(Field survey; June, 2007)

ODA Loan Project Ex-Post Monitoring Report

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Project Name: South Sumatra Swamp Improvement Project, Indonesia (L/A No. IP-389)

Outline of Loan Agreement

Loan Amount/Disbursement Amount	: 5,577 million yen/4,426 million yen
Loan Agreement	: October 1992
Loan Completion	: November 1999
Ex-Post Evaluation	: FY2002
Executing Agency	: Government of the Republic of Indonesia /Directorate General of Water Resources Development bureau (DGWRD)

Project Objective

The Project aimed to increase crop production in the South Sumatra Province districts of Pulau Rimau and Air Sugihan Kiri through repairing and improving irrigation facilities, and thereby contribute to raising local farmers' living-standards and to stimulating the region's economy.

Consultants: Euroconsult (Holland), Pacific Consultants international (Japan) and others
Contractors; Rinkai Construction SAC., PT. Huama Karya (Indonesia), and others

Overview of Results

Item	At Time of Ex-Post Evaluation	At Time of Ex-Post Monitoring
Effectiveness and Impact		,Although the cropping area, excluding rice, decreased in comparison to the ex-post evaluation, it had been switched to the more profitable crops such as palm oil and coffee. The unit yield and average production had been generally maintained until 2005, only falling in 2006 due to the adverse effects of natural disasters. In addition, a Beneficiaries Survey found that women had spent less time for drawing water and that sanitary conditions had improved.
	(1) Planned and actual cropping area (ha) by crop The table below shows the cropping area for the principal crops grown in Pulau Rimau and Air Sugihan Kiri.	(1) Actual cropping area (ha) according to crop The table below shows the cropping area for the principal crops grown in Pulau Rimau and Air Sugihan Kiri. The cropping areas for coconut and cassava both decreased due to the reasons stated below. However, planned targets for rice and corn were approximately achieved.

Table 1 : Pulau Rimau

Total cropping area in Pulau Rimau: 7,527 ha (1996)
→ increased to 15,045ha (2000) (83% of planned target)

	Plan	Actual Cropping Area(ha)				
		1996/97	1997/98	1998/99	1999/00	2000/01
Rice	8,192	2,720	3,108	4,912	5,860	6,160
Corn	1,638	2,242	2,.352	3,458	3,720	4,608
Cassava	n.a	2,325	2,578	2,570	2,850	2,900
Coconut	8,192	240	n.a.	n.a.	1,000	1,377
Total	18,022	7,527	8,038	10,940	13,430	15,045

Table 2 : Air Sugihan Kiri

Total cropping area in Air Sugihan Kiri: 7,527 ha (1996)
→ increased to 14,321 ha (2000) (128% of planned target)

Table 1 : Pulau Rimau

Farmers in Pulau Rimau continuously desire to grow rice and corn. However, since the farmers quitted growing low-profit crops such as cassava, total cropping area fell from 15,045 ha in 2000, to 12,610 ha in 2006. Because the farmers have continually shifted from low-profit coconut to high-profit palm oil since 2001, cultivation of coconut had practically stopped.

	Actual Cropping Area (ha)					
	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07
Rice	6,160	6,423	6,423	6,750	7,100	6,925
Corn	4,120	4,230	4,230	4,122	3,978	4,285
Cassava	751	662	421	306	354	140
Coconut	n.a	n.a	n.a	n.a	n.a	n.a
Palm oil	864	924	986	1,040	1,120	1,260
Total	11,895	12,239	12,060	12,218	12,552	12,610

Source: Banyu Asin Office

Table 2 : Air Sugihan Kiri

Farmers in Air Sugihan Kiri also continuously desire to cultivate rice and corn, but stopped growing the low-profitability crops of cassava and coconut. In addition, the desire for a stable income has led them to work for construction industries, or even a job-change to the food restaurant industries. As a result, farming in the district has decreased, and total cropping area fell from 14,321 ha in 2000, to 6, 538 ha in 2006. Between 2001 and 2003, some farmers switched from growing low-profit coconut to high-profit coffee. Because the farmable land available to these farmers is limited, in the past few years this switch has amounted to no more than 210 ha.

