



Completion Report

Project Number: 27357
Loan Number: 1469
October 2008

Indonesia: Integrated Pest Management for Smallholder Estate Crops Project

CURRENCY EQUIVALENTS

Currency Unit – Indonesian Rupiah

		At Appraisal (1 September 1996)	At Project Completion (30 April 2008)
Rp1.00		\$0.00048	\$0.00011
\$1.00	=	Rp2,341	Rp8,785

ABBREVIATIONS

AARD	–	Agency for Agricultural Research and Development
ADB	–	Asian Development Bank
AFERD	–	Agency for Forestry and Estate Crop Research and Development
AIAT	–	Assessment Institute for Agricultural Technology
BAPPENAS	–	Badan Perencanaan Pembangunan Nasional (National Development Planning Board)
CAQ	–	Center for Agricultural Quarantine
DGE	–	Directorate General of Estate Crops
DIP	–	Daftar Isian Proyek (Annual Budget)
DSC	–	development support communication
EA	–	executing agency
EIRR	–	economic internal rate of return
FFS	–	farmers field schools
FIRR	–	financial internal rate of return
GDP	–	gross domestic product
Ha	–	hectare
IAARD	–	Indonesian Agency for Agricultural Research and Development
IBRD	–	International Bank for Reconstruction and Development
IDC	–	interest during construction
IPM	–	integrated pest management
IPM-SECP	–	Integrated Pest Management for Smallholders' Estate Crops Project
Kg	–	Kilogram
MTR	–	mid-term review
MUV	–	Manufactures Unit Value
M&E	–	monitoring and evaluation
NPCT	–	National Project Coordination Team
OCR	–	ordinary capital resources
PDATP	–	Participatory Development of Agricultural Technology
PCR	–	project completion report
Pimbagpros	–	Pemimpin Bagian Proyek (provincial project managers)
Pimpro	–	Pemimpin Proyek (national project manager)
PL1	–	Pemandu Lapangan 1 (Level 1 Field Leaders, Master trainers)
PL2	–	Pemandu Lapangan 2 (Level 2 Field Leaders, FFS facilitators)
SECP	–	Smallholders' Estate Crops Project
TA	–	technical assistance
WTO	–	World Trade Organization

NOTE

In this report, "\$" refers to US dollars.

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BASIC DATA

A. Loan Identification

1.	Country	Indonesia
2.	Loan Number	1469
3.	Project Title	Integrated Pest Management for Smallholder Estate Crops Project
4.	Borrower	Republic of Indonesia
5.	Executing Agency	Directorate General of Estate Crops
6.	Amount of Loan	\$44 million Original Loan Amount: \$44 million Net Loan Amount: \$32.884 million
7.	Project Completion Report Number	1066

B. Loan Data

1.	Appraisal	
	– Date Started	11 June 1996
	– Date Completed	18 June 1996
2.	Loan Negotiations	
	– Date Started	26 August 1996
	– Date Completed	29 August 1996
3.	Date of Board Approval	26 September 1996
4.	Date of Loan Agreement	6 November 1996
5.	Date of Loan Effectiveness	
	– In Loan Agreement	7 January 1997
	– Actual	1 April 1997
	– Number of Extensions	1
6.	Closing Date	
	– In Loan Agreement	30 September 2004
	– Actual	30 April 2006
	– Number of Extensions	2
7.	Terms of Loan	
	– Interest Rate	Variable and Libor-based (floating) ^a
	– Commitment Charge	0.75% per annum on staggered basis
	– Maturity (number of years)	25 years
	– Grace Period (number of years)	7 years

^a The undisbursed balance of the Loan was transformed to Libor-based Loan on 15 December 2002.

8. Disbursements

a. Dates

Initial Disbursement	Final Disbursement	Time Interval
15 February 1997	19 September 2006	9 years, 7 months
Effective Date	Original Closing Date	Time Interval
7 January 1997	30 September 2004	7 years, 8 months

b. Amount (\$)

Category	Original Allocation	Restated Allocation (Dec 2002)	Last Revised Allocation	Amount Cancelled^a	Amount Disbursed
01 Civil Works	425,000	298,000	301,187	123,813	301,187
02 Vehicle, Equipment, Materials					
02A Vehicles	2,307,000	2,307,000	2,965,350	(658,350)	2,965,350
02B Major Laboratory & Office Equipment	1,400,000	1,400,000	2,485,114	(1,085,114)	2,485,114
02C Minor Equipment & Materials	1,352,000	947,000	310,876	1,041,124	310,876
02D Materials for Crop Diversification	4,235,000	2,965,000	0	4,235,000	0
03 Training					0
03A International Training	2,718,000	2,718,000	2,240,796	477,204	2,240,796
03B Local Training	6,640,000	4,648,000	7,060,110	(420,110)	7,060,110
04 Research, Studies & Publicity					
04A Research & Studies	3,021,000	2,115,000	455,881	2,565,119	455,881
04B Publicity	1,156,000	1,156,000	1,106,649	49,351	1,106,649
05 Consulting Services	6,502,000	6,502,000	5,161,036	1,340,964	5,161,036
06 Incremental Operation & Maintenance	2,987,000	2,091,000	838,017	2,148,983	838,017
07 Interest and Commitment Charge	9,943,000	8,900,000	7,580,000	2,363,000	7,580,000
08 Unallocated	1,314,000	4,112,000	0	1,314,000	0
09 Tsunami Assistance			2,379,348	(2,379,348)	2,379,348
Total	44,000,000	40,159,000	32,884,364	11,115,636	32,884,362

^aCancellations were: \$3.841 million on 16 Jul 1998, \$1.96 million on 17 Nov 2003, and \$2.5 million on 26 Apr 2006. Final cancellation of \$2.82 million was done on 19 Sep 2006.

Source: Loan Financial Information System.

9. Local Costs (Financed)

- Amount (\$'000)	10,308.24
- Percent of Local Costs	35.52%
- Percent of Total Cost	19.98%

C. Project Data

1. Project Cost (\$'000)

Cost	Appraisal Estimate	Actual
Foreign Exchange Cost	32,900	22,576
Local Currency Cost	46,700	29,017
Total	79,600	51,593

2. Financing Plan (\$'000)

Cost	Appraisal Estimate	Actual
Implementation Costs		
Borrower Financed	35,600	18,709
ADB Financed	34,100	25,304
Total	69,700	44,013
IDC Costs		
Borrower Financed		
ADB Financed	9,900	7,580
Total	79,600	51,593

ADB = Asian Development Bank, IDC = interest during construction.

3. Cost Breakdown by Project Component (\$'000)

Component	Appraisal Estimate	Actual
A. Capacity Building for IPM	46,300	33,242
B. IPM Research Program	6,500	2,723
C. Project Support and Coordination	6,600	5,669
Total Baseline Costs	59,400	41,634
Physical Contingencies	2,500	
Price Contingencies	7,800	
Tsunami Assistance		2,379
Total Project Costs	69,700	44,013
Interest During Construction and Commitment Charges	9,900	7,580
Total Costs	79,600	51,593

IPM = integrated pest management.

4. Project Schedule

Item	Appraisal Estimate	Actual
Date of Contract with Consultants	15 July 1997	16 December 1997
Date of Fielding of Consultants	30 August 1997	April 1998
Start of Operations	September 1997	16 December 1997
Civil Works Contract		
Date of Award	Q4 1997	Q1 1999
Completion of Work	-	Q1 2006
Vehicles		
First Procurement	Q4 1997	Q1 1998
Last Procurement	-	Q2 2005
Equipment and Supplies		
First Procurement	Q4 1997	Q1 1998
Last Procurement	-	Q1 2006
Completion of Equipment Installation		

Other Milestones

1. Partial Cancellations		
a. First: 16 July 1998		\$3,841,000.00
b. Second: 17 November 2003		1,959,000.00
c. Third: 26 April 2006		2,500,000.00
d. Fourth: 19 September 2006		2,815,637.63
2. Final Cancellation of Undisbursed Loan Balance		19 September 2006
3. Processing Adaption Phase Evaluation with Mid-term Review	Q4 2000 Q1 2001	Q4 2000 Q1 2001
4. Training Expansion Phase Start-up		2005
5. First loan closing date extension		November 2005
6. Second loan closing date extension		June 1998
7. First application of loan reduction		25 February 2004
8. Second application of loan reduction		8 April 2005
9. Fund reallocation for tsunami activities		

5. Project Performance Report Ratings

Implementation Period	Ratings	
	Development Objectives	Implementation Progress
From 1 January to 31 December 1998	Satisfactory (DO)	Satisfactory
From 1 January to 31 December 1999	Satisfactory (DO)	Satisfactory
From 1 January to 31 December 2000	Satisfactory (DO)	Satisfactory
From 1 January to 31 December 2001	Satisfactory	Satisfactory
From 1 January to 31 December 2002	Partly Satisfactory	Satisfactory
From 1 January to 30 September 2003	Partly Satisfactory	Satisfactory
From 1 October to 31 December 2003	Satisfactory	Satisfactory
From 1 January to 31 December 2004	Satisfactory	Satisfactory
From 1 January to 31 December 2005	Satisfactory	Satisfactory
From 1 January to 31 December 2006	Satisfactory	Satisfactory

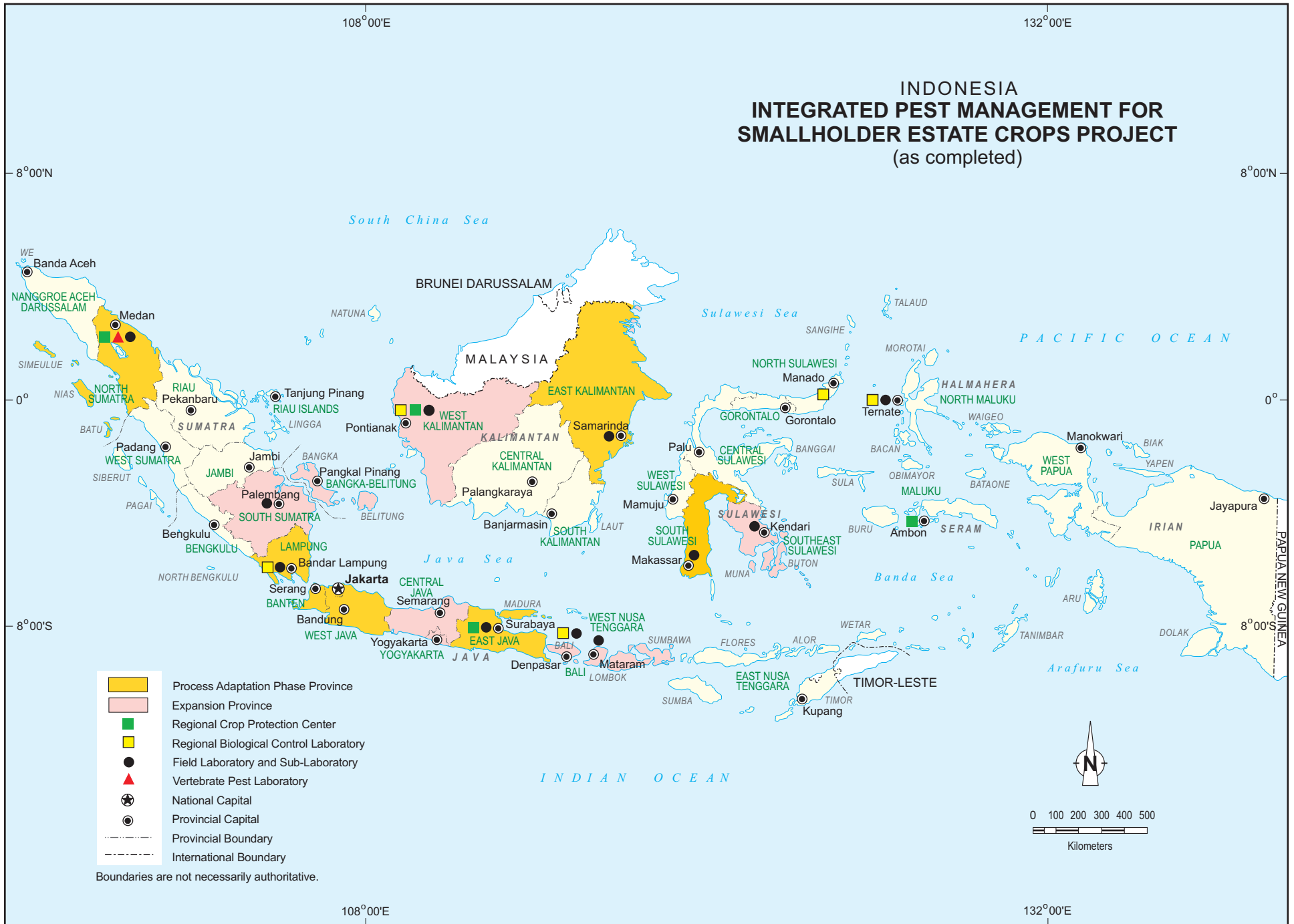
D. Data on Asian Development Bank Missions

Name of Mission	Date	No. of Persons	No. of Person-Days	Specialization of Members ^a
Fact Finding Mission	26 Feb–15 Mar 1996	6	114	a,h,l,m,p,o
Appraisal Mission	11–28 Jun 1996	4	72	a,h,n,o
Inception Mission	17–22 Feb 1997	2	12	a,c
Review Mission 1	24 Nov–12 Dec 1997	2	38	a,c
Review Mission 2	7–25 Sep 1999	2	38	a,d
Midterm Review Mission	2–20 Oct 2000	3	57	b,d,e
Special Project Administration Mission	11–13 Dec 2001	1	3	f
Review Mission 3	26 Aug–4 Sep 2002	1	9	g
Review Mission 4	21 May–5 Jun 2003	3	48	h,i,d
Review Mission 5	1–5 Dec 2003	1	5	h
Review Mission 6	2–12 Nov 2004	2	22	h,j
Consultation Mission for Tsunami Emergency Support	6–18 Feb 2005	1	13	h
Project Completion Review Mission ^b	21 Apr–2 May 2008	3	36	k,d,l

^a a = senior agronomist, b = project administration unit head, c = senior assistant, d = assistant project analyst, e = integrated pest management specialist (consultant), f = senior project engineer, g = rural development specialist, h = project economist, i = principal project specialist, j = associate project analyst, k = environmental engineer, l = agricultural economist (consultant), m = manager, n = counsel, o = programs officer, p = FAO-IC senior economist.

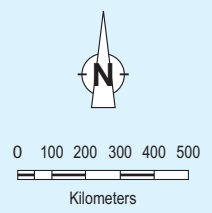
^b The project completion review mission comprised M. Nasimul Islam, environmental engineer (mission leader); E. Tayao-Castro, assistant project analyst; and B. Tan, agricultural economist (staff consultant).

INDONESIA INTEGRATED PEST MANAGEMENT FOR SMALLHOLDER ESTATE CROPS PROJECT (as completed)



- Process Adaptation Phase Province
- Expansion Province
- Regional Crop Protection Center
- Regional Biological Control Laboratory
- Field Laboratory and Sub-Laboratory
- ▲
 Vertebrate Pest Laboratory
- ★
 National Capital
- Provincial Capital
- Provincial Boundary
- International Boundary

Boundaries are not necessarily authoritative.



I. PROJECT DESCRIPTION

1. Smallholder estate crop farms in Indonesia cover over 13 million hectares (ha) and employ about 12 million farmers. They contribute 2.5% to the gross domestic product (GDP), employ 30% of the labor force, and account for 50% of agricultural exports and 18% of all non-oil exports. The productivity of these smallholder producers has remained low and stagnant because many holdings comprise old trees with severe pest infestation. To reduce huge productivity losses due to pest infestation, the Government of Indonesia initiated various efforts through the Directorate General of Estate Crops (DGE) to expand the adoption of integrated pest management (IPM) practices in smallholder estate crop farms. This Project was seen as part of a broader effort to promote a sustainable system of agricultural production and to raise the incomes of smallholder estate crop farmers who suffer considerable yield losses caused by pests, diseases, and poor agronomic practices. The Project promoted the adoption of cost-effective, environmentally-sound IPM practices by smallholder estate crop farmers by strengthening selected Government agencies and farmer groups. Smallholder production was intensified through an integrated farm management approach, instead of depending purely on pesticides. The Project is consistent with the Asian Development Bank's (ADB) strategy for developing the Indonesian agriculture sector in a sustainable and environmentally-friendly manner, while at the same time raising farm incomes and reducing the incidence of rural poverty.

2. The Project was approved in September 1996, became effective in April 1997, and closed in April 2006. The expected outcome of the Project was to promote the adoption of cost-effective, environmentally-sound IPM practices by smallholder estate crop farmers by strengthening selected government institutions and farmer groups. The expected outcome of the Project was to be achieved through widespread adoption of IPM practices by trained smallholder estate crop farmers as a result of the increased institutional training capability of government agencies and farmer groups. The Project aimed to streamline the responsibilities of the crop protection institutions and improve the institutional linkages between crop protection services, agricultural research, and plant quarantine. Agricultural research capacity was to be strengthened, and support for farmer-driven research was to be institutionalized to channel farmers' pest-related problems to the provincial and national research programs. The plant quarantine services were to be made more efficient through a streamlined organization with improved staff skills. The Project aimed to ensure the country's continued access to major export markets, thus protecting a major foreign exchange-earning industry.

3. The Project consisted of three parts: Part A - Capacity Building for IPM, which provided specialized training to farmers, extension workers, and plant quarantine staff to meet farmers' needs (including farming systems diversification) and upgrade national plant quarantine standards; Part B - IPM Research Program, which provided IPM solutions and strengthened feedback linkages between farmers, researchers, and crop protection services; and Part C - Project Management Support, which provided effective, decentralized, and responsive management of project investments and services. The Project's achievements in accordance with its design and monitoring framework are given in Appendix 1.

II. EVALUATION OF DESIGN AND IMPLEMENTATION

A. Relevance of Design and Formulation

4. The Project provided training (Appendix 2 – Summary of Training Activities) to over 122,600 farmers through farmers field schools (FFS). The training involved season-long (from 20

to 22 weeks), field-based learning for groups of 20 to 25 farmers. These groups were introduced to four principles of FFS, including (i) growing a healthy crop, (ii) conserving natural enemies, (iii) conducting regular field observations, and (iv) adopting sustainable IPM practices. The Project focused on six crops located in 13 provinces: coffee, cocoa, tea, pepper, cotton, and cashew nut; in the provinces of East Java, Central Java, West Java, Bali, North Sumatra, South Sumatra, East Kalimantan, West Kalimantan, Southeast Sulawesi, South Sulawesi, Lampung, Bangka-Belitung, and West Nusa Tenggara.

5. The Project provided support for strengthening the capabilities and skills of staff and personnel of four regional estate crop protection centers, six regional biological control laboratories, a pesticide analysis laboratory, selected field laboratories and biological sub-laboratories, and smallholder intensification teams. Staff in these centers participated in various training programs, including enrollment in degree courses, both local and overseas. Plant quarantine staffs were trained in basic quarantine procedures to improve their ability to intercept, identify, and eliminate quarantine organisms; and strengthen their capacity for the level of quality control needed to meet the new requirements prescribed under World Trade Organization (WTO) agreements.

