608 (1.24)	1,638	281%
Cassava	2,325	2,578 (1.11)	2,570 (1.00)	2,850 (1.11)	2,900 (1.02)	-	-
Coconut	240	n.a. (-)	n.a. (-)	1,000 (-)	1,377 (1.38)	8,192	17%
Total (4)	7,527	8,038 (1.07)	10,940 (1.36)	13,430 (1.23)	15,045 (1.12)	18,022	83%

Air Sugihan Kiri	Actual (1)					Planned (2)	Performance Ratio (3)
	1996/1997	1997/1998	1998/1999	1999/2000	2000/2001		
Paddy	2,408	2,889 (1.20)	3,467 (1.20)	4,296 (1.24)	3,793 (0.88)	5,088	75%
Palawija(maize)	3,416	3,905 (1.14)	3,185 (0.82)	4,663 (1.46)	4,104 (0.88)	1,018	403%
Cassava	2,496	1,827 (0.73)	2,206 (1.21)	2,540 (1.15)	2,928 (1.15)	-	-
Coconut	560	n.a. (-)	n.a. (-)	n.a. (-)	3,496 (-)	5,088	69%
Total (4)	8,880	8,621 (0.97)	8,858 (1.03)	11,499 (1.30)	14,321 (1.25)	11,194	128%

Remarks

- 1: Data acquired from the P2DR, SumSel (South Sumatra Province, Swamp Area Development Project).
- 2: Planned target for the second year after completion.
- 3: (Actual in 2000/2001)/Planned x 100
- 4: Calculations for 1997/1998 and 1998/1999 in Pulau Rimau, and from 1997/1998 to 1999/2000 in Air Sugihan Kiri, do not include coconut area.

In Pulau Rimau, the construction works covered by Packages VIII, IX and X were completed in 1997/1998 and those in Packages V, VI and VII were completed in 1998/1999. The actual data by crop seem to show an increasing trend matching the completion schedule of the works. The latest overall performance rate is 83%; for paddies it is 75% and for coconuts, 17%.

In Air Sugihan Kiri, the construction works covered in Packages II, III and IV were

completed in 1996/1997 and those in Packages I, V, VI and VII were completed in 1998/1999. The latest overall performance rate is 128%, exceeding the planned target. For paddies it is 75% and for coconuts, 69%.

In both areas, the Performance Ratio for paddy is 75%, still less than the planned target level, because of inappropriate facility operation and maintenance⁵⁾. On the other hand, the cropping area of maize, or palawija (the local name), is notably larger than the planned target. Possible reasons for the low performance level in coconut planting are as follows: 1) insufficient coordination between SSSIP and SSSTCDP regarding planting coconuts in the initial stage of the Project and 2) substantial damage by wild pigs, fires and flood.

2) Coordination with SSSTCDP

The Project was planned to be followed by SSSTCDP, under which coconut planting was to be implemented in the same project area. Both projects commenced in the first quarter of 1993. SSSTCDP required less lead time than SSSIP, for which preliminary survey investigations and designs had to be carried out before construction could begin. As a result, coconuts were planted in areas where the required drainage facilities had not yet been installed. Efforts to synchronize schedules had been made, but they were not successful.

On the SSSIP or DGWRD side, accelerating the construction schedule proved to be difficult, because of the need to follow standard pre-qualification, tendering and formal government-to-government procedures. On the SSSTCDP or DGFCH side, annual planting target had been set before the start of the Project, and if they were not accomplished, the project would not be assessed as of a good-performance, so that many coconuts were planted even in the poor areas in drain ability prior to completion of the SSSIP, before the termination of SSSTSDP in early 1999. In the event, however, the coconuts planting plan was not worked out. Hence it can be pointed out that a lack of coordination between SSSIP and SSSTSDP during the project implementation might have affected the current coconut planting project.

⁵⁾ See 2.5.2 Technical Capacity for more detail.

3) Average Yield and Production

The latest figures for average annual paddy yield⁶⁾ are 3.2 t/ha in Pulau Rimau and 2.6 t/ha in Air Sugihan Kiri. The respective performance rates are 98% and 79%, as seen in Table 3 below.