	Plan	Actual Cropping Area (ha)				
		1996/97	1997/98	1998/99	1999/00	2000/01
Rice	5,088	2,720	2,889	3,467	4,296	3,793
Corn	1,018	2,242	3,905	3,185	4,663	4,104
Cassava	n.a	2,325	1,827	2,206	2,540	2,928
Coconut	5,088	240	n.a	n.a	n.a	3,496
Total	11,194	7,527	8,621	8,858	11,499	14,321

(2) Unit yield by crop (t/ha)
The table below shows the unit yields of the principal crops in Pulau Rimau and Air Sugihan Kiri.

Table 3: Unit yield (t/ha) in Pulau Rimau by crop
Unit yield for rice in 2000, 99% of plan

	Plan	Actual Unit Yield(t/ha)				
		1996/97	1997/98	1998/99	1999/00	2000/01
Rice	3.3	2.2	2.5	2.5	3.1	3.2
Corn	n.a	2.4	2.9	3.4	4.3	4.0
Cassava	n.a	10.4	10.1	14.0	12.5	14.4
Coconut	n.a	n.a	n.a	n.a	n.a	n.a

Table 4: Unit yield (t/ha) in Air Sugihan Kiri by crop.
Unit yield for rice in 2000, 79% of plan.

	Actual Cropping Area (ha)					
	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07
Rice	2,910	3,100	3,700	3,700	3,400	2,980
Corn	3,114	3,676	3,109	3,245	2,918	2,352
Cassava	851	873	873	841	936	882
Coconut	654	464	286	286	239	114
Coffee	194	205	210	210	210	210
Total	7,723	8,318	8,178	8,282	7,703	6,538

Source: Musi Banyu Asin Office

(2) Unit yield by crop (t/ha)
The tables below show the unit yields of the principal crops in Pulau Rimau and Air Sugihan Kiri.

Table 3: Unit yield (t/ha) in Pulau Rimau by crop
From 2001 to 2005, unit yield for rice was between 82% to 91% of the planned targets. The natural fire in 2006 caused of a longer-than-usual drought at the time of harvest. Since it has drastically decreased, only 76% of the plan target was achieved in 2006. The corn and cassava yields also decreased due to the effects of the same fire.

	Actual Unit Yield (t/ha)					
	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07
Rice	3.0	2.9	2.9	2.7	3.0	2.5
Corn	3.9	3.7	4.2	4.1	3.8	2.2
Cassava	13.7	14.1	13.9	13.8	14.0	9.6
Coconut	0.7	0.8	0.8	0.8	0.8	0.6
Palm oil	n.a	n.a	0.7	1.8	2.4	2.1

Source: Banyu Asin Office

Table 4: Unit yield (t/ha) in Air Sugihan Kiri by crop.
Unit yield for rice from 2001 to 2005 was between 73% to 79% of the planned target. However, this fell to 52% in 2006 because of the natural fire caused of a longer-than-usual drought at harvest time resulted in a

	Plan	Actual Unit Yield(t/ha)				
		1996/97	1997/98	1998/99	1999/00	2000/01
Rice	3.3	1.6	2.0	1.6	2.9	2.6
Corn	n.a	2.1	2.1	2.6	3.2	2.7
Cassava	n.a	10.1	11.2	14.2	12.4	10.8
Coconut	n.a	n.a	n.a	n.a	n.a	n.a

(3) Average yearly production (t)
The table below shows yearly average production based on the figures in tables above.

Table 5: Yearly average production (estimate) in Pulau Rimau by crop.
Average yearly rice production in 2000, 74% of plan

	Plan	Actual Yearly Production (t)				
		1996/97	1997/98	1998/99	1999/00	2000/01
Rice	27,034	5,920	7,771	12,281	18,265	19,880
Corn	n.a	5,360	6,811	11,753	16,020	18,432
Cassava	n.a	24,233	25,970	36,083	35,670	41,660
Coconut	n.a	n.a.	n.a.	n.a.	n.a.	n.a.

decrease in crops yielded from the cropping area. The corn and cassava harvests also decreased in 2006 due to the effect of the same fire.

