

**REEVALUATION STUDY  
OF THE  
PALAWAN INTEGRATED AREA DEVELOPMENT PROJECT  
(Loan Nos. 528-PHI and 529-PHI[SF])  
IN THE  
PHILIPPINES**

**December 1998**

## CURRENCY EQUIVALENTS

Currency Unit - Peso (₱)

	At Appraisal	At Project Completion	At Postevaluation	At Reevaluation
₱1.00 =	\$0.1259	\$0.0357	\$0.0400	\$0.0252
\$1.00 =	₱7.94	₱28.00	₱25.00	₱39.76

## ABBREVIATIONS

ADF	-	Asian Development Fund
AID	-	Agricultural Intensification and Diversification
AOTA	-	Advisory and Operational Technical Assistance
CIP	-	Community Irrigation Project
DENR	-	Department of Environment and Natural Resources
DOA	-	Department of Agriculture
EEC	-	European Economic Community (now European Union)
EIRR	-	Economic Internal Rate of Return
IA	-	Irrigators' Association
IEP	-	Integrated Environmental Program
LGU	-	Local Government Unit
LRC	-	Livestock Resource Center
NEDA	-	National Economic and Development Authority
NIA	-	National Irrigation Administration
O&M	-	Operation and Maintenance
OCR	-	Ordinary Capital Resources
PAC	-	Provincial Agricultural Center
PBME	-	Project Benefit Monitoring and Evaluation
PCR	-	Project Completion Report
PCSD	-	Palawan Council for Sustainable Development
PIO	-	Provincial Irrigation Office
PIADPO	-	Palawan Integrated Area Development Project Office
PPAR	-	Project Performance Audit Report
RAC	-	Rural Agricultural Center
REM	-	Reevaluation Mission
RES	-	Reevaluation Study
RHC	-	Rural Health Center
RWA	-	Rural Water Association
SEP	-	Strategic Environmental Plan
UNDP	-	United Nations Development Programme
USP	-	Upland Stabilization Program

## NOTE

In this Report, \$ refers to US dollars.

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## EXECUTIVE SUMMARY

The Palawan Integrated Area Development Project aimed at increasing agricultural earnings, providing social services, and introducing sound environmental practices. The Project had 14 components, many with several subcomponents. The Project attempted to increase agricultural production and productivity through improvements in physical infrastructure (irrigation facilities, roads, and ports); through expansion, intensification, and diversification of agricultural production; and through improved land ownership arrangements. The major social components of the Project were malaria control, provision of water supply and sanitation facilities, and land classification and titling. The environmental component included land stabilization and preparation and implementation of an environmental plan.

The total cost of the Project was estimated at \$85 million of which the Bank was to finance \$32 million from the ordinary capital resources and \$15 million from Asian Development Fund through loans approved on 29 September 1981. The actual cost of the Project was \$58 million, of which \$32.9 million was financed by the Bank.

The Project suffered from numerous delays and changes, and some components remained incomplete or failed to achieve desired results. The Project Performance Audit Report (PPAR), which was circulated on 12 August 1993, stated that the Project had an inadequate database and that many agricultural components had inappropriate design features. The Brooke's Point port, one bridge, and some parts of the irrigation works were not completed. The Project resulted in the improvement or expansion of transport infrastructure, irrigation facilities, the area and yields of tree and annual crops, livestock numbers, support facilities for future agricultural development, malaria control, rural water supply, and institutional capability for environmental control. These in turn led to increased agricultural outputs and social benefits, but at a level lower than targeted. The maintenance of the road and irrigation facilities had been inadequate. The water user groups and irrigators' associations established under the Project required further development. Port facilities generated enough surplus for operation and maintenance (O&M) but not enough to recover capital costs. Beneficiary repayments of Government's investment in irrigation were running at 50 percent, with nothing left over for O&M. Recoveries for livestock distributed were expected to be low. The municipalities to which the agricultural extension staff had been transferred were unlikely to be able to finance their services. The Project was assessed as partly successful. The PPAR identified key issues for the future as increased upland development, continuation of agricultural development, and provision of agricultural credit, and made a number of recommendations that have not been acted upon.