Table 3 : Average Yield (ton/ha)

Pulau Rimau	Actual (1)					Planned (2)	Performance Ratio (3)
	1996/1997	1997/1998	1998/1999	1999/2000	2000/2001		
Paddy	2.2	2.5 (1.15)	2.5 (1.00)	3.1 (1.25)	3.2 (1.04)	3.3	98%
Palawija(maize)	2.4	2.9 (1.21)	3.4 (1.17)	4.3 (1.27)	4.0 (0.93)	n.a	n.a
Cassava	10.4	10.1 (0.97)	14.0 (1.39)	12.5 (0.89)	14.4 (1.15)	n.a	n.a
Coconut	n.a	n.a	n.a	n.a	n.a	n.a	n.a

Air Sugihan Kiri	Actual (1)					Planned (2)	Performance Ratio (3)
	1996/1997	1997/1998	1998/1999	1999/2000	2000/2001		
Paddy	1.6	2.0 (1.25)	1.6 (0.80)	2.9 (1.80)	2.6 (0.89)	3.3	79%
Palawija(maize)	2.1	2.1 (1.01)	2.6 (1.23)	3.2 (1.23)	2.7 (0.83)	n.a	n.a
Cassava	10.1	11.2 (1.10)	14.2 (1.28)	12.4 (0.87)	10.8 (0.87)	n.a	n.a
Coconut	n.a	n.a	n.a	n.a	n.a	n.a	n.a

Remarks

1: Data acquired from the P2DR.

2: Planned target for the second year after completion.

3: (Actual in 2000/2001)/Planned x 100

No data available for coconuts.

Table 4 shows annual production estimates by multiplying the actual cropping area, given in Table 2, and the average yields from Table 3. Compared with the figures in the original plan, actual annual paddy production performance in 2000/2001 is 74% in Pulau Rimau and 59% in Air Sugihan Kiri.

Table 4 : Production Estimate (ton)

Pulau Rimau	Actual					Planned	Performance Ratio
	1996/1997	1997/1998	1998/1999	1999/2000	2000/2001		
Paddy	5,920	7,771 (1.31)	12,281 (1.58)	18,265 (1.49)	19,880 (1.09)	27,034	74%
Palawija(maize)	5,360	6,811 (1.27)	11,753 (1.73)	16,020 (1.36)	18,432 (1.15)	n.a	n.a
Cassava	24,233	25,970 (1.07)	36,083 (1.39)	35,670 (0.99)	41,660 (1.17)	n.a	n.a
Coconut	n.a	n.a	n.a	n.a	n.a	n.a	n.a

Air Sugihan Kiri	Actual					Planned	Performance Ratio
	1996/1997	1997/1998	1998/1999	1999/2000	2000/2001		
Paddy	3,902	5,874 (1.51)	5,634 (0.96)	12,591 (2.23)	9,918 (0.79)	16,790	59%
Palawija(maize)	7,222	8,338 (1.15)	8,374 (1.00)	15,099 (1.80)	11,019 (0.73)	n.a	n.a
Cassava	25,239	20,374 (0.81)	31,374 (1.54)	31,596 (1.01)	31,659 (1.00)	n.a	n.a
Coconut	n.a	n.a	n.a	n.a	n.a	n.a	n.a

Regarding the agricultural performance of the Project, there is still room for improvement in coconut planting, especially in Pulau Rimau, and in paddy cultivation in both areas.

⁶⁾ In the SAPS Study (2001), it was estimated as 2.2 t/ha in Pulau Rimau and 2.7 t/ha in Air Sugihan Kiri .

2.3.2 Recalculation of EIRR

The EIRR of the current Project was re-calculated using the same methodology as at the time of appraisal. In setting assumptions, the actual costs were applied by combining the Project's annual disbursement and the planned disbursement of the IFAD portion, and the farmers' income increase (defined as benefit) resulting from the Interview Survey of the beneficiaries.⁷ The EIRR for 30 years' operation was re-evaluated at 7.4%, less than the original projection of 13.7%. This difference occurs because the planned benefit has not yet been realized. Farmer incomes have increased substantially, but the degree of increase is still smaller than planned.

2.4 Impacts

2.4.1 Environmental Impacts

Environmental aspects of the Project were discussed in the appraisal stage, and the in-depth environmental study during the implementation identified potential positive/negative impacts of the Project. Potentially significant negative impacts were predicted, as follows:

- a) Construction and rehabilitation works might cause serious pyrite oxidation / soil toxicity causing plants to die. Careful dredging/excavation works are necessary to avoid serious complications.
- b) Construction and rehabilitation works of water management structures might destabilize the water table, which may then lead to drought in the Project area. Optimal water gate operation and appropriate activities of water user/farmer groups are required to avoid problems.