	Actual Unit Yield (t/ha)					
	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07
Rice	2.4	2.4	2.6	2.3	2.5	1.7
Corn	2.6	2.9	3.1	3.2	2.4	1.9
Cassava	11.4	12.1	13.2	12.8	12.8	10.6
Coconut	0.8	0.8	0.7	0.8	0.8	0.9
Coffee	0.4	0.4	0.4	0.4	0.4	0.3

Source: Musi Banyu Asin Office

(3) Average yearly production (t):
The table below shows yearly average production based on the figures in tables above.

Table 5: Yearly average production (estimate) in Pulau Rimau by crop.
Rice production from 2001 to 2005 was between 67 to 79% of planned targets. In 2006, this fell to 64% due to a decrease in unit yield caused of the effects of natural fire. Corn production also fell in 2006 for the same reason. Between 2001 and 2005, cassava production was on a declining trend. This was a result of farmers reducing the cassava cropping area based on their perception of it as a low-profit crop. In addition, unit yield worsened in 2006 due to the effects of natural fire.

	Actual Yearly Production (t)					
	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07
Rice	18,480	18,627	18,627	18,225	21,300	17,313
Corn	16,068	15,651	17,766	16,900	15,116	9,427
Cassava	10,289	9,334	5,852	4,223	4,956	1,344
Coconut	n.a.	n.a.	n.a.	n.a.	n.a.	n.a
Palm oil	n.a.	n.a.	690	1,872	2,688	2,646

Source: Banyu Asin Office

Table 6: Production in Air Sugihan Kiri (estimate) by crop.
Rice production in 2000, 59% of plan

	Plan	Actual Production (t)				
		1996/97	1997/98	1998/99	1999/00	2000/01
Rice	16,790	3,902	5,874	5,634	12,591	9,918
Corn	n.a	7,222	8,338	8,374	15,099	11,019
Cassava	n.a	25,239	20,374	31,374	31,596	31,659
Coconut	n.a	n.a.	n.a.	n.a.	n.a.	n.a.

(4) Collection rates for irrigation service fees (ISF)
ISF are not imposed in either district.

(5) EIRR: 7.4%
(Calculation conditions) EIRR was calculated according to the following assumptions;
・The economic costs were applied by combining the project's annual disbursement and the planned disbursement of other plans,
・The economic benefits were the farmers' income increase (defined as benefit) obtained from the interview survey of the beneficiaries.

Table 6: Production in Air Sugihan Kiri (estimate) by crop.
Rice production from 2001 to 2005 was between 42 to 57% of the planned target. This was because of a decrease in the cropping area due to an increase in farmers working away from home and changing jobs. The adverse effect of natural fire in 2006 meant production fell to 30% of the planned target. The production of corn between 2001 and 2006 decreased for the same reasons.
In addition to the reasons above, production of cassava decreased as farmers reduced the cropping area of this low-profit crop. Production of coconut also decreased for the same reason. Coffee production in 2006 decreased due to a slight fall in unit yield.

	Actual Yearly Production (t)					
	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07
Rice	6,984	7,440	9,620	8,510	8,500	5,066
Corn	8,096	10,660	9,638	10,384	7,003	4,469
Cassava	9,701	10,563	11,524	10,765	11,981	9,349
Coconut	523	371	200	229	191	103
Coffee	78	82	84	84	84	63

Source: Musi Banyu Asin Office

(4) Collection rates for irrigation service fees (ISF)
The Indonesian government does not impose a legal obligation to collect ISF. However, the government recommends the collection of ISF to promote the operation and maintenance by farmers themselves. Despite this, the Palembang DOR (Regional Office of Directorate of Swamp) does not collect ISF in either district, nor do they plan to collect them in the future, in order to safeguard the farmers' standards of living.

(5) EIRR: Negative
(Calculation conditions) EIRR was calculated according to the following assumptions;
- The economic costs were applied by combining the project construction costs and the operation and maintenance costs of the irrigation facilities
- The economic benefits were the farmers' income increase (defined as benefit) obtained from the interview survey of the beneficiaries. EIRR was negative as the economic benefit, defined as farmers' income, decreased.