6. IPM facilities at national and provincial levels were upgraded to improve services and facilitate a speedy response from the regional biological control laboratory, field leader, smallholder intensification team, and pesticides analysis laboratory. Facilities at the Center for Agricultural Quarantine (CAQ) were also upgraded and 32 selected plant quarantine laboratories were rehabilitated to enable them to function effectively at an international standard.

7. Research activities were supported at three levels: (i) at the national level by addressing the problems identified at the provincial and local levels, including improvements in pest and disease resistance seeds and planting materials, biological control agent identification and development, management of soil-borne microorganisms, and understanding of crop and pest ecology; (ii) at the provincial level by supporting an adaptive IPM research program for testing off-the-shelf technology focusing on problems identified by farmers; and (iii) at the farm level by assisting farmer-driven IPM research aimed at strengthening the linkages between farmers and research and crop protection extension staff.

8. The Project was consistent with 1994 Ministerial Decree No. 390 that established the modalities for implementation of the national IPM program, and defined IPM as "the management of the population or level of infestation of organisms harmful to plant growth through the management techniques applied in an integrated manner in order to prevent economic loss and damage to the environment."¹ The Government viewed the Project as part of the broader effort to promote a more sustainable system of agricultural production, which was also an objective supported by ADB.

9. The project preparatory technical assistance² recommendations were not feasible with respect to: (i) cotton as one of the featured crops even though the planted area was less than 10,000 ha and cotton's production cost was lower than the import prices; and (ii) crop

¹ This decree spelt out implementation modalities for the Government Act No. 12 of 1992 on the Plant Cultivation System which declared use of IPM as a national policy.

² TA No. 2154-INO: Second National Estate Crop Protection Project carried out by the Food and Agriculture Organization (FAO).

diversification as a component of the Project since most of the participating farmers were already practicing this farming system.

B. Project Outputs

1. Part A: Capacity Building for IPM

10. This component strengthened the country's estate crop protection services to meet the needs of smallholders and improve the efficiency and effectiveness of plant quarantine services.

11. **Human Resource Development.** The Project trained and equipped 1,016 field leaders, including 239 farmer–trainers that participated in the FFS training program. In addition, the Project conducted six refresher courses for 185 field leaders, who in turn transmitted their newly-acquired knowledge to other field leaders in their respective areas and/or provinces. Training was also provided for 332 DGE staff, which included 11 staff who were sent for overseas degree training and another 4 staff who were sent for local degree training. Another 427 staff received hands-on training in biological control laboratories and another 262 staff, 7 of whom were sent abroad for degree courses, received training in plant quarantine. A total of 122,610 farmers were trained in FFS as compared to appraisal target of 106,000. The total number of women participants was 20,235 as compared to the appraisal target of 10,600. The trained farmers were organized into 5,000 farmer groups.

12. As a result of these trainings, 186 farmer groups are now engaged in biological control agent production. During the period from 1997 to 2005, these farmers produced more than 85 tons of biological control agents. More than 600 farmer groups participated in farmer-driven research during the later years of project implementation when this program was transferred from the Indonesian Agency for Agricultural Research and Development (IAARD) to DGE. About 500 farmer groups established community nurseries by utilizing part of the honorarium they received when they attended the FFS.

13. **Upgrading of IPM Facilities.** All civil works related to IPM facilities were completed satisfactorily. New construction and/or rehabilitation of regional research centers and laboratories were completed in accordance with the plans at appraisal. Facilities, equipment, and vehicles were procured on schedule to ensure effective and smooth project implementation.

14. **IPM Support Services.** The development support communication unit was established and made operational. Two IPM websites were developed and they currently remain functional.³ Public awareness materials (e.g., IPM handbooks, pamphlets, and CD-ROMs) were printed and used for trainings and workshops, and IPM public awareness information was broadcast on national television channels and radio. Plant quarantine departments conducted several campaigns for various groups and organizations to increase public awareness and promote better understanding of plant quarantine regulations. The computer-based information system on pests and quarantine regulations are updated regularly.

15. **IPM Research.** Except for farmer-driven research, other types of research programs fell short of the targets set at appraisal: (i) at the national level, 73 national long-term research studies were conducted as compared to the appraisal target of 84 studies; and (ii) at the provincial level, 58 studies were completed as compared to the appraisal target of 112. In

³ www.deptan.go.id and www.litbang.go.id.

general, at the initial stage of project implementation, the research conducted under this component was not completely aligned with farmer needs and priorities. The situation was corrected later in the Project when this responsibility was transferred to DGE from IAARD.

16. **Project Management Support.** Project monitoring and evaluation (M&E) system, project benefit estimation and a focused communications support system was not very effective during initial periods of project implementation. The recommendation to integrate the Project's M&E with the Ministry of Agriculture's M&E, as has been the case with other ADB projects, was not completely implemented. The policy study on cotton was undertaken, but the studies for sugar and pesticide were not conducted. The coordination teams at the national, provincial, and district levels could have been more effective and public awareness activities related to health and environmental issues could have been pursued more rigorously.

C. Project Costs

17. At appraisal the Project's cost was estimated at \$79.6 million, comprising \$32.9 million in foreign exchange and \$46.7 million in local currency. ADB financed \$44 million from its ordinary capital resources (OCR), comprising \$32.9 million in foreign exchange, and \$11.1 million in local costs. The Government's contribution was \$32.1 million for local costs and the farmers' contribution in labor was \$3.5 million. At official closing of the loan account, project expenditures totaled \$48.3 million (with the ADB portion at \$32.9 million). The Government contributed local currency costs equivalent to \$15.5 million. The farmer's contribution in the form of labor was \$3.26 million at loan closing date (Appendix 3 – Actual Yearly Expenditures).

18. There were loan savings amounting to \$3.84 million in the aftermath of the Asian financial crisis in 1997. As a result, on 16 July 1998, there was a partial loan cancellation amounting to \$3.84 million. However, related to these loan cancellations, in 2004, funds of \$5.98 million had to be transferred to increase budget allocations for purchasing vehicles; major laboratory and office equipment; and for local training activities. A sum amounting to \$2.5 million was reallocated for tsunami-related activities beginning in March 2005. The total loan disbursement at loan closing was \$32.9 million (Appendix 4 – Expenditure Accounts by Financier).

D. Disbursements

19. As of the loan closing date of 19 September 2006, the cumulative contract awards amounted to \$25.3 million, while the corresponding cumulative disbursements amounted to \$32.9 million, representing 77% and 100% of the net loan amount, respectively. Out of a total disbursement of \$32.9 million, \$2.38 million was disbursed under the Project's tsunami component. Loan disbursements reached their peak during 2003, when total disbursements amounted to \$6.76 million. Disbursements were also significant between the years 2004 and 2006 (Appendix 5 – ADB Annual Loan Disbursements). Four partial loan cancellations were effected as follows: (i) on 16 July 1998 amounting to \$3.84 million; (ii) on 17 November 2003 amounting to \$1.96 million; (iii) on 26 April 2006 amounting to \$2.5 million; and (iv) on 19 September 2006 amounting to \$2.82 million. At loan closing, the total loan cancellations amounted to \$11.1 million. In 1998 and 1999, the low disbursement levels of \$1.45 million and \$1.80 million, respectively, were related to late and inadequate counterpart funding. The timely availability of counterpart funding improved beginning in 2003, leading to subsequent improvements in the Project's financial and physical progress.

20. Based on findings of audited financial statements, the required documents were submitted to ADB properly and on time related to claims for reimbursement of expenditures incurred under the Loan. As of 30 September 2006, the OCR loan achieved an imprest fund turnover ratio of 2.21, which represented a satisfactory level of utilization of the imprest fund account.

E. Project Schedule

21. The Project was scheduled for completion on 31 March 2004 and the original loan closing date was 30 September 2004. There were two loan extensions during the Project. In the wake of the Asian financial crisis and the resulting devaluation of Indonesian Rupiah (Rp), the loan amount was reduced to \$40.2 million on 16 July 1998. In January 2004, ADB approved the Government's request for: (i) minor change in scope; (ii) an extension of the loan closing date by 15 months to 31 December 2005; and (iii) a partial cancellation of \$2.0 million, which reduced the loan size to \$38.2 million. In March 2005, a portion of the loan was reprogrammed to undertake rehabilitation and reconstruction work in tsunami- and earthquake-affected areas in Nanggroe Aceh Darussalam (NAD) province. The activities under the re-programmed component included: (i) rehabilitation of key buildings and infrastructure; (ii) revival of farming activities; and (iii) implementation support.

22. Appendix 6 shows the project implementation schedule. The first phase (process adaptation) was conducted over 4 years from 1997 to 2000. This phase trained government service personnel and farmers the practices related to implementation of IPM through the use of location- and commodity-specific training curricula. These curricula were developed through iterative processes that involved extensive discussions with stakeholders, needs assessment surveys, workshops, study visits, and actual pre-testing. The project adaptation phase covered five provinces and five commodities: tea for West Java, coffee for East Java, cocoa for North Sumatra, pepper for Lampung, and cotton for South Sulawesi.

23. The second phase (training expansion) began in 2001 and expanded the FFS program based on the IPM processes, strategies and institutional capacity established in the project adaptation phase. Eight additional provinces were covered: Central Java (coffee), Southeast Sulawesi (cocoa), Bali (coffee), West Nusa Tenggara (cashew), West Kalimantan (pepper), East Kalimantan (cocoa), Bangka-Belitung (pepper), South Sumatra (pepper and coffee after Bangka-Belitung was established as a new province in 2002). Cotton IPM was not continued in the training expansion phase since: (i) there were only limited cotton-producing areas in either West Nusa Tenggara or Central Java; (ii) the cotton FFS-IPM in South Sulawesi was weak; (iii) cotton was primarily grown under a contract system; and (iv) cotton was withdrawn from the list of priority crops since it did not have a comparative advantage. Cotton was replaced with cashew in West Nusa Tenggara and coffee in Central Java.

F. Implementation Arrangements

24. DGE was the executing agency (EA) and had overall responsibility for project implementation, coordination, and supervision. DGE was specifically tasked to handle the implementation of the capacity-building component, while supervising and coordinating the implementation of the other components. CAQ, as the implementing agency, was responsible for the capacity-building component of plant quarantine offices and laboratories. IAARD was the implementing agency charged with the IPM research program component. DGE was assisted by the Provincial Estate Crop Services and CAQ was assisted by 37 plant quarantine field laboratories. IAARD was assisted by the provincial offices of the Assessment Institute for

Agricultural Technology (AIAT). The coordination between these agencies was less effective because information was not readily shared amongst them and each agency had a different understanding regarding particular project activity goals (e.g., farmer-driven research). Also, the coordination meetings were conducted less frequently.

25. DGE chaired the National Project Coordination Team (NPCT). The Ministry of Agriculture designated the Director of Estate Crop Protection as the National Project Director and as the Secretary of the NPCT, and appointed: (i) national project managers (*Pimpro*) for DGE, IAARD, and CAQ to oversee the implementation of their respective components; and (ii) provincial project managers (*Pimbagpros*) for each project province to manage the IPM activities at the provincial level (Appendix 7 - Organization Chart).

26. The NPCT established the overall policy of the project and had the key management role in providing effective project coordination between the various government agencies at the national level. NPCT members included representatives from DGE, IAARD, CAQ, the National Development Planning Agency (BAPPENAS), Ministry of Finance, Ministry of Environment, district development and enforcement authorities, pesticide commissions, and private commodity associations. The NPCT was expected to meet monthly, particularly during the initial phase of the Project. The National Crop Protection Commission advised the NPCT on policy matters and procedures related to crop protection. The NPCT also received technical assistance (TA) from the National Support Team, comprising 12 international and 4 domestic TA consultants working on different project components. The implementation arrangements were in line with the proposal as set out at appraisal. However, frequent changes in DGE project directors and staff, infrequent coordination meetings, infrequent coordination between implementing agencies, changed conditions due to promulgation of 1999 decentralization laws⁴ all combined together resulting in less stronger levels of project coordination, monitoring and evaluation, and these situations had somewhat impacted better levels of implementation effectiveness during the initial period of the Project.

G. Conditions and Covenants

27. Compliance with loan covenants was generally satisfactory (Appendix 8). Compliance with the submission of statements of audited project accounts was satisfactory. The Loan Agreement included a specific covenant regarding recovery from farmers, the costs for production of biological control agents. The loan covenant (Loan Agreement, Schedule 6, Paragraph 16) specified full cost recovery by the end of sixth year of project implementation. This particular covenant was not complied with on-time. Prior to 2004, existing legislation did not allow field laboratories to charge farmers for the sale of its biological control agents. With the subsequent change in policy, DGE was able to recover from farmers its production costs for biological control agents sold to the private sector. The collected funds from the sale were channeled to the Ministry of Finance, which returned 69% of this amount to the provinces. Many provinces were able to provide additional operating funds from their annual budget, but funds for replacing equipment has been lacking. The benefit monitoring and evaluation system (Loan Agreement Schedule 6, Paragraph 17) was not completely operational during the initial period of project implementation and had scant information on environment, health, economic, and social parameters. This shortcoming could be attributed to somewhat lesser priority accorded by the executive agency on BME activities.

⁴ Regional Autonomy Law No. 22/1999 and Fiscal Autonomy Law No. 25/1999.

H. Consultant Recruitment and Procurement

28. The longer-than-anticipated time needed for recruiting project consultants had delayed project activities by one year. This delay was due to inability of the Government in adhering to the recruitment timetable as was indicated in the project administration memorandum. The recruitment process was due to start in February 1997, but government regulation did not allow any preparatory activities before the official project starting date and the local budget appropriation was only available in July of that same year. The Government and ADB's procedures for selection, approval, and award of the project implementation contract to the consortium firm took longer than was originally envisaged. The consultant team leader came on board in May 1998, more than one year after the start of the Project. Overall, the consultants' deployment schedules during project implementation could have been more timely.

I. Performance of Consultants, Contractors, and Suppliers

29. Consulting services (Appendix 9) were required for a wide range of activities to achieve the goals of the Project. A total of 242 person-months of international consultant services were utilized as compared to 267 person-months anticipated at appraisal. Services of some short-term consultants were deemed unnecessary as their proposed tasks were covered by the related longer-term consultant (e.g. the IPM curriculum reviewer was replaced by the curriculum development specialist, and the estate crop specialist was replaced by the tree crop agronomist). The mid-term review (MTR) mission concluded that the engagement of a large group of short-term international consultants was not cost effective. The local consultant inputs, on the other hand, were higher than what was originally planned: 1,070 person-months of local consulting services were utilized as compared to 821 person-months planned at appraisal. This increase was deemed necessary because more local consultants were needed to work with farmers and farmer groups.

30. The international consultants input was less than what was projected at appraisal (Appendix 9) and this was partly related to delays in recruitment and a shortfall in the budget that delayed some planned activities. Also, timely deployment of these consultants was also delayed. Due to intermittent nature of their deployment schedule, the consultants needed time to familiarize themselves with ongoing activities before any significant progress in their respective tasks were achieved.

31. The consultants provided limited focus related to sustainability aspects of the project. For example, the international M&E specialist failed to deliver an efficient M&E framework that could easily be understood and efficiently be used by the farmers or the provincial trainers. This situation led to the decision of reducing the services of the international M&E specialist and delayed the timely establishment and operation of project's M&E information management system. Also IAARD replaced the international pest monitoring specialist by an international pest ecologist. Although somewhat falling short of their original work plan targets, the consultant team was able to provide adequate technical and project management support for successful completion of the Project. The overall performance of the consultants is rated as partly satisfactory.

32. The contractors for civil works performed well and finished their work on time. The contracts were awarded through local competitive bidding, and no failure or penalties for delays in finishing the required construction were reported. The procurement of laboratory equipment was delayed. The delay was due to the preparation time needed for detailed specifications and

a lengthy procurement procedure. There were no major delays in procuring other equipment, furniture, and material supplies.

J. Performance of the Borrower and the Executing Agency

33. The Government (the Borrower) performed satisfactorily in complying with ADB's reporting requirements related to utilization of loan proceeds. The Government likewise established the necessary imprest accounts.

34. DGE performed satisfactorily as the EA for the Project, although they faced many challenges. The challenges include the task of implementing a broad scope of project activities, coordination of numerous agencies involved during implementation and the added complexity that the new decentralization law introduced into the project implementation.

35. There was limited oversight monitoring by DGE for activities tasked under CAQ. The objectives of the quarantine component was to strengthen the plant quarantine service in Indonesia and to: (i) protect Indonesia from invasion by quarantined organisms; (ii) limit the spread of pests that do not yet had a wide distribution within Indonesia; (iii) facilitate the export of agricultural commodities by meeting the quarantine demands and/or food safety standards of importing countries; and (iv) harmonize Indonesian plant quarantine legislation with international standards. Controlling the spread of major pests and diseases, such as the cocoa pod borer and citrus greening disease, was outside the purview of CAQ, which only had the mandate to prevent new diseases entering the country. The limited CAQ staff capacity was a bottleneck in implementing a more effective disease control program.

36. During an 18-month period from 1999 to 2000, research work undertaken by IAARD was delayed when these activities were transferred to the Agency for Forestry and Estate Crop Research and Development. During this time, DGE was transferred to the Ministry of Forestry. The coordination between DGE and the research agencies could have been stronger so as to improve the relevance and applicability of resulting research to farmers' field school activities. During this time, the research agenda was formulated by research scientists based on their own interaction with the farmers and with less coordination with DGE. Overall, the performance of Borrower, the EA, and the IAs is rated as satisfactory.

K. Performance of the Asian Development Bank

37. ADB policy and procedures on consultant selection and procurement did not pose a major constraint during project implementation. ADB fielded a total of 15 missions (including a special project administration mission in 2001, and four missions for the Aceh Tsunami Support Project in 2005 and 2006). The feedback from project adaptation phase evaluation and the recommendations from MTR conducted in August 2000, helped in rectifying training strategies and implementation gaps. The MTR noted that the project administration memorandum was rigidly followed despite the fact that its cost estimates were no longer relevant. The EA was advised to revise these figures to include agreed modifications. The other ADB missions helped to resolve and follow-up on issues related to implementation, supervision, and coordination of project activities, including tracking project expenditures. Changes in ADB project officers and their differing approaches to project implementation may have also contributed to confusion in project direction. ADB missions could have included multi-disciplinary specialists, which would have improved the quality and effectiveness of these review missions through more in-depth analysis of project components.

38. Following the 1997 Asian financial crisis, ADB re-evaluated the project cost and assessed the impact the dollar appreciation against rupiah. This led to a reduction of ADB loan size, particularly the amounts related to local currency expenditures. At that time, ADB assisted in adjusting the scope of the Project in order to ensure that the Project achieves its intended outcome. Training provided by ADB on *Procedure for Procurement and Disbursement* was helpful in improving the EA and IA staff's capability, particularly in familiarizing them with ADB's standard operating procedures. The mid-term and regular review missions were fielded as scheduled. The performance of ADB is rated as satisfactory.

