Indonesia

Integrated Horticultural Development in Upland Areas Project

External Evaluator: Takuya Okada

Field Survey: November 2004

1. Project Profile and Japan's ODA Loan

Project site location map

Mangoes from Cirebon, West Java Province

1.1 Background

Indonesia spans an area of 1,905,000km^2, and it is inhabited by 215,300,000 people[1]; approximately half of the nation's working population is engaged in agriculture. The agricultural sector accounts for 20% of the national GDP, with rice and cassava representing the major food crops; however, there has been a rise in demand for tropical fruits in recent years. This surge in demand has been stimulated by the increased purchasing power of consumers that has accompanied economic growth, the development of tourism-related businesses, and growth in the food processing industry, among other factors. By contrast, because the majority of the tropical fruit crops produced in Indonesia are grown by smallholders or on small garden plots and it is difficult to ensure a continuous supply of fruit that is uniform in size and of appropriate quality, imports have risen export growth has been limited. Facing these circumstances, the Government of Indonesia has been working to introduce good quality saplings and cultivating techniques with the aim of producing top quality fruits for the export market since the late 1990s. The development of the horticultural sector is also being viewed as a means to achieve efficient use of agricultural resources and greater diversity in food crops, and thereby of contributing to efforts to alleviate rural poverty and rectify inter-regional gaps.

1.2 Objectives

This project's objective was to improve horticultural productivity by extending support to

[1] Indonesia is approximately five times larger than Japan and its population around 1.7 times greater (as of 2005).

small-scale farmers in non-irrigated areas of Indonesia in the culturing and harvesting of horticultural produce (i.e. fruit trees) together with the development of agricultural infrastructure, and thereby contribute to the development of the horticultural sector and to improvements in on-farm income.

1.3 Borrower/Executing Agency

Government of the Indonesian Republic/Directorate General of Food Crops and Horticulture (DGFCH)[2]

1.4 Outline of Loan Agreement

Loan Amount/Disbursed Amount	7,769 million yen/4,612 million yen
Exchange of Notes/Loan Agreement	December 1996/December 1996
Terms and Conditions Interest Repayment Date (Grace Period) Procurement	 2.7% (2.3% for Consulting services) 30 years (10 years) General untied
Final Disbursement Date	December 2002
Main Contractors	Local companies
Contracted Consultants	Nippon Koei, PT. Pusat Pengembangan Agribisinis, PT. Trans Intra Asia, PT. Andal Agrikarya Prima
Feasibility Studies (F/S), etc.	1996: F/S, Government of Indonesia

2. Results and Evaluation

2.1 Relevance

2.1.1 Relevance of project plans at appraisal

REPELITA VI (1994-1998), Indonesia's sixth five-year development plan, stipulated that priority attention be given to reducing poverty in rural areas and to rectifying disparities among the regions, and it identified the need for improvements in the productivity of food crops as a means of achieving these ends. Under this policy framework, the government placed a priority on promoting the development of high value-added horticultural produce in rough, non-irrigated areas of the country as a means of contributing to increased productivity and diversity in the agricultural sector. This project was a high priority undertaking targeting smallholder farmers in un-irrigated areas of Indonesia, which involved the development of the basic infrastructure necessary for fruit production, procurement of saplings, fertilizer and other inputs, and training in propagation techniques.

[2] This organization has now been split into the Directorate General of Food Crops (DGFC) and the Directorate General of Horticulture (DGH).

2.1.2 Relevance of project plans at evaluation

The current national development plan (PROPENAS: 2000-2004) identifies "poverty reduction and the fulfillment of basic social needs" as key development issues and states that there is a need to expand labor/work opportunities for smallholder farmers in order to generate value. The Directorate General of Horticulture (DGH), targeting further development of the horticultural sector, is promoting an agribusiness development program (PAH: Pengembangan Agribisnis Hortikultura) that is designed to systemize farm operations and increase the efficiency of distribution while developing plantations and providing technical assistance for cultivation in un-irrigated areas of Indonesia. Thus this project, which involved the development of basic infrastructure for horticultural crop production, the provision of resources and training in propagation techniques, has remained highly relevant.

