

PROJECT COMPLETION REPORT

ON THE

LOW-INCOME UPLAND COMMUNITIES PROJECT
(Loan 999-PHI[SF])

IN THE

PHILIPPINES

July 2003

CURRENCY EQUIVALENTS

Currency Unit – peso (P)

		At Appraisal (October 1989)	At Project Completion (March 2003)
P1.00	=	\$0.046	\$0.018
\$1.00	=	P21.94	P54.45

ABBREVIATIONS

ADB	–	Asian Development Bank
CADC	–	certificate of ancestral domains claim
CCFSC	–	community certificate of forest stewardship contract
CENRO	–	community environment and natural resources office
CFCS	–	certificate of forest stewardship contract
CSC	–	certificate of stewardship contract
DENR	–	Department of Environment and Natural Resources
EA	–	executing agency
EIRR	–	economic internal rate of return
LBP	–	Land Bank of the Philippines
NGO	–	nongovernment organization
PBME	–	project benefit monitoring and evaluation
PENRO	–	provincial environment and natural resources office
PO	–	people's organization
SALT	–	sloping agricultural land technology
SMU	–	site management unit
SSC	–	<i>sitio</i> service center
TA	–	technical assistance
WMU	–	watershed management unit

GLOSSARY

<i>Barangay</i>	–	The lowest local government administrative unit.
<i>Sitio</i>	–	A hamlet that is administratively a part of a <i>barangay</i> .
<i>Kaingin</i>	–	The type of slash-and-burn agriculture usually practiced in the uplands.
Watershed	–	Land drained by a stream or fixed body of water and tributaries having a common outlet for surface runoff.

NOTES

- (i) The fiscal year (FY) of the Government ends on 31 December. FY before a calendar year denotes the year in which the fiscal year ends.
- (ii) In this report, "\$" refers to US dollars.

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BASIC DATA

A. Loan Identification

1.	Country	Philippines
2.	Loan Number	999
3.	Project Title	Low-Income Upland Communities Project
4.	Borrower	Republic of the Philippines
5.	Executing Agency	Department of Environment and Natural Resources (DENR) and the two provincial governments of Oriental Mindoro and Occidental Mindoro
6.	Amount of Loan	SDR25.04 million (\$32.0 million)
7.	Project Completion Report Number	PCR:PHI 745

B. Loan Data

1.	Appraisal	
	– Date Started	11 September 1989
	– Date Completed	29 September 1989
2.	Loan Negotiations	
	– Date Started	6 November 1989
	– Date Completed	7 November 1989
3.	Date of Board Approval	14 December 1989
4.	Date of Loan Agreement	18 December 1989
5.	Date of Loan Effectiveness	
	– In Loan Agreement	18 March 1990
	– Actual	15 February 1990
	– Number of Extensions	None
6.	Closing Date	
	– In Loan Agreement	30 June 1998
	– Actual	21 September 2001
	– Number of Extensions	Two
7.	Terms of Loan	
	– Interest Rate	1.0 percent per annum
	– Maturity	35 years
	– Grace Period	10 years
8.	Disbursements	
	– Dates	

Initial Disbursement	Final Disbursement	Time Interval
25 May 1990	21 September 2001	136 months
Effective Date	Original Closing Date	Time Interval
15 February 1990	30 June 1998	100 months

– Amount (\$'000)

Category or Subloan	Last			
	Original Allocation	Revised Allocation	Amount Disbursed	Undisbursed Amount ^a
Civil Works	4,437.9	5,517.9	4,980.1	483.8
Equipment	2,558.2	2,492.8	2,369.8	76.6
Nongovernment Organization				
Services	2,435.6	2,166.0	2,135.7	81.5
Consultants	637.6	504.1	503.1	13.8
Training	1,233.1	1,134.7	1,331.8	(169.6)
Operation & Maintenance	1,730.2	3,725.9	4,227.8	(346.7)
Land Surveys	48.6	241.1	99.4	133.5
Nurseries	1,087.4	917.3	1,041.5	(107.1)
Reforestation	11,268.0	4,552.9	4,186.4	388.7
Service Charge During Construction	980.1	1,059.3	1,062.3	0
Unallocated	5,584.2	261.1	0	243.8
Total	32,000.9	22,573.1	21,937.9	798.3

^a The undisbursed amount of SDR618, 976.67 (\$798,325.16) was cancelled on 21 September 2001.

– Amount (SDR'000)

Category or Subloan	Last			
	Original Allocation	Revised Allocation	Amount Disbursed	Undisbursed Amount ^a
Civil Works	3,473.0	3,999.4	3,624.3	375.1
Equipment	2,002.0	1,805.0	1,745.6	59.4
Nongovernment Organization	1,906.0	1,572.7	1,509.5	63.2
Services				
Consultants	499.0	366.8	356.1	10.7
Training	965.0	822.2	953.8	(131.6)
Operation & Maintenance	1,354.0	2,698.4	2,967.2	(268.9)
Land Surveys	38.0	174.9	71.4	103.5
Nurseries	851.0	664.2	747.3	(83.1)
Reforestation	8,818.0	3,301.3	2,999.9	301.4
Service Charge During Construction	767.0	767.0	767.0	0
Unallocated	4,370.0	189.1	0	189.1
Total	25,043.0	16,361.1	15,742.1	618.9

^a The undisbursed amount of SDR618, 976.67 (\$798,325.16) was cancelled on 21 September 2001.

9.	Local Costs (financed)	
	– Amount	\$16.57 million
	– Percent of Local Costs	68
	– Percent of Total Cost	56

C. Project Data

1. Project Cost (\$'000)

Cost	Appraisal Estimate	Actual
Foreign Exchange Cost	5,696	5,370
Local Currency Cost	33,859	24,429
Total	39,555	29,799

2. Financing Plan (\$'000)

	Appraisal Estimate			Actual		
	Foreign	Local	Total	Foreign	Local	Total
Implementation Costs						
ADB-Financed	4,568	26,453	31,021	4,308	16,568	20,876
Borrower-Financed	148	7,406	7,554	0	7,861	7,861
Total	4,716	33,859	38,575	4,308	24,429	28,737
IDC Costs						
ADB-Financed	980	—	980	1,062	0	1,062
Total	980	—	980	1,062	0	1,062

— = not applicable, ADB = Asian Development Bank, IDC = interest during construction.

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

Component	Appraisal Estimate	Actual
Community Organizing and Cooperatives Development	2,873	3,462
Resource Access and Resource Management	3,059	4,888
Agroforestry, Reforestation, and Livelihood	15,597	7,661
Infrastructure and Social Services	6,863	8,014
Project Management and Institution Building	3,200	4,712
Base Cost	31,592	28,737
Physical Contingencies	3,791	0
Price Escalation	3,192	0
Service Charge During Construction	980	1,062
Total	39,555	29,799

4. Project Schedule

Item	Appraisal Estimate	Actual
Date of Contract with Consultants	March 1990	November 1990
Civil Works Contract		
– Date of Award	March 1990	May 1990
– Completion of Work	February 1998	September 2001
Equipment and Supplies		
Dates		
– First Procurement	April 1990	September 1990
– Last Procurement	February 1998	October 1998
Other Milestones		
– First Partial Loan Cancellation		17 July 1997
– Second Partial Loan Cancellation		3 February 1999
– Extension of closing dates		30 December 1999
– Extension of closing dates		30 December 2000
– Final Loan Cancellation		21 September 2001

5. Project Performance Report Ratings

Project Administration Committee Notes

Implementation Period	Project Classification	
	Last	Current
October 1990	A	A
September 1991	A	A
December 1992	A	A
December 1993	—	AAA
September 1994	AAA	AAA
September 1995	AAA	AAA
November 1996	AAA	AAA
December 1997	AAA	AAA

— = not applicable.

Project Performance Report

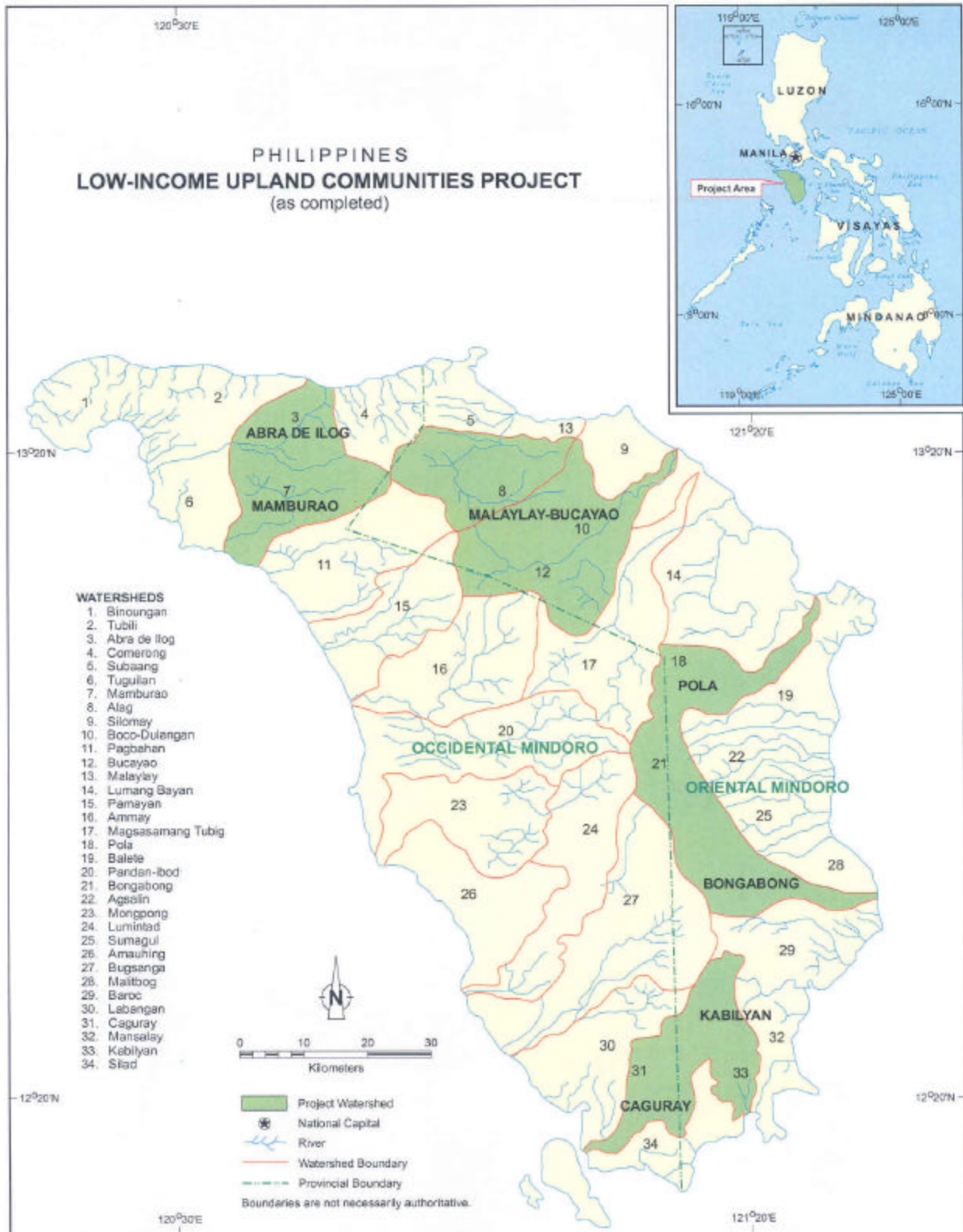
Implementation Period	Ratings	
	Development Objectives	Implementation Progress
February to December 1998	S	S
January to December 1999	S	S
January to May 2000	S	S

D. Data on Asian Development Bank Missions

Name of Mission	Date	No. of Persons	No. of Person-Days	Specialization of Members
Fact-Finding	24 July to 16 August 1989	2	46	senior project specialist, young professional/economist
Appraisal	11 to 29 September 1989	7	126	senior project specialist, counsel, agronomist, program officer, young professional/economist, consultant (watershed management specialist), consultant (agricultural economist)
Inception	8 to 16 May 1990	1	8	senior financial analyst
Loan Review 1	8 to 17 October 1990	1	9	senior financial analyst
Loan Review 2	26 November to 6 December 1991	2	20	project engineer, forestry specialist
Loan Review 3	3 to 7 November 1992	3	20	livestock specialist, senior financial analyst, forestry specialist
Loan Review 4	9 to 12 February 1993	2	6	forestry specialist, young professional
Loan Review 5	17 to 18 April 1993	1	1	young professional
Loan Review 6 (midterm review)	6 to 22 August 1993	4	64	project engineer, forestry specialist, staff consultant (agricultural/forest resource economist), senior project administrative clerk
Loan Review 7	5 to 20 August 1994	2	30	project engineer, senior project administrative clerk
Loan Review 8	6 to 17 March 1995	1	11	forestry specialist

Loan Review 9	30 June to 4 July and 23 to 27 July 1996	3	24	project engineer, project engineer, assistant
Loan Review 10	26 January to 3 February 1997	3	24	project engineer, forestry specialist, assistant
Loan Review 11	25 February to 5 March 1998	2	16	project engineer, assistant
Loan Review 12	27 October to 7 November 1998	1	11	project engineer
Loan Review 13	27 October to 8 November 1999	2	24	project engineer, assistant
Loan Review 14	29 May to 7 June 2000	1	9	project economist
Loan Disbursement	15 August 2001	2	2	control officer, senior disbursement analyst
Project Completion Review ^a	24 February to 7 March 2003	3	33	economist, associate operations analyst, staff consultant (forestry and environment specialist)

^a The PCR Mission comprised B. Alimov (economist and mission leader), J. Flores (associate operations analyst), and a staff consultant (V. Mendoza, forestry and environment specialist).



I. PROJECT DESCRIPTION

1. On 14 December 1989, the Asian Development Bank (ADB) approved a loan of SDR25.04 million (\$32.0 million) to the Government of the Philippines for the Low-Income Upland Communities Project. The Project had two objectives:

- (i) achieve sustainable development and self-reliance of upland communities (particularly those containing indigenous peoples), through improved security of tenure, agroforestry technologies, access to markets, delivery of basic services (education, health, and water supply) and infrastructure, and adoption of diversified income generating activities; and
- (ii) accelerate sustainable development and management of critical watersheds, with the cooperation of the residents of upland communities, particularly the indigenous peoples inhabiting these watersheds.

2. To achieve project objectives, the Project included five components:

- (i) **Community Organizing and Cooperatives Development.** This component supported community organizing and development of simple community-based socioeconomic development plans for project implementation.
- (ii) **Resource Access and Resource Management.** This component was designed to resolve issues related to project beneficiaries' farmland tenurial rights and to provide training for ecologically appropriate upland agricultural technologies.
- (iii) **Agroforestry, Reforestation, and Livelihood.** This component was designed to facilitate soil-conserving agroforestry technologies and reforestation of uplands and to support credit and alternative income-generating activities.
- (iv) **Infrastructure and Social Services.** This component was designed to provide basic social infrastructure to project beneficiaries.
- (v) **Project Management and Institution Building.** This component was designed to support institutional and resources strengthening of executing agencies (EAs) for project implementation.

3. A technical assistance (TA) grant was approved in association with the loan, to facilitate project implementation in the areas of agroforestry development and project benefit monitoring and evaluation (PBME), during the first 2 years of its implementation.¹

4. The Project's EAs were the Department of Environment and Natural Resources (DENR) and the provincial governments of Oriental Mindoro and Occidental Mindoro.

5. The loan became effective on 15 February 1990 and was closed on 31 December 2000. The disbursed loan amount was SDR15.74 million (\$21.9 million). At the request of the Government, two loan cancellations, totaling the equivalent of \$12.0 million, were made during implementation. Two loan extensions, totaling 30 months, were granted, to complete project works.

¹ ADB. 1989. *Technical Assistance to the Philippines for Agroforestry Research and Development Project*. Manila.

II. EVALUATION OF DESIGN AND IMPLEMENTATION

A. Relevance of Design and Formulation

6. The Project was consistent with the Government's objective of promoting poverty reduction and policies for the management of uplands mostly designated as forestlands. During the early 1970s, the Government's programs recognized that migration to uplands and slash-and-burn farming had roots in socioeconomic and demographic problems and could not be controlled only by punitive actions, such as eviction and prosecution. The Government adopted strategies that focused on assisting forest-based communities of migrants and indigenous peoples in building an enduring means of sustenance that did not conflict with ecological considerations and the effective redevelopment and management of forest resources. In order to promote upland rural development, the Government launched the Integrated Social Forestry Program in 1982, which had the following major features: it (i) granted tenure over the occupied lot (certificate of stewardship contract [CSC]) for a period of 25 years, renewable for a further period of 25 years and transferable to heirs; (ii) provided assistance in formulating farming and small-scale forestry plans and facilities; (iii) prioritized wage-based employment in government projects that are in the vicinity of settlement areas; and (iv) provided the opportunity to upland communities to undertake the execution of government-funded forestation projects. Another important initiative of the Government was the 14-year (1987-2000) National Forestation Program, which was announced in 1986 and included a broad policy framework that ensured sustained and comprehensive efforts to redevelop and conserve the country's forest resources.

7. The Project directly supported ADB's operational strategy in the area of poverty reduction and in the management and use of natural resources. In June 1988, ADB approved a forestry sector program for the Philippines to support the Government's initiatives in reforestation.² A parallel ADB-supported TA to help develop a 25-year Master Plan for Forestry Development was approved in June 1990³

8. The Project was designed under an ADB-financed project preparatory TA,⁴ which was conducted in close collaboration with the Government. Fact-finding related to the Project was undertaken from 24 July to 16 August 1989, and the Appraisal Mission was undertaken from 11 to 29 September 1989.