According to the aforementioned environmental study report in 1996, further environmental monitoring and assessment were to be carried out in order to investigate compliance with previous recommendations and to identify any further impacts. It is expected that the report will be prepared and submitted to the Project administrators in the near future.

Meanwhile, after completion of the Project, the high salinity of irrigation water and low permeability of soil caused salt accumulation in the soil because of seawater intrusion, according to the Project Manager. Though this situation does not necessarily mean that the project activities caused the salinization directly, appropriate monitoring and measures, such as improving soil permeability and planting saline-tolerant plants in order to limit soil salinization, should be taken.

⁷⁾ A questionnaire-based Interview Survey of the Beneficiaries was implemented in order to examine the project effects/impact. One hundred (100) interviewees were selected from a water management unit both in Pulau Rimau and Air Sugihan, with the cooperation of the P2DR (the Project Office). In Pulau Rimau, 6 water management units were chosen to collect 15 to 25 samples in each unit, while in Air Sugihan Kiri, 4 water management units were chosen and 25 samples were collected in each unit. The questionnaire covered: 1) accessibility and utilization of facilities, 2) farmers' participation in O&M activity, 3) women's participation, 4) impact of the project, 5) overall assessment of the project, and 6) additional requirements and recommendations. The data in Figure 2 are averages per household, based on responses to the questionnaire.

2.4.2 Impacts on Economy (1): Increase of Farmer Incomes

It was expected that the project would increase farmer incomes. Figure 2 illustrates “Farmers’ Average Income/Expense Status” before and after the Project, based on the Interview Survey.

In both geographic areas, total income increased by around 115%⁸⁾ overall, with agricultural income becoming the major income source. Consequently, savings increased by 162 % in Pulau Rimau and 166 % in Air Sugihan Kiri.

Figure 2 : Farmer’s Average Income/Expense Status



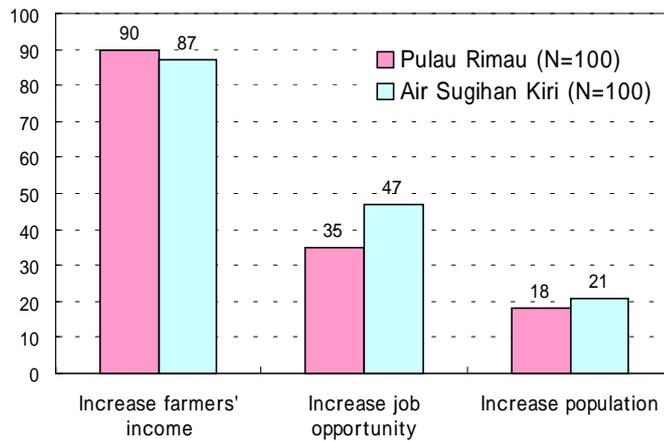
Remarks: All data is arranged as of 2000 basis.

2.4.3 Impacts on Economy (2): Qualitative Assessment on Regional Economy

It is difficult to analyze quantitatively how the Project contributes to improvements in the regional economy. To gain insight into the Project’s contribution, the results of the Interview Survey are quite relevant. In response to the subjective question, “Do you think this Project supports the economic activity?,” 100% of respondents said that the Project has sufficiently contributed to the regional economy. Subsequently, a multiple-choice question was asked, to specify the type of contribution. Responses are shown in Figure 3. Most respondents in both Pulau Rimau and Air Sugihan Kiri indicated the project had increased farmers’ income. Though the original target level for farmer incomes has not yet been reached, as discussed previously, the responses nevertheless imply that farmers assess the project’s contribution to their income status as very positive.

⁸⁾ Total income after deducting agricultural cost was projected to increase more than 350% overall at the time of the Project appraisal.