III. EVALUATION OF PERFORMANCE

A. Relevance

39. The Project streamlined the responsibilities of the crop protection institutions and improved the institutional linkages between crop protection services, agricultural research, and plant quarantine. It facilitated the transfer of FFS experience from rice to estate crops, enabled tree crop farmers to become self-reliant in decision-making, particularly with respect to pest control and crop management. Agricultural research capacity was strengthened, and support for farmer-driven research institutionalized. The efficiency and effectiveness of plant quarantine services improved through streamlining the organization and by improving staff skills. These project interventions were expected to improve Indonesia's continued access to major export markets and sustain its earnings from this major foreign exchange-earning industry.

40. The use of FFS as the training approach enabled farmers to achieve higher empowerment and control of their own learning processes. The FFS approach motivated farmers to experiment on their own in order to increase their knowledge and to make decisions based on their discoveries and not to remain dependent on others for their continued education. The group dynamics of FFS helped farmers develop their communication and leadership skills and strengthened their group cohesion, all of which are necessary elements for empowerment. Through FFS activities, the Project forged closer relationship between farmers and estate crops protection agencies. The participatory and iterative development of the training curriculum generated a sense of ownership among field leaders and other stakeholders.

41. At appraisal and completion, the Project was relevant to the policies of the Government and ADB. The support provided for institutional capacity building was also consistent with ADB's on-going country strategy and program. The Project contributed to the Government's and ADB's objectives of promoting economic growth, raising farm incomes, and reducing the incidence of poverty in rural areas. Additional investments are still required, especially in expanding the application of IPM to all tree crop farmers in Indonesia and for prioritizing physical investments to improve the livelihoods of low-income farming households. The Project is still relevant and consistent with the Government's current decentralization program, especially with the increased role and empowerment of local government agencies as decision-makers for planning and budgeting. Minor changes in the Project's scope and budget made during the MTR further improved the relevance of the Project. The Project is rated as highly relevant.

B. Effectiveness in Achieving Outcome

42. The Project achieved most of its intended outcomes in accordance with its quantitative objectives. The research component initially lagged behind, but progressed satisfactorily after the MTR with the establishment of the independent *ad hoc* committee. The committee was able

to significantly change the direction of the IAARD research program, with better coordination between this and other similar loan projects and those funded from the government budget. The approved annual national long-term research program had significant impact on solving the major IPM problems faced by small estate crop farmers.

43. Activities related to farmer-driven research was initially slow since IAARD researchers were not clear on what this term meant. Following the MTR, this component was transferred to DGE, which incorporated the program into the FFS curriculum that involved solving pest and disease problems that were identified by participating farmers in the field. Overall, the Project is rated as effective in achieving its outcome.

C. Efficiency in Achieving Outcome and Outputs

44. The routine change of DGE officials and project managers negatively affected smooth project implementation. Over the project duration, there were three different project directors and four project managers. Each change delayed the project implementation because each project director and/or manager needed time to familiarize themselves with the planned project activities. The change that occurred in 2005 delayed the implementation of the impact assessment study and the final loan disbursements.

45. Project coordination was difficult both horizontally across agencies, and vertically between the provincial and district project support staff. A similar situation prevailed in terms of project coordination with CAQ. The plant quarantine component was primarily supportive, rather than providing direct inputs to the field leaders' and farmers' training, skill development, and knowledge updating.

46. The project financial internal rate of return (FIRR) is estimated at 14.1% and the economic internal rate of return (EIRR) is estimated at 25.3% at project completion as compared with the appraisal estimates for EIRR at 12.7 percent. There were no estimates of project FIRR at appraisal. The main reason for the higher EIRR is the higher crop yields observed at project completion as compared to the forecast at appraisal. Commodity prices were also significantly higher. The estimates show that the project remains economically viable in future years even if the (i) costs rise by 20%; (ii) benefits are reduced by 20%; and (iii) number of beneficiaries is lowered by 50%.

47. The weighted average farm income⁵ of beneficiaries was raised from Rp8.02 million per year prior to the Project to Rp11.35 million per year at project completion, which represents an increase of 42%. The Project succeeded in meeting its objective of increasing farm productivity and farmers' incomes. Despite this improvement, the per capita income of project farmers remains low at less than \$0.85 per day.

48. The main reasons for continued low farm incomes are: (i) small size of crop area; and (ii) low crop productivity. The Project failed to address the problem of the small size of crop area farmed by project beneficiaries. Increases in productivity from the small area (less than one hectare) farmed by the majority of beneficiaries had a limited impact on incomes. Despite a 20% to 30% increase in crop productivity, overall crop productivity remained low and far below its potential. The farm yields achieved under the Project were below potential yields that could have been achieved under the smallholder conditions of the Project. This lower yield is related to several factors including: (i) the old age of tree stand; (ii) poor planting material; (iii) poor crop

⁵ Weighted according to area of crops improved under this Project.

maintenance prior to Project; (iv) high stand of trees per ha in the case of cashew; and (v) inadequate use of fertilizer inputs. By replanting with high-yield materials and improving crop maintenance, farmers could have potentially raised their farm yields and income by about 300%.

49. Many farmers are aware of their low yields and are taking measures to replant trees (or grafting trees in the case of cocoa) or using new high-yield seeds for cotton. However, a major problem faced by many farmers is the lack of credit facilities needed to finance the replanting of old trees. Overall, the Project was efficient in achieving its intended outcome and outputs.

D. Preliminary Assessment of Sustainability

50. A number of FFS groups expanded their role and began acting as an economic entity, either by entering into contracts with processors or undertaking processing at the group level. At the local level, there are indications that some local governments are keen to promote the activities of FFS alumni. The district governments supported the training of 8,600 farmers in IPM technologies. They also allocated funds for the production of biological control agents. The data for 2003 showed that two thirds of *Trichoderma sp.* and *Beauveria bassiana*⁶ production was financed through district government budgets. However, the level of support varies widely between different districts and provinces.

51. ADB advised DGE to prepare a plan to ensure the sustainability of project activities. The plan was to include a gradual phasing out of project-funded activities, such as farmer training, which were to be replaced with local funding. In addition, the plan was to explore linking FFS alumni to the district smallholder intensification teams, which are responsible for the detection and observation of estate crop pests, to seek funding through the district governments' own resources.

52. It is recommended that DGE prepare a formal plan and seek adequate funding to ensure the sustainability of IPM activities in project districts. The decentralization law dictates that greater effort should be exerted to familiarize local government staff with the activities that were undertaken by the Project in order to obtain their active support. However, the small budget available to many local governments may potentially limit their ability to provide adequate funding to continue IPM activities in their respective districts. Overall, the Project's sustainability is rated as less likely.

E. Impact

53. The Project provided environmental benefits since it enabled the (i) intensification of crop production through an integrated farm management approach without increased use of pesticides; (ii) promotion of biological control agents that are safe to use and are harmless to humans, animals, and the environment; (iii) reduction of health hazards to downstream population, off-farm pollution and soil erosion; and (iv) promotion of improved human health in the project area.

54. The impact assessment study undertaken for all 13 provinces identified positive benefits of FFS training on five aspects: (i) economic status of farmers; (ii) improvement in environmental conditions including human health; (iii) empowerment of farmers through increased technical

⁶ These are non-harmful funguses that are used as biological control agents (natural enemies) for controlling harmful pests in plants such as insects and pathogens.

knowledge and skill; (iv) social and institutional gains as demonstrated by the farmers' improved ability to work in groups; and (v) greater participation of women in all activities.

55. The FFS graduates' average score on the knowledge test⁷ was about 74% as compared to the average score of less than 55% for the exposed and control groups. There were also distinct differences across the three groups of respondents in various aspects of farm care, management practices and harvesting. FFS graduates were able to identify at least three pests and five natural enemies. In addition, they used more biological methods compared to chemical-based pesticide, to control pest infestations. They are also more likely to practice good crop culture techniques and farm sanitation, including regular pruning of trees and shrubs, picking of infected tea leaves and berries and harvesting. In case of tea, FFS graduates in West Java reported that their production costs are much lower and their net returns are about six times more than non-FFS farmers.

56. One important concern is the low farm size allocated to the beneficiaries under the Project. While the average farm size is 1.1 ha, about 30% of project farmers have farms of less than 0.5 ha and so it was difficult for these farmers to increase their incomes from IPM to sufficiently raise their incomes above poverty levels.

IV. OVERALL ASSESSMENT AND RECOMMENDATIONS

A. Overall Assessment

57. The Project trained 122,610 farmers in IPM, or 16% more than the target of 106,000. The Project completed training for 144 *Pemandu Lapangan 1* (Level 1 Field Leaders, Master trainers [PL1]), 872 *Pemandu Lapangan 2* (Level 2 Field Leaders, FFS facilitators [PL2]), 1,485 extension workers, and 102 field leaders, which represented 100%, 91%, 96%, and 142% of the respective targets for these activities. Twenty staff members (from DGE/CAQ/AARD) completed formal degree programs and 571 staff members completed non-degree training programs, as compared to targets of 22 degree programs and 488 non-degree training programs, respectively. Overall, based on Project's output achievement in terms of its relevance, effectiveness, efficiency and sustainability, the Project is rated as successful.

58. Progress with respect to IPM-related research was estimated at about 91%. The Project completed 73 national long-term research studies, 58 provincial adaptive studies, and 246 farmer-driven research studies, which represented 87%, 52%, and 110% of the respective targets.

59. The startup of physical activities on the reprogrammed component for supporting rehabilitation and reconstruction in Aceh was delayed until August 2005 due to delays in the approval of local counterpart funds and subsequent delay in timely release of reprogrammed funds to the provinces.

60. The findings of the project M&E survey showed that the majority of farmers trained under the Project had adopted IPM practices. The adoption rates were highest for pest, natural enemies, and ecosystem analysis. However, less than half of the respondent farmers reported production and use of biological control agents. This is because farmers are dependent on outside sources for the starter material. The survey results indicate considerable spillover

⁷ This knowledge test was based on a survey questionnaire that was used to test the IPM knowledge of the FFS graduates as part of the project impact assessment study conducted in December 2006 by the executing agency.

effects of farmer training activities. About half of the neighboring farmers adopted some form of IPM practices. The result indicates that improved product quality and increased bargaining power generated through project activities resulted in higher farm income returns for participating farmers.

61. Following the tsunami in Aceh in December 2004, a sum of \$2.3 million from project savings were allocated for rehabilitation of estate crops and infrastructure reconstruction. The aim of this program was to provide emergency assistance to the estate crops sector to recover from tsunami damage. The rehabilitation of estate crops consisted of (i) procurement of planting materials for 2,000 ha of oil palm; (ii) procurement of planting materials for 1,500 ha of coconut; (iii) rehabilitation of 1,845 ha of coconut plantation with corn intercropping; and (iv) rehabilitation of 726 ha of nutmeg plantation. Infrastructure reconstruction consisted of (i) provision of harvesting equipment and processing units; (ii) procurement of seeds for crop diversification; (iii) procurement of 48 motorcycles for field staff in 18 districts, and (iv) rehabilitation of office buildings in Banda Aceh and several other districts. Although most of the physical improvements and required procurements were completed, however, the input assistance program is not expected to be sustainable due to inadequate operational and maintenance funds and lack of credit worthiness of farmers who received the tsunami assistance.

62. DGE was the EA and had overall responsibility for the tsunami component, while the provincial and district estate crop services had the responsibility of carrying out field activities and coordination with related agencies. The activities under this component were completed within a period of 7 months.

B. Lessons Learned

63. There was sizable variability in the capacities of farmers to assimilate knowledge being imparted to them through FFS. A critical aspect relates to the level of understanding of IPM trainers regarding IPM related technology and their ability to impart IPM knowledge at a level that can easily be comprehended by the farmers. The rigid criteria for selecting trainers were relaxed due to difficulty in finding qualified applicants. The selection process should have also considered the fact that many of the trained farmers' children leave farming to seek jobs in the urban sector.

64. Priority should be given to farmers who directly manage estate crop production and who derive 50% or more of their household income from these crops. These farmers tend to practice IPM more seriously than those whose main sources of income are derived from other activities. Provision for providing FFS training to family members who are not farmers should be discontinued. This practice results in trainees who are unable to use their newly-acquired knowledge in the field, thereby reducing overall project benefits.

65. A large number of FFS alumni groups are not active and less than 20% of the farmer groups are engaged in any post-FFS activities. The DGE and *Dinas* (provincial or district government offices providing similar services to corresponding national government agencies) staff should maintain constant contact with these groups to motivate them to maintain their IPM activities and to promote group activities, especially in the areas of processing and joint marketing. More effort is needed in establishing links between farmer groups and traders. In some project areas, produce from FFS alumni are highly valued by traders and other consumers. Coffee traders in Central Java prefer to buy from FFS alumni because of quality assurance. With some additional support from the Government, it would be possible to establish

a niche market for pesticide-free commodities and organic food products. Additional training in product development and marketing improvements should be pursued.

66. Decentralization has led to different policies and priorities between central and the provincial/district governments. There is a need to inform and engage local government officials regarding the aims and objectives of the Project in order to ensure their support for sustaining project activities. DGE efforts need to continue in order to coordinate programs and activities of regional governments in order to ensure that farmers continue to benefit from activities undertaken by the Project.

67. The priorities of the local governments should be incorporated into the Project design. This applies particularly to the choice of crops selected for the Project. The crops in this program were in many cases not regarded as priority crops by the local government. Also, the choice of priority crops can change with the rise in commodity prices. During the last 3 years of project implementation, many districts adopted oil palm, coconut, and rubber as their priority crop. The Project design did not have the flexibility to change its training program to include farmers growing these crops.

68. Selecting one crop per district for the training program was not cost efficient since there were opportunities to include two or three crops to be included under this program. In addition, some farmers were growing two of these crops on the same farm (e.g., pepper and cocoa, or coffee and cocoa). Farmer trainings for several crops could have been conducted in each province, instead of just one crop at a time, for maximum efficiency.

69. The formulation of the project framework should have considered levels of inputs (particularly manpower inputs) required for the successful achievement of outputs related to the project components. The proposed M&E system and development support communication units required highly-skilled technicians for data gathering as well as hardware and software operation and maintenance. While trainings were undertaken to develop the required skills, the project framework should have considered that full absorption of such technical responsibility takes time, willingness, dedication, and practice. In addition, the data collection forms that were used for the M&E system were too long and complicated for the farmers, field leaders, and local government technicians.

70. The role of a well functioning development support communications unit is valuable for an IPM project. It can provide the educational materials needed for an extensive public awareness campaign that will facilitate the spread of IPM technologies to other farmers. As an example, the cultural practices of FFS and non-FFS coffee farmers does not differ significantly when technical information are readily available from television, radio, published materials, and regular visits by extension and field officers.

71. The Project did not address the important issue of small farm size. Improvements in crop productivity in these small farms did not raise farmers' income substantially and did not contribute significantly in reducing the incidence of poverty in the project areas.

72. Productivity in FFS farms was lower than expected due to (i) the old age of stand, (ii) poor planting material; (iii) poor crop maintenance prior to project; (iv) high stand of trees per ha in the case of cashew; and (v) inadequate use of fertilizer inputs. Despite achieving about 20% to 50% increases in crop productivity, yields remained low and were about 200% to 300% below their full potential.

73. The lack of a processing and marketing component resulted in a lack of opportunity for a price premium for pesticide-free farm produce. This has reduced the incentive for many non-FFS farmers to adopt IPM practices. In the case of tea and coffee in West and East Java, the Project engaged a short-term processing and marketing consultant who was able to form farmer groups to market their improved farm produce in bulk and convince traders to offer better prices for the farm produce of FFS alumni. In these areas, some farmer groups also undertook processing activities outside the scope of the Project.

C. Recommendations

1. Project Related

74. **Future Monitoring.** DGE needs to continue monitoring the progress of IPM technology dissemination and adoption. This can be facilitated through the design and establishment of a simpler and more practical information and communications system for regular updates of technical and financial activities related to FFS alumni. Monitoring, data collection, and database updates should be routine activities of regional offices and not be seen as an additional responsibility with no extra monetary reward. The project M&E should be a key responsibility of regional offices and field leaders should collect relevant IPM data to feed into M&E system. Formal training on M&E approaches, particularly in conducting surveys and data collection, is needed to improve the quality of information collected. This information will form the basis for policy recommendations and strategy development. Adequate government funding for these monitoring activities should be provided on a sustainable basis.

75. **Covenants.** The covenants in the loan agreement were appropriate and should be maintained.

76. **Further Action or Follow-Up.** The following is suggested as follow-up action from the Government:

- (i) The transfer of project management authority to the provinces and/or districts has to be supported by intensive capacity building of provincial-level staff, especially in relation to activity planning and monitoring. Strong coordination with central offices (DGE and IAARD in particular) will have to be maintained. This coordination will also help to facilitate the exchange and dissemination of new technologies and information across provinces.
- (ii) The quality of FFS training should be maintained or further improved. Training quality depends on the skills and capacity of trainers and the quality of the curriculum that is used. Both of these have to be updated regularly with new developments that are taking place and with evolving needs. Appropriate incentives, such as setting up of a reward system, should be developed to help sustain effective learning and creativity. Conducting FFS training for untrained farmers on IPM for other estate crops (excluding the six commodities of IPM included in the Project) should be strengthened.
- (iii) FFS groups need to be strengthened. This can be done by ensuring that FFS groups continue to meet regularly to discuss emerging challenges that needs resolution as well as opportunities that need to be ventured in. Activities related to market or business enterprise development increasingly needs to be part of post-FFS activities.

77. **Additional Assistance.** FFS activities in project districts need to be continued with more support from the local government. There is a need for greater support from the local governments to provide high-yielding planting materials to tree crop farmers in order to replant their old trees. Provincial government commitment to monitor post-FFS farmer activities should be stressed, including the provision of incentives for farmer groups that are keen in promoting IPM principles and technology to other farmers.

78. **Timing of the Project Performance Evaluation Report.** It is proposed that an evaluation of the impact of the Project be carried out after 3 years of project completion. The assessment should include rapid rural appraisal field surveys to update information related to the performance of FFS alumni in implementing IPM-recommended practices.