9. Over the course of implementation, the following changes in project scope were made: (i) community organizing responsibility was moved from nongovernment organizations (NGOs) to EAs and people's organizations (POs); (ii) Abra de Ilog–Mamburao Watershed was divided into two watershed management units; and (iii) operations in the Kabilyan watershed were scaled down, due to pervasive peace and order problems. All changes in project scope were approved by ADB.

² ADB. 1988. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the Philippines for the Forestry Sector Program*. Manila.

³ ADB. 1989. *Technical Assistance to the Philippines for the Master Plan for Forestry Development*. Manila.

⁴ ADB. 1989. *Technical Assistance to the Philippines for the Integrated Development for Low-Income Communities*. Manila.

B. Project Outputs⁵

1. Community Organizing and Cooperatives Development

10. The first key service to be provided to the beneficiaries under the Project was in the area of community organizing and cooperatives development. Self-generated socioeconomic and resource management decisions made by a community and cooperative efforts on the part of all its members are essential for a community to undertake sustainable socioeconomic development and watershed rehabilitation and management.

11. The activities envisaged under this component included (i) establishment of 24 site management units (SMUs) in the targeted areas and 60 sitio service centers (SSCs), to catalyze community-based initiatives among beneficiaries; (ii) establishment of links between government services and beneficiary communities and organize beneficiary cooperatives, to ensure project sustainability; (iii) assistance to community organizers in developing simple community-based socioeconomic development plans and in initiating community efforts aimed at establishing nurseries and undertaking agroforestry and reforestation; and (iv) providing at each site, a multipurpose community hall that will serve as a meeting hall, typhoon shelter, and cooperative store.

12. No major modifications were made in this component during project implementation, and, thus, there were no major implications affecting cost and expected benefits. Twenty-five SMUs were established, an additional SMU resulting from bifurcating the Abra de Ilog–Mamburao Watershed. These SMUs were able to develop and update their respective community development plans. A total of 94 POs, with a total of more than 2,514 members (60% of whom are indigenous peoples), were organized and strengthened through the Project. Seventy POs were registered with the Securities and Exchange Commission. These POs were engaged in a wide range of project activities that affected reforestation; agroforestry; land surveys; provision of manpower for infrastructure, forest protection, and income diversification activities; etc. After the Project's completion, the majority of POs continued their operations, but some did not sustain their activities due to a number of factors, including but not limited to lack of leadership and support from local governments. A total of 35 multipurpose buildings, which are being used as meeting halls, warehouses for agricultural inputs and farm produce, clinics, stores, typhoon shelters, etc., were constructed under the Project.

2. Resource Access and Resource Management

13. This component was designed to support (i) surveys and the provision of land tenure instruments; (ii) resolution of existing land title disputes; (iii) training of beneficiaries in community-based resource management techniques, including soil conserving agroforestry techniques, such as terracing, contour farming, hedgerow development, and diversion canal construction; and (iv) setting up six watershed management units (WMUs), in the central municipality of each watershed, to support site management services and establish links between the targeted communities and concerned government agencies.

14. In all, 8,160 farming families (mostly made up of indigenous peoples) were provided with three types of land tenure instruments, covering 201,039 hectares (ha). CSCs were provided for migrant farmers. Certificates of forest stewardship contract (CFSC), community certificates of forest stewardship contract (CCFSC), and certificates of ancestral domain claim (CADC) were

⁵ Details are shown in Appendix 1.

provided for Mangyan beneficiaries.⁶ In the late stage of project implementation, instead of the CCFSC, the CADC was issued to the Mangyan communities to address their concern related to ancestral domain claims. There were no major cost implications as a result of this change since the provincial environment and natural resources office (PENRO) survey party and the concerned communities used a cost-efficient survey method (Global Positioning System) when surveying and mapping the vast CADC areas.

15. Seven WMUs were established, one more than appraised, as a result of the bifurcation of the Abra de Ilog–Mamburao Watershed. A watershed management council, which functioned as a coordinating body, was organized for each watershed, with members coming from the community environment and natural resources office (CENRO) and concerned POs and NGOs.

16. The inherently slow pace of identifying, delineating, negotiating, validating, mapping, and processing these vast claims affected the overall pace of the implementation of the agroforestry and reforestation components. In addition, there were cases when Mangyan communities resisted migrants undertaking contract reforestation within Mangyan ancestral domains, due to their mistrust of the Government and fear that the migrants would encroach into their ancestral lands. These issues affected about 10% of the total project areas suitable for reforestation. The level of reluctance of certain Mangyan tribes to participate in contract reforestation was underestimated during project appraisal. The willingness of the Mangyans to participate in contract reforestation, or even agroforestry, was generally presumed without adequate consideration of the historical and social aspects.

3. Agroforestry, Reforestation, and Livelihood

17. As planned during the appraisal, this component was to support (i) establishment and operation of about 60 community nurseries, to facilitate the adoption of soil-conserving agroforestry technologies by about 7,500 farming families, covering an approximate area of 15,000 ha in targeted watersheds; (ii) reforestation on a contract basis, by the beneficiaries, of another 15,000 ha in targeted watersheds; and (iii) access to credit facilities and TA activities for income diversification, financed and administrated by the Land Bank of the Philippines (LBP).

18. Seventy-eight nurseries (130% of appraised target) were established. In 1994, 48 of these nurseries were destroyed by two severe typhoons. The remaining nurseries did not have sufficient capacity to meet the increasing demands for planting materials and did not meet technical standards. Eventually, EAs resorted to procuring agroforestry planting materials, in bulk, from commercial nursery operators. This modification did not have a major impact in terms of cost, but it had a positive impact in terms of accelerating progress in reforestation and agroforestry development. While nurseries for reforestation were abolished after the Project, commercial fruit tree nurseries—managed by individual families—exist at some project sites.

19. Reforestation targets were scaled down from 15,000 ha at appraisal to 10,500 ha in 1993. The reasons for this change in scope were (i) the inability to prepare local organizations—in terms of managerial, organizational, and technical capability—to undertake contract

⁶ The CSC, CFSC, and CCFSC have a validity period of 25 years and are renewable for another 25 years. They are awarded to individuals and families (CSC and CFSC) or communities (CCFSC) occupying or tilling portions of forestlands. The CADC is issued by DENR to an indigenous cultural community/indigenous peoples declaring, identifying, and recognizing their claim to a particular traditional territory, which they have possessed and occupied, communally or individually, in accordance with their customs and traditions.

reforestation on the scale envisaged during appraisal;⁷ (ii) lukewarm initial response of some target communities, particularly in the province of Oriental Mindoro, to undertaking contract reforestation, due to unresolved issues related to tenure security⁸ and issues related to contract cost and compensation; (iii) lack of the availability, suitability, and accessibility of contiguous open areas for reforestation, particularly in the Malaylay–Bucayao and Pola watersheds and portions of Caguray watershed; (iv) cancellation of pasture lease agreements in the province of Occidental Mindoro (the pastures involved were prime candidates for reforestation) due to legal issues; (v) difficult process of transition, including pullout of contracted NGOs that lacked the technical skills and expertise to implement reforestation works, frequent turnover of project managers and assistant project managers, and frequent changes in the leadership of local DENR offices; and (vi) deteriorating peace and order conditions throughout the project areas, which affected almost 40% of the total areas suitable for reforestation.⁹ There were also other transitional constraints, such as the unavailability of quality planting materials, remoteness and accessibility of project sites, which hampered monitoring, and miscommunication between project supervisors and reforestation contractors. The reduction in reforestation targets resulted in (i) loan savings, (ii) a reduction in the number of reforestation beneficiaries (from 7,500 to an estimated 5,400 families), and (iii) a consequent reduction in economic benefits expected from reforestation.

20. A total of 10,700 ha was planted, exceeding the revised target for reforestation of 10,500 ha. Indigenous species; fast-growing exotic species; and, to a limited extent, rattan species were used in the Malaylay–Bucayao watershed. In response to the demands of local communities in Oriental Mindoro to engage in small-scale, family-based contract reforestation, and in view of the inadequate capabilities of local organizations to handle relatively large reforestation contracts, the Project introduced, in 1995, family-based contract reforestation. This type of contract involved less than 10 ha per family, and performance (in terms of growth and survival rate) was generally satisfactory.¹⁰ This change in approach to reforestation did not have a substantial impact on project cost, but it accelerated reforestation progress, particularly in Oriental Mindoro. In the aftermath of a series of floods and typhoons in 1993 and 1994, which damaged the livelihood base of project beneficiaries, particularly in Oriental Mindoro, the interest of these beneficiaries in participating in contract reforestation increased.

21. Accomplishments varied in the two provinces. The performance of reforestation activities in Oriental Mindoro was impressive, in terms of survival rates (mostly around 80%) and actual growth performance. Occidental Mindoro, however, experienced very low survival rates and frequent fires. The difference in performance between the two provinces can be largely explained by Oriental Mindoro's more favorable weather conditions and better involvement and monitoring by DENR (Appendix 2).

22. Under agroforestry development, about 8,207 agroforestry farmers, cultivating 9,100 ha (5,300 ha in Oriental Mindoro and 3,800 ha in Occidental Mindoro), were provided with various kinds of support, including (i) about 400,000 assorted high-value fruit tree seedlings (durian,

⁷ NGOs that were tasked to facilitate community planning for reforestation and agroforestry were reluctant to facilitate large-scale reforestation projects, due to (i) their belief that communities were not ready to undertake contract reforestation because of an apparent lack of organization; (ii) limited technical capabilities of NGOs to assist communities in contract reforestation; and (iii) communication difficulties among NGOs, DENR, and project personnel.

⁸ The Appraisal Report underestimated the demands of Mangyan communities related to security of land tenure. They demanded security over their ancestral domain claims—covering vast areas, ranging from 200 to 93,000 ha per community—not just 50–100 ha of cultivated land per community, as projected at appraisal.

⁹ Due to peace and order problems, only 50 ha was reforested in the Kabilyan watershed, where almost 20% of reforestation areas proposed under the Project are located.

¹⁰ The reforestation assessment for Pola watershed was conducted by local DENR and project personnel in 1997.

mango, rambutan, lanzones, calamansi, etc.), banana suckers, high-value vegetable seeds, mango flower inducers, and garlic and onion seeds; (ii) farm tools and draft animals, which were supplied through local organizations; (iii) training in agroforestry development, totaling 11,823 trainee days including preparation of 12 demonstration farms, and in plant propagation, soil and water conservation, nursery establishment, and nursery operation and maintenance; and (iv) postharvest infrastructure (making miniwarehouses from multipurpose buildings and creating solar drying pavements), including assistance in agroforestry marketing, such as provision of market information, referrals, and trucking.

23. Agroforestry targets were reduced by 38%, from 15,000 ha to 9,300 ha, for the following reasons: (i) the accompanying TA for Agroforestry Development (TA 1243-PHI), which had been envisaged to support this subcomponent, was unable to adequately train and convince a critical number of upland farmers to adopt the sloping agricultural land technology (SALT);¹¹ and (ii) the shortcomings of the TA were aggravated by the equally unsatisfactory performance of the upland agriculture specialist and the training and extension specialist, as well as the early pullout of crucial NGO services. The progress in agroforestry development was subsequently boosted by the active involvement of the environment and natural resources offices of the provincial governments and PENROs and CENROs. The reduction in agroforestry targets correspondingly resulted in loan saving, but it also resulted in a reduction in the number of beneficiaries from agroforestry.

24. While the majority of sites successfully adopted new agroforestry technologies, and even exceeded the appraisal targets in terms of productivity, some, especially in Occidental Mindoro, showed only limited success. In some cases, agroforestry development stopped due to insufficient training or the absence of follow-up actions by EAs.

25. It was envisaged during appraisal that Land Bank of the Philippines (LBP), through its Integrated Rural Finance Program, would provide microcredit (estimated at no more than \$330,000, or about P7.26 million, at the 1990 official exchange rate) to project beneficiaries for income diversification activities. The contracted NGOs were responsible for developing project profiles and feasibility studies, liaising with the LBP field operations group in the province, and supervising subproject implementation and repayments. The credit scheme, however, did not take off, due to: (i) NGOs' inability to prepare project profiles and feasibility studies, and lack of liaison with the LBP field offices;¹² and (ii) the subsequent LBP pullout due to a change in its priorities to favor lowland agrarian reform communities.

26. Consequently, EAs resorted to the provision of social grants and to a limited extent coordinated with nonbank sources of credit, such as those from the provincial governments of Occidental and Oriental Mindoro and the Bureau of Rural Workers of the Department of Labor and Employment. This change in design did not have an impact in terms of project cost, since this was to be borne by LBP, but it reduced the extent of income diversification and the Project's impact on women.

¹¹ The failure of communities to adopt SALT can be explained by the strong belief among beneficiaries that the incremental costs of this technology outweigh the incremental benefits. This belief is based on the reluctance of the communities to wait for long periods before realizing benefits and their failure to recognize SALT's environmental impacts. This should have been addressed during the Project's appraisal.

¹² The contracted NGOs were unable to organize community groups into cooperatives (for reasons noted in paras. 19 and 44) and thus failed to meet a basic LBP requirement that allows the bank to extend loans to its clients. This particular expectation from the NGOs was not clearly spelled out in the terms of reference, and there was no provision for a cooperative development officer in NGO staffing.

27. Livelihood activities supported by the Project included a small-scale commercial banana plantation, backyard vegetable gardening, cattle fattening, goat and poultry raising, backyard fish culture, blacksmithing, dressmaking, banana chip production, rattan and minor forest product handicraft production, bead weaving, and producing novelty items. Various TA activities of cooperating agencies were also carried out.¹³ However, the successful adoption of these income diversification activities was limited to a few project sites largely due to inadequate community leadership.

4. Infrastructure and Social Services

28. This component was intended to support the (i) construction of basic social infrastructure, which would include in each *sitio* (hamlet) simple road networks, water supply with a minimum of two faucets, a school with a minimum of two classrooms, and a health clinic within the community hall of the SSC, and the delivery of related services from each of the 60 SSCs, according to each community's socioeconomic plan, developed with assistance from community organizers; (ii) labor-intensive construction of about 80 kilometers (km) of farm-to-market roads and the rehabilitation of another 80 km of these roads, including footbridges and spillway crossings; and (iii) labor-intensive construction of simple irrigation systems, where feasible, serving approximately 1,100 ha in the targeted *sitios*.

29. Most of the infrastructure targets were met. One hundred and fifteen water supply systems (87 in Oriental Mindoro and 28 in Occidental Mindoro) were constructed and are being maintained by the communities. A total of 44 (28 in Oriental Mindoro and 16 in Occidental Mindoro) one- and two-classroom buildings were constructed. The buildings are being maintained by POs, while the Department of Education supports the operation of the schools and provides appropriate instructional facilities.

30. A total of 152 km of arterial and secondary farm-to-market roads were constructed (105 km in Oriental Mindoro and 47 km in Occidental Mindoro) and 185 km (118 km in Oriental Mindoro and 67 km in Occidental Mindoro) were rehabilitated, and certain critical portions (those that are steep and highly prone to erosion) were concreted, as a cost-effective measure. In addition, the Project provided for the maintenance of 1,459 km of roads. The doubling of the length of roads to be rehabilitated (compared to the appraisal target) resulted from a series of natural calamities that hit the project areas in 1993, 1994, and 1998. Twenty-nine box culverts/spillway crossings were constructed along these newly constructed or rehabilitated roads. A total of 102 km of graded trails and 17 hanging bridges of different lengths were constructed to improve access to isolated communities.

31. A total of 1,920 ha (1,400 ha in Oriental Mindoro and 520 ha in Occidental Mindoro) of rice farms benefited from the construction, rehabilitation, and/or upgrading of communal irrigation facilities. In the Malaylay-Bucayao watershed, the major rehabilitation of an irrigation facility was the result of cooperation among EAs, the National Irrigation Administration, and Plan International (an NGO operating in the area). This facility, with a service area of 300 ha, is successfully maintained by the community. The irrigation facility in Tagumpay was built to serve 3,000 ha, but massive flooding in 1998 destroyed it. The change in the flow of the river made rehabilitation impossible. The Project consequently constructed a simpler community irrigation system, serving about 1,000 ha, using the service canals partly rehabilitated after the disaster.

¹³ The Technical Education and Skills Development Authority, Department of Agriculture–Oriental Mindoro Agricultural Experimental Station, and the Polytechnic College of Calapan provided these activities.

5. Project Management and Institution Building

32. The Project was to support (i) establishment of the National Project Coordinating Office and provincial project management offices; (ii) strengthening of PENROs, CENROs, and the provincial governments, particularly for the implementation of the infrastructure component; (iii) assistance to contracted NGOs for providing community organization and community-based watershed management activities; and (iv) provision of consulting services.

33. During project implementation, the Project Management Office and POs took over the role envisaged for NGOs. Additional consulting services and additional heavy equipment were also procured. The Project significantly strengthened the capabilities of PENROs, CENROs, and provincial governments in project implementation.