The Reevaluation Mission found that low Project impact and low sustainability of Project benefits reflect design weaknesses such as inadequate information, inadequate consideration of existing farming systems, limited consultation with beneficiaries and stakeholders, and the failure to recognize institutional and sociological constraints as well as the risks of a sudden shift to the high-technology, multistory cropping systems promoted under the Project. Overestimates of water availability resulted in the overdesign of irrigation schemes. Neglect of watershed management and deforestation contributed to reduced water flows and siltation problems.

Incomplete physical infrastructure components were finished eventually, but maintenance of the Project irrigation schemes is poor. Cropping intensity in the area serviced is low and is expected to continue declining over time in the absence of new investments to improve watershed areas, or to rehabilitate diversion weirs and canals. Only 15 percent of scheduled amortization fees has been collected. The first priority for water use revenues collected by the irrigators' associations is for making amortization payments; however, longer term sustainability interests may be better served by channeling the funds first into O&M.

There was a shift from multistory cropping promoted under the agriculture intensification and development (AID) component of the Project to perennial crops with an emphasis on cashews and fruits. The use of the 2.4 million seedlings distributed from the nurseries established under the Project was not monitored, and there was no cost recovery. Seven of the eight rural agricultural centers (RACs) established under the Project, which are critical for the provision of agricultural research and extension services, have been devolved to local government units (LGUs), and most of them are atrophying for lack of adequate resources.

Current statistics on the livestock component are not available. Limited livestock funding from LGUs to which this component was transferred resulted in the virtual cessation of support services. Mortality rates among the cattle distributed are reportedly high, and calving rates low. Repayment by farmers through offspring, always low, has virtually ceased. Livestock auction centers were never used and are now overgrown.

Only 15 percent of the agricultural credit offered under the Project was utilized despite relaxation of eligibility rules. Institutional credit for the farmers in the Project area is not effective.

Improvements in the port facilities at Puerto Princesa and Brooke's Point have enabled increased throughput of cargo, but maintenance of Project roads and Bailey bridges is poor.

The incidence of malaria declined by 58 percent over the period of Project implementation. At the end of 1997, it was 82 percent lower than at the start of the Project, thanks to the continuation of the anti-malaria program under the Second Palawan Integrated Area Development Project. However, malaria is still a leading cause of morbidity and mortality in Palawan.

About 456 tubewells were established against the target of 430 for rural water supply schemes. Of these, only 95 are functional. Of the 123 sanitation facilities, the 76 installed in schools are being maintained; all those in public places except one are dysfunctional.

The land (use) classification and cadastral survey were completed as planned. Against the appraisal target of 33,000 titles and the revised target of 27,000 titles for lots 5 hectares (ha) and under that were to be processed in the province, 22,580 titles were processed and approved at the time of the Mission's visit, but distribution figures have not been monitored. No statistics are available regarding progress on lots over 5 ha, which were processed in the Department of Environment and Natural Resources, Manila.

The pilot Upland Stabilization Program (USP) to control shifting cultivation and settle three tribal minority groups (489 households) was implemented, but there was little replication of the program. Watersheds are still deteriorating due to continued immigration; moreover, the unstable character of watercourses and the El Niño phenomenon has resulted in dry rivers and a dramatic increase in fires during the current dry season. Thus, some problems expected to be addressed by USP have instead become worse. The Strategic Environment Plan (SEP) was completed, and provides guidelines for future development of the province. However, its operationalization has been slow, and its contribution to arresting deterioration of the environment in the province has been limited. The environmental and benefit monitoring component was successful in terms of creating facilities and activities, but its effect on environmental protection has not been significant.