2. General

79. To ensure the sustainability of the Project and to build on its successful outcome, the following are recommended:

- (i) The research agenda should be based on interviews with farmers. A national research program should focus on research that correlates with farmers needs, which should also include crop ecosystems research. The research agenda should include more aggressive and location-specific strains of biological control agents that can immediately be used for biological control agent production (e.g., starter formulation for *Beauveria bassiana* and *Trichoderma sp.* formulations). Provincial adaptive research, on the other hand, should give priority to developing new cultural and mechanical control methods and not on producing technology packages of inputs that control only a single pest. Tighter working relationships between farmers and researchers should be established. Field leaders and farmers should be involved in carrying out field trials and results should be made known to them immediately.
- (ii) There should be active management of relationships between IAARD organizations and post-FFS activities, including future FFS trainings. Technology testing should be done with farmers trained under FFS. Results should be communicated immediately and should not wait until a formal report or a journal article is out for publication.
- (iii) IPM activities must place greater emphasis on promoting the market for improved farm produce from FFS farmers. More effort is needed to link traders and retailers with these farmers to ensure that farmers obtain better farm prices for their superior products. This includes the possibility of issuing certificates indicating that these products are pesticide-free commodities.
- (iv) Farmers with small farms should be assisted in purchasing state land to provide them with a larger base for their operation. This will ensure that they can produce sufficient quantity of farm produce to raise their income above poverty levels.
- (v) Farmers with old tree stand should be assisted in replanting these holdings. The most important assistance would be in making high-yield seedlings accessible to farmers at affordable prices. This would ensure that the new technology that they have acquired through FFS can be employed to obtain high production from replanted holdings.
- (vi) FFS farmers should be assisted in undertaking group marketing activities in order to ensure that they obtain better prices for their produce. Farmer groups should have access to credit facilities to place them in a better bargaining position in dealing with traders and processors.

- (vii) The system of integrating livestock rearing with tree crop cultivation developed by IAARD under ADB's Loan 1526-INO⁸ should be promoted as this will ensure that: (a) farmers will utilize more organic manure for their tree crops and reduce their requirement for chemical fertilizer which becomes more expensive as commodity prices rise; (b) farmers are provided with an additional source of income; and (c) the rural environment is improved through reduced use of chemical pesticides. The current practice of promoting the use of compost has limitations because its nutrient contents are low and supplementary doses of inorganic fertilizers are needed.
- (viii) Additional government funding and support from ADB will be needed to expand this program to other areas and commodities. The Government has identified three priority commodities (oil palm, rubber, and coconut) that currently enjoy high market prices. IPM activities need to focus on these three commodities as it could have a significant impact on raising the income of a large number of farmers and contribute substantially in increasing the country's foreign exchange earnings.
- (ix) The Project has shown that the IPM program can raise smallholders' yields significantly. In view of a large number of farmers that would require training (more than 12 million spread over 29 provinces), the next phase of the Project should adopt the ADB's multi-tranche approach, initially focusing on a small number of provinces and commodities and, over a 15- to 20-year period, expand to cover all farmers and all tree crop commodities in Indonesia.

⁸ Loan Project to the Government of Indonesia for Participatory Development of Agricultural Technology Project approved on 1 July 1997 for \$ 63.8 million

PROJECT FRAMEWORK

Design Summary	Project Targets (Verifiable Indicators)	Risks/ Assumptions	Achievements
<p>1. Goals</p> <p>1.1 To enhance and protect the environment.</p> <p>1.2 To improve product quality and increase the productivity and incomes of smallholder farmers.</p>	<ul style="list-style-type: none"> • By 2007, about 106,000 farmers from 13 provinces trained in integrated pest management (IPM) practices; 60 percent provinces trained in IPM practices; 60 percent of whom practiced IPM, while 80 percent of cotton farmers reduced the number of sprayings per season to three or four. • By 2007, 50 percent of farmers adopted farming systems diversification and conservation farming practices; thus reducing soil erosion and negative downstream impacts from siltation. • By 2007, 30 percent of farmers enjoy high quality products, with low pesticide residues. • By 2007, wealth indicators used in the socioeconomic baseline survey are significantly higher for integrated pest management adaptors compared to non-adaptors. 	<p>Continued Government support for the National IPM Program</p>	<p>Project trained 122,610 farmers.</p> <p>Chemical pesticide application was reduced to one or two times per season.</p> <p>An additional 4,200 farmers were trained in 2007 and 2,850 farmers will be trained in 2008 using local government funding.</p> <p>Monitoring on environment not carried out .</p> <p>50% of farmers achieved better product quality.</p> <p>Average farm income raised by 20 to 30%.</p> <p>About 60% of the Project farmers enjoy high quality products with low pesticide residue (but no premium price).</p>
<p>2. Objective</p> <p>2.1 To promote the adoption of environmentally-sound IPM practices by smallholder estate crop farmers by strengthening Government institutions and farmer groups</p>	<ul style="list-style-type: none"> • About 106,000 farmers from 12 provinces trained in IPM practices at Project completion. • At least 80 percent of farmers trained during process adaptation phase practice IPM at midterm review. • 32 selected plant quarantine laboratories upgraded according to a clear set of quality 	<p>World market prices for estate crops as projected</p>	<p>Average international prices fell by 7% for cocoa, 68% for coffee, 14% for tea, and 28% for cotton from 1997 to 2006.</p> <p>Local currency depreciated by 280% from 1997 to 2006.</p> <p>Net impact is doubling of farm-gate prices.</p> <p>In 2006, there were 122,610 farmers in 13 provinces trained and</p>

Design Summary	Project Targets (Verifiable Indicators)	Risks/ Assumptions	Achievements																																	
	<p>standards, in terms of infrastructure and staff skills.</p> <ul style="list-style-type: none"> All 37 plant quarantine laboratories reorganized into four classifications with clear responsibilities. 		<p>practicing IPM. South Sumatra was divided into two provinces (Bangka Belitung and South Sumatra) due to decentralization in 2001.</p>																																	
<p>3. Components and Outputs</p> <p>3.1 Capacity Building for IPM</p>																																				
<p>3.1.1 Human Resource Development Training of Extension Service Staff and Farmers</p> <p>3.1.1.1 Staff of Provincial Estate Crop Protection Services in 12 provinces effectively trained in extending the IPM approach.</p>	<ul style="list-style-type: none"> Knowledge of IPM Provincial and District Field Leaders in farmer field schools (FFS) training approach has significantly improved after the training. Number of field leaders at the provincial level trained: <table border="1" data-bbox="500 1062 821 1230"> <thead> <tr> <th>Year</th> <th>Per Year</th> <th>Cumulative</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>60</td> <td>60</td> </tr> <tr> <td>3</td> <td>0</td> <td>60</td> </tr> <tr> <td>4</td> <td>0</td> <td>60</td> </tr> <tr> <td>5</td> <td>84</td> <td>144</td> </tr> </tbody> </table> <ul style="list-style-type: none"> Number of field leaders at the district level trained: <table border="1" data-bbox="500 1335 821 1535"> <thead> <tr> <th>Year</th> <th>Per Year</th> <th>Cumulative</th> </tr> </thead> <tbody> <tr> <td>3</td> <td>200</td> <td>200</td> </tr> <tr> <td>4</td> <td>200</td> <td>400</td> </tr> <tr> <td>5</td> <td>0</td> <td>400</td> </tr> <tr> <td>6</td> <td>280</td> <td>680</td> </tr> <tr> <td>7</td> <td>280</td> <td>960</td> </tr> </tbody> </table>	Year	Per Year	Cumulative	2	60	60	3	0	60	4	0	60	5	84	144	Year	Per Year	Cumulative	3	200	200	4	200	400	5	0	400	6	280	680	7	280	960	<p>Experts are available to assemble information on IPM technologies for the priority crops.</p> <p>Experienced IPM trainers available in a timely manner as local consultants.</p> <p>Support from Directorate General of Estates (DGE) and provincial governments for required change to IPM training approach.</p>	<p>The Project's key output was the farmer training through farmer field schools. The Project trained and equipped 1,016 field leaders who conducted the long-running FFS (239 are farmer-trainers).</p> <p>144 PL1s (field leaders at provincial level) were trained and 872 PL2s (field leaders at district level) were trained.</p>
Year	Per Year	Cumulative																																		
2	60	60																																		
3	0	60																																		
4	0	60																																		
5	84	144																																		
Year	Per Year	Cumulative																																		
3	200	200																																		
4	200	400																																		
5	0	400																																		
6	280	680																																		
7	280	960																																		
<p>3.1.1.2 Farmers in 12 provinces effectively trained in IPM approaches for estate crops.</p>	<ul style="list-style-type: none"> Knowledge of farmers in IPM practices has significantly improved after the training. 10 percent (10,600) of trained farmers are women. 	<p>Effective and sustainable mechanisms of transferring IPM practices to farmers can be developed.</p> <p>Technical support is adequate during</p>	<p>FFS has trained 122,610 farmers (beyond the 16.5% target), of which 20,235 were women.</p>																																	

Design Summary	Project Targets (Verifiable Indicators)	Risks/ Assumptions	Achievements																		
	<ul style="list-style-type: none"> • Number of farmers trained: <table border="1" data-bbox="500 338 821 506"> <thead> <tr> <th>Year</th> <th>Per Year</th> <th>Cumulative</th> </tr> </thead> <tbody> <tr> <td>3</td> <td>2,000</td> <td>2,000</td> </tr> <tr> <td>4</td> <td>3,600</td> <td>5,600</td> </tr> <tr> <td>5</td> <td>25,600</td> <td>31,200</td> </tr> <tr> <td>6</td> <td>28,400</td> <td>59,600</td> </tr> <tr> <td>7</td> <td>46,320</td> <td>105,920</td> </tr> </tbody> </table>	Year	Per Year	Cumulative	3	2,000	2,000	4	3,600	5,600	5	25,600	31,200	6	28,400	59,600	7	46,320	105,920	<p>process adaptation phase to successfully initiate program.</p>	
Year	Per Year	Cumulative																			
3	2,000	2,000																			
4	3,600	5,600																			
5	25,600	31,200																			
6	28,400	59,600																			
7	46,320	105,920																			
<p>3.1.1.3 Regional biological control laboratories and sub-laboratories' staff effectively trained,</p>	<ul style="list-style-type: none"> • 600 farmer groups produce and use biological, control agents on a regular basis at Project completion. • Five training sessions for private sector entrepreneurs in biological control agent production conducted per annum. • Biological control laboratories are able to satisfy demand for pure culture. • Contamination of biological control agent culture reduced from 30 percent to 10 percent. 		<p>611 farmer groups undertook farmer-driven research, and 186 farmer groups conducted biological control agent production.</p>																		
<p>3.1.1.4 Plant quarantine staff effectively trained.</p>	<ul style="list-style-type: none"> • Capacity to conduct basic plant quarantine courses significantly improved. • Success rate of staff to detect bacteria, virus, and nematode contamination increased by 25 percent. • Five short training courses for Provincial Extension Services for Estate Crops (DISBUN) staff and farmers on plant quarantine problems conducted by plant quarantine staff. • Public awareness campaign launched. 	<p>Suitably qualified candidates are available.</p> <p>Controlling sea ports and land frontiers is impossible without the cooperation of traders and the general public.</p>	<p>At the end of 2005, the Project completed six refresher courses participated in by 185 field leaders. Technologies learned and new information gathered by the field leaders are being taught to other field leaders.</p> <p>An IPM website was developed. Some public awareness materials (e.g., handbooks, pamphlets, CDs) were printed and used during trainings. Under cooperation with the National Television Channel in 2002, the Project broadcasted an IPM movie on six commodities (cotton, pepper, cacao, cashew, tea and coffee).</p> <p>Conducted campaigns to various groups to increase</p>																		

Design Summary	Project Targets (Verifiable Indicators)	Risks/ Assumptions	Achievements
			awareness on plant quarantine pests and promote better understanding of plant quarantine regulations. The computer-based information system on pests and quarantine regulations needs to be updated regularly and made easily accessible. Increased public awareness of plant quarantine function.
3.1.2 Farming Systems Diversification	<ul style="list-style-type: none"> 50 percent increase in the number of farmers practicing diversification with high-value crops 	Directorate General of Estates (DGE) fully supports diversification in mature plantations.	Crop diversification activities were not done.
3.1.3 Strengthening IPM Support Services 3.1.3.1 Pest monitoring and reporting streamlined	<ul style="list-style-type: none"> Staff time allocated to pest monitoring and reporting reduced by 80 percent. Report/map of normal pest and disease incidence produced. 	Farmer groups report abnormal pest incidence to smallholder intensification team staff.	240 staff were responsible for pest monitoring and reporting.
3.1.3.2 Development support communications improved.	<ul style="list-style-type: none"> At least 80 percent of smallholder intensification team staff have access to updated crop protection information by 2002. A least 70 percent of estate crop smallholders in target provinces are aware of 1PM concept. 	Service and maintenance of computers at field laboratories ensured.	200 staff responsible for development support and communication, with five publications produced.
3.1.4 Improvement of Regional IPM Facilities 3.1.4.1 Regional biological control laboratories upgraded	<ul style="list-style-type: none"> Biological control laboratories and sub-laboratories meet demand for biological control agents. Laboratories have tested seven new biological control 	Field leaders will play a central role in coordinating project implementation in each province. New sub-labs can	Four regional biological control laboratories were improved; 9 biological control laboratories and sub-biological control laboratories equipment packages were procured; two regional estate crop

Design Summary	Project Targets (Verifiable Indicators)	Risks/ Assumptions	Achievements
	<p>agents in the field.</p> <ul style="list-style-type: none"> • Twelve existing crop protection brigades converted into sub-laboratories. 	perform biological control laboratory tasks and produce biological control agents.	protection centers were rehabilitated.
3.1.4.2 Regional estate crop protection centers equipped.	<ul style="list-style-type: none"> • Coordination and supervision function improved. 	Regional estate crop protection centers perform useful coordination and supervisory functions.	50 regional estate crop protection centers were equipped.
3.1.4.3 Plant quarantine facilities constructed and/or upgraded.	<ul style="list-style-type: none"> • Upgraded plant quarantine stations meet the classification criteria related to Class A, B, and C Quarantine Stations. 	Available construction sites adequate	For the upgrading of plant quarantine facilities, achievement are as follows: 17 plant quarantine offices and/or laboratories were improved in accordance to quality standards; three plant quarantine offices and/or labs were renovated; 71 units of computers were procured; 34 units of vehicles procured; 7 packages of plant quarantine laboratories were equipped to high quality international standards.
<p>3.1.5 Improvement of Provincial IPM Facilities</p> <p>3.1.5.1 FLS rehabilitated and reequipped.</p>	<ul style="list-style-type: none"> • 12 field laboratories rehabilitated and reequipped. 		12 Field Laboratories were rehabilitated; 12 units Crop Protection Brigade were converted to biological sub laboratories.
3.1.5.2 Smallholder intensification team facilities constructed, upgraded, and re-equipped.	<ul style="list-style-type: none"> • Upgraded and reequipped 84 existing smallholder intensification team facilities. • Constructed 36 new SITs. • Constructed 2 houses per province for smallholder intensification team facilities. 	Suitable sites are available for new smallholder intensification team facilities.	All civil works required were provided and completed. New construction and/or rehabilitation of smallholder intensification team facilities and regional research centers and laboratories were done. Facilities, equipment and vehicles were procured to ensure effective project implementation. 82 smallholder intensification team facilities were rehabilitated, and 17 newly constructed.

Design Summary	Project Targets (Verifiable Indicators)	Risks/ Assumptions	Achievements
<p>3.2 1PM Research Program</p> <p>3.2.1 Long-term research on new IPM technologies carried out successfully.</p>	<ul style="list-style-type: none"> • Annual Agency for Agricultural Research and Development (AARD) IPM research program on estate crop agreed and executed. • Pest and disease tolerant cultivars selected. • New biological control agents developed and tested. • Estate cropping systems research conducted. • Program to develop and test IPM technologies for citrus completed. 	<p>Research agencies are prepared to adapt to small farmer's needs.</p> <p>Suitably qualified staff available.</p>	<p>National long-term research studies conducted was 11 studies less than the 84 studies expected. 75 research and studies were executed. The provincial IPM adaptive research had a lower accomplishment at 57%. Performance of the research component in terms of identifying and conducting IPM research studies improved only in the latter part of the Project (from 2003).</p>
<p>3.2.2 Provincial adaptive research carried out successfully.</p>	<ul style="list-style-type: none"> • Annual research program in each province agreed and carried out. • Economic viability of IPM technologies established. • Natural enemies of major pests identified. • Long-term research findings field tested and adopted by farmers. 	<p>Relevant research proposals submitted.</p> <p>Suitably qualified staff available.</p>	<p>58 research and studies were carried out. Conduct of the farmer-driven research was facilitated, and implementation transferred from IAARD to DGE.</p>
<p>3.2.3 Farmer-driven research successfully initiated.</p>	<ul style="list-style-type: none"> • Annual program of grants from Assessment Institute for Agricultural Technology (AIAT) to local universities, biological control laboratories, or non-government organizations to carry out applied action research activities systematized and effective. • Results of ecosystems research available, • Smallholder intensification units receive funds to conduct simple, farmer-initiated research and trials 	<p>Reluctance of smallholder intensification team staff to take farmer participation seriously.</p>	<p>246 research and studies were conducted. Farmer-driven research activity picked up only during the Project's latter part when farmer-driven research implementation was transferred to DGE. Only a small number (503) of farmer groups took advantage of the crop rehabilitation assistance.</p>

Design Summary	Project Targets (Verifiable Indicators)	Risks/ Assumptions	Achievements
	<p>through farmer groups participating in the training program.</p> <ul style="list-style-type: none"> Farmer assessments fed back to AIAT Assessment and AARD via smallholder intensification teams and field leaders. 		
<p>3.3 Project Support and Coordination</p>	<ul style="list-style-type: none"> Project implemented as scheduled. Project monitoring and review process led to iterative improvement of Project implementation. Policy related studies carried out and policy formulation strengthened and effective. Public awareness of health, environmental and quarantine issues increased. 	<p>Need for policy support and liaison between DGE, AARD and Center for Agricultural Quarantine.</p>	<p>M&E system was established, but its operation needs strengthening. Recommendation to integrate the Project's M&E with that of the Ministry of Agriculture was still not pursued. Project benefit monitoring and evaluation is conducted regularly and is being institutionalized. Data collected from project benefit monitoring and evaluation are good sources of information on how to further strengthen IPM.</p> <p>Consulting services performed:</p> <p>1,245.5 person-months (pm) for DGE</p> <p>35 pm for IAARD</p> <p>31 pm for Center for Agriculture Quarantine (CAQ)</p> <p>4 pm of special studies were conducted. Rp 16.657 billion was spent for project support and coordination.</p>

AARD = Annual Agency for Agricultural Research and Development, AIAT = Assessment Institute for Agricultural Technology, CAQ = Center for Agriculture Quarantine, DGE = Directorate General of Estate Crops, FFS = farmer field school, IPM = integrated pest management, PL1 = field leaders at provincial level, PL2 = field leaders at district level, pm = person-month.