C. Project Costs

34. At appraisal, the project cost was estimated at the equivalent of \$39.6 million, comprising \$5.7 million in foreign currency and the equivalent of \$33.9 million in local currency. ADB was to finance the entire foreign exchange cost of \$5.7 million, plus \$26.3 million of the local currency cost, while the Government was to finance the remaining local currency cost of \$7.6 million. The actual project cost at loan closing was the equivalent of \$29.8 million, comprising \$5.4 million in foreign currency and \$24.4 million equivalent in local currency. The actual project cost was significantly reduced, due to (i) the reduction in reforestation and agroforestry targets, and (ii) the devaluation of the peso against the dollar during the 1997–1998 economic crisis. At the request of the Government, two loan cancellations totaling SDR8.68 million (\$12 million) were made during implementation. The unused loan balance of \$0.8 million was cancelled at loan closing. Thus, a total of SDR9.30 million (\$12.8 million) of the loan was cancelled, leaving a net loan amount of SDR15.74 million (\$21.9 million). A comparison of appraisal and actual project costs, by component, is shown in Appendix 3.

D. Disbursements

35. Total loan disbursements amounted to SDR15.74 million (\$21.9 million), or about 96% of the revised amount of SDR16.36 million (\$22.6 million) (para. 34). Of the total amount disbursed, \$5.4 million was in foreign currency and the equivalent of \$16.6 million in local currency. Annual disbursement under the Project is shown in Appendix 4. Payments to contractors, suppliers, and consultants were made on time and in accordance with government and ADB procedures.

E. Project Schedule

36. The appraisal implementation schedule envisaged completion of project works within an 8-year time frame, by December 1997. However, problems with project implementation at early stages, principally due to the slow process of community organizing, severely slowed down implementation (Appendix 5). The change of responsibilities of community organizing from NGOs to POs and EAs, combined with the occurrence of a series of natural calamities, placed additional constraints on project implementation. Because of the significant delays in community organizing and the increased priority of local communities toward ancestral domain claims, there were substantial delays in the project start-up, which subsequently resulted in an overrun of the project completion date. At the request of the Government, two loan extensions, totaling 30 months, were granted to complete the Project.

F. Implementation Arrangements

37. There were several changes in project implementation arrangements. Initially, as envisaged at approval, one NGO per targeted watershed was contracted to act as a project intermediary between beneficiaries and delivering agencies. The eventual withdrawal of NGOs from the Project (para. 19) resulted in shifting these responsibilities to EAs. Although the transition took time, the performance of EAs in this aspect was satisfactory. The microcredit program supported by LBP was never operational (para.25). The Project's organization chart is shown in Appendix 6.

G. Conditions and Covenants

38. The Loan Agreement included 20 covenants, and Government has satisfactorily complied with most of them (Appendix 7). The covenants that were partly complied with related to those concerning provision of government counterpart funds and the role of NGOs. During project implementation, NGOs engaged only in community organizing and pulled out from the Project in 1993. The establishment of an imprest account was complied with, after a slight delay.

H. TA 1243-PHI: Agroforestry Research and Development Project

39. The TA, in an amount of \$600,000, supported agroforestry research and development in uplands. It had the following objectives: (i) test applications and develop localized adaptations of ecologically appropriate upland agricultural practices in the Project's watersheds and in other selected provinces where the Project would be replicated; (ii) strengthen concerned implementing institutions, by measures that include the training of field staff, for effective dissemination of upland agriculture technologies in the Project's watersheds and in other selected provinces; and (iii) provide independent monitoring and impact assessment of project implementation.

40. The TA was unsuccessful. The communities never adopted SALT, which was advocated by the TA. The relative failure of the TA in implementing SALT can be attributed to the reluctance of local communities to adopt this costly technology. PBME was also not established during the first years of project implementation, due to the poor performance of the original PBME specialist who resigned in August 1991. Although the replacement specialist designed the system, there was no time for field testing and actual implementation of the system. Eventually, the PBME system was completely redesigned by a consultant hired under the Project and became operational only in 1998. The final disbursed amount for the TA was \$556,534. The TA Completion Report is in Appendix 8.

I. Consultant Recruitment and Procurement

41. The Project engaged NGOs and domestic consultants in accordance with ADB's *Guidelines on the Use of Consultants*. As planned at appraisal, the Project was to be assisted by up to six NGOs (one for each WMU) and eight domestic consultants contracted individually for 250 person-months of services. The recruitment of consultants was generally satisfactory.

42. There were no significant problems in procurement. Equipment and vehicles were procured on the basis of international shopping and international competitive bidding, in accordance with ADB's *Guidelines for Procurement*. Supply contracts that were valued at \$50,000 or less were awarded under normal government procurement procedures.

43. Civil works under the Project were generally simple, small, dispersed, and labor intensive and were either carried out by force account or were awarded on the basis of local competitive bidding procedures, as envisioned during appraisal. Construction of all civil works was contracted on the basis of a labor-based/equipment supported system and gave preference for employment to project beneficiaries.

J. Performance of Consultants, Contractors, and Suppliers

44. The performance of most of the NGOs contracted under the Project was less than satisfactory.¹⁴ This was due to the following factors: (i) inadequate technical staff to implement the reforestation and agroforestry activities that were designed under the Project, (ii) frequent changes in staff, (iii) lack of proper planning and targeting, and (iv) inadequate supervision and monitoring of NGOs by DENR. In August 1993, ADB recommended that DENR terminate the contracts of nonperforming NGOs and either replace them with other NGOs or undertake implementation directly. In light of the expected termination of their contracts, all NGOs pulled out of the Project, and their functions were later satisfactorily carried out by PENROs, CENROs, and POs.

45. The performance of consultants did not meet the objectives set during appraisal because there was (i) a lack of coordination among individually contracted consultants (those performing well could not meet the terms of reference, because their work was linked to the performance of other consultants); and (ii) a general lack of cooperation between consultants and NGOs. Among the consultants, social forestry, agricultural marketing, and small-scale industry specialists performed satisfactorily. All other consultants, including monitoring and evaluation, training and extension, upland agriculture, process documentation, and project management specialists, performed poorly. The engagement of a design and construction specialist (who was replaced by a process documentation consultant, at the time of recruitment, upon the request of DENR) could have accelerated project progress in civil works, as there was a lack of expertise related to the design of vertical structures (hanging bridges, and multipurpose and school buildings).

46. The performance of local civil works contractors and suppliers was generally satisfactory. Before 1995, when the Project used the force account method for civil works, there were occasional transitional problems, related to shortage of supply (cement and lumber), and warehousing problems.

K. Performance of the Borrower and Executing Agencies

47. The performance of EAs was satisfactory. The Government established the imprest account and generally met counterpart fund requirements. Weaknesses in the performance of EAs related to persistent delays in the flow of funds, which contributed to project implementation delays, but these weaknesses are mainly attributable to the overall budgetary constraint of the central Government. DENR provided sound management and had staff that were reasonably qualified to implement the Project. It successfully took over the responsibilities of NGOs after their withdrawal from the Project. Provincial governments took over project implementation in 1997. Their performance during project implementation was satisfactory, particularly in regard to the infrastructure component, which underwent some minor changes after damage was caused by natural calamities in 1998. There is a need for postproject involvement on the part of provincial governments to ensure the Project's sustainability. The Project provided an example

¹⁴ Based on field observations, only the performance of the Philippine Association for Intercultural Development was considered satisfactory.

of successful cooperation between the national EA (DENR) and regional EAs (provincial governments).

L. Performance of the Asian Development Bank

48. In general, ADB's performance was satisfactory. The project design was appropriate for achieving its objectives. ADB fielded 14 missions during implementation and provided necessary guidance at the start and at midterm. It provided sound advice on project implementation matters and timely approvals to EAs. Although project officers were changed several times during implementation, this did not affect project supervision and progress. Given the widely distributed project sites and deteriorating peace and order conditions, not all project locations were visited, particularly those in Kabilayan watershed, by ADB's review missions. The objectives of the Project were not clearly explained to NGOs, particularly their position in the organization chart and the technical requirements they would have to meet. However, ADB took an active role in facilitating a smooth transition after NGOs disengaged from the Project. The accompanying TA had design flaws (Appendix 8).

III. EVALUATION OF PERFORMANCE

A. Relevance

49. The Project provided support to the Government in addressing the issues of poverty and environmental degradation in uplands. The provision of land tenure, accompanied by agroforestry development and reforestation, will have significant positive long-term effects, not only on economic conditions in uplands but also on the overall environment. Awarding land tenure rights before addressing deforestation problems, instead of simply subsidizing reforestation, provided a good model for sustainable forest management, which has been followed by the Government. Given the Government's continued commitment to poverty reduction and reforestation activities, the Project is considered relevant.

B. Efficacy in Achievement of Objectives

50. The Project clearly achieved its immediate objectives. The Project reduced poverty through employment generation; increased incomes; and improved access to basic education, primary health care, and water supply. The Project created about 9,200 person-years of employment, during implementation. Real annual per capita income (in 1989 prices) of project beneficiaries increased by 84%, from P2,066 at appraisal to P3,797 at completion. Because the full benefits from most of the tree crops will be available only after full maturity, incomes will continue to rise until 2012. At full development, average incremental farm incomes are estimated to be P96,000 (in 2003 prices), including returns to farm labor, which is a more than 300% increase from preproject incomes of P28,437 (in 2003 prices). Although food remains the highest expenditure item, its share in total expenditure was reduced from the appraisal estimate by 8%. There is significant improvement in basic services to project beneficiaries: 90% of the beneficiaries confirm that accessing potable water and health and education services is easier than it was before the Project. There is also a notable improvement in housing quality, particularly in reforestation contract communities. The Project has also had a demonstration effect on local communities adjacent to the project areas.

51. At full development, the Project is expected to result in significant environmental and economic benefits. Environmental benefits include improved water retention in uplands, resulting from an increased number of trees, higher soil fertility, and reduced soil erosion, and economic benefits include institutional strengthening of the beneficiaries and improved access

to education and health facilities. The Project should also result in other secondary benefits, in terms of reduced river siltation, improved availability of water for irrigation systems, and increased carbon sequestration. The occurrence of flash floods should also be reduced, if not altogether stopped. Overall, the Project was efficacious in meeting its objectives.

C. Efficiency in Achievement of Outputs and Objectives

52. The base case of project economic internal rate of return (EIRR) at completion is estimated at 15.9%, higher than the 12% opportunity cost of capital but lower than the 26% EIRR estimated during appraisal. Lower EIRR can be largely explained by (i) overestimation of the EIRR at appraisal assuming benefits from SALT, (ii) reduction in agroforestry targets and the subsequent reduction in expected crop yields, and (iii) nonoperation of the microcredit component. The reduction in reforestation had a minimal effect on EIRR, as a decrease in economic benefits was accompanied by savings in project costs. An increase in costs for infrastructure component, resulting in additional but nonquantified benefits that were not included in the estimation of EIRR, is an additional reason for a decrease in EIRR. Appendix 9 provides the details of the economic and financial analysis.

53. EIRR estimates are based only on farm benefits from agroforestry and reforestation. The economic benefits from infrastructure development (road development, access to potable water, etc.) and provision of land tenure, which project beneficiaries valued the most, could not be quantified and are not included in the estimation of EIRR.

54. Project implementation was slowed by significant delays in community organizing in the early stages, particularly due to the unsatisfactory performance of NGOs. Overall, project implementation progressed satisfactorily when DENR took over NGO responsibilities. Despite the reduction in agroforestry targets, the overall economic development impact on project communities was favorable. The relatively higher levels of economic development of project sites in Oriental Mindoro compared with Occidental Mindoro can be attributed to the differences in quality of community leadership, more favorable climatic conditions and support from regional DENR offices and provincial governments. The relatively unsatisfactory performance of the reforestation activities in Occidental Mindoro is mainly due to more difficult climatic conditions and the failure of DENR to properly adjust the technical reforestation procedures to these differences in climate.

55. The pioneering approach of resolving property rights before addressing deforestation problems, undertaken by the Project, provided a firm base for improvement in environmental management of forest resources. However, the success of the management of renewable resources, such as natural forests, also depends on population pressures, which were not considered in the Project's design.

56. Despite slow project implementation and general delays in the flow of counterpart funds, most of the targeted outputs and objectives were achieved with reasonable efficiency as reflected in the EIRR estimates at completion.

D. Preliminary Assessment of Sustainability

57. The Project successfully demonstrated that degradation of forest resources can be arrested and reversed through empowerment of local communities. The provision of land tenure instruments to indigenous peoples, combined with a significant increase in their environmental awareness, serves as a guarantee of sound environmental management practices. The continuation of provincial governments' support to project communities in maintenance of

completed civil works and marketing of their products could further reinforce Project's sustainability (para. 61). The positive economic prospects of project areas (because of a demand for tree crops) remains strong, and relative proximity to Metro Manila ensures considerable absorbing and processing capacity, which reinforces the future environmental sustainability of the Project. The communities in Oriental Mindoro already receive reasonable income from livelihood and agroforestry activities developed under the Project and have real potential to extend them further. The reforestation component is particularly successful there, and there is little doubt of economic and environmental sustainability in the province. Occidental Mindoro, mainly due to its less favorable climatic conditions, received a relatively less successful development impact and is not likely to achieve economic gains on a scale comparable to those in Oriental Mindoro. However, there is a definite economic improvement in the province, compared with the preproject situation. Further economic development in Occidental Mindoro will bring additional environmental improvement, since the Project has made the forest dwelling communities aware of the importance of preserving natural assets, by conferring on them property rights, through the provision of land tenure. In view of highly visible project impacts, which are well appreciated by local communities, the Project's sustainability is likely.

E. Environmental, Sociocultural, and Other Impacts

58. Reforestation and agroforestry activities helped substantially improve watershed protection in project areas (Appendix 2). An increased awareness of local communities of the need for environmental protection and management had a positive impact in many project sites, resulting in further agroforestry development in flood-prone areas. Beneficiaries have the will and desire to protect and maintain the forested areas, especially in Oriental Mindoro. There has been a decrease in illegal logging in the project area, due to the activities of forest rangers fielded by local communities.

59. The impact of community organizing and provision of land tenure goes far beyond the preparation for successful implementation of agroforestry and reforestation. It resulted in a change in agricultural practices, from *kaingin* (slash-and-burn cultivation) to permanent cultivation, and led to the development of entrepreneurial activities among the beneficiaries, such as livestock and poultry raising, handicraft production, and commercial nursery development. The Project has had a significant positive impact on women at the farm level. Women were actively involved in the adoption of income diversification activities, particularly livestock and poultry-raising, and handicraft development. The Project has provided greater stability of employment to households, and now women work on their own farms and as wage earners on neighboring farms. The additional income enables them to improve family nutrition, provide for children's education, and generally improve their homes.

IV. OVERALL ASSESSMENT AND RECOMMENDATIONS

A. Overall Assessment

60. The Project met all of its revised physical targets and achieved all of its immediate development objectives. Project beneficiaries were granted land tenure, which alone has produced significant economic and environmental benefits. Agroforestry development and provision of basic social infrastructure has provided a base for sustained economic development. Reforestation has not only been a major factor in improved watershed protection but also generated incomes, which were invested by communities in purchasing land, livestock, and agricultural equipment. Community organizing of the beneficiaries, combined with their increased environmental awareness, has strengthened the environmental management of

uplands. The Project was hampered by significant delays in the early stages, which extended the completion period by 30 months. The reduction in reforestation and agroforestry targets resulted in loan cancellations. Despite the failure of the TA to implement SALT and the nonoperation of the microcredit program, the Project significantly improved the quality of life of the beneficiaries.

61. Based on the Project Performance Rating Assessment criteria, the Project is rated as successful.

B. Lessons Learned

62. The following key lessons were learned from the Project:

- (i) Much of the Project's success can be attributed to the active participation of targeted beneficiaries in its planning, design, and implementation. Winning the confidence of some sections of the Mangyan communities in regard to project goals and objectives was a slow process, but they ultimately contributed to the Project's successful implementation.
- (ii) The Project's success reaffirms the validity of using a holistic approach that accommodates various priority needs of the people and adopting a participatory process, while designing projects for disadvantaged communities.
- (iii) Project facilitation by community organizing could have been further enhanced, if the roles of all implementers, particularly NGOs, were better defined at the commencement of the Project. More rigorous screening of NGOs is critical.
- (iv) The Project suffered from inadequate PBME activities, which should have been started early and run concurrently with the Project.
- (v) The local application of SALT failed. To ensure sustainability, any farming system to be introduced to indigenous peoples must be adjusted to local conditions and should have a relatively low maintenance cost.
- (vi) Sustainable environmental management is possible only when accompanied by sustainable economic development of communities. The Project provides a good model for reaching the poorest of the poor through viable economic development and sustainable environmental management.

C. Recommendations

1. Project-Related

63. Project-related recommendations include the following:

- (i) Provincial governments should ensure regular monitoring and surveillance of completed project components and must provide adequate annual budgets for maintenance of completed civil works.
- (ii) Provincial governments should assist and provide guidance to communities in marketing their products and renewing business permits.

- (iii) ADB should field a project performance audit report mission in about 5 years, when most of the plantations will (or should) be in full production.

2. General

64. Uplands constitute about 55% of the Philippines and are home to 30% of country's population. In addition to being an important contributor to the national agriculture sector, uplands play a critical role in maintaining the ecological balance and protecting the productivity of lowland areas. Unfavorable economic conditions are a major cause for continuing environmental degradation. The Project was able to address both economic development and environmental management in uplands. The lessons learned from the Project should be considered when planning future government projects. Other recommendations emanating from implementation of the Project are:

- (i) Socioeconomic and cultural aspects of beneficiary communities should be carefully assessed during appraisal, to clearly identify community needs. During community organizing, the objectives of the Project should be clearly identified, and project design should allow for flexibility in addressing specific demands of local communities.
- (ii) The recruitment of consultants, whose outputs are interrelated, should be done on a team basis, rather than on individual basis.
- (iii) The Project showed the importance of local government ownership and active participation in ensuring project success. Local governments should be fully involved in designing and implementing environment and natural resources management projects that involve the mobilization of local communities.