The Project has had a positive socioeconomic impact in the Project area at a level considerably lower than originally expected. Ports, roads, malaria control, and land classification and titling had positive impacts, though sustainability of the impacts requires continuing inputs. The impact of the irrigation, AID, livestock, credit, and the rural water supply and sanitation components has been disappointing. Irrigation facilities have contributed to increased farm incomes for some farmers, but others incurred losses when they invested in developing irrigation land and never received the promised supplies of water. Relatively few farmers benefited from the input-intensive, multistory technologies promoted by the Project; some of those who did benefit initially subsequently abandoned the systems, and suffered losses as a result.

The economic internal rate of return (EIRR) was calculated for the irrigation and ports components at 3.9 percent and 8.9 percent, respectively. Lack of data does not permit the EIRR calculation for the whole Project or for the other components, but indications are that these would be low or negative.

There are concerns about the sustainability of several Project outputs, e.g., irrigation schemes, RACs, and water supply and sanitation facilities. The livestock and credit components initiated by the Project have largely wound down. Additional investments as well as an improvement in their financial performance are needed in the ports at Puerto Princesa and Brooke's Point to ensure sustainability. Roads and many of the Bailey bridges are in poor condition. The reduction in the supply of antimalaria drugs risks allowing the incidence of illness to rise again. There has been no replication of USP, and little operationalization of SEP.

Several key issues need to be addressed. The degradation of forest and coastal environments remains the most important threat to sustainable economic development in Palawan. It is having major adverse effects on water catchments, increasing volatility in water flows, soil erosion, and siltation of irrigation facilities in the Project area. In-migration of people and subsequent expansion of the cropping area continues at the expense of the environment. Institutional arrangements for the sustainability of Project benefits are poor. Facilities devolved to LGUs are not being funded and are consequently deteriorating. Water user charges are being used for amortization and not for O&M. Water user groups are not functional in rural water supply schemes. O&M of irrigation and agriculture facilities, roads and bridges, and water

supply and sanitation needs to be stepped up. Cost recovery has been particularly poor in almost all Project components. There are no effective or sustainable arrangements for institutional credit.

Agricultural components of the Project were unsuccessful. The transportation infrastructure and social sector components achieved success but in varying degrees. The environmental components were partly successful. Some components were not quite technically feasible or were not economically viable. For relatively successful components, the benefits achieved were less than expected, and their sustainability is open to question. Some objectives of the Project were achieved, but not cost effectively. There are institutional weaknesses including problems of O&M, cost recovery, and financing of Project facilities and services. The environment in Palawan continues to deteriorate. On an overall basis, the Project is classified as partly successful.

The following lessons were learned from the Project: (i) a sound database is critical to project formulation; (ii) where hydrological data is deficient, assessment of water availability for irrigation and water supply projects should be conservative; in the latter, potability of water supply must also be determined; (iii) beneficiaries must be consulted in community irrigation schemes and involved in the protection of water catchment areas; (iv) new, high-risk technologies in agriculture should be adopted incrementally; (v) market failures should be clearly outlined before project interventions are designed to improve them; (vi) adequate institutional arrangements for O&M are essential to the sustainability of project benefits; (vii) coordination overload through unduly complex projects should be avoided; (viii) midterm project reviews should be rigorous and carried out with an open mind.

It is recommended that (i) proceeds from water use fees be spent first on O&M of existing facilities, then on amortization payments; (ii) consideration be given to reducing amortization, and to directly involving irrigators' associations in measures to improve watershed management to the extent practicable; (iii) water supply to farmers who are not paying their dues be disconnected; (iv) responsibility for ownership and O&M of Project facilities be clarified as a matter of urgency; (v) the role of government support to livestock development in Palawan be reassessed; (vi) arrangements for the supply of institutional credit to the rural poor in Palawan be considered; (vii) the allocation criteria for O&M of gravel roads be reconsidered; (viii) conversion of Bailey bridges to concrete ones be considered; (ix) port expansion plans include a review of navigation and marine safety arrangements and environmental impact assessment; (x) dysfunctional water supply schemes be restored to operation where feasible; (xi) effective institutional arrangements be made for the O&M of rural water supply schemes; (xii) supply of antimalarial drugs in adequate quantities be continued; (xiii) issuance of land titles be monitored; and (xiv) the effects of the in-migration in Palawan be carefully reassessed with a view to reconsideration of the policy.