Impact	(1) Impact on the living environment A beneficiary survey showed that approximately 75% of respondents believed that the condition of the facilities provided by this project was "good." Since the domestic-use water supply facility was being used to supply drinking water, women came to spend less time drawing water, and that sanitary conditions improved (2) Impact on the environment 1. Salt accumulated in the soil 2. A report on an additional environmental monitoring survey was planned to be submitted to the project operation and maintenance institution. 3. Effect on plant life from oxidized pyrite and soil pollution resulting from construction and repair work	(1) Impact on the living environment According to a beneficiary survey, 76% of respondents considered the facilities provided by the project "needed repairs." Regarding the domestic-use water supply facility (a large container placed beneath a water spout to capture and collect rain water), 99% of respondents said that that it had contributed to reducing the time women spent drawing water and to improving sanitary conditions. (2) Impact on the environment 1. In both Pulau Rimau and Air Sugihan Kiri, water-regulating gates for the primary, secondary, and tertiary canals were completely inoperable due to rust damage. As a result, during high tide in the dry season—particularly during September and October—seawater flowed into the irrigated land and caused salt damage. However, it has not become a chronic problem as the large quantities of rain falling during the rainy season, which starts from January, acts to wash away the accumulated salt. 2. A report on the environment monitoring survey was not submitted to the relevant authorities because it has a low priority for them. 3. The effect of the construction and repair work on plant-life has not been ascertained.
Sustainability	(1) Technical capacity : Uncertain On the other hand, operation and maintenance policy was determined in consultation with the farmers. Although an operation and maintenance training program was conducted in cooperation with local universities, additional training was desirable since not all the local community had received sufficient instruction in technology for operation and maintenance. However, this additional training has not been conducted. (2) Operation and maintenance system: Water use associations (WUAs), which are responsible for management and operation and maintenance, are hoped to be strengthened.	The problems in organizational structure and financial status identified at the time of ex-post evaluation are still evident. Due to these problems, the adequate operation and maintenance of both facilities and equipment by the project has become harder and. the sustainability of this project is concerned. (1) Technical capacity: The Palembang DOR, which operates and maintains the primary and secondary canals and bridges, and the farmers, who operate and maintain the tertiary canal, believe that they have no problems with their technical capacities, but it lacks of objective evidence. (2) Operation and maintenance system: Regarding the yearly management and operation and maintenance of the project, between 1998

		and 2000—the period prior to the decentralization of power to regional governments—the government allocated a budget and a support system necessary for sustainability. Decentralization to the regions saw the responsibility for management, and operations and maintenance transferred to the South Sumatra Province Regional Government for the period of 2001 to 2004. The support system deteriorated as the government no longer allocated a budget. In addition, so far the WUAs has conducted no special management or operation and maintenance activities except for group meetings for the purpose of information exchange. Since they have not collected ISF and so have had no funding for their operations, farmers were unable to carry out operation, maintenance, and other activities because many were working away from home or had changed jobs.
	Target 2000/01 Achievement Rate Pulau Rimau 102 associations 40 associations 39% Air Sugihan Kiri 110 associations 42 associations 38%	2006/07 Achievement Rate Pulau Rimau 40 Associations 39% Air Sugihan Kiri 42 Associations 38% * Farmer numbers are unlikely to increase, due to reasons such as farmers working away from home. Consequently, expectations are low that WUA numbers, the achievement rate, will increase.
	(3) Financial status: The government budget allocation was considerably less than the amount required for the project (the necessary amount), at 18.4% for Pulau Rimau and 13.9% for Air Sugihan Kiri. In addition, because the expected collection rate of ISF is low, the operation and maintenance costs budgets in both districts is less than 20% of the actual required amount.	(3) Financial Status: The government budget allocated to the project has been considerably less than the amount required (the necessary amount). No government budget was allocated to Pulau Rimau between 2001 and 2004, and in 2005 and 2006 it was 4% and 30% respectively of the necessary amount. Similarly, in Air Sugihan Kiri, no government budget was allocated between 2001 and 2004, and in 2005 and 2006 it was 7% and 14% respectively of the necessary amount. Therefore, the actual budget for operation and maintenance has been less than 30% of the necessary amount. As a result, of the 26 bridges in both districts that cross the primary canals, as of the present, six have been left in a state of disrepair. In addition, due to the above stated reasons, the WUA have not conducted any special management and operation and maintenance activities. Consequently, some of the tertiary canal is overgrown with weeds, and is unable to maintain the necessary volume of water flow for irrigation.
	(4) The operation and maintenance situation 1. The primary and secondary canals are operated and maintained by	(4) The operation and maintenance situation 1. The Palembang DOR still operates and maintains the primary and secondary canals. But due to the previously stated chronic shortage of funds, it cannot conduct optimal operation and maintenance. The canals