**SUMMARY OF MAJOR PROJECT OUTPUTS
1990–2000**

Components	Unit	Targets		Actual Accomplishment
		Appraisal	Revised	
1. Community Organizing and Cooperative Development				
a. Site Management Unit	Number	24	25	25
b. Sitio Service Centers	Number	60	76	75
c. Multipurpose Buildings	Number	24	35	35
2. Resource Access and Resource Management				
a. Land Tenure Assistance	Families	7,500	7,964	8,160
b. Training	Trainee-Days	42,000	108,487	111,423
3. Agroforestry, Reforestation, and Livelihood				
a. Community Nurseries	Number	60	60	78
b. Nursery Operations	Number	210	245	245
c. Agroforestry	Hectares	15,000	9,294	9,100
d. Reforestation	Hectares	15,000	10,500	10,700
4. Infrastructure and Social Services				
a. Water Supply Systems	Number	135	118	115
b. School Buildings	Number	20	44	44
c. Market Access				
i. Construction	Kilometers	80	148	152
ii. Rehabilitation	Kilometers	80	186	185
iii. Maintenance	Kilometers	0	1,459	1,459
iv. Graded Trails	Kilometers	119	102	102
v. Bridges	Number	32	19	17
vi. Culverts/Spillways	Number	6	34	29
d. Irrigation	Hectares	1,100	1,955	1,920
5. Project Management and Institution Building				
a. Nongovernment organizations	Number	6	6	6
b. Consultancy	Man-Months	240	136	136
c. Vehicles/Equipment	Number	583	735	735

Source: Asian Development Bank, Department of Environment and Natural Resources.

ENVIRONMENTAL ASSESSMENT

A. Introduction

1. About 50 years ago, the forests in the two Mindoro provinces were diverse, productive, and stable. Tropical forest vegetation was intact, which enhanced the watershed value of uplands. The Mangyans were living in full harmony with the forest ecosystem. They were mainly hunter-gatherers, and their agricultural practices were minimal. After harvesting a crop or two, the Mangyans moved on to other sites, leaving small fallow clearings. At that time, the planting pattern was sustainable.

2. The harmonious and sustainable relationship between humans and the environment was disrupted by the land reform adopted by the Government in 1955. This policy encouraged several sectors to get a share of forestlands. The people's long-established respect of the forestry laws and regulations evaporated within a short period of time. The new mentality of the people, enunciated by that policy, significantly contributed to the rapid deterioration of watershed ecosystems. Logging operations came next. The two Mindoro provinces were not spared from the onslaught of massive timber harvesting by big logging companies. As the forest cover in the uplands diminished, there was massive soil erosion that changed the landscape and led to a consequent decrease in agricultural productivity. An increase in population pressure added to increased exploitation of forests for agricultural production.

3. The abandoned logging roads provided lowland migrants with ideal access to watersheds. The removal of large diameter trees, by the loggers, facilitated *kaingin* (slash-and-burn cultivation). Massive hillside farming, by migrants, finished off almost all of the remaining forest vegetation. Since lowland-farming technology entails constant cultivation, the hillsides became seriously eroded. Over time, those plots that became unproductive were abandoned. The eroded hillsides were invaded by grass species, mostly cogon (*Imperata cylindrica*), samon grass (*Themeda triandra*), and talahib (*Saccharum spontaneum*). The annual burning of those grasslands eliminated any chances of natural forest renewal (regeneration). Environmental degradation of uplands led to a significant reduction in livelihood opportunities for indigenous peoples. Continuing expansion of migrants searching for more land only made the problem worse.

4. The Low-Income Upland Community Project reduced poverty in upland communities and at the same time addressed worsening conditions in watershed ecosystems. Two interrelated objectives were the Project's main focus: (i) sustainable economic development and self-reliance of upland communities, through improved land tenure security and agroforestry technologies, diversified income-generating activities, and easier access to markets and the delivery of basic services; and (ii) acceleration of sustainable development and management of critical watersheds.

B. Environmental Assessment

5. The province of Occidental Mindoro has a total land area of about 587,985 hectares, a population of 380,250, and an average temperature of 31.7° Celsius. The province of Oriental Mindoro has a total land area of about 436,470 hectares, a population of 704,230, and an average temperature of 27.3° Celsius. Two climatic factors in Oriental Mindoro—the longer rainy season and lower average temperature—were among the main factors that made reforestation activities in the province relatively more successful than those in Occidental Mindoro.

1. Quality of reforestation

6. In Occidental Mindoro, surviving planted trees were observed only in small patches, confined to one or two portions of plantations. The planted species were mostly exotic, such as yemane (*Gmelina arborea*), *Acacia mangium*, *Acacia auriculiformis*, and River redgum (*Eucalyptus camaldulensis*). Narra (*Pterocarpus indicus*) was the only endemic species planted in the project sites. However, yemane is generally not suitable for watershed planting. The dried leaves do not help soil buildup, since these are easily decomposed with no litter accumulation on the ground. Eucalyptus, likewise, is not a proper species for watershed planting. There are several endemic tree species that could have been considered for planting in open areas, such as molave (*Vitex parviflora*) or the dry site species banaba (*Lagerstroemia speciosa*) and narra. Batino (*Alstonia macrophylla*), dungon (*Heritiera sylvatica*), buri (*Corypha utan*), and bagalunga (*Melia dubia*) are also excellent species for site conditions in Occidental Mindoro. The survival performance of reforestation areas supported by the Project in Occidental Mindoro is shown in Table A2.1.

Table A2.1: Reforestation Performance in Occidental Mindoro

Watershed	Species	Area Planted (Hectares)	Average Survival Rate (%)
Abra de Ilog	Gmelina, Eucalyptus, Narra, Acacia	4,795	22.00
Caguray	Gmelina, Narra, Mahogany	978	25.00
Mamburao	Gmelina, Eucalyptus, Narra	1,215	67.00
Total		6,988	

Source: Provincial Environment and Natural Resources Office.

7. Yemane, narra, and mahogany were the tree species selected for planting in Oriental Mindoro. Rattan (a palm) and bamboo (the tallest grass) were also planted, on a small scale, in selected sites. The performance of reforestation in Oriental Mindoro is impressive, in terms of survival (80%) and growth performance.

Table A2.2: Reforestation Performance in Oriental Mindoro

Watershed	Species	Area Planted (Hectares)	Average Survival Rate (%)
Malaylay–Bucayao	Gmelina, Narra, Mahogany, Rattan, Bamboo	2,162	80.00
Pola	Gmelina, Narra, Mahogany, Rattan	1,211	80.00
Bongabong/Kabilyan	Gmelina, Narra, Mahogany	1,257	80.00
Total		4,630	

Source: Provincial Environment and Natural Resources Office.

8. Reforestation in Occidental Mindoro suffered from improper timing and site-species matching; inadequate monitoring of reforestation activities; inadequate application of soil amendments; lack of design of a forest protection system, with attendant training of members of a fire management team; and insufficient supervision of EAs. Improper species matching partly resulted from difficulty in sourcing seeds of desired species. Likewise, seedlings were procured from any available supplier, without adequate quality control. The supervision by DENR personnel in Oriental Mindoro, however, was commendable. Their monitoring activities, to enforce quality standards and specifications, played a key role that led to the satisfactory performance of reforestation activities. DENR and NGO inputs, the enthusiasm of the POs, and the favorable climate in the province all acted in unison, resulting in the good performance of reforestation in Oriental Mindoro.

2. Efficiency of protection of plantations

9. The plantation protection scheme in project sites is inadequate. The main weakness lies in the absence of an organization that is trained and equipped to respond to emergencies, such as the occurrence of large fires in the watersheds. The result is persistent burning of wide grasslands in the watersheds, especially in Occidental Mindoro.

3. Environment impact of infrastructure and agroforestry

10. The construction of infrastructure facilities did not have a negative environmental impact. Furthermore, as a result of basic infrastructure development, which increased agricultural profitability, beneficiaries became less dependent on the forest. The roads did not encourage illegal logging since communities in Oriental Mindoro have been actively protecting the watersheds from illegal logging and there are not too many trees suitable for logging remaining in the forests in Occidental Mindoro.

11. Agroforestry development resulted in further strengthening of watershed protection. While beneficiaries discontinued forest tree reforestation after project completion, they plant fruit trees on the barren hills. The shift from slash-and-burn agricultural practice to agroforestry and permanent cultivation of crops contributes to sustainable watershed protection.

C. Conclusion

12. Watershed reforestation and activities aimed at alleviating economic difficulties resulted in a significant reduction in environmental degradation despite a mixed reforestation performance in Occidental Mindoro. The project participants overwhelmingly agree on and realize the importance of environmental management of the uplands. Provision of land tenure accompanied with livelihood, agroforestry, and reforestation training gave project beneficiaries a solid base for economic development. The improved and sustained socioeconomic conditions of target communities are the strongest assurance of sustained and effective protection of watersheds.

SUMMARY OF PROJECT COSTS
1990–2000
(\$'000)

Components	Appraisal			Actual Cost		
	Foreign Currency	Local Currency	Total	Foreign Currency	Local Currency	Total
1. Community Organizing and Cooperative Development	435	2,438	2,873	552	2,910	3,462
1.1 SMU/Community Development	435	2,263	2,698	552	2,720	3,272
- Multipurpose building	160	373	533	154	453	607
- Site Management Services	0	1,579	1,579	0	1,397	1,397
- O&M	0	280	280	0	870	870
- Equipment	275	31	306	398	0	398
1.2 Training	0	175	175	0	190	190
2. Resource Access and Resource Management	426	2,633	3,059	777	4,111	4,888
2.1 CSC Survey	0	48	48	0	99	99
2.2 WMU/Watershed Management	426	1,743	2,169	777	2,800	3,577
2.3 Training	0	842	842	0	1,212	1,212
3. Agroforestry, Reforestation, Livelihood	0	15,597	15,597	615	7,046	7,661
3.1 Community Nurseries	0	317	317	0	470	470
3.2 Nursery Operations	0	769	769	0	891	891
3.3 Reforestation	0	14,014	14,014	615	5,180	5,795
3.4 Extension and Training	0	497	497	0	505	505
4. Infrastructure and Social Services	2,914	3,949	6,863	2,189	5,825	8,014
4.1 Water supply system	51	119	170	34	100	134
4.2 Irrigation	421	983	1,404	214	1,775	1,989
4.3 Physical Access	630	2,297	2,927	636	2,536	3,172
4.4 Schools	130	303	433	139	1,075	1,214
4.5 Equipment	1,682	187	1,869	1,166	264	1,430
4.6 Training	0	60	60	0	75	75
5. Project Mngt. and Institution Bldg	199	3,001	3,200	175	4,537	4,712
5.1 National Project Office	11	71	82	17	315	332
5.2 PPMUs	135	781	916	131	1,000	1,131
5.3 PENRO & CENRO Offices	18	602	620	27	1,050	1,077
5.4 Consulting Services	35	754	789	0	592	592
5.5 Operations & Maintenance	0	793	793	0	1,580	1,580
Base Cost	3,974	27,618	31,592	4,308	24,429	28,737
6. Physical Contingencies	477	3,314	3,791			0
7. Price Escalation	265	2,927	3,192			0
8. Service Charge during construction	980	0	980	1,062		1,062
Total Cost	5,696	33,859	39,555	5,370	24,429	29,799

CENRO = Community Environment and Natural Resources Office, CSC = Certificate of Stewardship Contract, O&M = operations and maintenance, PENRO = Provincial Environment and Natural Resources Office, PPMUs = Provincial Project Management Unit, SMU = site management unit, and WMU = watershed management unit.

UTILIZATION OF LOAN PROCEEDS

Table A4.1: Year 1990-1993

Item	1990		1991		1992		1993	
	US\$	SDR	US\$	SDR	US\$	SDR	US\$	SDR
01 Civil Works			16,611	12,472	96,511	70,036	188,082	134,359
02 Equipment	93,840	66,544	1,430,187	1,061,636	99,811	72,552	155,467	111,580
03B NGO Services	59,324	42,694	267,523	197,593	329,147	230,715	465,469	330,292
03C Consultants			90,547	66,575	74,817	53,866	37,686	27,052
03D Training			15,216	11,467	57,647	41,287	57,471	40,890
03E Operation & Maintenance	3,525	2,436	108,968	82,174	559,601	400,663	430,960	306,382
03F Land Surveys							7,189	5,140
03G Nurseries			29,211	22,028	248,376	178,427	21,199	15,013
03H Reforestation					43,914	31,884	98,416	69,894
04 Service Charge During Construction	2,335	1,677	10,450	7,684	32,981	22,988	51,659	36,686
05 Unallocated								
Total	159,025	113,351	1,968,713	1,461,630	1,542,805	1,102,419	1,513,597	1,077,289

Table A4.2: Year 1994-1997

Item	1994		1995		1996		1997	
	US\$	SDR	US\$	SDR	US\$	SDR	US\$	SDR
01 Civil Works	135,847	94,662	117,343	75,409	586,238	404,033	1,182,991	862,628
02 Equipment	12,413	8,521	41,389	26,449	61,787	42,170	7,670	5,596
03B NGO Services	170,527	118,918	184,180	119,342	275,814	190,341	86,172	62,851
03C Consultants	41,002	28,638	68,660	45,429	101,104	69,187	63,620	46,361
03D Training	73,628	50,825	107,989	69,985	116,045	80,213	247,192	180,104
03E Operation & Maintenance	603,704	416,154	676,637	434,236	140,831	97,573	403,403	287,068
03F Land Surveys	5,584	3,933	1,523	971	10,125	7,015	12,235	8,956
03G Nurseries	87,132	59,990	42,152	27,414	59,861	41,473	101,251	73,589
03H Reforestation	182,933	126,631	392,364	251,609	769,390	530,650	989,422	720,283
04 Service Charge During Construction	69,482	48,194	89,970	58,710	112,255	77,435	130,469	94,873
05 Unallocated								
Total	1,382,253	956,467	1,722,207	1,109,555	2,233,450	1,540,090	3,224,423	2,342,309

Table A4.3: Year 1998-2001

Item		1998		1999		2000		2001		Total	
		US\$	SDR	US\$	SDR	US\$	SDR	US\$	SDR	US\$	SDR
01	Civil Works	848,888	628,655	785,774	576,547	550,726	411,970	471,062	353,504	4,980,072	3,624,276
02	Equipment	463,964	348,178	2,373	1,748			930	674	2,369,833	1,745,648
03B	NGO Services	79,668	58,712	4,658	3,373	86,549	62,999	126,715	91,659	2,135,746	1,509,491
03C	Consultants	7,541	5,654	6,543	4,802	8,272	6,040	3,322	2,540	503,115	356,145
03D	Training	197,113	147,336	86,379	63,475	107,916	81,311	265,227	186,907	1,331,822	953,801
03E	Operation & Maintenance	93,579	67,699	189,137	139,018	408,083	308,129	609,373	425,710	4,227,801	2,967,242
03F	Land Surveys	25,560	18,939			21,451	15,570	15,755	10,874	99,424	71,398
03G	Nurseries	150,720	111,451	68,441	50,282	145,347	107,378	87,769	60,220	1,041,458	747,266
03H	Reforestation	625,371	471,619	173,408	127,764	317,201	236,368	593,950	433,157	4,186,369	2,999,860
04	Service Charge During Construction	154,161	113,808	183,247	133,440	196,741	148,816	28,602	22,688	1,062,353	767,000
05	Unallocated									0	0
Total		2,646,565	1,972,051	1,499,961	1,100,450	1,842,288	1,378,582	2,202,707	1,587,934	21,937,992	15,742,128

ACTUAL PROJECT IMPLEMENTATION SCHEDULE

Table A5.1: Year 1990-1995

Project Activity Schedule/Watershed	1990		1991		1992		1993		1994		1995	
	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual
A. Oriental Mindoro 1. Malaylay Bucayao Watersheds - WMU established - SMUs established - SSCs	Baco	Calapan	Paitan	Paitan Banuton Tagumpay San Andres Putik	Arangin	Dulangan III	Mayabig	Arangin Balete	San Teodoro Pigturian	Lantuyang Mamangan Mayabig		Calangatan
			Bucayao Grande	Mutya Basal Salibayan Karero Bucayao Grande	Lantuyang	Banilad Katarata Asillon	Kabarangay	Barangan Sinai Manna Misyon Belen		Pandaraganon Kimbalay	Sipit Saburan	Areta Mamalao Ayambukog
2. Pola Watershed - WMU established - SMUs established - SSCs established	Socorro	Socorro Bugtong na Tooa	Fortuna Tiqao Mayi		Sabana	Sabana	Bugtong na Tooa Sunda Granvida	Sabana Tibunq Mangyan Poblacion Taytay- Bunga Maria	Ma. Concepcion Happy Valley	La Fortuna Tatlong Pulo Laisan Libas		Maye Comondot
3. Bongabong Watershed - WMU established - SMUs established - SSCs established	Bongabong	San Mariano,	Haqan Lisap Batangan	Batanqan	Batangan/ Lisap	Lisap	Panluan					Lisap
			Siqaw	Panluan Alyanon	Fanuban Siyange	Balete Siqao Pastuhan	Alyanon	Hal-bong	Bahayaw			Siyange Pavaqnon
4. Kabilyan Watershed - WMU established - SMUs established - SSCs established	Bulalacao	San Mariano Roxas Nasukob	Kabilyan Yunot	Kabilyan Pawikan Suryawon Lagnas Bayog	Binli Abintang	Binli Amindang Parawanon Bailan Balading	Yunot Amindang	Cabalwa Binli Centro Kuranqa		San Roque Abintang Balditan Sui Agok-ok		

(cont'd.)