## I. BACKGROUND

## A. Project History, Objectives, and Scope

1. Two loans, one for \$32 million from the ordinary capital resources and the other for \$15 million from Asian Development Fund were approved for the Palawan Integrated Area Development Project on 29 September 1981.<sup>1</sup> The total cost of the Project was \$85 million of which \$7 million was to be financed by the European Economic Community<sup>2</sup> as a grant. Advisory and operational technical assistance was approved along with the loan to finance the services of the consultants to assist the Project Office in planning, coordination, and monitoring of Project implementation.<sup>3</sup>

2. The Project was to be the first phase of a development process in Palawan. It aimed at increasing agricultural earnings, providing social services, and introducing sound environmental practices. An integrated area development approach was adopted to provide a comprehensive solution to the development needs of the area. The Project had 14 components, many with several subcomponents, and eight executing agencies (Appendix 1). It aimed to increase agricultural production and productivity through improvements in physical infrastructure (irrigation facilities, roads, and ports); through expansion, intensification, and diversification of agricultural production based on provision of inputs and services; and through improved security of land ownership. The major social components of the Project were malaria control, provision of water supply and sanitation facilities, and land classification and titling. The environmental component included land stabilization, and preparation and implementation of an environmental plan.

3. Project scope included (i) construction of eight new, and rehabilitation of eight existing, community irrigation schemes and formation of irrigators' associations (IAs); (ii) establishment of one provincial agricultural center (PAC) and eight rural agricultural centers (RACs) to support the agricultural intensification and diversification (AID) program through research and extension and through production of seedlings; (iii) establishment of a Livestock Resource Center (LRC) and three auction markets, procurement and production and distribution of cattle and goats, upgradation of animal health services, demonstration and extension services, and introduction of bee-keeping; (iv) establishment of three pilot areas for controlling shifting agriculture under the upland stabilization program (USP); (v) provision of credit for agriculture; (vi) construction/improvement of 159 kilometers (km) of secondary roads and 160 km of feeder roads and upgrading of the Provincial Engineer's Office; (vii) expansion of port facilities at Puerto Princesa and Brooke's Point; (viii) expansion of programs for mosquito control and detection and treatment of malaria; (ix) establishment of 430 simple wells, 2 water supply schemes with multiple public faucets, 100 public sanitation facilities, and a number of water users' groups; (x) support for the Government's program of survey and classification of 700,000 hectares (ha) of land; (xi) expansion of the ongoing program of cadastral survey and processing and issuance of about 34,000 land titles; (xii) studies for preparing strategies and plans of action for improved environmental planning and control; (xiii) preparation and implementation of an environment and benefit monitoring system; and (xiv) support to the Project Office.

<sup>1</sup> The Project had been prepared under TA No. 326-PHI: *Palawan Integrated Area Development*, for \$650,000 approved on 17 December 1979. Technical assistance costs were shared by the United Nations Development Programme (\$300,000) and the European Economic Community (\$350,000).

<sup>2</sup> On 1 November 1993, the European Economic Community became the European Union (EU).

<sup>3</sup> TA No. 416-PHI: *Palawan Integrated Area Development*, approved for \$350,000 on 29 September 1981.