2.2 Efficiency

2.2.1 Outputs

This project was designed to support the cultivation of eight horticultural crops (mango, citrus, passion fruit, rambutan, banana, salak (snake palm), durian, melindjo) in 31 areas in 15 provinces of Indonesia. The areas targeted for development were selected from those which are difficult to farm and un-irrigated, with some being covered by existing programs[3] and others being new projects. The areas covered by existing projects were selected on the basis of project performance (productivity, degree of farmer participation, marketability of crops, etc.), while other areas not previously targeted for development were selected on the basis of their potential (soil, weather conditions, eagerness of farmers, etc.). As the result, the following 31 areas were chosen[4].

[3] The programs referred to are horticultural sector development programs that are either being funded by the Government of Indonesia's development fund or by sector program loans.
[4] Besides Polewali Mamasa, all other areas had already been targeted for development under other programs.

Table 1. Developed Areas by Province/Regency and Crops (Planned & Actual) and Numbers of Beneficiary Farmers

Province	Target Area (Regency)	Area of Developed Farmland (ha)		No. of farmers (beneficiaries)
		Planned	Actual	
Aceh	Sabang	500 Mango	As planned	595
North Sumatra	Karo	500 Passion fruit	As planned	763
	North Tapanuli	1,000 Citrus	As planned	1,208
	Lankkat	500 Rambutan	530	894
Riau	Kep. Riau	500 Citrus	--	--
	Karimun	--	500 Citrus	699
Jambi	Bungku	1,000 Melindjo Durian	200 Rambutan 800 Melindjo	1,229
Lampung	Central Lampung	500 Banana	--	--
	North Lampung	1,000 Citrus	--	--
	East Lampung	--	500 Banana	708
	Turan Bawang	--	1,000 Citrus	1,129
West Java	Majalengka	500 Mango	As planned	1,646
	Indramayu	1,000 Mango	As planned	2,998
	Cirebon	1,000 Mango	As planned	3,491
Central Java	Banjarneggara	1,000 Salak	As planned	3,822
	Magelang	1,000 Salak	As planned	4,175
	Jepara	500 Durian	As planned	2,751
East Java	Ponorogo	500 Citrus	As planned	2,034
	Situbondo	1,000 Mango	As planned	1,370
	Mojokerto	1,000 Banana	As planned	1,697
West Kalimantan	Singtang	500 Durian	As planned	1,391
South Kalimantan	Barito Kuala	400 Citrus	500	410
East Kalimantan	Kutai	1,200 Durian, Sukun (breadfruit)	As planned	1,752
North Sulawesi	Minahasa	500 Rambutan	As planned	672
South Sulawesi	Pulau Selayar	500 Citrus	As planned	507
	Bulukumba	500 Citrus	As planned	839
	Bantaeng	500 Citrus	As planned	1,375
	Jeneponto	1,000 Mango	As planned	2,292
	Takalar	500 Mango	As planned	955
	Sinjai	1,000 Passion fruit	As planned	1,488
	Luwuk	500 Rambutan	As planned	616
	Polewali Mamasa	500 Passion fruit	As planned	1,128
Southeast Sulawesi	Buton	500 Citrus	As planned	756
East Nusa Tenggara	South-central region, eastern districts	500 Citrus	As planned	956
Total		**21,600 ha**	**21,730 ha**	**46,346**

Note: Planning documents state that rambutan is to be cultivated in the three districts of Jepara, Sintang and Kutai; however, as shown in this table, the plan was in fact to grow durian and/or sukun (breadfruit).

As Table 1 shows, despite some minor shuffling of the target areas and an increase in the total development area by 130 hectares (0.6%), the work was basically implemented in the areas targeted under initial plans.