Project Activity Schedule/Watershed	1990		1991		1992		1993		1994		1995	
	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual
Sub-total WMUs	4	4							1			
Oriental SMUs		4	4	6	5	4	4	3	2	5		2
SSCs			6	13	7	13	7	15	7	10	1	7
B. Occidental Mindoro												
5. Abra de Ilog Watershed												
- WMU established	Abra de Ilog	Abra de Ilog										
- SMUs established			Cabacao	Cabacao/Ar	San Vicente	San Vicente	Cabacao	Armado	San Vicente	Balao	San Vicente	Continuation of operations
- SSCs established			Banabaan	Banabaan	Pambuhan	Pambuhan	Rayusan	Dumapi	Tara	Laço	Tara	
			Cabilogan	Masaklang Rayusan	Kadilawan	Kadilawan Tara Mamara Kabilogan	Masaklang	Balantoy	Kulaungan	Lawaan Hebron	Kalaungan	
6. Caguray Watershed												
- WMU established	Maqsaysay	Maqsaysay										
- SMUs established			Hinango	Paclolo	Paclolo	Purnaga	Malutok	Cont'n. of operations	Lourdes/ Sto. Cristo	Gapasan	Lourdes/ Sto. Cristo	Continuation of operations
- SSCs established			Malutok Hinango	Imok Canhabang Bantulao Basa	Nalwak Canhabang	Nalwak Sta. Maria Hinango Bambanay	Pogo Inatas	SMU 1 & 2				
7. Mamburao Watershed												
- WMU established												Mamburao Balansay Fatima Sulong Ipil Igsu
- SMUs established												
- SSCs established												
Sub-total WMUs	2	2										
Occidental SMUs			2		2		2		3			
SSCs			5		5		4		3			
Total for WMUs	6	6	0	0	0	0	0	0	1	0	0	0
Project SMUs	0	4	6	6	7	4	6	3	5	5	0	2
SSCs	0	0	11	13	12	13	11	15	10	10	1	7

Table A5.2: Year 1996-2000

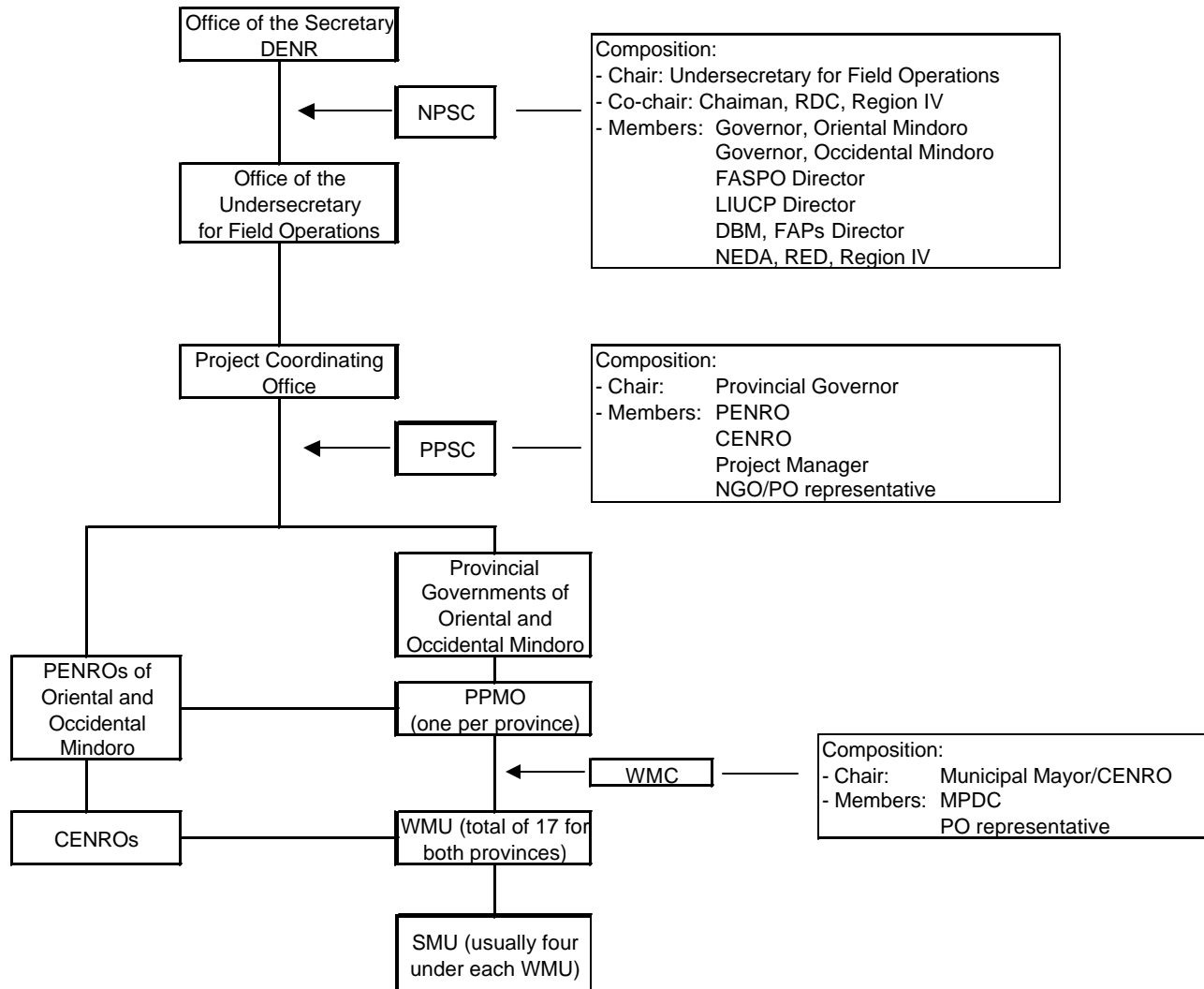
Project Activity Schedule/Watershed	1996		1997		1998		1999		2000	
	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual
A. Oriental Mindoro										
1. Malaylay Bucayao Watersheds - WMU established - SMUs established - SSCs established		Baras Calangatan Malmes Beksing Mamalaw		Centro Ayan-Uway Cabaranggay Arya-wood		Villaflor Catarata Pagturian Sipit-Saburan		Villaflor Sacalg Kamatis Ambang	Continuation of activities	
2. Pola Watershed - SMUs established - SSCs established		Happy Valley Mamao Liit Mamao Laki Kadluan		Sabang Taytan Bunga Tibung Tagalog		Sabang Maria Nayong-Pilipino San Andres Maria Concepcion Panakan		La Fortuna Tigao Taguikan		La Fortuna Mayo
3. Bongabong Watershed - SMUs established - SSCs established		Lisap Manacsi		Gumatos Balete Fanuban		Sisap Mabaktu		Hagan Akliyang		Morente Nawa
4. Kabilyan Watershed	Development activities stopped due to peace and order problem.									
Sub-total WMUs										
Oriental SMUs		3		2		3		3		2
SSCs		9		7		8		3		2
B. Occidental Mindoro										
5. Abra de Ilog Watershed - SMUs established - SSCs established	Balaguhan	Nangka Tuuyan		Cabacao Mamangan Pamakyanon				Continuation of operations		

(cont'd.)

Project Activity Schedule/Watershed	1996		1997		1998		1999		2000	
	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual
6. Caguray Watershed										
- SMUs established		Batasan	Continuation of operations			Gapasan		San Nicolas	Continuation of activities	
- SSCs established		Naibuan Kianay				Pugo Talayob		Bamban Calachuchi Bukal Bagong Silang		
7. Mamburao Watershed										
- SMUs established		Balansay	Continuation of operations					Talabaan Balansay	Continuation of activities	
- SSCs established		Puricon Cabalwa Mimping Balaguhan Bignay						Talapa Lagyo mimping		
Sub-total										
Occidental										
WMUs										
SMUs		2				1		7		
SSCs	1	9		3		2		6		
Total for Project										
WMUs		0		0		0		0		0
SMUs		5		2		4		10		2
SSCs	1	18		10		10		9		2

SMU = Site Management Unit, SSC = Sitio Service Center, WMU = Water Management Unit

ORGANIZATION CHART



ABM = Agency Budget Matrix, CENRO = Community Environment and Natural Resources Office/Officer, DBM = Department of Budget Management, FAP = Foreign Assisted Project, FASPO = Foreign Assisted and Special Programs Office, LIUCP = Low-Income Communities Project, NEDA = National Economic Development Authority, NGO = Nongovernment Organization, NPSC = National Project Steering Committee, PENRO = Provincial Environment and Natural Resources Office/Officer, PO = People's Organization, PPDO = Provincial Planning Development Officer, PPMU = Provincial Project Management Unit, PPSC = Provincial Project Steering Committee, RDC = Regional Development Council, RED = Regional Executive Director, SMU = Site Management Unit, WMC = Water Management Committee, and WMU = Water Management Unit.

STATUS OF COMPLIANCE WITH LOAN COVENANTS

Covenants	Reference to Loan Documents	Status
<p>1. Counterpart funds The Borrower shall make available, promptly as needed, the funds, facilities, services, land and other resources, which are required, in addition to the proceeds of the Loan, for the carrying out of the Project and for the operation and maintenance of the Project facilities.</p>	Article IV, Section 4.02	Partly complied with. There were delays related to the flow of counterpart funds.
<p>2. Financial statement The Borrower shall submit to the Bank not later than six months after the end of each related fiscal year, unaudited financial statements, and not later than nine months after the end of each related fiscal year, certified copies of audited accounts and financial statements.</p>	Article IV, Section 4.06(b)	Complied with.
<p>3. Progress report The Borrower shall submit to the Bank quarterly reports on the carrying out of the Project and on the operation and management of the Project facilities. Such reports shall indicate, among other things, progress made and problems encountered during the quarter under review, steps taken or proposed to be taken to remedy these problems, and proposed program of activities and expected progress during the following quarter.</p>	Article IV, Section 4.07(b)	Complied with.
<p>4. Project completion report Promptly after physical completion of the Project, but not later than six (6) months thereafter, the Borrower shall prepare and furnish to the Bank a report, 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 the accomplishment of the purposes of the Loan.</p>	Article IV, Section 4.07(c)	Complied with.
<p>5. Nongovernment organization contract Six NGOs shall be contracted as the project intermediaries between project beneficiaries and delivering agencies in each targeted watershed.</p>	Schedule 6, paragraph 2	Complied with. However, NGOs withdrew from the project in the initial years. Project and local government staff, instead, took charge of coordinating project implementation and working with communities.
<p>6. Nongovernment organization obligation Project services, including community organizing, land titling, agroforestry extension, reforestation contracts and infrastructure construction shall be implemented by the</p>	Schedule 6, paragraph 3	Partly complied with. See item 5 above. Provinces engaged NGOs

Covenants	Reference to Loan Documents	Status
NGOs through Site Management Units (SMUs) and Sitio Service Centers (SSCs), which the NGOs will set up in each watershed.		organizations to focus only on community organizing and preparation.
<p>7. Watershed management units Six Watershed Management Units (WMUs) one each in Baco, Socorro, Bongabong, Bulalacao, Magsaysay and Abra de Ilog, shall be established by the contracted NGOs. The WMUs shall support its SMUs and shall be responsible for preparing and obtaining approval of work and financial plans for the watershed.</p>	Schedule 6, paragraph 4	Complied with.
<p>8. Appointment of project manager A Provincial Project Management Office (PPMO) shall be established in each Province. The Department of Environment and Natural Resources (DENR) shall appoint the Project Managers (PM; one for each province), who shall be responsible for Project Management for the first four years of Project implementation. The Governor of each province shall appoint the Assistant Project Manager.</p>	Schedule 6, paragraph 5	Complied with.
<p>9. Provincial project steering committee Each PPMO shall be guided by a Provincial Project Steering Committee (PPSC) comprising the Governor of the Province concerned as Chairman and the head of the relevant PENRO, the concerned Provincial Development Officer, and a representative from the NGO sector.</p>	Schedule 6, paragraph 7	Complied with.
<p>10. National project coordinating office Within 14 days of the effective date, DENR shall establish a National Project Coordinating Office (NPCO) to coordinate the operations of both PPMOs, to facilitate funds flow and to assist in procurement and selection of Project consultants.</p>	Schedule 6, paragraph 8	Complied with.
<p>11. Land tenure instruments Within one year of the effective date, DENR shall issue, or cause to be issued, land tenure instruments to at least 25 per cent of targeted Project beneficiaries.</p>	Schedule 6, paragraph 12	Complied with.
<p>12. Land tenure instruments With respect to subsequent years, DENR shall issue land tenure instruments to Project beneficiaries at least six months prior to the scheduled delivery of Project services.</p>	Schedule 6, paragraph 13	Complied with.
<p>13. Community-based socioeconomic development plan Within six months of the fielding of community organizers (COs), the concerned PPMO and NGO shall develop a community-based socioeconomic development plan for the community. No agroforestry, reforestation, income diversification, or infrastructure activities under the Project</p>	Schedule 6, paragraph 14	Complied with.

Covenants	Reference to Loan Documents	Status
shall be initiated in any <i>barangays</i> (lowest local government administrative units) until such development plan is in place.		
<p>14. Forestland pasturing leases Within 15 months of the effective date, DENR shall evaluate all Forestland Pasturing Leases over land within the Project areas or bordering those areas for compliance with lease conditions.</p>	Schedule 6, paragraph 15	Complied with.
<p>15. Provincial project steering committee members Each PPSC shall have a representative from the NGO sector, appointed in consultation with NGOs currently operating in the concerned province. Each watershed management council shall have a representative from the NGO sector, appointed in consultation with the NGO representative on the relevant PPSC.</p>	Schedule 6, paragraph 16	Complied with.
<p>16. Imprest account An Imprest Account shall be established immediately after the effective date with the Central Bank of the Philippines.</p>	Schedule 6, paragraph 17	Complied with but with delay. The account was established in September 1990.
<p>17. DENR's monitoring DENR, through the PPMOs, shall closely monitor the Project in (i) upland agricultural/agroforestry developments; (ii) general watershed natural resource management; and (iii) socioeconomic indicators.</p>	Schedule 6, paragraph 20	Complied with.
<p>18. Monitoring and evaluation of implementation Critical aspects of the implementation process shall be monitored and evaluated, including NGOs' performance, the effectiveness of community organizing processes and techniques, and the overall implementation strategy and process utilized by the Project.</p>	Schedule 6, paragraph 21	Complied with.
<p>19. Project benefit monitoring and evaluation The PPMO shall be assisted in PBME activities by the monitoring and evaluation consultant. The database shall be computerized and the information feedback system shall involve all concerned agencies and Project beneficiaries. Reports shall be made available to the NPCO and the Bank on a quarterly, biannual, and annual basis.</p>	Schedule 6, paragraph 22	Complied with.
<p>20. Midterm review A comprehensive midterm review shall be undertaken at the end of the fourth year of Project implementation and prior to handing over Project Management to the Provincial Governments.</p>	Schedule 6, paragraph 23	Complied with. The midterm review was held in August 1993.