SUMMARY OF TRAINING ACTIVITIES

No.	Province/ District	Year 1998 - 2005		Year 2007						Year 2008						Total	
		Loan 1469-INO (IPM)		NAB			PAB			NAB			PAB			FLs	FFS Alumni
		FLs	FFS Alumni	FLs	FFS Alumni	Cost (Rp000)	FLs	FFS Alumni	Biaya (Rp000)	FLs	FFS Alumni	Cost (Rp000)	FLs	FFS Alumni	Biaya (Rp)		
1	NAD			50	43,352		2	25								2	150
	Aceh Besar			50	43,352												
2	North Sumatra	92	11,120	100	86,704					100	122,200					92	11,320
	Simalungun			50	43,352												
	Langkat			50	43,352					100	122,200						
3	West Sumatra			75	65,028		1	25		50	61,300					1	150
	Padang			25	21,676												
	Agam			25	21,676					50	61,300						
	Pasaman			25	21,676												
4	Bengkulu			50	43,352		2	25		75	87,350					2	150
	Kepahyang			25	21,676					75	87,350						
	Bengkulu Utara			25	21,676												
5	Jambi			50	43,352		2	25		50	61,300					2	125
	Kerinci			25	21,676					50	61,300						
	Tanjung Jabung Barat			25	21,676												
6	South Sumatra	64	4,520	400	346,816					100	122,200					64	5,020
	Ogan Kemering Ulu			50	43,352												
	Ogan Kumering Ilir			50	43,352												
	Muara Enim			50	43,352												
	Lahat			50	43,352												
	Musi Rawas			50	43,352												
	Musi Banyuasin			50	43,352												
	Pagar Alam			50	43,352												
	Lubuk Linngau (Prop)			50	43,352												

No.	Province/ District	Year 1998 - 2005		Year 2007					Year 2008					Total		
		Loan 1469-INO (IPM)		NAB		PAB			NAB			PAB			FLs	
		FLs	FFS Alumni	FLs	FFS Alumni	Cost (Rp000)	FLs	FFS Alumni	Biaya (Rp000)	FLs	FFS Alumni	Cost (Rp000)	FLs	FFS Alumni		
7	Lampung	92	18,925	350	303,464				100	122,200				92	19,375	
	Lampung Selatan			50	43,352											
	Lampung Tengah			50	43,352											
	Lampung Utara			50	43,352											
	Lampung Barat			50	43,352											
	Tanggamus			50	43,352											
	Tulang Bawang			50	43,352											
	Lampung Timur			50	43,352											
8	Bangka Belitung	20	2,775											20	2,775	
9	Banten			50	43,352	2	25		50	61,300				2	125	
	Pandeglang			25	21,676											
	Serang			25	21,676											
10	West Java	92	17,130	500	433,520				100	122,200				92	17,730	
	Clanjur			50	43,352				100	122,200						
	Kota Bandung			50	43,352											
	Sukabumi			50	43,352											
	Garut			50	43,352											
	Tasik Malaya			50	43,352											
	Ciamis			50	43,352											
	Majalengka			50	43,352											
	Purwakarta			50	43,352											
	Sumedang			50	43,352											
	Subang			50	43,352											
11	Central Java	78	7,920	350	303,464				100	122,200				78	8,370	
	Purbalingga			50	43,352											
	Negara			50	43,352											
	Purworejo (Prop)			50	43,352											
	Grobogan			50	43,352											
	Magelang (Prop)			50	43,352											
	Pati			50	43,352											
	Klaten			50	43,352											

No.	Province/ District	Year 1998 - 2005		Year 2007					Year 2008					Total			
		Loan 1469-INO (IPM)		NAB			PAB		NAB			PAB		FLs	FLs		
		FLs	FFS Alumni	FLs	FFS Alumni	Cost (Rp000)	FLs	FFS Alumni	Biaya (Rp000)	FLs	FFS Alumni	Cost (Rp000)	FLs			FFS Alumni	Biaya (Rp)
	Jepara			50		43,352											
	Temanggung			50		43,352											
	Kendal			50		43,352											
	Kurus			50		43,352											
	Semarang			50		43,352											
12	D.I. Yogyakarta			25		21,676	4	50		100		122,620				4	175
	Yogyakarta			25		21,676											
	Kulon Praga																
13	East Java	92	18,050		250	216,760				75		87,350				92	18,375
	Pacilan				50	43,352											
	Malang				50	43,352											
	Bondowaso				50	43,352				75		87,350					
	Madiun				50	43,352											
	Lamongan				50	43,352											
14	Bali	84	6,375		350	303,464				75		87,350				84	6,800
	Jembrana				50	43,352											
	Tabanan				50	43,352											
	Badung				50	43,352											
	Bangil				50	43,352				75		87,350					
	Buleleng				50	43,352											
	Karangasem				50	43,352											
	Gianyar				50	43,352											
15	West Nusa Tenggara	84	6,695	44	300	260,112				75		87,350				128	7,070
	Lombok Timur				50	43,352											
	Sumbawa				50	43,352											
	Bima				50	43,352											
	Lombok Barat				50	43,352											
	Lombok Tengah				50	43,352											
	Dompu				50	43,352											

No.	Province/ District	Year 1998 - 2005		Year 2007					Year 2008					Total	
		Loan 1469-INO (IPM)		NAB		PAB			NAB			PAB			FLs
		FLs	FFS Alumni	FLs	FFS Alumni	Cost (Rp000)	FLs	FFS Alumni	Biaya (Rp000)	FLs	FFS Alumni	Cost (Rp000)	FLs	FFS Alumni	
16	West Kalimantan	40	4,070	225	260,112				75	87,350					
	Landak			50	43,352										
	Kelapang			50	43,352										
	Singkawang (Prop)			25	43,352										
	Sanggau			25	43,352										
	Bengkayang			25	43,352										
	Pontianak			50	43,352										
17	South Kalimantan								50	61,300					50
18	East Kalimantan	54	3,820	450	390,168				75	87,350					54 4,345
	Kutai Timur			50	43,352				75	87,350					
	Samarinda			50	43,352										
	Pasir			50	43,352										
	Bulungan			50	43,352										
	Kutai Kartanegara			50	43,352										
	Berau			50	43,352										
	Malinau			50	43,352										
	Panajam Paser Utara			50	43,352										
	Nunukan			50	43,352										
19	South Sulawesi	102	9,992	500	390,168				200	244,480					102 10,692
	Bulukumba			50	43,352										
	Bantaeng			50	43,352										
	Jenepono			50	43,352										
	Gowa			50	43,352										
	Sinjai			50	43,352										
	Pinrang			50	43,352										
	Luwu Utara								100	122,240					
	Luwu Utara			50	43,352				100	122,240					
	Tana Toraja			50	43,352										
	Takalar			50	43,352										
	Enrekang			50	43,352										

No.	Province/ District	Year 1998 - 2005		Year 2007					Year 2008					Total		
		Loan 1469-INO (IPM)		NAB			PAB		NAB			PAB		FLs		
		FLs	FFS Alumni	FLs	FFS Alumni	Cost (Rp000)	FLs	FFS Alumni	Biaya (Rp000)	FLs	FFS Alumni	Cost (Rp000)	FLs			FFS Alumni
20	West Sulawesi	38	3,723	150	130,056						200	224,480			38	4,073
	Polewali Mandar			50	43,352						100	122,240				
	Majene			50	43,352											
	Mamuju			50	43,352						100	122,240				
21	Central Sulawesi			100	86,704	20	250				200	244,400			20	550
	Palu			50	43,352											
	Poso			25	21,676						100	122,200				
	Morowali			25	21,676											
	Prigi Moutong										100	122,200				
22	Southeast Sulawesi	84	7,495	100	86,704						200	244,480			84	7,795
	Konawe			25	21,676											
	Kolaka			25	21,676						100	122,240				
	Kolaka Utara										100	122,240				
	Muna			25	21,676											
	Buton			25	21,676											
23	North Sulawesi										50	61,300				50
	Minahasa Selatan										50	61,300				
24	Gorontalo			50	43,352	2					75	97,300			2	125
	Bone Bolango			25	21,676											
	Gorontalo			25	21,676						50	61,300				
	Kota Gorontalo										25	36,000				
25	East Nusa Tenggara			50	43,352	40	600				50	61,300			40	700
	Sikka			50	43,352						50	61,300				
26	North Maluku			50	43,352	30	425				50	61,300			30	525
	Ternate			50	43,352											
27	Papua			50	43,352	2	25									
	Jaya Pura			50	43,352											
	TOTAL	1,016	122,610	44	4,875	4,226,820	107	1,475	—	—	2,350	2,849,310			1,165	131,235

FFS = farmer field school, FL = field leader, INO = Indonesia, IPM = integrated pest management, NAB = national annual budget, No. = number, PAB = provincial annual budget.

Sources: NABs and PABs.

ACTUAL YEARLY EXPENDITURES
(Rp)

Category	1997			1998			1999		
	ADB	Government of Indonesia	Total	ADB	Government of Indonesia	Total	ADB	Government of Indonesia	Total
01 Civil Works	0	0	0	1,157,783,286	1,198,020,373	2,355,803,659	789,308,394	2,391,351,522	3,180,659,916
02A Vehicles	0	0	0	1,797,642,926	0	1,797,642,926	2,035,980,158	0	2,035,980,158
02B Major Laboratory and Office Equipment	0	0	0	3,696,272,505	13,853,686	3,710,126,191	2,266,726,148	62,840,969	2,329,567,117
02C Minor Equipment and Materials	0	0	0	80,850,836	55,380,335	136,231,171	179,446,792	150,583,337	330,030,129
02D Materials for Crop Diversification	0	0	0	0	0	0	0	0	0
03A International Training	0	0	0	182,649,250	0	182,649,250	8,474,750	78,120,055	86,594,805
03B Local Training	0	0	0	895,791,942	57,730,321	953,522,263	1,869,546,670	1,700,855,947	3,570,402,617
04A Research and Studies	0	0	0	938,870,066	681,397,299	1,620,267,365	404,046,624	370,740,660	774,787,284
04B Publicity	0	0	0	164,514,430	0	164,514,430	266,662,810	1,251,640	267,914,450
05 Consulting Services	0	0	0	0	0	0	4,502,595,463	409,000	4,503,004,463
06 Incremental Operation and Maintenance	0	0	0	1,885,477,681	792,289,840	2,677,767,521	1,638,878,231	1,786,009,793	3,424,888,024
07 Interest and Commitment Charge	601,024,184	0	601,024,184	2,007,744,512	0	2,007,744,512	4,340,925,184	0	4,340,925,184
09 Tsunami Assistance	0	0	0	0	0	0	0	0	0
Total Expenditures	601,024,184	0	601,024,184	12,807,597,434	2,798,671,854	15,606,269,288	18,302,591,224	6,542,162,923	24,844,754,147

Category	2000			2001			2002		
	ADB	Government of Indonesia	Total	ADB	Government of Indonesia	Total	ADB	Government of Indonesia	Total
01 Civil Works	223,580,977	1,196,716,940	1,420,297,917	301,951,002	1,485,995,452	1,787,946,454	19,007,230	635,987,656	654,994,886
02A Vehicles	12,014,432,386	0	12,014,432,386	3,275,061,182	0	3,275,061,182	3,870,838,021	0	3,870,838,021
02B Major Laboratory and Office Equipment	2,407,248,303	0	2,407,248,303	2,851,422,846	53,165,464	2,904,588,310	5,168,164,642	0	5,168,164,642
02C Minor Equipment and Materials	310,733,525	284,667,518	595,401,043	430,679,593	297,068,577	727,748,170	0	0	0
02D Materials for Crop Diversification	0	0	0	0	0	0	0	30,208,750	30,208,750
03A International Training	255,761,500	0	255,761,500	3,768,341,998	0	3,768,341,998	485,348,770	0	485,348,770
03B Local Training	4,722,176,390	5,036,436,018	9,758,612,408	7,918,188,097	8,404,263,491	16,322,451,588	10,952,597,638	13,517,531,387	24,470,129,025
04A Research and Studies	126,628,409	192,113,759	318,742,168	487,417,480	734,919,257	1,222,336,737	72,232,932	908,064,819	980,297,751
04B Publicity	285,582,000	4,168,800	289,750,800	834,469,800	0	834,469,800	164,526,730	40,275,000	204,801,730
05 Consulting Services	10,261,429,944	0	10,261,429,944	6,069,338,433	0	6,069,338,433	1,249,023,562	0	1,249,023,562
06 Incremental Operation and Maintenance	1,119,691,580	2,055,893,324	3,175,584,904	945,262,484	3,379,122,848	4,324,385,332	426,168,975	4,407,691,804	4,833,860,779
07 Interest and Commitment Charge	4,444,766,840	0	4,444,766,840	7,100,374,400	0	7,100,374,400	10,585,431,666	0	10,585,431,666
09 Tsunami Assistance	0	0	0	0	0	0	0	0	0
Total Expenditures	36,172,031,854	8,769,996,359	44,942,028,213	33,982,507,315	14,354,535,089	48,337,042,404	32,993,340,166	19,539,759,416	52,533,099,582

Category	2003			2004			2005		
	ADB	Government of Indonesia	Total	ADB	Government of Indonesia	Total	ADB	Government of Indonesia	Total
01 Civil Works	316,273,043	1,708,250,481	2,024,523,524	0	0	0	0	0	0
02A Vehicles	3,139,898,675	0	3,139,898,675	154,181,818	13,950,000	168,131,818	0	0	0
02B Major Laboratory and Office Equipment	3,185,168,909	47,882,500	3,233,051,409	342,220,000	0	342,220,000	0	0	0
02C Minor Equipment and Materials	369,887,455	75,592,000	445,479,455	0	36,350,000	36,350,000	0	0	0
02D Materials for Crop Diversification	0	1,376,716,660	1,376,716,660	0	0	0	0	0	0
03A International Training	5,294,883,722	0	5,294,883,722	3,986,456,715	0	3,986,456,715	1,957,971,084	0	1,957,971,084
03B Local Training	20,400,359,214	24,694,072,634	45,094,431,848	10,512,926,553	23,628,196,327	34,141,122,880	7,010,352,853	18,481,715,715	25,492,068,568
04A Research and Studies	777,491,125	1,186,422,211	1,963,913,336	662,178,040	1,012,891,827	1,675,069,867	350,230,994	644,323,913	994,554,907
04B Publicity	4,425,073,967	0	4,425,073,967	2,164,723,230	7,292,500	2,172,015,730	97,246,800	149,552,400	246,799,200
05 Consulting Services	2,416,147,790	0	2,416,147,790	4,097,022,386	0	4,097,022,386	386,895,420	0	386,895,420
06 Incremental Operation and Maintenance	70,902,800	3,145,990,301	3,216,893,101	0	5,509,649,500	5,509,649,500	0	5,876,514,792	5,876,514,792
07 Interest and Commitment Charge	9,660,158,159	0	9,660,158,159	10,137,895,552	0	10,137,895,552	11,977,458,120	0	11,977,458,120
09 Tsunami Assistance	0	0	0	0	0	0	0	0	0
Total Expenditures	50,056,244,859	32,234,926,787	82,291,171,646	32,057,604,294	30,208,330,154	62,265,934,448	21,780,155,271	25,152,106,820	46,932,262,091

Category	2006			Grand Total of Expenditures		
	ADB	Government of Indonesia	Total	ADB	Government of Indonesia	Total
01 Civil Works	0	0	0	2,807,903,932	8,616,322,424	11,424,226,356
02A Vehicles	0	0	0	26,288,035,166	13,950,000	26,301,985,166
02B Major Laboratory and Office Equipment	0	0	0	19,917,223,353	177,742,619	20,094,965,972
02C Minor Equipment and Materials	0	0	0	1,371,598,201	899,641,767	2,271,239,968
02D Materials for Crop Diversification	0	0	0	0	1,406,925,410	1,406,925,410
03A International Training	0	0	0	15,939,887,789	78,120,055	16,018,007,844
03B Local Training	0	0	0	64,281,939,357	95,520,801,840	159,802,741,197
04A Research and Studies	0	0	0	3,819,095,670	5,730,873,745	9,549,969,415
04B Publicity	0	0	0	8,402,799,767	202,540,340	8,605,340,107
05 Consulting Services	649,071,090	0	649,071,090	29,631,524,088	409,000	29,631,933,088
06 Incremental Operation and Maintenance	0	0	0	6,086,381,751	26,953,162,202	33,039,543,953
07 Interest and Commitment Charge	3,641,439,900	0	3,641,439,900	64,497,218,517	0	64,497,218,517
09 Tsunami Assistance	3,641,439,900	0	3,641,439,900	3,641,439,900	0	3,641,439,900
Total Expenditures	7,931,950,890	0	7,931,950,890	246,685,047,491	139,600,489,402	386,285,536,893

ADB = Asian Development Bank.
Sources: audited financial statements.