At appraisal, project outputs were set as (1) infrastructure for the horticultural sector (roads, drainage, irrigation, wells, etc.; for details, refer to Table 2), (2) supplies of saplings, etc., (3) training (for farmers and PR workers), and (4) consulting services (program coordination, schedule management, etc.: equivalent to 420 man-months (M/M)). The achievements for outputs (1)-(3) exceeded targets, while the number of man-months for (4)

was increased as the consulting services for the sector program loan (SPL) that was being implemented simultaneously were incorporated into those provided for this project (IHDUAP).

Table 2. Planned and Actual Infrastructure for Horticultural Sector

Content		Planned	Actual
Water supply infrastructure	a. Wells and pumps	261	705
	b. Reservoirs (for farming purposes)	899	1,150
	c. Water channels, irrigation pipes	565,200 m	1,009,666 m
Basic infrastructure	a. Farmland development		
	i) Soil preservation	2,200 ha	Unknown
	ii) Ground leveling	21,350 ha	21,730 ha
	iii) Sorjan systems	950 ha	Unknown
	b. Drainage channels	160,400 m	163,486 m
	c. Access roads		
	i) New roads	114,000 m	131,539 m
	ii) Road repairs	107,300 m	155,594 m
	iii) Connecting infrastructure (bridges, etc.)	969	30 bridges, 156 underground drains
	d. Windbreak forest	33,000 m	Total: 147,146 m
	e. Boundary fencing	59,000 m	
	f. Post-harvest processing facilities		
	i) Produce collection centers	216	129
	ii) Wrapping facilities	37	27
	iii) Processing facilities	4	29
Consulting services		420M/M	The monitoring work required for the SPL that was being executed simultaneously was added into the consulting services for the IHDUAP.

2.2.2 Project Period

The project was scheduled to run over a period of approximately five years from the signing of the loan agreement in December 1996 through September 2001; however, the time required to make adjustments in the specifications (wells, increased construction of holding ponds, extensions to water channels, etc.) during the construction phase, invited delays in the start of subsequent processes. In consequence, implementation was delayed by fifteen months (25%) and the project was completed in December 2002.

2.2.3 Project Cost

The Asian currency crisis that occurred during the implementation phase of the project caused depreciation in the local currency that exceeded inflation meaning that the total cost of the project in yen amounted to 8,407 million, i.e. 81% of the budgeted figure of 10,359

million yen.

2.3 Effectiveness

2.3.1 Productivity

Although no specific targets were set for fruit productivity at appraisal, in so far as is evidenced by the performance of each of the areas (regencies) visited during the field survey, productivity (yields) at evaluation is broadly in line with the age estimates for the respective areas and can be expected to increase in the future.

Table 3. Productivity of Four Crops in the Seven Regencies Visited (tons/ha)

		2002	2003	2006 target
Salak (snake palm)[5] Magelang, Central Java	Planned	3.63	5.13	5.4
	Actual	3.59	6.22	
Mango Takalar, South Sulawesi	Planned	0.02	0.12	2.0
	Actual	0.02	0.12	
Mango Jeneponto, South Sulawesi	Planned	0.03	0.12	2.2
	Actual	0.08	0.19	
Mango Cirebon, West Java	Planned	-	0.01	0.2
	Actual	-	0.01	
Rambutan Minahasa, North Sulawesi	Planned	0.05	0.35	3.8
	Actual	0.10	0.25	
Citrus Bantaeng, South Sulawesi	Planned	2.43	6.08	19.7
	Actual	10.04	9.92	
Citrus Bulukumba, South Sulawesi	Planned	1.61	4.60	17.5
	Actual	1.94	3.70	

Newly developed plantations and fruit crops

A salak (snake palm) plantation in Magelang, Java Tengah

Salak

A mango plantation in Jeneponto, South Sulawesi

Mango

[5] With the exclusion of salak (Magellan, Java Tengah), other trees are still in the juvenile period of growth and are not yet capable of producing sizeable yields, meaning that much of the fruit is consumed by the farmers.