	the Palembang DOR.	are unable to maintain the necessary volume of water-flow for irrigation due to the accumulation of mud flowing in from the river. For example, water depth at one location in the primary canal was measured at one meter, despite an original depth of four meters.
	2. The tertiary canal is operated and maintained by the WUAs.	2. The farmers (the WUAs) operate and maintain the tertiary canal. But adequate operation and maintenance cannot be conducted due to the previously stated lack of operational budget and manpower. Some of the tertiary canal is overgrown with weeds and unable to maintain the necessary volume of water flow for irrigation.
	3. Several bridges that cross the primary canal have been damaged by seawater. However, some had already been repaired, and the remainder was planned for repair by the beginning of 2001.	3. The Palembang DOR conducts operation and maintenance of bridges constructed across the primary canal. But it cannot conduct adequate operation and maintenance due to the previously stated chronic shortage of funds. Currently, of the 26 bridges in both districts, six have been left in a state of disrepair and cause inconvenience to travel. However, they are scheduled for repair when funds become available.
	4. Adequate operation and maintenance of the water-regulating gates had not been conducted.	4. The Palembang DOR operates and maintains the primary and secondary canal water-regulating gates, while the farmers (the WUAs) operate and maintain those at the tertiary canal. But because of the previously stated reasons, adequate operation and maintenance had not been conducted, and more than 90% of these gates have been rendered inoperable by rust damage. As a result, the volume of water-flow for irrigation cannot be controlled. For these reasons, significant concerns remain regarding; the organizational structure of operation and maintenance institution, the financial status, and the operation and maintenance conditions of the irrigation facilities. The factors jeopardize the sustainability of the project, and are expected to have an adverse effect on both effectiveness and impact in the future.

Lessons Learned, Recommendations, Information Resources and Monitoring Methods (1) Follow up on lessons learned and recommend-ations made in ex-post evaluation report or other evaluations conducted after the ex-post evaluation (2) Lessons learned at the time of ex-post monitoring and recommendations for securing sustainability	(1) In order to achieve the project goals, coordination between the relevant government agencies and other bodies is essential. ・ There has been insufficient coordination between the SSSIP and the SSSTCDP during this project on the scheduling of coconut planting. The result has been coconut cultivation continually falling beneath the planned target. All relevant government bodies and institutions must coordinate sufficiently and develop a better working environment in order to promote mutual understanding and to raise awareness of the tasks assigned to each institution. These measures will enable the joint goals of the project to be realized. ・ It is also vital an O&M training program is conducted from the perspective of project sustainability and the potential for independent development. (The project-constructed canals function as both irrigation and drainage channels, making them considerably more complicated than conventional irrigation facilities. As a result, substantial expertise and abilities are required for their operation and management.)	To maintain and improve the project's yearly production targets, the policy support for farmers' shift away from low-profit crops such as cassava and coconut is needed in the future. In addition, some irrigation facilities should be rehabilitated. Furthermore, to increase the sustainability, it is also important to improve the operation and maintenance system and financial status (1) Recommendations for the present, seven years after the completion of the project. Recommendations for the WUAs, the Palembang DOR, and the Ministry of Public Works. To maintain and improve the project's yearly production targets, the policy support for farmers' shift away from low-profit crops such as cassava and coconut is needed in the future. In addition, in a rice-producing region where irrigation plays a vitally important role, the functions of some of the irrigation facilities need to be repaired – particularly both mud-dredging and replacing the rust-damaged water-regulating gates in the primary and secondary canals. To increase the sustainability of this project, it is essential that the organizational structure for operation and maintenance and the financial status are improved. To achieve this, the Palembang DOR has to secure the necessary budget from Ministry of Public Works and has to strengthen the organizational structure and the financial status to establish divisions which support farmers for switching crops, as well as to secure staff necessary for conducing operations. Further, the WUA should replace its deliberate policy of not collecting ISF with a system for collecting fees solely for the operation and maintenance of equipment. This will help strengthen the organizational structure, such as securing necessary operation and maintenance staff, and also serve to strengthen the financial status.