Figure 3 : An assessment on regional economy



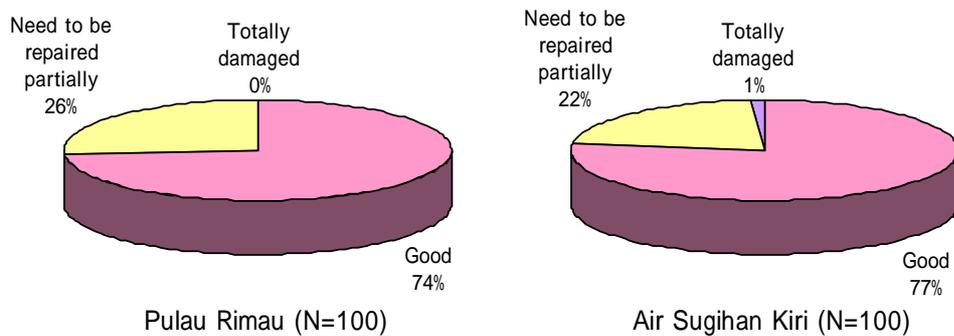
2.4.4 Impacts on Living Environment

Water supply facilities (Figure 4) are a major component of improving sanitary conditions in the Project area. Most Survey respondents assessed facility conditions as “Good” or “Needing to be repaired partially” (Figure 5), meaning that the facilities are still in good working order. Additionally, respondents said they use the reserved water mainly for drinking rather than for washing or bathing; consequently, the burden of carrying water, which rests on women, decreased and sanitary conditions improved.

Figure 4 : Domestic Water Tank



Figure 5 : Assessment of the condition of water supplying facilities



2.5 Sustainability

2.5.1 Operation and Maintenance

1) Main and Secondary Canal

The Dinas PU Pengairan South Sumatra Province under the Central Government is responsible for O&M of main and secondary canals of the Project, through its technical operational unit. Since SSSIP is still on-going, there are no plans to transfer the responsibility of O&M to the Local Government.

2) Tertiary Canals and On-farm Irrigation Facilities

WUA (Water Users Associations) are responsible for the O&M of tertiary canals and on-farm irrigation facilities. At present, 40 WUAs have been formed in Pulau Rimau (3,785 members) and 42 in Air Sugihan Kiri (1,943 members). These numbers are expected to reach 102 (8,192 members) and 110 (5,088 members), respectively. The current accomplishment ratio is less than 40% of target levels in terms of the number of WUA, and less than 50% in terms of participating members.

Formulation of WUA is a fundamental condition for the management of irrigation facilities, and 100% formulation is required to fulfill farmers' obligation for the O&M activities.

2.5.2 Technical Capacity

The management concept for O&M was designed in consultation with representative farmers. However, it became apparent during the construction period that, as a whole, the local population was not aware of the details of the concept and had not been informed of the operation methods for the water control structures. Consequently, late in the Project, it was decided to implement an enhanced O&M program, which commenced in May 1999 with the assistance of the University of Sriwijaya. It consists of the following major activities:

- a) Establishment of model O&M areas, covering 6 secondary blocks, 3 each in Pulau Rimau and Air Sugihan Kiri,
- b) Preparation of training materials (based on standards developed by the integrated Swamps Development Project) for WUAs,
- c) Preparation of courses to train trainers in selected model areas (training to be conducted when a sufficient number of trainees are available in the model areas),
- d) Operation of the water regime in model areas to optimize agricultural and socio-economic conditions and, where necessary, revision of dry-season structure operating rules for various land categories.

The program was conducted successfully and encouraged the participants. But because it covered only a couple of dry and wet seasons, there was not enough time to develop O&M techniques, so it is unlikely that these techniques have been disseminated to all local farmers. One major reason for difficulties in O&M might be that the project canals are used as both irrigation and drainage facilities, because of the local tidal effect. It is difficult to operate the system efficiently, even with sufficient knowledge of tidal variation. In addition to the characteristics of the facilities, it is likely that no installed gates have been operated appropriately so far, which has resulted in low agricultural performances, as stated in 2.3 Effectiveness.

The project office currently places a high priority on strengthening manpower capability, training and expanding WUAs. Unfortunately, the lack of governmental funds means there is no budgetary allocation for such follow-through activities.

2.5.3 Financial Status

O&M costs, covered by government funds, and ISF (Irrigation Service Fees) by WUAs for main and secondary canals are shown in Table 5.

In both of the Project areas, the available governmental budget is much less than required: 18.4% of the actual requirement in Pulau Rimau and 13.9% in Air Sugihan Kiri, based on the average requirement over the last three years. Total expected amount of ISF is 922 million Rp. in Pulau Rimau and 452 million Rp. in Air Sugihan Kiri, with a respective contribution by WUAs of 50,000 Rp./ha/year⁹⁾ in Pulau Rimau and 39,500 Rp./ha/year in Air Sugihan Kiri. However, actual collected ISF is much smaller than expected, probably because of the low formulation ratio of WUA. Consequently, the actual total budget is less than 20% of the requirement in each area.