2.3.2 Harvested Areas

A comparison of national harvested areas and areas developed under the IHDUAP, together with the percentage of the total, is given for fiscal 2003 in the table below[6]. These figures show that the project has served to expand the harvested area of target crops by approximately 4%.

Table 4. Harvested Areas for Indonesia by Crop and Areas Developed under the IHDUAP

Fruit tree	Harvested Area (Nationwide)	Harvested Area (Percentage of the National Harvested Area)	
Citrus	69,139 Ha	6,000 Ha	(8.7)
Mango	158,894 Ha	5,500 Ha	(3.5)
Rambutan	90,928 Ha	1,730 Ha	(1.9)
Durian	53,770 Ha	2,200 Ha	(4.1)
Banana	85,690 Ha	- Ha	(-)
Salak	40,336 Ha	2,000 Ha	(5.0)
Melindjo	17,405 Ha	800 Ha	(4.6)
Passion fruit	3,026 Ha	2,000 Ha	(66.1)
Total	519,188 Ha	20,230 Ha	(3.9)

Source: Directorate General of Horticulture (DGH)

2.4 Impact

2.4.1 Stimulation of the Horticultural Sector

Although the share of real GDP accounted for by the horticultural sector has been small since the currency crisis of the late 1990s (since 2001), it is growing at a faster rate than the total GDP growth accounted for by agriculture, forestry and fisheries industries. This suggests that the sector is contributing to an incremental increase in the diversity of the agriculture, forestry and fisheries sector.

Table 5. Real GDP Growth Rates for the Horticultural Sector

* Percent given in parenthesis represent the share of total GDP (estimated)

Fiscal year	**Horticultural sector**	Agriculture, forestry and fisheries	National (excluding oil and gas)
1997	**1.37 (2.6)**	1.00 (16.1)	5.23
1998	**0.05 (3.0)**	-1.33 (18.5)	-14.22
1999	**1.91 (3.1)**	2.16 (18.7)	1.00
2000	**0.19 (2.9)**	1.88 (18.1)	5.31
2001	**5.69 (3.0)**	1.68 (17.7)	4.20
2002*	**4.20 (3.0)**	2.01 (17.3)	4.09
2003*	**5.16 (3.0)**	2.48 (17.0)	4.60

Note: Growth rates given for 2002 and 2003 are estimates (Central Bureau of Statistics)

2.4.2 Improvements in On-farm Income

The implementation and completion of this project was expected to “raise farmer incomes by increasing the production of high value-added crops, rectify inter-regional disparities and alleviate poverty”. To this end, the changes wrought on the household finances of the farmers were verified through the beneficiary survey[7] (see Figure 1), which revealed that

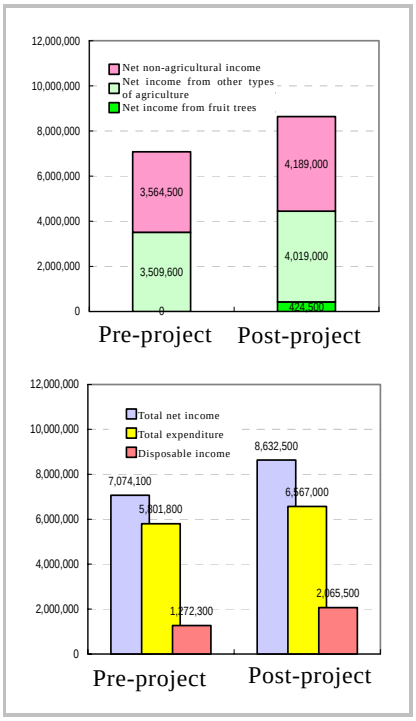
[6] Banana plantations, which have suffered pest damage and are not currently being cultivated, are omitted.
[7] A sample survey comprising fifty farmers per district was conducted.

certain fruit crops are beginning to effect gradual increases in incomes[8].