## **B. The Project as Implemented**

4. The Project was implemented with many changes and delays (nine years against the planned seven), but some components remained incomplete. Only half the targeted area was irrigated. Intensification was of different crops from those intended. Herd development was unsatisfactory, and dispersal of calves was early. Agriculture credit targets were grossly underachieved. Some communities were converted from shifting agriculture as planned. The environmental plan for the island was completed. The malaria control program was implemented. All rural water supply and sanitation facilities were provided, though the water of many wells was not potable. Although greatly delayed, the targets for land classification and titling were substantially achieved, but by the Project's end many titles were still to be issued. Actual Project cost was \$58 million against the revised (in 1988) cost of \$65 million, with Bank disbursement of \$32.9 million (70 percent) of the approved amount.<sup>1</sup>

5. The Project Completion Report (PCR), which was circulated in June 1991, rated the Project as generally successful. It recommended (i) regular and effective maintenance of roads; (ii) monitoring of the deposits of sediment loads at the diversion sites and in the canal networks; (iii) provision of funds for operation of the large number of inoperative wells; (iv) provision of funds for the maintenance of RACs; and (v) establishment of a suitable credit program.

## **C. The Second Palawan Integrated Area Development Project**

6. Two loans, one for \$33 million from the ordinary capital resources and the other for \$25 million from the Asian Development Fund, were approved on 27 September 1990 for the Second Palawan Integrated Area Development Project.<sup>2</sup> The Second Project has several components similar to the Project. It covers the northern part of the province, whereas the Project covered the central and southern parts of Palawan; however, some components such as irrigation development, integrated community health program, and upper catchment rehabilitation activities cover the entire province. The Second Project is expected to close by 31 December 1998.

## **II. POSTEVALUATION FINDINGS**

7. The Project Performance Audit Report (PPAR) was circulated on 12 August 1993. It states that many features of the agriculture component, which had been designed using an inadequate database and therefore had inappropriate design parameters, were modified during implementation. Implementation of infrastructure components was set back by the political and

<sup>1</sup> The Bank released \$2.15 million from two special project implementation assistance loans (Loan Nos. 779-PHI(SF) and 780-PHI) to help overcome Government funding problems. The actual share of the European Economic Community was \$6.06 million.

<sup>2</sup> Loan Nos. 1033-PHI and 1034-PHI(SF).

economic upheaval in the country in 1986. Nevertheless, the Project's physical infrastructure was constructed essentially as planned, although the Brooke's Point port, one bridge, and some parts of the irrigation works were not completed. The Project resulted in the improvement or expansion of transport infrastructure, irrigation facilities, the area and yields of tree and annual crops, livestock numbers, support facilities for future agricultural development, malaria control, rural water supply, and institutional capability for environmental control. These in turn led to increased agricultural outputs and social benefits, but at a level lower than targeted. The Strategic Environmental Plan (SEP) for Palawan developed under the Project provides a planning and legislative framework for guiding future development. Maintenance of the road and irrigation facilities has been inadequate, and flood damage to these components has increased. The IAs and water user groups established under the Project require further development.

8. Port facilities generate enough surplus for operation and maintenance (O&M) but not enough to recover capital costs. Beneficiary repayments of Government investments in irrigation were running at 50 percent, with nothing left over for O&M. Economic internal rates of return (EIRRs) for the irrigation component and the port facilities were calculated at 6 and 8 percent, respectively.

9. The Project's contribution to economic, social, and environmental improvements was less than expected. The PPAR rated the Project as partly successful. The full benefits of the roads, ports, AID, irrigation, and the livestock components were still to be realized. This would depend upon many factors, including the continuation of migration patterns, completion and rehabilitation of Project facilities, and sustained institutional improvements in the management of Project facilities.

10. The PPAR identified key issues for the future as increased upland development, continuation of agricultural development, and provision of agricultural credit. It recommended research into alternative cropping patterns, development of stronger IAs, resolution of right-of-way problems, remedying construction deficiencies to improve irrigation operations, investigation of low-calving rates in the cattle distributed, continuation of USP activities including expansion of the area covered and strengthening of beneficiary groups, monitoring the settlement and cropping practices of people in upland areas along the new west coast roads, development and implementation of a program to encourage these people to use appropriate agricultural practices to minimize erosion, and early completion of Brooke's Point port facilities and the bridge along the Quezon-Aramaywan road.