ACTUAL YEARLY EXPENDITURES

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Category	1997			1998			1999		
	ADB	Government of Indonesia	Total	ADB	Government of Indonesia	Total	ADB	Government of Indonesia	Total
01 Civil Works	0	0	0	20,651	160,808	181,459	108,129	329,387	437,517
02A Vehicles	0	0	0	143,020	0	143,020	96,484	0	96,484
02B Major Laboratory and Office Equipment	0	0	0	125,111	1,860	126,970	224,652	8,656	233,308
02C Minor Equipment and Materials	0	0	0	13,745	7,434	21,178	85,386	20,742	106,128
02D Materials for Crop Diversification	0	0	0	0	0	0	0	0	0
03A International Training	0	0	0	0	0	0	0	10,760	10,760
03B Local Training	0	0	0	4,352	7,749	12,101	113,061	234,278	347,338
04A Research and Studies	0	0	0	23,256	91,463	114,719	53,590	51,066	104,657
04B Publicity	0	0	0	15,004	0	15,004	6,045	172	6,217
05 Consulting Services	0	0	0	782,463	0	782,463	498,310	56	498,367
06 Incremental Operation and Maintenance	0	0	0	81,352	106,348	187,699	200,345	246,007	446,352
07 Interest and Commitment Charge	73,367	0	73,367	245,086	0	245,086	413,579	0	413,579
09 Tsunami Assistance	0	0	0	0	0	0	0	0	0
Total Expenditures	73,367	0	73,367	1,454,038	375,661	1,829,699	1,799,582	901,124	2,700,707

Category	2000			2001			2002		
	ADB	Government of Indonesia	Total	ADB	Government of Indonesia	Total	ADB	Government of Indonesia	Total
01 Civil Works	78,895	126,236	205,131	15,138	147,860	162,998	26,135	71,721	97,857
02A Vehicles	638,934	0	638,934	956,474	0	956,474	102,593	0	102,593
02B Major Laboratory and Office Equipment	401,469	0	401,469	372,973	5,290	378,263	258,009	0	258,009
02C Minor Equipment and Materials	46,568	30,028	76,596	43,376	29,559	72,935	35,943	0	35,943
02D Materials for Crop Diversification	0	0	0	0	0	0	0	3,407	3,407
03A International Training	0	0	0	175,584	0	175,584	368,149	0	368,149
03B Local Training	422,482	531,270	953,752	700,905	836,245	1,537,150	627,147	1,524,390	2,151,538
04A Research and Studies	60,830	20,265	81,095	28,195	73,126	101,322	15,991	102,404	118,395
04B Publicity	48,373	440	48,812	38,303	0	38,303	79,524	4,542	84,066
05 Consulting Services	1,136,197	0	1,136,197	663,324	0	663,324	883,115	0	883,115
06 Incremental Operation and Maintenance	202,173	216,866	419,040	130,556	336,231	466,788	82,152	497,061	579,214
07 Interest and Commitment Charge	575,747	0	575,747	828,032	0	828,032	1,061,622	0	1,061,622
09 Tsunami Assistance	0	0	0	0	0	0	0	0	0
Total Expenditures	3,611,669	925,105	4,536,774	3,952,858	1,428,312	5,381,170	3,540,381	2,203,525	5,743,906

Category	2003			2004			2005			
	ADB	Government	Total	ADB	Government	Total	ADB	Government	Total	
		of Indonesia			of Indonesia			of Indonesia		
01	Civil Works	21,799	200,852	222,652	29,544	0	29,544	0	0	0
02A	Vehicles	741,846	0	741,846	271,266	1,503	272,770	0	0	0
02B	Major Laboratory and Office Equipment	924,581	5,630	930,211	106,942	0	106,942	37,280	0	37,280
02C	Minor Equipment and Materials	76,303	8,888	85,191	3,540	3,917	7,457	1,287	0	1,287
02D	Materials for Crop Diversification	0	161,871	161,871	0	0	0	0	0	0
03A	International Training	753,148	0	753,148	302,727	0	302,727	487,958	0	487,958
03B	Local Training	1,848,264	2,903,477	4,751,741	2,071,885	2,546,142	4,618,027	619,028	1,888,780	2,507,808
04A	Research and Studies	108,413	139,497	247,910	71,397	109,148	180,545	58,828	65,848	124,676
04B	Publicity	256,480	0	256,480	392,435	786	393,221	224,922	15,284	240,206
05	Consulting Services	767,971	0	767,971	243,388	0	243,388	114,149	0	114,149
06	Incremental Operation and Maintenance	78,505	369,899	448,404	8,367	593,712	602,079	0	600,564	600,564
07	Interest and Commitment Charge	1,180,227	0	1,180,227	1,205,744	0	1,205,744	1,304,734	0	1,304,734
09	Tsunami Assistance	0	0	0	0	0	0	0	0	0
	Total Expenditures	6,757,538	3,790,115	10,547,653	4,707,235	3,255,208	7,962,443	2,848,186	2,570,476	5,418,662

Category	2006			Grand Total			
	ADB	Government	Total	ADB	Government	Total	
		of Indonesia			of Indonesia		
01	Civil Works	896	0	896	301,187	1,036,865	1,338,052
02A	Vehicles	14,733	0	14,733	2,965,350	1,503	2,966,853
02B	Major Laboratory and Office Equipment	34,097	0	34,097	2,485,114	21,435	2,506,549
02C	Minor Equipment and Materials	4,727	0	4,727	310,876	100,567	411,443
02D	Materials for Crop Diversification	0	0	0	0	165,278	165,278
03A	International Training	153,229	0	153,229	2,240,796	10,760	2,251,556
03B	Local Training	652,985	0	652,985	7,060,110	10,472,331	17,532,441
04A	Research and Studies	35,380	0	35,380	455,881	652,817	1,108,698
04B	Publicity	45,563	0	45,563	1,106,649	21,224	1,127,872
05	Consulting Services	72,119	0	72,119	5,161,036	56	5,161,092
06	Incremental Operation and Maintenance	54,567	0	54,567	838,017	2,966,688	3,804,705
07	Interest and Commitment Charge	691,862	0	691,862	7,580,000	0	7,580,000
09	Tsunami Assistance	2,379,348	0	2,379,348	2,379,348	0	2,379,348
	Total Expenditures	4,139,507	0	4,139,507	32,884,362	15,449,526	48,333,888

ADB = Asian Development Bank.

Sources: Asian Development Bank and Government of Indonesia.

EXPENDITURE ACCOUNTS BY FINANCIER
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Category	Appraisal				Actual			
	ADB	Farmers' Contribution	Government of Indonesia	Total	ADB	Farmers' Cont.	Government of Indonesia	Total
A. Investment Costs								
01 Civil Works	500	—	2,100	2,600	302	—	1,036.87	1,339
02A Vehicles	2,400	—	200	2,600	2,965	—	1.50	2,967
02B Major Laboratory and Office Equipment	3,850	—	2,350	6,200	2,485	—	21.44	2,506
02C Minor Equipment and Materials	3,850	—	2,350	6,200	311	—	100.57	412
02D Materials for Crop Diversification	—	—	—	0	0	—	165.28	165
03A International Training	2,700	—	0	2,700	2,240	—	10.76	2,250.76
03B Local Training	7,000	—	5,800	12,800	7,060	—	10,472.33	17,532.33
04A Research and Studies	3,000	—	4,500	7,500	456	—	652.82	1,108.82
04B Publicity	1,200	—	100	1,300	1,106	—	21.22	1,127.22
05 Consulting Services	6,500	—	200	6,700	5,161	—	0.06	5,161.06
09 Tsunami Assistance		—		0	2,380	—	0.00	2,380.00
Farm Labor		3,500	3,700	7,200	—	3,260	0.00	3,260.00
Subtotal (A)	31,000	3,500	21,300	55,800	24,466	3,260	12,482.84	40,208.84
B. Recurrent Costs								
1 Salary Incentives	700	—	2,900	3,600				
2 Field and/or Travel Allowances	600	—	2,300	2,900				
3 Building Maintenance	100	—	200	300				
4 Equipment Maintenance	600	—	2,000	2,600				
5 Vehicle Maintenance	900	—	2,700	3,600				
6 Office Supplies	200	—	600	800				
Subtotal (B)^a	3,100	0	10,700	13,800	840		2,965.00	3,805.00
C. IDC and Commitment Charge	9,900	—	—	9,900	7,580		0	7,580.00
Total	44,000	3,500	32,000	79,500	32,886.00	3,260.00	15,447.84	51,593.84

^a Incremental operation and maintenance.

IDC = interest during construction.

Sources: Asian Development Bank; audited financial statements.

ADB ANNUAL LOAN DISBURSEMENTS

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Category	1997	1998	1999	2000	2001
01 Civil Works	0.00	20,650.96	108,129.27	78,895.02	15,137.57
02A Vehicles	0.00	143,019.64	96,484.49	638,934.43	956,473.74
02B Major Laboratory and Office Equipment	0.00	125,110.74	224,652.30	401,469.31	372,972.81
02C Minor Equipment and Materials	0.00	13,744.60	85,386.42	46,568.12	43,376.05
02D Materials for Crop Diversification	0.00	0.00	0.00	0.00	0.00
03A International Training	0.00	0.00	0.00	0.00	175,583.56
03B Local Training	0.00	4,351.88	113,060.74	422,482.47	700,904.58
04A Research and Studies	0.00	23,255.88	53,590.34	60,830.08	28,195.27
04B Publicity	0.00	15,004.16	6,044.97	48,372.58	38,302.72
05 Consulting Services	0.00	782,462.88	498,310.31	1,136,197.36	663,323.54
06 Incremental Operation and Maintenance	0.00	81,351.56	200,344.65	202,173.13	130,556.38
07 Interest and Commitment Charge	73,367.21	245,085.58	413,578.79	575,746.74	828,032.33
09 Tsunami Assistance	0.00	0.00	0.00	0.00	0.00
Total Loan Disbursements	73,367.21	1,454,037.88	1,799,582.28	3,611,669.24	3,952,858.55

Category	2002	2003	2004	2005	2006	Total
01 Civil Works	26,135.45	21,799.40	29,543.50	0.00	895.64	301,186.81
02A Vehicles	102,593.16	741,845.62	271,266.32	0.00	14,732.73	2,965,350.13
02B Major Laboratory and Office Equipment	258,009.06	924,581.11	106,941.61	37,280.02	34,097.16	2,485,114.12
02C Minor Equipment and Materials	35,943.28	76,302.94	3,540.07	1,287.19	4,727.35	310,876.02
02D Materials for Crop Diversification	0.00	0.00	0.00	0.00	0.00	0.00
03A International Training	368,148.88	753,148.44	302,727.12	487,958.32	153,229.26	2,240,795.58
03B Local Training	627,147.19	1,848,264.34	2,071,885.08	619,028.12	652,985.39	7,060,109.79
04A Research and Studies	15,991.00	108,413.42	71,396.78	58,828.36	35,380.07	455,881.20
04B Publicity	79,523.78	256,480.21	392,434.99	224,921.80	45,563.30	1,106,648.51
05 Consulting Services	883,114.65	767,970.93	243,388.41	114,148.76	72,119.01	5,161,035.85
06 Incremental Operation and Maintenance	82,152.28	78,504.87	8,366.69	0.00	54,567.38	838,016.94
07 Interest and Commitment Charge	1,061,621.87	1,180,227.02	1,205,744.22	1,304,733.84	691,862.40	7,580,000.00
09 Tsunami Assistance	0.00	0.00	0.00	0.00	2,379,347.62	2,379,347.62
Total Loan Disbursements	3,540,380.60	6,757,538.30	4,707,234.79	2,848,186.41	4,139,507.31	32,884,362.57

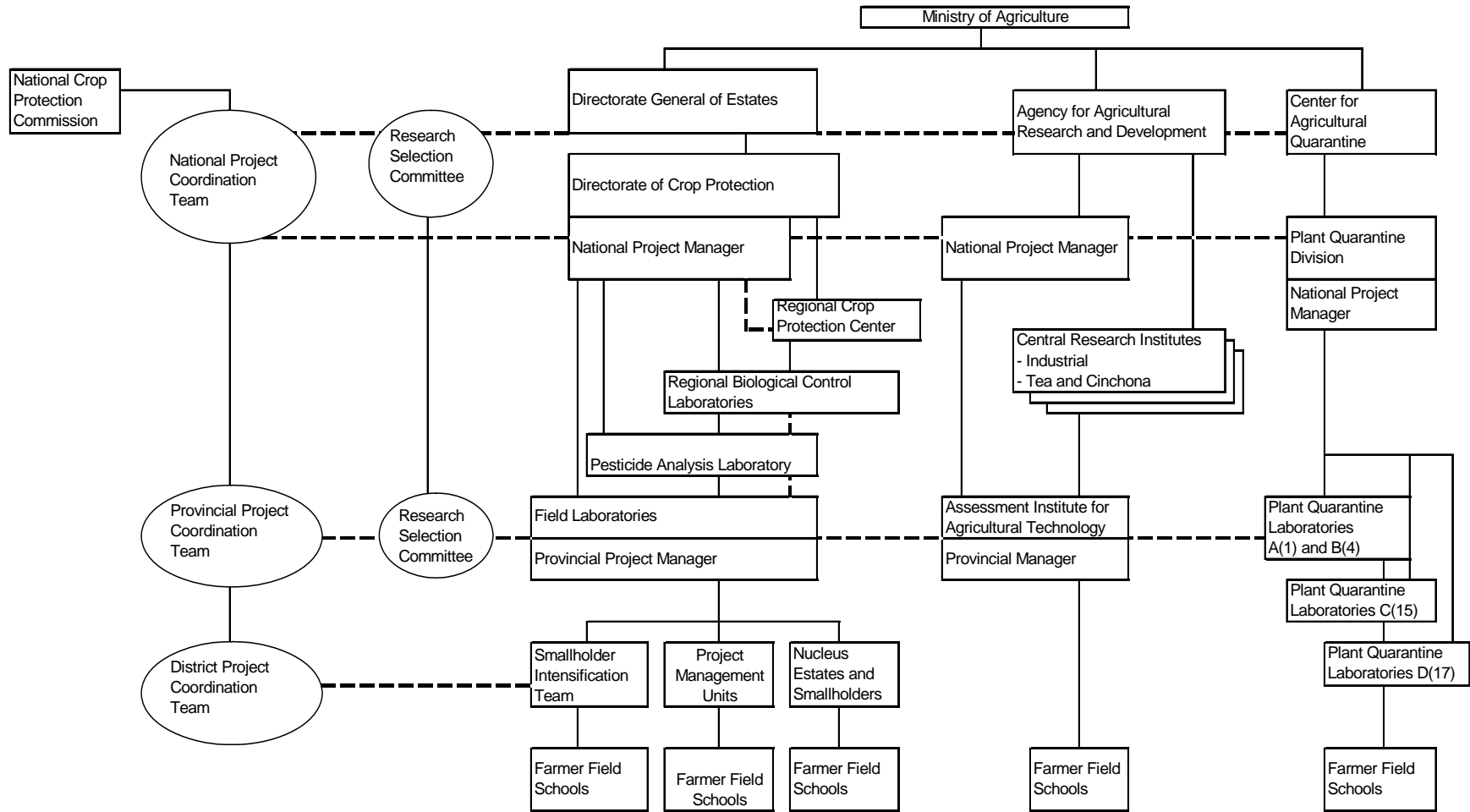
Source: ADB's Loan and Financial Information System.

PROJECT IMPLEMENTATION SCHEDULE: IPM-SECP

Project Activity	1997/98	1998/99	1999/2000	2001	2002	2003	2004	2005	2006
A. Capacity Building in IPM 1. DGE Activities 2. CAQ Activities									
B. IPM Research 1. National Long-Term Research 2. Adaptive Research 3. Farmer-Driven Research									
C. Project Support 1. Coordination and Monitoring 2. Impact Assessment									
Original project completion period: January 1997–March 2004									
Original loan closing date: 30 September 2004									
First loan extension date: 31 December 2005									
Second loan extension date: 30 April 2006									

CAQ = Center for Agricultural Quarantine, DGE = Directorate General of Estate Crops, IPM-SECP = Integrated Pest Management for Smallholders' Estate Crops.
Source: Directorate General of Estate Crops.

ORGANIZATION CHART



Source: ADB. 1996. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the Republic of Indonesia for the Integrated Pest Management for Smallholder Estate Crops Project*. Manila.

STATUS OF COMPLIANCE WITH LOAN COVENANTS

Covenant	Reference in Loan Agreement	Status of Compliance
<p>National Project Coordination Team The Borrower shall establish a National Project Coordination Team chaired by the Director General of Estates, or his representative, within six months after the effective date, which shall be responsible for the overall coordination of the Project, and shall include representatives of BAPPENAS, Ministry of Finance, AARD, CAQ, Ministry of Environment, the Pesticide Commission and the Private Commodity Assn.</p>	Schedule 6, para. 3	Complied with.
<p>Provincial Project Coordination Teams The Borrower shall establish, within six months after the Effective Date, a Provincial Project Coordination Team in each Project province for coordination of the Project at the Provincial level. Each Provincial Project Coordination Team shall be chaired by the Provincial Representative of Ministry of Agriculture (Kanwil) and its members shall include the Chief of Disbun Tk.I, Head of the Crop Protection Division of Disbun Tk.I, representatives of AIAT, plant quarantine services, estate crops field laboratories, RECPCs, RBCLs, local universities, the private sector and LCOs. The Provincial Project Managers referred to in para 8 of this Schedule, shall report to the respective Provincial Project Coordination Team on the IPM training and research activities under the Project.</p>	Schedule 6, para. 4	Complied with.
<p>District Project Coordination Teams The Borrower shall establish, within six months after the Effective Date, District Project Coordination Teams in every district of the Project provinces for coordination of the Project at the district level, which shall be chaired by the chiefs of Disbun Tk.II and their members shall include the representatives of smallholder intensification team staff, LCOs and farmer groups.</p>	Schedule 6, para. 5	Complied with.

Covenant	Reference in Loan Agreement	Status of Compliance
<p>National Project Director DGE shall appoint within six months after the Effective Date, the Director of its Crop Project Directorate as the National Project Director to provide overall coordination and supervision in implementing the Project. The National Project Director shall also serve as secretary of the National Project Coordination Team.</p>	Schedule 6, para. 6	Complied with.
<p>National Project Managers DGE, HARD and CAQ shall each appoint a National Project Manager to be based in Jakarta, within six months after the Effective Date, who shall be responsible for the implementation of their respective parts of the Project and coordination at the national level.</p>	Schedule 6, para. 7	Complied with.
<p>Provincial Project Managers Ministry of Agriculture shall appoint a Provincial Project Manager (i) within six months after the Effective Date, for each of the Project provinces of East Java, West Java, South Sulawesi, North Sumatra and Lampung; and (ii) by 1 April 1998, for the remaining Project provinces. The Provincial Project Managers shall assist the national Project Managers in the implementation of the Project, including IPM training of extension services workers and farmers located in their respective project provinces. The National Project Manager appointed by CAQ shall also be assisted by the heads of the Plant Quarantine Laboratories in the implementation of the IPM training on quarantine matters.</p> <p>AARD shall appoint, within six months after the Effective Date, the senior staff of AIAT stations and/or substations in the Project provinces as Provincial Project Managers to assist the National Project Manager appointed by AARD in implementing Part B of the Project.</p>	<p>Schedule 6, para. 8</p> <p>Schedule 6, para. 9</p>	<p>Complied with.</p> <p>Complied with.</p>

Covenant	Reference in Loan Agreement	Status of Compliance
<p>Research Selection Committee The Borrower will ensure that the existing Research Selection Committee (research selection committee) within AARD at the national level, established under the World Bank-financed Agricultural Research Management Project, shall be responsible for screening, evaluating and approving long-term IPM research proposals under Part B.1 of the Project. The proposals for provincial adaptive research and farmer-driven IPM research shall be screened, <u>evaluated and approved by the RSCs at the provincial level under</u> Parts B.2 and B.3 of the Project. The members of the "RSCs" at both the national and provincial levels shall include representatives of DGE and CAQ.</p>	Schedule 6, para. 10	Complied with. In FY2000, 8 new research projects received grant funds for \$13,634 from ADB. Due to budget shortage, 2 <u>research</u> projects were funded by IBRD-ARMP (\$12,265), while 4 received funds from ADB-PDATP (\$16,251).
<p>Training The Borrower shall ensure that the cadre of IPM trainers trained under the Project shall remain on the job for the duration of the Project implementation period and for an additional three years thereafter.</p> <p>The Borrower shall also ensure that the Government of the Project provinces allocate sufficient funds to their respective Disbun to continue to provide IPM training for at least three years after completion of Project implementation to about 180,000 more smallholder farmers by utilizing the available cadre of IPM trainers trained under the Project.</p> <p>The Borrower shall engage the services of local universities and LCOs by the end of the first year of Project implementation to conduct social preparatory activities and socioeconomic baseline surveys and to explore alternative approaches to IPM training by focusing on aspects of farmer commitment and sustainability.</p>	<p>Schedule 6, para. 11</p> <p>Schedule 6, para. 12</p> <p>Schedule 6, para. 13</p>	<p>Being complied with.</p> <p>Partially complied. Funds provided for training only adequate for 50% of target.</p> <p>Not complied with.</p>

Covenant	Reference in Loan Agreement	Status of Compliance
<p>Grant Funds The Borrower shall cause DGE to make grant funds available to farmers under Part A.2(b) of the Project in accordance with selection criteria to be agreed upon between the Borrower and the Bank.</p>	Schedule 6, para. 14	Partially complied. Funds provided was only 30% of amount needed.
<p>Project Evaluation and Review An evaluation of the processing adaption phase and a midterm review shall be conducted at the end of the fourth year of Project implementation.</p> <p>The Borrower shall, by the end of the first year of Project implementation, submit to the Bank for approval a final set of performance criteria according to which the effectiveness of (i) the IPM training curricula; (ii) the IPM training methodologies under the farmer field school approach; and (iii) the social preparation processes, and the farmers' interest in and commitment to the IPM training shall be determined. The processing adaption phase evaluation shall also determine whether to proceed with the expansion of the IPM training program under the Project.</p> <p>The midterm review shall (i) determine the most feasible implementation arrangements for the farming system diversification, including the crops and area coverage for expansion in the following years; (ii) identify the problems encountered in implementation, provide measures to overcome any deficiencies in the Project design and identify lessons learned; (iii) evaluate the scope of the Project, physical progress and costs, adequacy of operation and maintenance of Project facilities; health and environment impacts of the Project, performance of the Project executing agency, AARD and CAQ, and the consultants, and effectiveness of the coordination among the agencies concerned; and (iv) make recommendations on Project design modifications, if any, based on its findings.</p>	Schedule 6, para. 19(c)	Complied with. The MTR mission, together with an IPM Specialist (staff consultant) was fielded in October 2000.