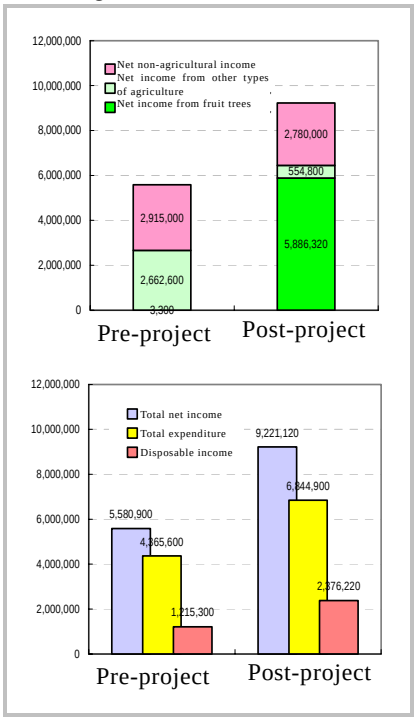
Figure 1. Improvements in On-farm Income evidenced by the results of the Beneficiary Survey (sample average)

Monetary unit: Million Rp./Year/Household

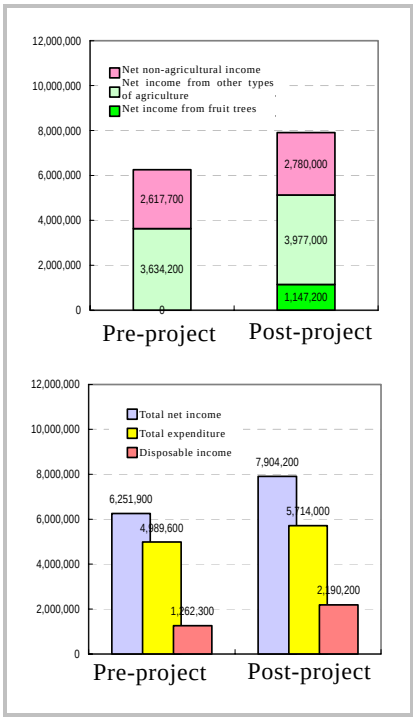
Mango; Jeneponto, South Sulawesi



Salak; Magellan, Central Java



Rambutan; Minahasa, North Sulawesi



Note: Standard prices for 2003

Mango and rambutan trees are still in the juvenile period of growth and much of the fruit harvested is for personal consumption, meaning that revenues generated from these crops remain low. The salak trees being cultivated in Magelang (high-yielding varietals) attained target productivity in 2003, ahead of the initial target, and income from production of this crop accounts for more than 60% of gross earnings. The reason that earnings from target crops are higher than the increase in gross is because farmers have switched to the high-yielding salak varietals that were introduced under this project. In terms of earnings from other crops, in Jeneponto, farmers make money from growing onions and nuts, and from harvesting and selling seaweed. Meanwhile, in Minahasa, earnings are generated from companion (catch) crops, such as sweet corn, oil palm and durian, or from salary-paying jobs, or operating motorbikes/taxis.

According to local government data[9] and information gleaned from hearings conducted with the farmers and at farmer association offices, the following qualitative observations provide some indication of the income increasing effect of the project.

i) Increased ownership of TVs, motorbikes and cars

[8] However, given that current production levels are low as the trees are still in the juvenile period of growth, it is too early to draw any definitive conclusions as to the efficiency of this project or its impact on eliminating regional gaps and alleviating poverty. The impact of the project should ideally be re-evaluated two to three years down the line in conjunction with the series of agricultural development projects, for example.