TA COMPLETION REPORT

Division: SEAE

TA No. and Name TA No. 1243-PHI: Agroforestry Research and Development			TA Amount Approved: \$600,000.00 Revised Amount:		
Executing Agency Department of Environment and Natural Resources			TA Amount Undisbursed \$43,466.09	TA Amount Utilized \$566,533.91	
Approval	Signing	Date	Fielding of Consultants	Original	Closing Date
14 December 1989	18 December 1989	19 August 1990		30 April 1992	9 August 1992
<p>Technical Assistance Description</p> <p>The uplands, which constitute about 55% of the Philippines, play a critical role in maintaining the ecological balance of the country and in protecting the productivity of the lowland areas. The Philippines is losing well over 5% of upland forests every year, and the resultant erosion damages watersheds and wreaks havoc on lowland farms. Lowland irrigation systems are degraded, driving out small farmers. Between 1968 and 1988, agricultural areas without sufficient water expanded fourteen-fold, a situation made worse by periodic droughts. In many localities, slash-and-burn agricultural practices destroy the very trees that bind the hills together, producing soil erosion of more than 100 tons per hectare annually, compared with less than 2 tons per hectare for intact forest. These factors consequently reduce the extent of arable land, lower agricultural productivity, and entail high social costs.</p> <p>In 1989, the Asian Development Bank (ADB) approved a loan to the Government of the Philippines for the Low-Income Upland Communities Project (LIUCP). The Project had two objectives: (i) achieve sustainable development and self-reliance of upland communities (particularly those containing indigenous peoples), through improved security of tenure, agroforestry technologies, access to markets, delivery of basic services (education, health, water supply) and infrastructure, and adoption of diversified income generating activities; and (ii) accelerate sustainable development and management of critical watersheds, with the cooperation of the residents of upland communities, particularly the indigenous peoples inhabiting these watersheds.</p> <p>Assistance was needed in carrying out one of the recommended strategic interventions in watershed protection—the adoption of agricultural technologies, which are ecologically appropriate to uplands and conserve soil and water. While much research has been done on lowland agricultural technologies, limited attention has been devoted to development and dissemination of the ecologically appropriate agricultural technologies for uplands.</p> <p>TA Objectives and Scope</p> <p>The main objectives of the technical assistance (TA) were to (i) test applications and develop localized adaptations of ecologically appropriate upland agricultural practices in the Project's watersheds and in other selected areas for future replication; and (ii) develop and establish a specific project benefit monitoring and evaluation (PBME) system, tailored to the local conditions of upland areas. More specifically, the TA was to assist the Government in the establishment and development of Sloping Agricultural Land Technology (SALT) demonstration farms and outline activities for these demonstration farms for the next 5 years. SALT was devised to avoid the three worst aspects of short-rotation slash-and-burn cultivation (predominant among Mangyans before the Project): inadequate nutrient cycle, accelerated soil erosion, and aggressive weed growth. It was intended that the PBME system to be developed under the TA would enable Executing Agencies (EAs) and other implementers to (i) manage project resources effectively and efficiently; (ii) help in generating reports, required by EAs; and (iii) be a source of data for tracking effects over time to compare operating units (such as watershed management units).</p> <p>Technical Assistance Inputs Evaluation</p> <p>A total of 30 person-months (pm) of consulting services were provided, 17 pm by an international agroforestry/extension specialist and 13 pm by an international program monitoring and evaluation (PME) specialist. Also contracted under the TA were 175 pm of consulting services provided by domestic consultant-technicians with experience in upland agriculture. The TA was implemented over 2 years, as scheduled.</p> <p>The consultants, Oregon State University (USA) in association with MADECOR (Philippines), assisted the EAs in setting up six demonstration farms in selected watersheds, for application tests and developing technology adaptations of appropriate upland agricultural practices. The terms of reference of the TA provided for testing SALT and adapting it to local conditions, since this land use system was an alien concept to the indigenous cultural</p>					

communities involved. The design of the TA is not considered appropriate, as it focused only on the development of local applications of SALT, without considering a development of alternative and ecologically appropriate upland agricultural practices.

The performance of the agroforestry/extension specialist was unsatisfactory, as he failed to develop and disseminate the local applications of SALT. The performance of the first PME specialist was also unsatisfactory and subsequently led to his substitution. This change of the PME specialist in the middle of TA implementation resulted in a submission of an untested PME system. ADB did not respond efficiently to EA complaints, which stated that the consultants' team leader did not respond to numerous requests to test the proposed PBME system before the TA ended.

Technical Assistance Outputs Evaluation

The final report by the consultants was completed in December 1992. The consultants designed and submitted *Monitoring and Evaluation System Guidelines and Implementation Modules* and *Manual on the LIUCP Monitoring and Evaluation Data System* as a section of the final report.

The concept of SALT was new to the indigenous peoples of Mindoro, and field visits during review missions confirmed that the Mangyans were very reluctant to replicate this technology. SALT was considered too labor intensive for beneficiaries and therefore was not attractive. An additional factor that made this technology unattractive to project beneficiaries was the fact that the Project offered several attractive income generating opportunities to the Mangyans, such as reforestation and road construction/rehabilitation. Since most upland farmers were poor, they could not afford to invest in conservation technologies with long-term payoffs. The consultants failed to meet the terms of reference requirement stating that the demonstration farms will test SALT and adapt it to local conditions. Instead, the demonstration farms repeated the technology as it had been researched and established in its original version in Mindanao. Consequently, the communities never adopted SALT.

The establishment of a PBME system under the TA was also unsuccessful. Although the consultants prepared guidelines for the proposed PBME system, it was never tested under field conditions during project implementation and was never operational. It was later redeveloped by a local monitoring and evaluation specialist and put into operation 6 years into project implementation. As a result, the Project suffered from delays in PBME system development.

Technical Assistance Overall Assessment and Rating

Based on the inputs and outputs evaluations, the TA is considered unsuccessful in meeting its objectives and scope. It failed in achieving both objectives—SALT was never adopted in the target areas, and the PBME system designed under the TA was never tested and eventually was completely redesigned and substituted.

Major Lessons Learned

The following lessons were learned from the establishment of SALT demonstration farms: (i) to ensure the sustainability of any farming system introduced to indigenous peoples, it must be adjusted to the local conditions; (ii) farming systems introduced to indigenous peoples should have a relatively low cost of establishment and maintenance, considering the low income levels of local communities.

Follow-Up Action and Recommendation

Although SALT performed successfully in some parts of the country, its application in uplands, among indigenous peoples, is not recommended without undertaking a comprehensive study, which may require adjustments to this technology, financial assistance in setting it up, or development of alternative and ecologically appropriate agricultural practices suitable for indigenous cultural communities.

Prepared by Bobur Alimov Designation Economist

ECONOMIC AND FINANCIAL ANALYSIS

1. The economic analysis is undertaken on the basis of the methodology used during project appraisal. Economic internal rate of return (EIRR) is estimated for the Project as a whole. The analysis is based on data obtained during field visits by the project completion report mission, together with project data from project benefit monitoring and evaluation surveys.

A. Major Assumptions

2. The economic analysis is based on the following assumptions:

1. Prices

3. Prices used in the analysis are expressed in constant 2003 levels. The economic prices, at the farm gate, of internationally traded agricultural outputs and inputs are based on world market prices listed in *Global Economic Prospects 2003*, published by the World Bank. These prices were adjusted to a 2003 level using the World Bank's manufacturing unit value index. Adjustments have also been made for quality, freight, insurance, handling, inland transport, and processing. The derivation of economic prices for internationally traded commodities is presented in Table A9.1.

4. Economic prices for nontraded commodities, including materials, civil works, and transportation, are derived from financial prices using a standard conversion factor (SCF) of 0.9. The valuation of inputs and outputs in economic terms excludes internal transfer payments, such as taxes and subsidies, as these represent domestic monetary movements and have no bearing on real resources costs.

5. Based on the legislated minimum wage rate of P167 for plantation agriculture and P147 for nonplantation agriculture, in the economic analysis a wage rate of P167 per day adjusted by the shadow wage rate factor of 0.7 was used without seasonal variations.

2. Period of Analysis

6. Following the approach taken at appraisal, the economic life of the Project is assumed to be 30 years, from 1992 to 2021.

3. Project Costs

7. The economic costs for the total project are based on actual investment costs incurred between 1990 and 2001. Costs are expressed in economic prices, by excluding taxes and duties and applying the SCF of 0.9 to the local component of costs. Investment costs are expressed in constant 2002 base prices, by adjusting the local cost element by the consumer price index and the manufacturers' unit price value index for the international cost component.

4. Project Benefits

8. The economic benefits of the Project that were considered at appraisal arise from an increase in cropping intensities; diversification of crop mix; and moderately higher crop yields, due to the intensification of production systems and strengthening of downstream activities by line agencies. The estimation of the benefits is limited to the participating beneficiaries of the Project only.

9. These benefits are represented by three groups of benefits identified in this analysis: traditional crops, agroforestry, and reforestation. The economic benefits from an increase in agricultural productivity of traditional crops (rice and corn) are derived from a change of agricultural practices—from *kaingin* (slash-and-burn cultivation) to permanent cultivation—resulting from the change in property rights for land, use of high-yield seeds and fertilizers, and provision of irrigation. The economic benefits from agroforestry arise from an increase in cultivation of high-yield tree and vegetable crops (mango, durian, jackfruit, lanzones, rambutan, coffee, cashew, calamansi, sweet potato, and cassava). These benefits were particularly substantial in Oriental Mindoro, due to the favorable weather conditions. Reforestation benefits used in this analysis are limited only to financial returns from forest tree plantations.

10. Project benefits are the difference between the stream of net farm income for with-project and without-project conditions. It is assumed that no substantial changes in production and income levels were expected in the project area without the Project. The economic analysis follows the project appraisal methodology by considering four representative farm models. Models 1 and 3 represent farm models of migrant farmers in Occidental Mindoro and Oriental Mindoro, respectively. Similarly, Models 2 and 4 are farm models of indigenous farmers in Occidental Mindoro and Oriental Mindoro.

11. Benefits from the Project that are relatively difficult to quantify, including secondary benefits, are not included in the analysis. These primarily include benefits from institutional strengthening of the beneficiaries; infrastructure (road development, access to potable water, etc.); and environmental benefits, such as the improved water retention in uplands resulting from an increased number of trees, higher soil fertility, and reduced soil erosion. The benefits from improved access to education and health facilities are also not included in the estimation of the EIRR. Secondary benefits are primarily enjoyed by the lowland population, and include reduced river siltation and improvement in the availability of water from irrigation systems. Occurrence of flush floods should also be reduced, if not altogether stopped.

B. Economic Internal Rate of Return for the Entire Project

12. **Base Case.** The result of the EIRR calculation for the whole Project is presented in Table A9.2. The base case of project EIRR is estimated at 15.9%, which is higher than the opportunity cost of capital of 12% but lower than the EIRR estimate (at appraisal) of 26%. The lower actual EIRR can be explained by the reduction in agroforestry targets and the overestimation of the EIRR at appraisal assuming benefits from SALT. Reduction in reforestation targets had a minimal effect on EIRR, as a decrease in economic benefits was accompanied by savings in project costs. However, an increase in project costs in the infrastructure component, while resulting in additional but nonquantified benefits, is an additional reason for a decrease in EIRR, which is estimated with the methodology employed in the appraisal.

13. **Sensitivity Analysis.** The objective of the sensitivity analysis is to examine if factors over which there is a degree of uncertainty have significant impacts on EIRR. Lowering anticipated future yields by 10% reduces EIRR for the Project to 14.7%. An assumed reduction in future product prices reduces overall EIRR to 14.9%. Thus, although changes in agricultural income from changes in yields and output prices reduce project EIRR, they do not change project economic viability.

C. Financial Analysis

14. Farm model analysis was carried out to assess the direct impact of the Project on the beneficiaries. Farm budget models for different crops are presented in Tables A9.3 and A9.4. The financial analysis is based on cropping patterns presented in Table A9.5. A major increase in net income results from agroforestry development.

15. The province of Oriental Mindoro is the largest producer of calamansi in the country (61% of country's production), annually harvesting more than 100,000 metric tons. Agroforestry development in project areas will contribute only 5,500 metric tons. Numbers are similar for other crops under the Project. At full development, project beneficiaries are expected to produce around 1,000 metric tons of lanzones, compared with national production of almost 70,000 metric tons. Mango production in project areas will yield 3,400 metric tons of fruits, compared with annual national production of 844,000 metric tons. Cassava production in project areas is expected to be 40,000 metric tons, compared with the national average of almost 2 million metric tons. Considering that the fruits planted under the agroforestry development component of the Project are mainly exported commodities, and considering the fact that the region's population is continuously growing, it is safe to assume that the agricultural products of project beneficiaries will have future markets and that prices will not be driven down due to insufficient market size.

16. When maximum project benefits are achieved, average incremental farm incomes are estimated to be P96,000 (in 2003 prices), if returns to farm labor are included. Thus, the Project is estimated to increase farm family income by more than 300%, from P28,437 (in 2003 prices) estimated at appraisal. The results of the financial analysis are presented in Table A9.6.

Table A9.1: Computation of Economic Prices of Internationally Traded Commodities**A. Economic Price of Paddy**

Item	Year				
	1990	2000	2005	2010	2015-21
Import parity price for rice: Thai, 5% broken					
FOB Bangkok at constant 1990 prices (\$/t) ^a	271	208	227	234	224
FOB Bangkok 2003 constant prices (\$/t) ^b	269	207	225	232	222
Quality adjustment factor	20%	20%	20%	20%	20%
Less: adjustment for quality (\$/t)	54	41	45	46	44
Adjusted rice price (\$/t)	215	165	180	186	178
Add: freight and insurance costs (\$/t)	35	35	35	35	35
CIF Manila (\$/t)	250	200	215	221	213
Official exchange rate (peso/\$)	24.31	44.19	54.45	54.45	54.45
Standard conversion factor	0.90	0.90	0.90	0.90	0.90
Shadow exchange rate (peso)	27.01	49.10	60.50	60.50	60.50
CIF Manila, peso equivalent (peso/t)	6,760	9,834	13,026	13,362	12,867
Add: port charges/handling and storage losses (peso/t) ^c	-	-	-	-	-
Wholesale price (peso/t)	6,760	9,834	13,026	13,362	12,867
Less: transport from mill to wholesaler (peso/t) ^f and wholesaler cost (peso/t) ^g	100	100	100	100	100
Ex-mill price (peso/t)	6,660	9,734	12,926	13,262	12,767
Less: milling cost (peso/t) ^h	-	-	-	-	-
Add: by-product value (peso/t) ⁱ	-	-	-	-	-
Economic price of rice at mill (peso/t)	6,660	9,734	12,926	13,262	12,767
Equivalent price of paddy at mill (peso/t) ^j	-	-	-	-	-
Less: cost of handling/transport from farm (peso/t) ^f	100	100	100	100	100
Economic farmgate price of paddy (peso/t)	- 100	- 100	- 100	- 100	- 100
Economic farmgate price of paddy (peso/kg)	-0.10	-0.10	-0.10	-0.10	-0.10

B. Economic Price of Corn

Item	Year				
	1990	2000	2005	2010	2015-21
Import parity for Corn					
FOB US Gulf 1990 constant prices (\$/t) ^a	109	91	111	108	110
FOB 2003 constant prices (\$/t) ^b	109	90	110	107	109
Add: freight and insurance costs (\$/t)	20	20	20	20	20
CIF, Manila Port (\$/t)	129	110	130	127	129
Official exchange rate (peso/\$)	24.31	44.19	54.45	54.45	54.45
Standard conversion factor	0.90	0.90	0.90	0.90	0.90
Shadow exchange rate (peso)	27.01	49.10	60.50	60.50	60.50
CIF, Manila peso equivalent (peso/t)	3,473	5,420	7,881	7,694	7,802
Add: port charges/handling and storage losses (peso/t) ^c and transport to port to wholesaler (peso/t) ^e	40	40	40	40	40
Wholesaler's warehouse gate (peso/t)	3,513	5,460	7,921	7,734	7,842
Less: transport to farm to wholesaler (peso/t) ^f	100	100	100	100	100
Economic farmgate price maize (peso/t)	3,413	5,360	7,821	7,634	7,742
Economic farmgate price maize (peso/kg)	3.41	5.36	7.82	7.63	7.74

C. Economic Price of Urea

Item	Year				
	1990	2000	2005	2010	2015-21
Import parity urea price (\$/t)					
FOB Europe 1990 constant prices (\$/t) ^a	119	104	122	118	115
FOB 2003 constant prices (\$/t) ^b	119	103	121	117	114
Add: freight and insurance costs (\$/t)	35	35	35	35	35
CIF, Manila (\$/t)	154	138	156	152	149
Official exchange rate (peso/\$)	24.31	44.19	54.45	54.45	54.45
Standard conversion factor	0.90	0.90	0.90	0.90	0.90
shadow exchange rate (peso)	27.01	49.10	60.50	60.50	60.50
Peso equivalent (pesos/t)	4,146	6,786	9,467	9,215	9,004
Add: port charges/handling and other costs (peso/t) ^d and transport to port to wholesaler (peso/t) ^e	-	-	-	-	-
Wholesaler's warehouse gate (peso/t)	4,186	6,826	9,507	9,255	9,044
Add: dealer handling (peso/t) and ^k transport to wholesaler to farm (peso/t) ^f	-	-	-	-	-
Economic farmgate price urea (peso/t)	4,286	6,926	9,607	9,355	9,144
Economic farmgate price urea (peso/kg)	4.29	6.93	9.61	9.35	9.14

D. Economic Price of TSP

Item	Year				
	1990	2000	2005	2010	2015-21
Import parity TSP price (\$/t)					
FOB US Gulf 1990 constant prices (\$/t) ^a	132	142	145	135	131
FOB 1998 constant prices (\$/t) ^b	131	141	144	134	130
Add: freight and insurance costs (\$/t)	35	35	35	35	35
CIF, Manila (\$/t)	166	176	179	169	165
Official exchange rate (peso/\$)	24.31	44.19	54.45	54.45	54.45
Standard conversion factor	0.90	0.90	0.90	0.90	0.90
Shadow exchange rate (peso)	27.01	49.10	60.50	60.50	60.50
Peso equivalent (peso/t)	4,482	8,620	10,819	10,224	9,978
Add: port charges/handling and other costs (peso/t) ^d and transport to port to wholesaler (peso/t) ^e	-	-	-	-	-
Wholesaler's warehouse gate (peso/t)	4,522	8,660	10,859	10,264	10,018
Add: Dealer handling (peso/t) ^k and transport to wholesaler to farm (peso/t) ^f	-	-	-	-	-
Economic farmgate price TSP (peso/t)	4,622	8,760	10,959	10,364	10,118
Economic farmgate price TSP (peso/kg)	4.62	8.76	10.96	10.36	10.12

E. Economic Price of KCl

Item	Year				
	1990	2000	2005	2010	2015-21
Import parity KCl price (\$/t)					
FOB Vancouver 1990 constant prices (\$/t) ^a	98	126	120	114	110
FOB 1998 constant prices (\$/t) ^b	97	125	119	113	109
Add: freight and insurance costs (\$/t)	35	35	35	35	35
CIF, Manila (\$/t)	132	160	154	148	144
Official exchange rate (peso/\$)	24.31	44.19	54.45	54.45	54.45
Standard conversion factor	0.90	0.90	0.90	0.90	0.90
Shadow exchange rate (peso)	27.01	49.10	60.50	60.50	60.50
Peso equivalent (peso/t)	3,577	7,859	9,311	8,980	8,710
Add: port charges/handling and other costs (peso/t) ^d and transport to port to wholesaler (peso/t) ^e	40	40	40	40	40
Wholesaler's warehouse gate (peso/t)	3,617	7,899	9,351	9,020	8,750
Add: Dealer handling (peso/t) ^k and transport to wholesaler to farm (peso/t) ^f	100	100	100	100	100
Economic farmgate price KCl (peso/t)	3,717	7,999	9,451	9,120	8,850
Economic farmgate price KCl (peso/kg)	3.72	8.00	9.45	9.12	8.85

^a Source: World Bank, Global Economic Prospects 2002.