Table 5 : O&M cost

Pulau Rimau	1998/1999	1999/2000	2000/2001	Average	Remarks
Gov. Budget					
(a) Proposed	768	1,109	1,280	1,052	million Rp.
(b) Realized	72	388	121	194	million Rp.
	3,900	21,050	6,560	10,500	Rp./ha
(c) = (b)/(a)	9.4	35.0	9.4	18.4	%
ISF fund					
(d) Expected	n.a.	n.a.	922	922	million Rp.
(e) Collected	n.a.	n.a.	118	118	million Rp.
	n.a.	n.a.	6,400	6,400	Rp./ha
(f) = (e)/(d)	n.a.	n.a.	12.8	12.8	%
Total					
(g) = (a)+(d)	-	-	2,202	1,974	million Rp.
(h) = (b)+(e)	-	-	239	312	million Rp.
	-	-	13,000	16,900	Rp./ha
(i) = (h)/(g)	-	-	10.9	15.8	%
Air Sugihan Kiri	1998/1999	1999/2000	2000/2001	Average	Remarks
Gov. Budget					
(a) Proposed	460	665	768	631	million Rp.
(b) Realized	69	104	92	88	million Rp.
	6,030	9,080	8,040	7,700	Rp./ha
(c) = (b)/(a)	15.0	15.6	12.0	13.9	%

⁹⁾ 50,000 Rp./ha/year in Pulau Rimau consists of 2,500 as ISF both in wet season and dry season, 40,000 as membership fee and 5,000 as Gotong-Royong (mutual supporting). While, 39,500 Rp./ha/year in Air Sugihan Kiri consists of 2,250 as ISF both in wet season and dry season, 30,000 as membership fee and 5,000 as Gotong-Royong (mutual supporting).

ISF fund					
(d) Expected	n.a.	n.a.	452	452	million Rp.
(e) Collected	n.a.	n.a.	92	92	million Rp.
	n.a.	n.a.	8,040	8,040	Rp./ha
(f) = (e)/(d)	n.a.	n.a.	20.4	20.4	%
Total					
(g) = (a)+(d)	-	-	1,220	1,083	million Rp.
(h) = (b)+(e)	-	-	184	180	million Rp.
	-	-	16,070	15,700	Rp./ha
(i) = (h)/(g)	-	-	15.1	16.6	%

source : P2DR

2.5.4 Current Status of the Project Facilities

A major problem for the Project facilities is the intrusion of mud through the navigation channels, making irrigation, drainage and navigation impossible. This is a result of the high-velocity canal flow from the rivers during high tide. It should be noted that such mud intrusion is likely to be a continuing problem; hence, dredging of canal sedimentation would only be a temporary measure and would not really alter the situation. The project office had already proposed that the central government provide approach channels with discharge control gates as an alternative measure, instead of conducting dredging. However, the idea has not been realized so far because of constraints on available governmental funds. In addition, some type-B bridges in main canals constructed under the Project were damaged. The steel piles of the bridges have corroded at a rate of ± 1 mm per year because of the intrusion of highly acidic seawater during the dry season. Some of the damaged steel piles were already replaced by concrete piles in works covered by the governmental budget, and remaining piles are also scheduled for replacement as early as 2001.

Figure 6 : Repaired Bridge



2.5.5 Toward Sustainability

The Project has accomplished its objective to a certain extent, and the minimal O&M activities have been carried out so far using the governmental funds available, as seen in the replacement of the bridge pile. However, there is room for further improvement in terms of facility conditions and management.

Seawater intrusion into the Project area has become a major problem, affecting facility conditions and agricultural production. To cope with the situation, it is necessary to improve the facilities, as needed, and to obtain a budget that is sufficient to finance the work. However, a sufficient budget is not enough to ensure that the Project is sustainable. Much more work is needed to assure the appropriate operation of the installed facilities, which directly influences

crop intensity, crop yield and production. Moreover, the training program carried out during the implementation stage is to be continuously provided to the local farmers as well as to Project staff, in order to improve their abilities in O&M activities.