[9] Socio-Economic Impact Evaluation (March, 2003)

ii) Renovation of existing/construction of new permanent dwellings (see photographs below)
iii) Creation of local jobs by horticulture
iv) Increase in educational spending for children

A traditional house (left) and a newly-constructed house (right) in Banyuadem village, Magelang, Central Java Province (salak plantations)

2.5 Sustainability

As already discussed in "2.2 Efficiency", this project was primarily executed under a system coordinated by the Directorate General of Food Crops and Horticulture (as was), i.e. the central government. Since completion, responsibility for the maintenance and operation of developed plantations has been transferred to farmers' groups. Local governments are positioned to provide technical assistance and guidance to the farmers' groups. The central government, while having lost any direct jurisdiction or responsibility over the project through decentralization, exists to provide technical assistance to local government administrators. The following paragraphs examine the technical capacity, institutional systems and financial status of project proponents in order of the strength of their involvement: i.e. the farmers' groups, followed by local governments and the central government.

2.5.1 Farmer Associations

2.5.1.1 Technical Capacity

Responsibility for maintaining the developed lands post-project belongs to the farmers' groups. While these groups have a degree of technical competence in terms of facilities/equipment maintenance and the cultivation of fruit crops, there is a need to increase knowledge and skill levels in the area of distribution (marketing).

The leader of the farmers' group in Tritilo Village, Bulukumba Regency

2.5.1.2 Operation and Maintenance System

Farmers' groups have been organized in all of

the districts visited during the field survey. Although the style of farmers' groups are somewhere in the middle of the traditional reciprocal help-out style (*gotong-royong* in Indonesian) and a form of systematic control, where necessary, the groups will take appropriate and systematic action (sharing cleaning work, mending fences, etc.) and the work being undertaken is up to standard. In many cases, farmers' groups and water use associations are combined, and in such instances water use charges are collected from members. Farmers deliver their produce to buyers at the plantations or take them directly to market for sale. In some areas, Bulukumba Regency in South Sulawesi Province, for example, the farmers' groups have adopted a proactive stance and developed new sales channels for the citrus fruit they produce and attempting to procure resources without restricted to the local market. These activities merit future attention.

2.5.1.3 Financial Status

Where water distribution facilities and equipment (pumps and water tanks, etc.) that were installed via this project are in good working order, the farmers' groups are levying water use charges on the basis of billing rules[10], but the financial status of the groups varies from region to region.

2.5.2 Local Governments (Regency)

2.5.2.1 Technical Capacity

Since completion of the project the local governments have been providing adequate technical guidance and assistance on facilities maintenance to the farmers' groups, and the technical capacity of local government officials is deemed to be of an appropriate level.

2.5.2.2 Operation and Maintenance System

The regency offices of the DGFC or the DGH are responsible for providing assistance to the farmers' groups. With the systemic changes that resulted from the enforcement of the decentralization laws, many of the technical instructors employed by the central government during the implementation phase of the project (field inspectors: one assigned per 100-ha area) are now working under district government authority. They are treated as local government employees and are continuing with their activities as before.

2.5.2.3 Financial Status

Of the eight fruit crops targeted, those identified as being key crops by the Directorate General of Horticulture (DGH), i.e. mango, citrus, banana and durian, receive, where

[10] The various farmers' groups have established their own rules that comprise fixed charges, metered charges, and amounts individuals are willing to pay.

necessary, financial support from the central government (for facilities/equipment repair, procuring saplings, etc.). By contrast, passion fruit, salak (snake palm), rambutan and melindjo, which are not included in the above list, currently receive no support from the central, and any assistance is limited to the technical guidance provided by the local (regency) governments.

2.5.3 Central Government (DGH)

2.5.3.1 Technical Capacity

Since the project was completed, technical assistance has been extended to the local governments on an as-needs basis (pest control, etc.), and the competence of the central government is deemed to be of an appropriate level.