Covenant	Reference in Loan Agreement	Status of Compliance
<p>Policy Issues The Borrower shall encourage the participation of the private sector in the Project by: (i) promoting the production of BCAs by private companies, and by at least 600 farmer groups to be assisted under the Project for their own use and sale to other farmers on a commercial basis; and (ii) promoting the participation of cooperatives and private companies in the production of certified seeds of pest-resistant cotton varieties for sale to farmers.</p> <p>The Borrower, after review of the results of the cotton sector study to be conducted under the Project and in consultation with the Bank, shall take necessary measures to implement the recommendations of such study starting not later than one year after its completion.</p>	<p>Schedule 6, para. 20</p> <p>Schedule 6, para. 21</p>	<p>Being complied with. Proposal for training of 36 private estate crop companies (E.Java10; W.Java-10; N. Sulawesi-16) involving 250 processing adaption phase farmers is under preparation.</p> <p>Not relevant since ADB and Government agreed that cotton sector study will not be carried out.</p>
<p>Pesticide Analysis Laboratory The Borrower shall, by the end of the first year of Project implementation, register pesticides analysis laboratory with the National Pesticide Commission, and make available two staff with degrees in chemistry or agriculture to operate pesticides analysis laboratory in order to provide services to the public and the private sector.</p>	<p>Schedule 6, para 22</p>	<p>Not complied in year 1 since project implementation was delayed due to financial crisis in 1998. Compliance delayed by 3 years.</p>

Covenant	Reference in Loan Agreement	Status of Compliance
<p>Financial Statements The Borrower shall (i) maintain separate accounts for the Project, have such accounts and related financial statements audited annually, in accordance with appropriate auditing standards consistently applied, by independent auditors whose qualifications, experience and terms of reference are acceptable to the Bank, and furnish to the Bank, as soon as available, but in any event not later than nine (9) months after the end of each related fiscal year, certified copies of such audited accounts and financial statements and the report of the auditors relating thereto (including the auditor's opinion on the use of the Loan proceeds and compliance with the covenants of the Loan Agreement.</p>	<p>Article IV, Sec. 4.06(b)</p>	<p>Complied with.</p>
<p>Semi-Annual Progress Reports The Borrower shall furnish to the Bank semi-annual reports on the carrying out of the Project and on the operation and management of the Project facilities. Such reports shall be submitted in such form and in such detail and within such a period as the Bank shall <u>reasonably request, and shall indicate, among other things,</u> progress made and problems encountered during the period under review, steps taken or proposed to be taken to remedy these problems, and proposed program of activities and expected progress during the following period.</p>	<p>Article IV, Sec. 4.07(b)</p>	<p>Complied with</p>
<p>Project Completion Report Promptly after physical completion of the Project, but in any event, not later than three (3) months thereafter or such later date as may be agreed for this purpose between the Borrower and the Bank, the Borrower shall prepare and furnish to the Bank a report, in such form and in such detail as the Bank shall reasonably request, on the execution and initial operation of the Project, including its cost, the performance by the Borrower of its obligations under the Loan Agreement and accomplishment of the purpose of the Loan.</p>	<p>Article IV, Sec. 4.07(c)</p>	<p>Complied with</p>

AARD = Agency for Agricultural Research and Development, ADB = Asian Development Bank, AIAT = Assessment Institute for Agricultural Technology, BAPPENAS = *Badan Perencanaan Pembangunan Nasional* (National Development Planning Board), CAQ = Center for Agricultural Quarantine, DGE = Directorate General of Estate Crops, IBRD-ARMP = International Bank for Reconstruction and Development-ARMP, IPM = integrated pest management, MTR = mid-term review, PDATP = Participatory Development for Agricultural Technology, PAP = processing adaptation phase, RBCL = regional biological control laboratory, RECPC = Regional Estate Crop Protection Centers, RSC = research selection committee, SIT = smallholder intensification team.

SUMMARY OF CONSULTING SERVICES

Position	International Consultants		Domestic Consultants		Reason(s) for variation
	PAM	Actual	PAM	Actual	
	(person-months)		(person-months)		
A. For DGE					
IPM Training Specialist-cum Team Leader	48	51	—	—	
Curriculum Development Specialist	14	22	12	20	
Tree Crop Agronomist	18	21	—	—	
Pest Monitoring Specialist	12	8	—	—	Services not continued
IPM Cotton Specialist	6	3	—	—	Man-months reduced
Training Specialist	15	18	30	32	
Development Support Communication Specialist	12	12	—	—	
BCA Specialist	15	18	23	32	
Monitoring and Evaluation Specialist	18	13	36	36	Services not continued
IPM Curriculum Reviewer	3	—	—	—	Proposed assignment was adequately covered by other experts
Estate Crop Specialist	12	—	—	—	Proposed assignment was adequately covered by other experts
Information Systems	3	—	—	—	Proposed assignment was adequately covered by other experts
Pest Management Reviewer	3	—	—	—	Proposed assignment was adequately covered by other experts
Computer Specialist	—	—	—	18	
Marketing Specialist	—	—	—	4.5	
Institutional Training Specialist	—	—	—	4.5	
Policy Studies	9	—	12	—	Cotton, sugar market studies as well as pesticide policy study cancelled.
Provincial based consultants			354	547.5	Need to continue work on fields especially
IPM Trainers			242	239	FFS, BCA training, PBME, post FFS, FL
Short-Term Advisors			112	136	training, etc.
Project Review					
PAP-cum-Mid-term Review	8	—	—	—	
Project Impact Design	4	10	—	—	Local consulting firm to do survey and data analysis was not contracted
Subtotal (A)	200	176	821	1,069.5	

Position	International Consultants		Domestic Consultants		Reason/s for variation
	PAM	Actual	PAM	Actual	
	(person-months)		(person-months)		
B. For AARD					
Citrus Researcher	6	4	—	—	Man-months reduced
Pest Ecologist	15	22	—	—	
Economic Entomologist	15	9	—	—	Man-months reduced
Subtotal (B)	36	35	0	0	
C. For CAQ					
Taxonomist	12	12	—	—	
Pest Risk Analysis	2	2	—	—	
Post-Entry Quarantine	4	4	—	—	
Quality Management	1	1	—	—	
Quarantine Procedures	3	3	—	—	
Information System	9	9	—	—	
Subtotal (C)	31	31	0	0	
Total, by column	267	242	821	1,069.5	
Total appraisal estimate, International and local	1,088				
Total actual, International and domestic	1,480				

AARD = Agency for Agricultural Research and Development, BCA = biological control agent, CAQ = Center for Agricultural Quarantine, DGE = Directorate General of Estate Crops, FFS = farmers field schools, IAARD = Indonesian Agency for Agricultural Research and Development, IPM = integrated pest management, PAM = project administration memorandum, PAP = processing adaptation phase, PBME = project benefit monitoring and evaluation = project benefit monitoring and evaluation.

Source: Directorate General of Estate Crops.

PROCUREMENT DETAILS

Quantity (units)	Particulars	Amount (\$'000)	Procurement Mode	User Agency/Office
	Civil Works	328.7	LCB/Force	DGE
36	Fax, Computers, and Accessories	791		DGE
63	Motor Vehicles: Kijang type and 4-WD (24 for training, 12 for field leaders)	1,192.30		DGE
455	Motorcycles (240 smallholder intensification teams, 24 field leaders, 121 for training)	651.4		DGE
667	Consulting Services (person-months)	5,373.70		DGE
	Farming Systems Diversification Inputs	4,658.80	Local purchase	DGE
12	Computers and Accessories	47.8	IS/LCB	IAARD
36	Consulting Services (person-months)	602		IAARD
12	Motor Vehicles for Assessment Institute for Agricultural Technology: 4-WD	230.3		IAARD
32	Civil Works	139.4	LCB/Force	CAQ
43	Computers and Accessories	213.9	IS/LCB	CAQ
19	Motor Vehicles: Kijang type and 4-WD	347.8		CAQ
3	Major Laboratory Equipment	929.1	IS	CAQ
31	Consulting Services (person-months)	521.6		CAQ
	Office Equipment, Furniture, and materials	1,055.60		CAQ/DGE/IAARD
	Training	11,048.70	Force	CAQ/DGE/IAARD
	Project Administration	3,009.60	Force Account	CAQ/DGE/IAARD

CAQ = Center for Agricultural Quarantine, DGE = Directorate General of Estate Crops, IAARD = Indonesian Agency for Agricultural Research and Development, IS = international shopping, LCB = local competitive bidding, WD = wheel drive.

Note: Appraisal estimate: \$31 million

Sources: Directorate General of Estate Crops.; ADB. 1996. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the Republic of Indonesia for the Integrated Pest Management for Smallholder Estate Crops Project*. Manila.

ECONOMIC AND FINANCIAL ANALYSIS

A. Introduction

1. The financial economic analysis was conducted based on information in the project impact assessment study¹ (Impact Study) and data obtained during field visits to 7 of the 14 project provinces by the Project Completion (PCR) Mission from 21 April to 2 May 2008. Prices used in the analysis are adjusted to constant 2008 levels. The financial and economic internal rate of returns (FIRR and EIRR) were calculated based on the estimated value of incremental agricultural cost and benefits. The benefits of improvements to the environment such as improvement in health due to the decreased use of chemicals and pesticides, and better soil and water quality are excluded due to the difficulties in quantifying these impacts.

1. Main Assumptions

2. The main assumptions used in this analysis are: (i) total project cost are adjusted to 2008 prices using the World Bank MUV² index; (ii) project activities were implemented over a 9-year period from 1998 to 2006; (iii) the economic life of the Project is taken as 20 years for financial and economic analyses and this corresponds with the period used at appraisal; (iv) standard conversion factor (standard conversion factor) for farm inputs used in this analysis is 0.9 (as used at appraisal) while that for labor is 0.8³; (v) price of labor is assumed at Rp25,000 per day, which is the prevailing rate in the project area; and (vi) forecasted prices of traded commodities are based on World Bank commodity price projections, while prices of other commodities are based on prevailing local market prices⁴.

2. Project Benefits

3. The Project provided training to 122,600 farmers cultivating 129,700 hectares (ha) of six estate crops supported by the Project. It focused on six crops: coffee, cocoa, tea, pepper, cotton and cashew located in 13 Provinces; East Java, Central Java, West Java, Bali, North Sumatra, South Sumatra, East Kalimantan, West Kalimantan, Southeast Sulawesi, South Sulawesi, Lampung, Bangka-Belitung, and West Nusa Tenggara. These farmers were trained in farmers field schools (FFS) and the alumni of these schools have spread their knowledge to another 150,000 neighboring farmers. However the Impact Study found that this method of disseminating information from farmer-to-farmer was not very effective. In view of this finding, this additional benefit was excluded in the project economic and financial analysis.

4. Table A11.4 shows the project location and average size of the estate crop area supported by the Project. The average size of the project crops farmed by the beneficiaries is 1.06 ha. The number of farmers trained during the course of the Project is shown in Table A11.5. Cashew and cotton have the smallest cropped area and they comprise 4% and 6% of the Project's total cropped area as compared with 30% for cocoa, 23% for coffee, 20% for pepper and 18% for tea.

5. The alumni of the FFS have been able to raise their crop yield by some 20% to 50%. Tables A11.7 and A11.8 show the financial and economic cost and benefit per ha of these crops

¹ DGE. 2006. *Impact Assessment Study of the IPM-SECP*.

² World Bank. *MUV Index 2004*.

³ ADB. 2007. *Project Completion Report on the Northern Sumatra Irrigated Agriculture*.

⁴ World Bank. 2007. *Commodity Price Projection*.

with and without the Project. With the exception of cashew and cotton, the higher yields require additional labor input. All improved crops require higher material cost, mainly fertilizer, despite enjoying some savings in reducing or eliminating the use of expensive pesticides.

6. With the Project, farmers net income per ha have been raised considerably: 18% for pepper, 15% for coffee, 41% for tea, 24% for cocoa, 96% for cashew, and 86% for cotton. The large increases in cashew and cotton did not raise farmers' income substantially since these increases were from a small base.

7. The impact of this Project on farm incomes is shown in Table A11.9. In this analysis, all cost and prices are adjusted to current prices. It is significant to note that the estate crops covered by this Project do not form a significant part of the farmers' land in the case of pepper (18%) and cotton farms (30%). Both these crops are not long-term tree crops with cotton being a short-term crop (4 months) and pepper being a labor-intensive crop (150 days per ha per year), which means that a farmer can only plant 0.25 ha to 0.50 ha of this crop since they rely entirely on family labor. For other crops such as coffee, tea, cocoa, and cashew, these farmers utilize more than two third of their farm land growing these estate crops.

8. Without the Project, farm incomes ranged from a low of Rp3.6 million per year for cashew farmers to a high of Rp11.2 million per year for pepper farmers. The corresponding figures for the other crops are Rp4.9 million per year for coffee, Rp5.4 million per year for cotton, Rp7.6 million per year for tea and Rp9.6 million per year for cocoa.

9. With Project, farm income will be raise to a range of Rp7.0 million per year for cashew farmers to Rp13.9 million per year for pepper farmers. The corresponding figures for the other crops are Rp8.6 million per year for coffee, Rp8.7 million per year for cotton, Rp11.0 million per year for tea and Rp13.1 million per year for cocoa.

10. The weighted average farm income⁵ of beneficiaries has been raised from Rp8.02 million/year Without Project to Rp11.35 million per year With Project or an increase of 42%. Thus, the Project has succeeded in meeting its objective of increasing farm productivity and income. Despite this improvement, the average income of project farmers remains low at less than \$0.85 per capita per day.

11. The main reasons for persistent low farm income are small size of crop area and low crop productivity. The Project failed to address the problem of the small size of crop area farmed by beneficiaries. Increases in productivity from this small area of less than one hectare farmed by the majority of beneficiaries had a limited impact on farm income. Despite the 20% to 50% increases, crop productivity remains far below its potential. Table 1 show that the yields achieved in the Project are far below the potential yields that can be achieved under smallholder conditions. This is due to several factors including: (i) the old age of tree stand, (ii) poor planting material; (iii) poor maintenance prior to project; (iv) high stand of trees per ha in the case of cashew; and (v) inadequate use of fertilizer inputs. With replanting with high yielding materials and good crop maintenance, farmers could potentially raise their farm yields and income by about 300%.

12. Many farmers are aware of their low yields and are taking measures to replant small areas with high-yield seedlings (or grafting their trees in the case of cocoa) and using new high-yield seeds for cotton. The South Sulawesi provincial government has signed a memorandum of

⁵ Weighted according to area of crops improved under this Project.

understanding with a Chinese company to introduce transgenic seeds capable of yielding 3 to 4 tons per ha per crop. However, a major problem faced by many farmers is the lack of credit facilities to finance the replanting of old trees.

Table A11.1: Actual Crop Output and Potential Yields
(kg/ha/year)

Crop	Without Project	With Project	Potential Yield	With Project as % of Potential
Pepper	700	838	2,000	0.42
Coffee	510	624	1,500	0.42
Tea	600	750	1,500	0.50
Cocoa	583	725	2,000	0.36
Cashew	300	450	1,500	0.30
Cotton	260	325	2,000	0.16

Source: ADB. 2007. *Technical Assistance to the Republic of Indonesia for Preparing Productivity Enhancement for Tree Crops Project*. Manila. Mission's estimate.

13. International prices for the four main commodities included in the Project fell significantly during the early years of implementation. The average international price for the period from 1998 to 2006 for cocoa was 73% lower than the 1997 prices; while the corresponding price decline for robusta coffee was 69%, cotton 29%, and tea 14%. However, during this period, the Indonesian rupiah depreciated by about 250% and the net impact was a significant increase in farm-gate prices. In the last 2 years, commodity prices improved significantly and Table A11.10 shows that from 2000 to 2007, cocoa prices improved by 149% while the corresponding figures for the other commodities were robusta coffee at 150%, cashew at 35%, pepper at 29%, cashew at 15%, and tea at 9%.

14. Despite producing high-quality, pesticide-free produce, the FFS farmers continue, with few exceptions, to receive the same price for their farm commodity as other farmers following traditional farm practices. Traders generally mixed all their purchases and were unable to obtain premium prices for better farm produce. This has reduced the incentive for many non-FFS farmers to adopt IPM practices. In the case of tea and coffee in West and East Java, the Project engaged a short-term processing and marketing consultant who was able to form farm groups to market their improved farm produce in bulk and convince traders to offer better prices for the FFS alumni farm produce. In these areas, some farmer groups also undertook processing activities outside the scope of this Project.

15. With high commodity expected to prevail in the near future, the benefits to project farmers are expected to be maintained or improved for the remaining years of the project period, or up to 2016.

3. Results of Economic Analysis

16. The project FIRR is estimated at 14.1% while the EIRR is estimated at 25.3% at project completion as compared with the appraisal estimates for EIRR at 12.7 percent (Table A11.2). There were no estimates of project FIRR at project appraisal. The main reason for the higher EIRR is the higher yields observed at PCR than forecasted at appraisal. Commodity prices were also significantly higher. The Project will remain economically viable in future years even if the: (i) costs are raised by 20%; (ii) benefits are reduced by 20%; and (iii) number of beneficiaries is lowered by 50%. As in the case with appraisal, it is assumed that only 60% of the farmers trained are achieving the higher crop yields made possible by this Project.

17. Table A11.3 shows the switching values for the project FIRR and EIRR. There need to be either a 42% increase in project cost or a 16% fall in project benefits to reduce the project FIRR to below 12.0%.