^b 2003 constant prices; G5-MUV in 1990 constant prices readjusted to 2003 prices (2003 index = 99.33).

^c Percentage of CIF price, Manila = 2%.

^d Percentage of CIF, Manila = 10%.

^e Transport cost is P1.00/ton-km; for 40 km.

^f Transport cost is P1.00/ton-km; for 100 km.

^g Assumed percentage of wholesale price, Manila = 2%.

^h Percentage of ex-mill price = 2%.

ⁱ Percentage of ex-mill price = 10%.

^j Milling recovery rate = 60%.

^k Dealer's margin assumed as a percent of warehouse gate = 2.5%.

Table A9.2: Economic Internal Rate of Return

Item		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Project Investments		271,477	111,947	102,233	127,376	165,188	238,481	195,743	110,939	136,257	162,914
Net Farm Income	Model 1	29,807	29,807	29,807	29,807	29,807	29,807	29,807	29,806	30,234	30,252
from Crops Without	Model 2	38,695	38,695	38,695	38,695	38,695	38,695	38,695	38,695	38,889	38,795
Project	Model 3	46,132	46,132	46,132	46,132	46,132	46,132	46,132	46,131	47,084	47,271
	Model 4	50,581	50,581	50,581	50,581	50,581	50,581	50,581	50,581	50,850	50,736
Net Farm Income	Model 1	70,985	70,985	70,985	70,985	70,985	70,985	70,985	70,984	71,715	71,774
from Crops	Model 2	38,105	38,105	38,105	38,105	38,105	38,105	38,105	38,103	38,319	38,277
With Project	Model 3	45,435	45,435	45,435	45,435	45,435	45,435	45,435	45,432	47,284	48,070
	Model 4	65,097	65,097	65,097	65,097	65,097	65,097	65,097	65,096	65,518	65,463
Agroforestry	Model 1	-316	-632	-948	-1,264	-1,580	-1,896	7,298	10,278	13,165	17,986
Net Benefits	Model 2	-38	-76	-115	-153	-191	-229	631	1,118	1,634	2,574
	Model 3	-959	-1,917	-2,876	-3,835	-4,794	-4,761	11,291	17,322	29,197	48,658
	Model 4	-522	-1,045	-1,567	-2,089	-2,612	-2,323	1,540	4,203	13,102	27,192
Reforestation											
Net Benefits											
Net Incremental											
Benefits from the											
Project		-257,011	-99,316	-91,437	-118,416	-158,063	-231,388	-158,682	-61,720	-61,701	-48,250
Project EIRR		15.60%									

EIRR = economic internal rate of return.

(cont'd.)

Item		2002	2003	2004	2005	2006	2007	2008	2015	2021
Project Investments										
Net Farm Income	Model 1	30,389	30,716	30,538	30,440	30,391	30,386	30,382	30,438	30,597
from Crops Without	Model 2	38,819	38,961	38,841	38,787	38,750	38,750	38,750	38,784	38,851
Project	Model 3	47,602	48,302	47,992	47,808	47,724	47,711	47,698	47,795	48,129
	Model 4	50,766	50,954	50,804	50,738	50,691	50,690	50,690	50,730	50,815
Net Farm Income	Model 1	72,016	72,569	72,282	72,120	72,041	72,033	72,024	72,116	72,409
from Crops	Model 2	38,363	38,565	38,423	38,342	38,305	38,304	38,303	38,355	38,476
With Project	Model 3	48,869	50,255	49,814	49,494	49,389	49,356	49,323	49,477	50,210
	Model 4	65,607	65,967	65,730	65,600	65,535	65,533	65,530	65,611	65,815
Agroforestry	Model 1	24,771	33,143	39,783	48,910	60,329	74,823	93,256	103,088	103,088
Net Benefits	Model 2	4,119	5,956	7,484	9,578	12,092	15,286	19,338	22,424	22,424
	Model 3	68,544	95,019	120,949	157,768	195,745	240,612	298,227	405,916	405,916
	Model 4	39,936	57,280	75,592	101,692	127,695	155,374	191,141	273,455	273,455
Reforestation										
Net Benefits							279,270			
Net Incremental										
Benefits from the										
Project		156,287	211,257	263,458	337,388	415,272	784,750	621,320	824,341	824,926
Project EIRR	15.86%									

EIRR = economic internal rate of return.

Table A9.3: Farm Production Costs "Without" Project in 2003 Constant Prices (P/ha)

Item	Unit	Price/Unit (P/Unit)	Amount per ha	Economic Cost/ha	Year						
					1995	1998	2000	2005	2010	2015	2020
Rainfed paddy											
A. Cost of material inputs: ^a											
Seeds	kg	10.00	50	500	500	500	500	500	500	500	500
Fertilizers											
- Urea	kg	4.15	30	124	124	124	204	284	276	270	270
- TSP	kg	4.48	10	45	45	45	86	108	102	100	100
- KCL	kg	3.58	3	11	11	11	24	28	27	26	26
Agrochemicals		1,000	1	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Miscellaneous				168	168	168	168	168	168	168	168
Total cost of material inputs				1,848	1,848	1,848	1,981	2,088	2,074	2,064	2,064
B. Cost of labor: ^b											
Land preparation	man-animal day	200.00	14	2,800	2,800	2,800	2,800	2,800	2,800	2,800	2,800
Transplanting	person-day	167.00	15	2,505	2,505	2,505	2,505	2,505	2,505	2,505	2,505
Fertilizer/pesticide application	person-day	167.00	3	501	501	501	501	501	501	501	501
Weeding	person-day	167.00	10	1,670	1,670	1,670	1,670	1,670	1,670	1,670	1,670
Harvesting/threshing	person-day	167.00	17	2,839	2,839	2,839	2,839	2,839	2,839	2,839	2,839
Total labor cost				10,315	10,315	10,315	10,315	10,315	10,315	10,315	10,315
C. Total production cost				12,163	12,163	12,163	12,296	12,403	12,389	12,379	12,379
D. Yield/ha	t/ha				2.30	2.30	2.30	2.30	2.30	2.30	2.30
E. Farmgate price	pesos/t				6,760	6,760	9,834	13,026	13,362	12,867	12,867
F. Gross revenue/ha	pesos/ha				15,548	15,548	22,618	29,960	30,734	29,595	29,595
G. Net farm income/ha	pesos/ha				3,385	3,385	10,322	17,556	18,345	17,216	17,216
Corn											
A. Cost of material inputs:											
Seeds	kg	6	50	300	300	300	300	300	300	300	300
Fertilizers											
- Urea (46-0-0)	kg	4.15	40	166	207	207	339	473	461	450	450
- Complete (14-14-14)	kg	11.50	50	575	575	575	575	575	575	575	575
Total cost of material inputs				1,041	1,082	1,082	1,214	1,348	1,336	1,325	1,325
B. Cost of labor:											
Land preparation	man-animal day	200.00	14	2,800	2,800	2,800	2,800	2,800	2,800	2,800	2,800
Fertilizer/pesticide application	person-day	167.00	1	167	167	167	167	167	167	167	167
Weeding	person-day	167.00	4	668	668	668	668	668	668	668	668
Harvesting/threshing	person-day	167.00	12	2,004	2,004	2,004	2,004	2,004	2,004	2,004	2,004
Total labor cost				5,639	5,639	5,639	5,639	5,639	5,639	5,639	5,639
C. Total production cost				6,680	6,721	6,721	6,853	6,987	6,975	6,964	6,964
D. Yield/ha	t/ha				1.30	1.30	1.30	1.30	1.30	1.30	1.30
E. Farmgate price	pesos/t				3,473	3,473	5,420	7,881	7,694	7,802	7,802
F. Gross revenue/ha	pesos/ha				4,515	4,515	7,046	10,245	10,002	10,143	10,143
G. Net farm income/ha	pesos/ha				- 2,207	- 2,207	193	3,257	3,028	3,179	3,179

Table A9.4: Farm Production Costs "With" Project in 2003 Constant Prices (P/ha).

Item	Unit	Price/Unit (P/Unit)	Amount per ha	Economic Cost/ha	Year							
					1995	1998	2000	2005	2010	2015	2020	
Irrigated paddy												
A. Cost of material inputs: ^a												
Seeds	kg	18.00	50	900	900	900	900	900	900	900	900	900
Fertilizers												
- Urea	kg	4.15	150	622	622	622	1,018	1,420	1,382	1,351	1,351	1,351
- TSP	kg	4.48	50	224	224	224	431	541	511	499	499	499
- KCL	kg	3.58	50	179	179	179	393	466	449	435	435	435
Agrochemicals		1,500	1	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
Total cost of material inputs				3,425	3,425	3,425	4,242	4,827	4,742	4,685	4,685	4,685
B. Cost of labor: ^b												
Land preparation	man-animal day	200.00	14	2,800	2,800	2,800	2,800	2,800	2,800	2,800	2,800	2,800
		167.00	15	2,505	2,505	2,505	2,505	2,505	2,505	2,505	2,505	2,505
Transplanting	person-day	167.00	7	1,169	1,169	1,169	1,169	1,169	1,169	1,169	1,169	1,169
Fertilizer/pesticide application	person-day	167.00	14	2,338	2,338	2,338	2,338	2,338	2,338	2,338	2,338	2,338
Weeding	person-day	167.00	10	1,670	1,670	1,670	1,670	1,670	1,670	1,670	1,670	1,670
Irrigating	person-day	167.00	28	4,676	4,676	4,676	4,676	4,676	4,676	4,676	4,676	4,676
Harvesting/threshing	person-day			15,158	15,158	15,158	15,158	15,158	15,158	15,158	15,158	15,158
Total labor cost				18,583	18,583	18,583	19,400	19,985	19,900	19,843	19,843	19,843
C. Total production cost					3.83	3.83	4.00	4.00	4.00	4.00	4.00	4.00
D. Yield/ha	t/ha				6,760	6,760	9,834	13,026	13,362	12,867	12,867	12,867
E. Farmgate price	pesos/t				25,891	25,891	39,336	52,104	53,450	51,469	51,469	51,469
F. Gross revenue/ha	pesos/ha				7,308	7,308	19,936	32,119	33,549	31,626	31,626	31,626
G. Net farm income/ha	pesos/ha											
Rainfed paddy												
A. Cost of material inputs: ^a												
Seeds	kg	18.00	50	900	900	900	900	900	900	900	900	900
Fertilizers												
- Urea	kg	4.15	150	622	622	622	1,018	1,420	1,382	1,351	1,351	1,351
- TSP	kg	4.48	50	224	224	224	431	541	511	499	499	499
- KCL	kg	3.58	50	179	179	179	393	466	449	435	435	435
Agrochemicals		1,500	1	1,500	1,500	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Total cost of material inputs				3,425	3,425	2,925	3,742	4,327	4,242	4,185	4,185	4,185
B. Cost of labor: ^b												
Land preparation	man-animal day	200.00	14	2,800	2,800	2,800	2,800	2,800	2,800	2,800	2,800	2,800
Transplanting	person-day	167.00	15	2,505	2,505	2,505	2,505	2,505	2,505	2,505	2,505	2,505
Fertilizer/pesticide application	person-day	167.00	7	1,169	1,169	501	501	501	501	501	501	501
Weeding	person-day	167.00	14	2,338	2,338	1,670	1,670	1,670	1,670	1,670	1,670	1,670
Harvesting/threshing	person-day	167.00	28	4,676	4,676	2,839	2,839	2,839	2,839	2,839	2,839	2,839
Total labor cost				13,488	13,488	10,315	10,315	10,315	10,315	10,315	10,315	10,315
C. Total production cost				16,913	16,913	13,240	14,057	14,642	14,557	14,500	14,500	14,500
D. Yield/ha	t/ha				3.83	3.83	4.00	4.00	4.00	4.00	4.00	4.00
E. Farmgate price	pesos/t				6,760	6,760	9,834	13,026	13,362	12,867	12,867	12,867
F. Gross revenue/ha	pesos/ha				25,891	25,891	39,336	52,104	53,450	51,469	51,469	51,469
G. Net farm income/ha	pesos/ha				8,978	12,651	25,279	37,462	38,892	36,969	36,969	36,969

(cont'd.)

Item	Unit	Price/Unit (P/Unit)	Amount per ha	Economic Cost/ha	Year						
					1995	1998	2000	2005	2010	2015	2020
Corn											
A. Cost of material inputs: ^a											
Seeds	kg	8.00	50	400	400	400	400	400	400	400	400
Fertilizers											
- Urea (46-0-0)	kg	4.15	100	415	415	415	679	947	921	900	900
- Complete (14-14-14)	kg	11.50	150	1,725	1,725	1,725	1,725	1,725	1,725	1,725	1,725
Insecticide	li	685.00	2	1,370	1,370	1,370	1,370	1,370	1,370	1,370	1,370
Fungicide	kg	360	1	360	360	360	360	360	360	360	360
Total cost of material inputs					4,270	4,270	4,534	4,802	4,776	4,755	4,755
B. Cost of labor: ^b											
Land preparation	man-animal day	200.00	15	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000
Planting	person-day	167.00	2	334	334	334	334	334	334	334	334
Weeding	person-day	167.00	7	1,169	700	700	700	700	700	700	700
Fertilizer/pesticide application	person-day	167.00	5	835	835	835	835	835	835	835	835
Harvesting/threshing	person-day	167.00	12	2,004	2,004	2,004	2,004	2,004	2,004	2,004	2,004
Total labor cost				7,342	6,873	6,873	6,873	6,873	6,873	6,873	6,873
C. Total production cost				7,342	11,143	11,143	11,407	11,675	11,649	11,628	11,628
D. Yield/ha	t/ha				2.20	2.20	2.20	2.20	2.20	2.20	2.20
E. Farmgate price	pesos/t				3,473	3,473	5,420	7,881	7,694	7,802	7,802
F. Gross revenue/ha	pesos/ha				7,640	7,640	11,924	17,337	16,927	17,165	17,165
G. Net farm income/ha	pesos/ha			-	3,503	3,503	518	5,662	5,278	5,537	5,537

Item	Unit	Price/Unit (P/Unit)	Amount per ha	Economic Cost/ha	Year						
					1995	1998	2000	2005	2010	2015	2020
Coffee											
A. Cost of material inputs: ^a											
Seeds	kg	13.00	1700	22,100	22,100	-	-	-	-	-	-
Fertilizers											
- Urea (46-0-0)	kg	4.15	500	2,073	2,073	2,073	3,393	4,734	4,607	4,502	4,502
- DAP (18-46-0)	kg	11.50	270	3,105	3,105	3,105	3,105	3,105	3,105	3,105	3,105
- Potash (0-0-60)	kg	8.50	450	3,825	3,825	3,825	3,825	3,825	3,825	3,825	3,825
Insecticide	li	685.00	2	1,370	1,370	1,370	1,370	1,370	1,370	1,370	1,370
Fungicide	kg	360	1	360	360	360	360	360	360	360	360
Bamboo poles	poles	65.00	5	325	325	325	325	325	325	325	325
Total cost of material inputs					33,158	11,058	12,378	13,719	13,592	13,487	13,487
B. Cost of labor: ^b											
Land preparation	man-animal day	200.00	33	6,600	6,600	-	-	-	-	-	-
Transplanting	person-day	167.00	8	1,336	1,336	-	-	-	-	-	-
Weeding	person-day	167.00	7	1,169	700	700	700	700	700	700	700
Fertilizer/pesticide application	person-day	167.00	6	1,002	1,002	1,002	1,002	1,002	1,002	1,002	1,002
Harvesting/threshing	person-day	167.00	50	8,350	-	8,350	8,350	8,350	8,350	8,350	8,350
Total labor cost				18,457	9,638	10,052	10,052	10,052	10,052	10,052	10,052
C. Total production cost				18,457	42,796	21,110	22,430	23,771	23,644	23,539	23,539
D. Yield/ha	t/ha					1.00	1.40	2.00	2.00	2.00	2.00
E. Farmgate price	pesos/t	50000			-	50,000	50,000	50,000	50,000	50,000	50,000
F. Gross revenue/ha	pesos/ha				-	50,000	70,000	100,000	100,000	100,000	100,000
G. Net farm income/ha	pesos/ha			-	42,796	28,890	47,570	76,229	76,356	76,461	76,461

(cont'd.)