In addition, accessibility of the project was improved within each Project area by constructing bridges across canals, although there is still a need to develop/improve access to points outside the project areas, especially to Palembang City. The distance to the city from each Project site is not very far, about 50-60km. However, it can take four hours by car from Pulau Rimau because of bad road conditions; i.e. bumpy surfaces, pot holes and insufficient width. It takes two and a half hours by boat from Air Sugihan Kiri. These access conditions are significant obstacles to further economic growth and improvement and have yet to be solved.

3 . Lessons Learned

(1) Coordination with related Ministry or agency is required to accomplish the ultimate goal.

In this project, there was not enough coordination between SSSIP and SSSTCDP in regarding schedules for planting coconuts, which led to perennial shortfalls in targets for coconuts cropping. The Project Manager cited insufficient field drainage facilities as another reason for low performance levels. In general, each administrative party should aim for better coordination and work to achieve mutual understanding and clarity in each mission, so that the ultimate, common objective of the project can be realized.

(2) Training program for O&M is vital in view of Project sustainability.

Since the Project canals function as irrigation and drainage facilities, as explained in 2.5.2 Technical Capacity, the Project system is somewhat more complicated than a normal irrigation scheme. Thus, administration of the Project irrigation facilities requires greater knowledge and capability in facilities operation.

Comparison of Original and Actual Scope

Item	Plan	Actual
(1) Project Scope		
1. Rehabilitation works and upgrading works of existing canals/drains		
(Air Sugihan)		
-Secondary SDU canals	99,400 m	162,200 m
-Secondary SPD canals	-	165,000 m
-Tertiary canals	309,170 m	654,100 m
(Pulau Rimau)		
-Navigation canals	28,000 m	54,900 m
-Primary canals (SPD)	72,000 m	86,800 m
-Secondary/Tertiary canals	290,000 m	874,000 m
2. Construction of new canals/drains		
(Air Sugihan)		
-Primary canals	-	21,600 m
-N-S canal	-	12,000 m
-Tertiary drains	62,710 m	- m
(Pulau Rimau)		
-Primary canals	-	55,400 m
-Secondary SDU	80,000 m	169,500 m
-Tertiary drains	290,000 m	198,000 m
3. Construction of dike		
(Air Sugihan)		
-Flood protection dike	2,225 m	31,200 m
4. Construction of culverts		
(Air Sugihan)		
-Tertiary culverts	639 units	-
5. Construction of water control structures		
(Air Sugihan)		
-SPD flapgate structures	7 units	40 units
-Tertiary flapgate structures	728 units	681 units
-Tertiary structure	-	702 units
(Pulau Rimau)		
-Primary flapgate structures	29 units	24 units
-Secondary/Tertiary flapgate structures	580 units	292 units
-Secondary/Tertiary structures	-	309 units
6. Upgrading and construction of roads		
(Air Sugihan)	47,450 m	38,800 m
(Pulau Rimau)	100,000 m	-
7. Construction of bridges		
(Air Sugihan)	58 units	706 units

(Pulau Rimau)	296 units	306 units
8. Construction of jetties (Pulau Rimau) -Jetties	8 units	-
9. Construction of domestic water supply facilities (Air Sugihan) (Pulau Rimau)	5,184 units 8,100 units	as planned as planned
10. O/M equipment and facilities	Lump Sum	-
11. Consulting services	Pro(A) Foreign:115 M/M Pro(B) Local :270 M/M	Pro(A) Foreign: 186 M/M Pro(B) Local : 500 M/M
(2) Implementation Schedule		
1. Loan Agreement	Sep. 1992	Oct. 1992
2. Selection of Consultant	Jul. 1992 – Jul. 1993	---
3. Consulting Services	Aug. 1993 – May.1996	Jan. 1993 – Sep.1996
4. Construction	Nov. 1994 – Mar. 1998	Feb. 1994 – Jul. 1999
	(is project completion)	(is project completion)
(3) Project Cost		
Foreign currency	2,166 million yen	3,732 million yen
Local currency	4,396 million yen (68,691 million Rp)	734 million yen (47,710 million Rp)
Total	6,562 million yen	4,466 million yen
ODA loan portion	5,577 million yen	4,426 million yen
Exchange Rate	1Rp. = 0.064 yen (Apr. 1992)	1Rp. = 0.015 yen (Sep. 1999)