Table A11.2: Project FIRR, EIRR, and Sensitivity Analysis

Item	FIRR	EIRR
Base Case	14.1	25.3
From 2008 onwards		
Cost + 10%	14.1	24.9
Cost + 20%	13.5	24.5
Benefit - 10%	13.1	24.1
Benefit - 20%	11.3	22.8
No. of Beneficiary Decline by 25%	12.2	21.9

EIRR = economic internal rate of return, FIRR = financial internal rate of return, no. = number.
Source: Asian Development Bank.

Table A11.3: Switching Value

Item	FIRR	EIRR
	(%)	
From 2008 onwards		
Increase in Project Cost	42.0	190.0
Shortfall in Incremental Benefits	16.0	64.0

Note: Switching Value for IRR = 12%.

Note: Switching value for IRR = 12%.

EIRR = economic internal rate of return, FIRR = financial internal rate of return.

Source: Asian Development Bank

Table A11.4: Area of Tree Crops, Project Farmers, and Farm Size

Crop	Location	No. of Farmers	Average Size (ha) Tree Crop	Total Area (ha)
Pepper	Bangka Belitung	2,775	0.94	2,609
	West Kalimantan	4,070	0.51	2,076
	Lampung	18,925	1.1	20,818
	Subtotal	25,770	0.99	25,502
Coffee	Bali	6,545	1.16	7,592
	Central Java	7,920	0.68	5,386
	South Sumatra	4,520	1.03	4,656
	East Java	17,880	0.7	12,516
	Subtotal	36,865	0.82	30,149
Cocoa	East Kalimantan	3,820	1.63	6,227
	South Sulawesi	7,135	0.93	6,636
	Souteast Sulawesi	7,495	1.8	13,491
	North Sumatra	11,120	1.1	12,232
	Subtotal	29,570	1.3	38,585
Tea	West Java	17,130	1.38	23,639
Cashew	West Nusa Tenggara	6,695	0.69	4,620
Cotton	South Sulawesi	6,580	1.1	7,238
	Total	122,610	1.06	129,733

ha = hectare, no. = number.

Source: Directorate General of Estate Crops, project completion report, 2007.

Table A11.5: Number of Farmers Trained by Year

Crop	1999	2000	2001	2002	2003	2004	2005	Total
Pepper	1,047	2,094	3,141	4,188	7,100	5,675	2,525	25,770
Coffee	1,179	2,358	3,537	4,716	11,350	8,125	5,600	36,865
Tea	653	1,306	1,959	2,612	4,400	3,000	3,200	17,130
Cocoa	1,068	2,136	3,204	4,272	8,940	4,600	5,350	29,570
Cashew			410	410	2,175	1,825	1,875	6,695
Cotton				120	4,200	1,120	1,140	6,580
Total	3,947	7,894	12,251	16,318	38,165	24,345	19,690	122,610

Source: Directorate General of Estate Crops, project completion report, 2007.

Table A11.6: Area of Crops Improved During Project

Crop	1999	2000	2001	2002	2003	2004	2005	Total
Pepper	1,036	2,072	3,108	4,144	7,026	5,616	2,499	25,502
Coffee	964	1,928	2,893	3,857	9,282	6,645	4,580	30,149
Tea	901	1,802	2,703	3,605	6,072	4,140	4,416	23,639
Cocoa	1,394	2,787	4,181	5,574	11,666	6,002	6,981	38,585
Cashew			283	283	1,501	1,259	1,294	4,620
Cotton				132	4,620	1,232	1,254	7,238
Total	4,295	8,590	15,986	17,595	40,167	24,894	21,023	129,733

Source: Directorate General of Estate Crops, project completion report, 2007.

Table A11.7: Financial Crop Budget with and Without Project

Item	Pepper	Coffee	Tea	Cocoa	Cashew	Cotton
Without Project						
Labor cost	3,750,000	1,000,000	2,500,000	2,000,000	750,000	1,000,000
Material cost	3,200,000	700,000	1,000,000	1,600,000	200,000	800,000
Other cost	20,000	10,000	20,000	20,000	10,000	20,000
Total Cost	6,970,000	1,710,000	3,520,000	3,620,000	960,000	1,820,000
Labor person-day	150	40	100	80	30	40
Yield – kg/ha	700	510	600	583	300	260
Price/kg	27,595	12,899	12,892	12,892	6,214	8,619
Total Benefit	19,316,745	6,574,207	7,735,262	7,509,732	1,864,215	2,238,920
Net Benefit	12,346,745	4,864,207	4,215,262	3,889,732	904,215	418,920
With Project						
Labor cost	4,000,000	1,250,000	2,500,000	2,500,000	750,000	1,000,000
Material cost	4,500,000	1,200,000	1,200,000	2,000,000	250,000	1,000,000
Other cost	20,000	20,000	20,000	20,000	20,000	20,000
Total Cost	8,520,000	2,470,000	3,720,000	4,520,000	1,020,000	2,020,000
Labor person-day	160	50	100	100	30	40
Yield – kg/ha	838	624	750	725	450	325
Price/kg	27,595	12,899	12,892	12,892	6,214	8,619
Total Benefit	23,111,106	8,046,951	9,669,078	9,352,780	2,796,323	2,798,650
Net Benefit	14,591,106	5,576,951	5,949,078	4,832,780	1,776,323	778,650
With-Without Project						
Additional Cost	1,550,000	760,000	200,000	900,000	60,000	200,000
Additional Benefit	3,794,361	1,472,744	1,933,816	1,843,048	932,108	559,730
Net Additional Benefit	2,244,361	712,744	1,733,816	943,048	872,108	359,730

kg = kilogram, ha = hectare.

Source: Asian Development Bank.

Table A11.8: Economic Crop Budget with and Without Project

Item	Pepper	Coffee	Tea	Cocoa	Cashew	Cotton
Without Project						
Labor cost	3,000,000	800,000	2,000,000	1,600,000	600,000	800,000
Material cost	2,880,000	630,000	900,000	1,440,000	180,000	720,000
Other cost	18,000	9,000	18,000	18,000	9,000	18,000
Total Cost	5,898,000	1,439,000	2,918,000	3,058,000	789,000	1,538,000
Labor person-day	150	40	100	80	30	40
Yield – kg/ha	700	510	600	583	300	260
Price/kg	27,595	12,899	12,892	12,892	6,214	8,619
Total Benefit	19,316,745	6,574,207	7,735,262	7,509,732	1,864,215	2,238,920
Net Benefit	13,418,745	5,135,207	4,817,262	4,451,732	1,075,215	700,920
With Project						
Labor cost	3,200,000	1,000,000	2,000,000	2,000,000	600,000	800,000
Material cost	4,050,000	1,080,000	1,080,000	1,800,000	225,000	900,000
Other cost	18,000	18,000	18,000	18,000	18,000	18,000
Total Cost	7,268,000	2,098,000	3,098,000	3,818,000	843,000	1,718,000
Labor person-day	160	50	100	100	30	40
Yield – kg/ha	838	624	750	725	450	325
Price/kg	27,595	12,899	12,892	12,892	6,214	8,619
Total Benefit	23,111,106	8,046,951	9,669,078	9,352,780	2,796,323	2,798,650
Net Benefit	15,843,106	5,948,951	6,571,078	5,534,780	1,953,323	1,080,650
With-Without Project						
Additional Cost	1,370,000	659,000	180,000	760,000	54,000	180,000
Additional Benefit	3,794,361	1,472,744	1,933,816	1,843,048	932,108	559,730
Net Additional Benefit	2,424,361	813,744	1,753,816	1,083,048	878,108	379,730

kg = kilogram, ha = hectare.

Source: Asian Development Bank.

Table A11.9: Farm Income With and Without Project

Items	Pepper	Coffee	Tea	Cocoa	Cashew	Cotton
Without Project – 2008						
Crop Area – ha						
Area of project crop	0.51	0.68	1.38	1.80	1.10	0.69
Other crop area	2.21	0.39	0.62	0.72	0.54	1.57
Total farm size	2.72	1.07	2.00	2.52	1.64	2.26
Farm Income – Rp						
Farm income	6.30	3.31	5.82	7.00	0.99	0.29
Other farm income	4.42	0.78	1.24	1.44	1.08	3.14
Off-farm Income	0.50	0.80	0.50	1.20	1.50	2.00
Total farm income	11.22	4.89	7.56	9.64	3.57	5.43
Number family members	4.00	4.00	4.00	4.00	4.00	4.00
Per capita income	2.80	1.22	1.89	2.41	0.89	1.36
With Project – 2008						
Crop Area – ha						
Area of project crop	0.51	0.68	1.38	1.80	1.10	0.69
Other crop area	2.21	0.39	0.62	0.72	0.54	1.57
Total farm size	2.72	1.07	2.00	2.52	1.64	2.26
Farm Income – Rp						
Farm income	7.44	3.79	8.21	8.70	1.95	0.54
Other farm income	4.42	0.78	1.24	1.44	1.08	3.14
Off-farm Income	2.00	4.00	1.50	3.00	4.00	5.00
Total farm income	13.86	8.57	10.95	13.14	7.03	8.68
Number family members	4.00	4.00	4.00	4.00	4.00	4.00
Per capita income	3.47	2.14	2.74	3.28	1.76	2.17

ha = hectare.

Source: Asian Development Bank.

Table A11.10: Derivation of Farm-gate Prices for Project Commodities, 2000 and 2006.

Item	Cocoa		Coffee		Cashew		Tea		Pepper		Cotton	
	2000	2007	2000	2007	2000	2007	2000	2007	2000	2007	2000	2007
\$/mt ^a	932	1,952	943	1,909	3,500	4,250	1,931	1,909	3,400	3,950	1,340	1,395
Quality Differential ^a	792	1,659	849	1,718	3,150	3,825	1,738	1,718	3,060	3,555	1,206	1,256
Freight, Jakarta–Europe	60	70	60	70	50	50	50	50	50	50	50	50
FOB Jakarta \$	732	1,589	789	1,648	3,100	3,775	1,688	1,668	3,010	3,505	1,156	1,206
Exchange Rp '000 = \$	8,422	9,300	8,422	9,300	8,422	9,300	8,422	9,300	8,422	9,300	8,422	9,300
FOB Jakarta, Rp '000/mt	6,167	14,780	6,642	15,327	26,108	35,108	14,215	15,513	25,350	32,597	9,736	11,211
Port handling	30	30	35	35	35	35	35	35	35	35	35	35
Transport cost	100	120	100	120	500	500	100	100	100	100	100	100
Ex-factory price	6,037	14,630	6,507	15,172	25,573	34,573	14,080	15,378	25,215	32,462	9,601	11,076
Processing cost	175	175	700	700	50	50	250	250	600	600	500	500
Processing margin	130	130	140	140	0	0	800	800	1,200	1,200	1,000	1,000
Marketing margin -10%	573	1,432	567	1,433	2,552	3,452	1,303	1,433	2,342	3,066	810	958
Commodity	dry bean		dry bean		raw nut		dry leaves		black pepper		raw cotton	
Financial farm price	5,158	12,892	5,101	12,899	4,594	6,214	11,727	12,895	21,074	27,595	7,291	8,619
Economic farm price	5,259	13,081	5,255	13,142	4,666	6,304	12,921	14,102	23,121	29,715	8,885	10,228

FOB = freight on board, mt = metric tons.

^a Quality differential of 10–15%.

Source: International Bank for Reconstruction and Development Commodity Price Forecasts, December 2007.

Table A11.11: Financial Cost and Benefits of Project

Item	1997	1998	1999	2000	2001	2002
Cost						
IPM Project Cost	700.59	18,903.92	30,197.59	55,805.25	61,840.87	68,060.65
With – Without Project Cost						
Pepper			1,124.17	3,372.50	6,745.01	11,241.68
Coffee			512.97	1,538.90	3,077.81	5,129.68
Tea			126.16	378.48	756.96	1,261.60
Cocoa			877.97	2,633.92	5,267.83	8,779.72
Cashew			0.00	0.00	11.88	23.76
Cotton			0.00	0.00	0.00	18.48
Total Cost	700.59	18,903.92	32,838.85	63,729.05	77,700.35	94,515.56
With – Without Project Benefits						
Pepper				2,751.93	8,255.80	16,511.61
Coffee				994.04	2,982.12	5,964.24
Tea				1,219.85	3,659.54	7,319.08
Cocoa				1,797.94	5,393.81	10,787.63
Cashew				0.00	0.00	184.59
Cotton				0.00	0.00	0.00
Total Benefits				6,763.76	20,291.28	40,767.14
Net Benefits	(700.59)	(18,903.92)	(32,838.85)	(56,965.30)	(57,409.08)	(53,748.43)
Item	2003	2004	2005	2006	2007	2008
Cost						
IPM Project Cost	99,181.74	70,201.16	52,913.35	8,802.18		
With – Without Project Cost						
Pepper	18,864.97	24,958.24	27,669.34	27,669.34	27,669.34	27,669.34
Coffee	10,067.91	13,602.99	16,039.48	16,039.48	16,039.48	16,039.48
Tea	2,111.68	2,691.28	3,309.52	3,309.52	3,309.52	3,309.52
Cocoa	16,129.04	19,910.56	24,308.64	24,308.64	24,308.64	24,308.64
Cashew	86.80	139.68	194.02	194.02	194.02	194.02
Cotton	665.28	837.76	1,013.32	1,013.32	1,013.32	1,013.32
Total Cost	147,107.41	132,341.68	125,447.68	81,336.50	72,534.33	72,534.33
With – Without Project Benefits						
Pepper	27,519.34	46,180.98	61,097.14	67,733.85	67,733.85	67,733.85
Coffee	9,940.39	19,509.81	26,360.17	31,081.64	31,081.64	31,081.64
Tea	12,198.47	20,417.96	26,022.16	31,999.97	31,999.97	31,999.97
Cocoa	17,979.38	33,029.54	40,773.47	49,779.99	49,779.99	49,779.99
Cashew	369.17	1,348.37	2,170.00	3,014.14	3,014.14	3,014.14
Cotton	51.72	1,861.89	2,344.60	2,835.93	2,835.93	2,835.93
Total Benefits	68,058.48	122,348.55	158,767.53	186,445.53	186,445.53	186,445.53
Net Benefits	(79,048.94)	(9,993.14)	33,319.86	105,109.02	113,911.20	113,911.20
FIIR (with – without project)	17.28%					
NPV (12%)	Rp 88,759 million					

() = negative, FIRR = financial internal rate of return, IPM = integrated pest management, NPV = net present value.
Source: Asian Development Bank estimates.

Table A11.12: Economic Cost and Benefits of Project

Items	1997	1998	1999	2000	2001	2002
Cost						
IPM Project Cost	630.54	17,013.53	27,177.83	50,224.73	55,656.78	61,254.59
With - Without Project Cost						
Pepper			993.62	2,980.86	5,961.72	9,936.19
Coffee			444.80	1,334.39	2,668.78	4,447.97
Tea			113.54	340.63	681.26	1,135.44
Cocoa			741.40	2,224.20	4,448.39	7,413.99
Cashew			0.00	0.00	10.69	21.39
Cotton			0.00	0.00	0.00	16.63
Total Cost	630.54	17,013.53	29,471.19	57,104.80	69,427.63	84,226.19
With - Without Project Benefits						
Pepper				8,255.80	16,511.61	27,519.34
Coffee				2,982.12	5,964.24	9,940.39
Tea				3,659.54	7,319.08	12,198.47
Cocoa				5,393.81	10,787.63	17,979.38
Cashew				0.00	184.59	369.17
Cotton				0.00	0.00	51.72
Total Benefits				20,291.28	40,767.14	68,058.48
Net Benefits	(630.54)	(17,013.53)	(29,471.19)	(36,813.53)	(28,660.49)	(16,167.71)

Items	2003	2004	2005	2006	2007	2008
Cost						
IPM Project Cost	89,263.56	63,181.05	47,622.02	7,921.96		
With - Without Project Cost						
Pepper	16,674.20	22,059.87	24,456.13	24,456.13	24,456.13	24,456.13
Coffee	8,729.94	11,795.23	13,907.92	13,907.92	13,907.92	13,907.92
Tea	1,900.51	2,422.15	2,978.56	2,978.56	2,978.56	2,978.56
Cocoa	13,620.08	16,813.36	20,527.30	20,527.30	20,527.30	20,527.30
Cashew	78.12	125.72	174.62	174.62	174.62	174.62
Cotton	598.75	753.98	911.99	911.99	911.99	911.99
Total Cost	130,865.16	117,151.35	110,578.54	70,878.48	62,956.52	62,956.52
With - Without Project Benefits						
Pepper	46,180.98	61,097.14	67,733.85	67,733.85	67,733.85	67,733.85
Coffee	19,509.81	26,360.17	31,081.64	31,081.64	31,081.64	31,081.64
Tea	20,417.96	26,022.16	31,999.97	31,999.97	31,999.97	31,999.97
Cocoa	33,029.54	40,773.47	49,779.99	49,779.99	49,779.99	49,779.99
Cashew	1,348.37	2,170.00	3,014.14	3,014.14	3,014.14	3,014.14
Cotton	1,861.89	2,344.60	2,835.93	2,835.93	2,835.93	2,835.93
Total Benefits	122,348.55	158,767.53	186,445.53	186,445.53	186,445.53	186,445.53
Net Benefits	(8,516.61)	41,616.18	75,866.99	115,567.05	123,489.01	123,489.01

EIRR (with– without project)

29.85%

NPV (12%)

Rp 230,655 million

() = negative, EIRR = economic internal rate of return, ipm = integrated pest management, NPV = net present value.

Source: Asian Development Bank estimates.

PROJECT OVERALL ASSESSMENT

Criterion	Weight (%)	Definition	Rating Description	Rating Value
1. Relevance	20	Relevance is the consistency of a project's impact and outcome with the government's development strategy, the Asian Development Bank's lending strategy for the country, and the Asian Development Bank's strategic objectives at the time of approval and evaluation and the adequacy of the design.	Highly relevant Relevant Partly relevant Irrelevant	3 2 1 0
2. Effectiveness	30	Effectiveness describes the extent to which the outcome, as specified in the design and monitoring framework, either as agreed at approval or as subsequently modified, has been achieved.	Highly effective Effective Less effective Ineffective	3 2 1 0
3. Efficiency	30	Efficiency describes, ex post, how economically resources have been converted to results, using the economic internal rate of return, or cost-effectiveness, of the investment or other indicators as a measure and the resilience to risk of the net benefit flows over time.	Highly efficient Efficient Less efficient Inefficient	3 2 1 0
4. Sustainability	20	Sustainability considers the likelihood that human, institutional, financial, and other resources are sufficient to maintain the outcome over its economic life.	Most likely Likely Less likely Unlikely	3 2 1 0
Overall Assessment (weighted average of above criteria)	Highly Successful: Overall weighted average is greater than or equal to 2.7. Successful: Overall weighted average is greater than or equal to 1.6 and less than 2.7. Partly Successful: Overall weighted average is greater than or equal to 0.8 and less than 1.6. Unsuccessful: Overall weighted average is less than 0.8.			