Item	Unit	Price/Unit (P/Unit)	Amount per ha	Economic Cost/ha	Year							
					1995	1998	2000	2005	2010	2015	2020	
Jackfruit												
A. Cost of material inputs: ^a												
Seedlings	pc	60.00	172	10,320	10,320	-	-	-	-	-	-	-
Fertilizers												
- Complete (14-14-14)	kg	11.50	20	230	230	230	230	230	230	230	230	230
Insecticide	li	685.00	2	1,370	1,370	1,370	1,370	1,370	1,370	1,370	1,370	1,370
Total cost of material inputs					11,920	1,600	1,600	1,600	1,600	1,600	1,600	1,600
B. Cost of labor: ^b												
Land preparation	man-animal day	200.00	42	8,400	8,400	-	-	-	-	-	-	-
Transplanting	person-day	167.00	8	1,336	1,336	-	-	-	-	-	-	-
Weeding	person-day	167.00	3	501	700	700	700	700	700	700	700	700
Fertilizer/pesticide application	person-day	167.00	3	501	501	501	501	501	501	501	501	501
Harvesting/threshing	person-day	167.00	20	3,340	-	-	3,340	3,340	3,340	3,340	3,340	3,340
Total labor cost				14,078	10,937	1,201	4,541	4,541	4,541	4,541	4,541	4,541
C. Total production cost				14,078	22,857	2,801	6,141	6,141	6,141	6,141	6,141	6,141
D. Yield/ha	t/ha					0.84	3.69	21.63	50.00	50.00	50.00	50.00
E. Farmgate price	pesos/t	22000			-	22,000	22,000	22,000	22,000	22,000	22,000	22,000
F. Gross revenue/ha	pesos/ha				-	18,480	81,163	475,954	1,100,000	1,100,000	1,100,000	1,100,000
G. Net farm income/ha	pesos/ha				-	22,857	15,679	75,022	469,813	1,093,859	1,093,859	1,093,859

Item	Unit	Price/Unit (P/Unit)	Amount per ha	Economic Cost/ha	Year							
					1995	1998	2000	2005	2010	2015	2020	
Durian												
A. Cost of material inputs: ^a												
Seedlings	pc	45.00	170	7,650	7,650	-	-	-	-	-	-	-
Fertilizers												
- Urea (46-0-0)	kg	4.15	150	622	622	622	1,018	1,420	1,382	1,351	1,351	1,351
- DAP (18-46-0)	kg	11.50	175	2,013	2,013	2,013	2,013	2,013	2,013	2,013	2,013	2,013
- Potash (0-0-60)	kg	8.50	500	4,250	4,250	4,250	4,250	4,250	4,250	4,250	4,250	4,250
Insecticide	li	615.00	2	1,230	1,230	1,230	1,230	1,230	1,230	1,230	1,230	1,230
Total cost of material inputs					15,764	8,114	8,510	8,913	8,875	8,843	8,843	8,843
B. Cost of labor: ^b												
Land preparation	man-animal day	200.00	38	7,600	7,600	-	-	-	-	-	-	-
Transplanting	person-day	167.00	4	668	668	-	-	-	-	-	-	-
Weeding	person-day	167.00	3	501	700	700	700	700	700	700	700	700
Fertilizer/pesticide application	person-day	167.00	3	501	501	501	501	501	501	501	501	501
Harvesting/threshing	person-day	167.00	20	3,340	-	-	3,340	3,340	3,340	3,340	3,340	3,340
Total labor cost				12,610	9,469	1,201	4,541	4,541	4,541	4,541	4,541	4,541
C. Total production cost				12,610	25,233	9,315	13,051	13,454	13,416	13,384	13,384	13,384
D. Yield/ha	t/ha					0.84	13.40	46.20	55.00	55.00	55.00	55.00
E. Farmgate price	pesos/t	45000			-	-	45,000	45,000	45,000	45,000	45,000	45,000
F. Gross revenue/ha	pesos/ha				-	-	37,800	603,000	2,079,000	2,475,000	2,475,000	2,475,000
G. Net farm income/ha	pesos/ha				-	25,233	9,315	24,749	589,546	2,065,584	2,461,616	2,461,616

(cont'd.)

Item	Unit	Price/Unit (P/Unit)	Amount per ha	Economic Cost/ha	Year						
					1995	1998	2000	2005	2010	2015	2020
Lanzones											
A. Cost of material inputs: ^a											
Seedlings	pc	80.00	440	35,200	35,200	-	-	-	-	-	-
Fertilizers											
- Ammonium Sulfate (21-0-0)	kg	8.00	150	1,200	1,200	1,200	1,200	-	-	-	-
- Complete (14-14-14)	kg	11.50	100	1,150	-	-	-	1,035	1,035	1,035	1,035
Insecticide	li	685.00	2	1,370	1,370	1,370	1,370	1,370	1,370	1,370	1,370
Fungicide	kg	360	1	360	360	360	360	360	360	360	360
Total cost of material inputs					38,130	2,930	2,930	2,765	2,765	2,765	2,765
B. Cost of labor: ^b											
Land preparation	man-animal day	200.00	38	7,600	7,600	-	-	-	-	-	-
Transplanting	person-day	167.00	8	1,336	1,336	-	-	-	-	-	-
Weeding	person-day	167.00	3	501	700	700	700	700	700	700	700
Fertilizer/pesticide application	person-day	167.00	3	501	501	501	501	501	501	501	501
Harvesting/threshing	person-day	167.00	18	3,006	-	-	3,006	3,006	3,006	3,006	3,006
Total labor cost				12,944	10,137	1,201	4,207	4,207	4,207	4,207	4,207
C. Total production cost											
D. Yield/ha											
	t/ha				12,944	48,267	4,131	7,137	6,972	6,972	6,972
E. Farmgate price											
	pesos/t	18000			-	-	18,000	18,000	18,000	18,000	18,000
F. Gross revenue/ha											
	pesos/ha				-	-	14,400	39,420	63,000	63,000	63,000
G. Net farm income/ha											
	pesos/ha				- 48,267	- 4,131	7,263	32,448	56,028	56,028	56,028

Item	Unit	Price/Unit (P/Unit)	Amount per ha	Economic Cost/ha	Year						
					1995	1998	2000	2005	2010	2015	2020
Mango											
A. Cost of material inputs: ^a											
Seedlings	pc	80.00	200	16,000	16,000	-	-	-	-	-	-
Fertilizers											
- Ammonium Sulfate (21-0-0)	kg	8.00	150	1,200	1,200	1,200	1,200	-	-	-	-
- Complete (14-14-14)	kg	11.50	100	1,150	-	-	-	1,035	1,035	1,035	1,035
Insecticide	li	685.00	2	1,370	1,370	1,370	1,370	1,370	1,370	1,370	1,370
Fungicide	kg	360	1	360	360	360	360	360	360	360	360
Total cost of material inputs					18,930	2,930	2,930	2,765	2,765	2,765	2,765
B. Cost of labor: ^b											
Land preparation	man-animal day	200.00	10	2,000	2,000	-	-	-	-	-	-
Transplanting	person-day	167.00	8	1,336	1,336	-	-	-	-	-	-
Weeding	person-day	167.00	30	5,010	700	700	700	700	700	700	700
Fertilizer/pesticide application	person-day	167.00	24	4,008	4,008	4,008	4,008	4,008	4,008	4,008	4,008
Harvesting/threshing	person-day	167.00	20	3,340	-	-	3,340	3,340	3,340	3,340	3,340
Total labor cost				15,694	8,044	4,708	8,048	8,048	8,048	8,048	8,048
C. Total production cost											
D. Yield/ha											
	t/ha				15,694	26,974	7,638	10,978	10,813	10,813	10,813
E. Farmgate price											
	pesos/t	20000			-	-	-	18,000	18,000	18,000	18,000
F. Gross revenue/ha											
	pesos/ha				-	-	-	50,400	108,000	108,000	108,000
G. Net farm income/ha											
	pesos/ha				- 26,974	- 7,638	- 10,978	39,587	97,187	97,187	97,187

(cont'd.)

Item	Unit	Price/Unit (P/Unit)	Amount per ha	Economic Cost/ha	Year						
					1995	1998	2000	2005	2010	2015	2020
Sweet Potato											
A. Cost of material inputs: ^a											
Seeds	kg	12.00	300	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600
Fertilizers											
- Urea (46-0-0)	kg	4.15	200	829	829	829	829	1,814	1,853	1,809	1,801
- Complete (14-14-14)	kg	11.50	200	2,300	2,300	2,300	2,300	2,300	2,300	2,300	2,300
Fungicide	kg	360	1	360	360	325	325	325	325	325	325
Insecticide	li	685.00	2	1,370	1,370	1,370	1,370	1,370	1,370	1,370	1,370
Total cost of material inputs					8,459	8,424	8,424	9,409	9,448	9,404	9,396
B. Cost of labor: ^b											
Land preparation	man-animal day	200.00	16	3,200	3,200	3,200	3,200	3,200	3,200	3,200	3,200
Planting	person-day	167.00	5	835	835	835	835	835	835	835	835
Weeding	person-day	167.00	7	1,169	700	700	700	700	700	700	700
Fertilizer/pesticide application	person-day	167.00	5	835	835	835	835	835	835	835	835
Harvesting/threshing	person-day	167.00	16	2,672	2,672	2,672	2,672	2,672	2,672	2,672	2,672
Total labor cost					8,711	8,242	8,242	8,242	8,242	8,242	8,242
C. Total production cost				8,711	16,701	16,666	16,666	17,651	17,690	17,646	17,638
D. Yield/ha	t/ha				13.20	13.20	13.20	13.20	13.20	13.20	13.20
E. Farmgate price	pesos/t	16000			16,000	16,000	16,000	16,000	16,000	16,000	16,000
F. Gross revenue/ha	pesos/ha				211,200	211,200	211,200	211,200	211,200	211,200	211,200
G. Net farm income/ha	pesos/ha				194,499	194,534	194,534	193,549	193,510	193,554	193,562
Cassava											
A. Cost of material inputs: ^a											
Seeds	kg	6.00	300	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800
Fertilizers											
- Urea (46-0-0)	kg	4.15	300	1,244	1,244	1,244	1,244	2,721	2,779	2,714	2,701
- Complete (14-14-14)	kg	11.50	300	3,450	3,450	3,450	3,450	3,450	3,450	3,450	3,450
Fungicide	kg	360	1	360	360	325	325	325	325	325	325
Insecticide	li	685.00	2	1,370	1,370	1,370	1,370	1,370	1,370	1,370	1,370
Total cost of material inputs					8,224	8,189	8,189	9,666	9,724	9,659	9,646
B. Cost of labor: ^b											
Land preparation	man-animal day	200.00	16	3,200	3,200	3,200	3,200	3,200	3,200	3,200	3,200
Planting	person-day	167.00	5	835	835	835	835	835	835	835	835
Weeding	person-day	167.00	7	1,169	700	700	700	700	700	700	700
Fertilizer/pesticide application	person-day	167.00	5	835	835	835	835	835	835	835	835
Harvesting/threshing	person-day	167.00	16	2,672	2,672	2,672	2,672	2,672	2,672	2,672	2,672
Total labor cost					8,711	8,242	8,242	8,242	8,242	8,242	8,242
C. Total production cost					16,466	16,431	16,431	17,908	17,966	17,901	17,888
D. Yield/ha	t/ha				14.00	14.00	14.00	14.00	14.00	14.00	14.00
E. Farmgate price	pesos/t	8000			8,000	8,000	8,000	8,000	8,000	8,000	8,000
F. Gross revenue/ha	pesos/ha				112,000	112,000	112,000	112,000	112,000	112,000	112,000
G. Net farm income/ha	pesos/ha				95,534	95,569	95,569	94,092	94,034	94,099	94,112

(cont'd.)

Item	Unit	Price/Unit (P/Unit)	Amount per ha	Economic Cost/ha	Year							
					1995	1998	2000	2005	2010	2015	2020	
Cashew												
A. Cost of material inputs: ^a												
Seeds	kg	43.00	1700	73,100	73,100	-	-	-	-	-	-	-
Fertilizers												
- Urea (46-0-0)	kg	4.15	500	2,073	2,073	2,073	3,393	4,734	4,607	4,502	4,502	4,502
- DAP (18-46-0)	kg	11.50	270	3,105	3,105	3,105	3,105	3,105	3,105	3,105	3,105	3,105
- Potash (0-0-60)	kg	8.50	450	3,825	3,825	3,825	3,825	3,825	3,825	3,825	3,825	3,825
Insecticide	li	685.00	2	1,370	1,370	1,370	1,370	1,370	1,370	1,370	1,370	1,370
Fungicide	kg	360	1	360	360	360	360	360	360	360	360	360
Herbicide	gallon	2,080	1	2,080	2,080	2,080	2,080	2,080	2,080	2,080	2,080	2,080
Total cost of material inputs					85,913	12,813	14,133	15,474	15,347	15,242	15,242	15,242
B. Cost of labor: ^b												
Land preparation	man-animal day	200.00	33	6,600	6,600	-	-	-	-	-	-	-
Transplanting	person-day	167.00	8	1,336	1,336	-	-	-	-	-	-	-
Weeding	person-day	167.00	7	1,169	700	700	700	700	700	700	700	700
Fertilizer/pesticide application	person-day	167.00	6	1,002	1,002	1,002	1,002	1,002	1,002	1,002	1,002	1,002
Harvesting/threshing	person-day	167.00	65	10,855	-	10,855	10,855	10,855	10,855	10,855	10,855	10,855
Total labor cost				20,962	9,638	12,557	12,557	12,557	12,557	12,557	12,557	12,557
C. Total production cost				20,962	95,551	25,370	26,690	28,031	27,904	27,799	27,799	27,799
D. Yield/ha	t/ha					0.90	0.90	0.90	0.90	0.90	0.90	0.90
E. Farmgate price	pesos/t	80000			-	80,000	80,000	80,000	80,000	80,000	80,000	80,000
F. Gross revenue/ha	pesos/ha				-	72,000	72,000	72,000	72,000	72,000	72,000	72,000
G. Net farm income/ha	pesos/ha				-	95,551	46,630	45,310	43,969	44,096	44,201	44,201

Item	Unit	Price/Unit (P/Unit)	Amount per ha	Economic Cost/ha	Year							
					1995	1998	2000	2005	2010	2015	2020	
Gmelina												
A. Cost of material inputs: ^a												
Seedlings	pc	10.00	625	6,250	6,250	-	-	-	-	-	-	-
Fertilizers												
- Complete (14-14-14)	kg	11.50	50	575	575	-	-	-	-	-	-	-
Insecticide	li	685.00	2	1,370	1,370	-	-	-	-	-	-	-
Fungicide	kg	360	1	360	360	-	-	-	-	-	-	-
Total cost of material inputs					8,555	-	-	-	-	-	-	-
B. Cost of labor: ^b												
Land preparation	man-animal day	200.00	46	9,200	9,200	-	-	-	-	-	-	-
Transplanting	person-day	167.00	10	1,670	1,670	-	-	-	-	-	-	-
Fertilizer/pesticide application	person-day	167.00	1	167	167	-	-	-	-	-	-	-
Harvesting/threshing	person-day	167.00	45	7,515	-	-	-	-	-	-	-	-
Total labor cost				18,552	11,037	-	-	-	-	-	-	-
C. Total production cost				18,552	19,592	-	-	-	-	-	-	-
D. Yield/ha	t/ha					-	-	-	-	-	-	-
E. Farmgate price	pesos/t	1800			-	-	-	-	-	-	-	-
F. Gross revenue/ha	pesos/ha				-	-	-	-	-	-	-	-
G. Net farm income/ha	pesos/ha				-	19,592	-	-	-	-	-	-

^a Cost of material inputs expressed in 2003 prices.^b Price of labor adjusted by a Shadow Wage Rate Factor = 0.70.

Table A9.5: Cropping Patterns for Farm Models

Item	Model 1	Model 2	Model 3	Model 4
A. Annual Crops (1 ha) With Project				
1. Rainfed paddy	0.1	0.3	0.1	0.3
2. Irrigated paddy	0.1	0.0	0.3	0.0
3. Corn	0.3	0.2	0.6	0.2
4. Cassava	0.5	0.3	0.5	0.4
5. Sweet Potato	0.2	0.2	0.0	0.2
Total	1.2	0.9	1.5	1.1
B. Perennials (1 ha) Incremental				
1. Mango	0.060	0.020	0.080	0.030
2. Jackfruit	0.060	0.015	0.080	0.050
3. Durian	0.001	0.001	0.040	0.040
4. Lanzones	0.001	0.001	0.040	0.040
5. Rambutan	0.000	0.000	0.010	0.000
6. Cashew	0.150	0.015	0.150	0.020
7. Coffee	0.000	0.000	0.040	0.040
8. Calamansi	0.000	0.000	0.120	0.200

Table A9.6: Financial Analysis
(\$'000)

		1995	1999	2000	2005	2010	2015	2020
Net Revenue from Crops	Model 1	40,147	40,186	40,445	40,487	40,426	40,493	40,495
	Model 2	1,547	1,627	2,905	4,195	4,314	4,153	4,153
	Model 3	391	540	2,718	5,137	5,135	5,088	5,088
	Model 4	18,876	18,977	21,955	24,877	25,140	24,761	24,763
Net Revenue from Agroforestry	Model 1	-1,425	9,434	12,149	47,794	101,451	101,972	101,972
	Model 2	-176	1,021	1,507	9,440	21,874	22,286	22,286
	Model 3	-4,240	15,574	26,655	154,983	373,471	403,132	403,132
	Model 4	-2,281	3,573	11,828	100,294	247,811	272,058	272,058
Net Revenue (Project)		52,839	90,932	120,162	387,208	819,622	873,942	873,946
Net Revenue per farm		6	10	13	43	90	96	96