2.5.3.2 Operation and Maintenance System

The current system for providing technical and financial assistance for key crops is adequate. Ad hoc support is also being provided when pest outbreaks occur. Although it was stated at appraisal that "since small farm holdings are scattered across the nation, (the central government) will need to monitor project implementation status on a continuous basis", under the decentralized system, the Ministry of Agriculture no longer has direct authority or responsibility over monitoring activities. In consequence, the Ministry of Agriculture does not currently have a system for ascertaining the overall performance of the project.

2.5.3.3 Financial Status

The central government extends financial support as necessary (for facilities/equipment repair, procuring saplings, etc.) to the four key groups, but is providing nothing in respect of the other four fruit varieties (passion fruit, salak, rambutan, and melindjo).

2.5.4 Current Operation and Maintenance Status

There was evidence of equipment breakage/damage to pump irrigation systems in places[11]. Equipment needs to be repaired and/or replaced as necessary and the technical training given to farmers followed up on. In some cases, water from wells, pumps and storage tanks for watering the plantations is being used for domestic purposes. In such instances, each household is being charged a certain amount for using the water and the funds collected are being used for maintenance[12]. Water for domestic use is distributed via the fruit farmer

[11] It has been observed sporadically in the mango plantations of South Sulawesi.

[12] In the village of Malasolo, Bangkara, Jeneponto, for example, each household is charged a fixed rate of Rp. 5,000/month. In the village of Ceranming, Bontotiro, Burukumba, water gauges have been installed in each of the households and users are charged Rp. 1,500/m^3 (approximately half the rate charged by the local water

group (FGG) and water use association (P3A) system[13].

3. Feedback

3.1 Lessons Learned (None)

3.2 Recommendations

[To the Ministry of Agriculture] To further stimulate the horticultural sector, the Ministry of Agriculture is advised to enhance the cooperation of local governments in actively providing farmers with the opportunity to show their products by, for example, holding regular trade fairs, or nationwide contests for the farmers' groups on good performance. It is hoped that this will give farmers the incentive to get involved in cultivating horticultural crops and that it will further increase motivation.

board), while in Tritilo villagers are charged Rp. 3,500/m^3.

[13] Observed in Jeneponto, Burukumba and Bantaeng, in South Sulawesi Province.

Comparison of Original and Actual Scope

Item	Planned	Actual
(1) Outputs	i) Infrastructure for horticultural farming (roads, drainage channels, irrigation, wells, etc.) ii) Supply of saplings, etc. iii) Technical training iv) Consulting services 420M/M	i)-iii) were executed as planned With iv) the monitoring work required for the SPL that was being executed simultaneously was added into the consulting services for the IHDUAP
(2) Project period -L/A -Consultant selection -Consulting services -Surveys/design -Basic infrastructure -Sapling adjustment -Technical training -Institutional development -Project completion	Dec. 1996 – Sept. 2001 December 1996 Mar. 1996 – Oct. 1997 Apr. 1997 – Sept. 2001 Apr. 1997 – Aug. 1997 Oct. 1997 – Sept. 1998 Feb. 1997 – Nov. 1997 Feb. 1998 – Nov. 1998 Jul. 1997 – Dec. 1999 Jan. 1997 – Sept. 2001 September 2001 (58 months)	Dec. 1996 – Dec. 2002 December 1996 Mar. 1996 – Oct. 1997 Jan. 1997 – Dec. 2002 Same as left May 1997 – Nov. 2002 May 1997 – Nov. 2002 Jan. 1997 – Dec. 2002 Jan. 1997 – Dec. 2002 December 2002 (73 months)
(3) Project cost Foreign currency Local currency Total ODA loan portion Exchange rate	 329 million yen 10,030 million yen (Rp. 218,056 million) 10,359 million yen 7,769 million yen Rp. 1 = 0.046 yen (April 1996)	 740 million yen 7,730 million yen (Rp. 350,158 million) 8,470 million yen 4,612 million yen Rp. 1 = 0.022 yen (1996-2002 average)