### **III. REEVALUATION RATIONALE, OBJECTIVES, FOCUS, AND SOURCES**

11. A reevaluation of this Project was deemed necessary for two main reasons. First, the overall success rating given to the Project by the PPAR was lower than that given by the PCR (paras. 5 and 9), partly because the recommendations of the PCR had not been adequately acted upon at the time of postevaluation. (For example, a number of the Project's physical facilities remained incomplete). This reevaluation study (RES) was aimed at finding out how the PPAR's recommendations had been treated.

12. Second, a major devolution of responsibilities to local government units (LGUs) in the Philippines has occurred since postevaluation, with significant implications for the management, operation, and financing of several Project facilities. Therefore, an RES was considered a possible tool for translating the first Project's experience into lessons relevant to the sustainability of the Second Project's benefits.

13. The objective of the RES is to assess the long-term impact of the Project, with a focus on the completion of Project facilities, and on the achievement of full Project benefits and their sustainability, which depends upon the effective and sustained provision of Project services and inputs. These in turn depend upon several factors: the institutional arrangements under the new LGU regime for O&M; financing (including cost recovery); effective organization and professional management of Project facilities, services, and inputs; and actions to give effect to the recommendations of the PPAR.

14. This reevaluation is based on the visit of the Reevaluation Mission (REM) to Palawan and several Project components and subcomponents. It draws on discussions held with representatives from National Economic and Development Authority (NEDA), line agencies, and the Palawan Council for Sustainable Development (PCSD),<sup>1</sup> Project authorities, regional and provincial government officials, beneficiaries and stakeholders in Palawan, and Bank staff; and on Bank files and documentation, and available Government statistics and documents. Copies of the draft RES were provided to the Borrower, to the executing and recipient agencies, field offices in Palawan, and concerned Bank staff; their comments were taken into account before finalizing this Report.

#### IV. REEVALUATION FINDINGS

##### A. Project Design

15. A fundamental weakness in the Project was that several of its major components were designed with a poor database, inadequate knowledge of local resources and potential, a poor appreciation of the local sociological conditions and institutional parameters, and insufficient consultation with beneficiaries and stakeholders.

16. Lack of basic hydrological data resulted in overestimation of water availability for most irrigation schemes, such that a substantial part of the irrigation service cannot be utilized outside of the wet season (para. 23).<sup>2</sup> Other land cannot be utilized during the wet season because of drainage problems and flooding. During design and implementation, the community irrigation component was treated as a hardware component in which the farmers could make little input, rather than as social infrastructure where beneficiary inputs are essential to the

<sup>1</sup> PCSD is the successor-in-interest to the Palawan Integrated Area Development Project Office (PIADPO).

<sup>2</sup> The Mission saw the facilities at the height of an especially severe dry season, but allowances were made for the unusual conditions in making this assessment.

sustainability of investments. In the absence of better data on water flows,<sup>1</sup> closer consultation with local farmers and officials could have minimized design weaknesses. Greater attention could have been paid to lower cost alternatives such as improving the brush-dam facilities developed by farmers in some irrigation areas.<sup>2</sup> Inadequate attention was given to watershed management, and deforestation has aggravated water supply problems and caused silting problems at many of the diversion weirs.

17. The original focus of the AID component on intensive multistory cropping systems<sup>3</sup> was inappropriate and was generally not accepted by farmers. Major implementation problems suggest that the AID and livestock components were designed with inadequate information on local resources and agriculture potential, with inadequate consideration of existing farming systems, and after only limited consultation with intended beneficiaries. This was reflected in the failure to recognize basic agronomic and environmental constraints and risks associated with the relatively high-technology multistory cropping systems promoted under the Project. Given the lack of basic information at Project design, it may have been more appropriate to opt for a less ambitious design, focusing initially on more gradual technical improvements to existing cropping systems, while undertaking field trials to better assess the technical, social, and economic feasibility of alternative cropping systems. This approach would have allowed a better appreciation of production constraints and potential farmer interest in such technologies, and would have improved the basis for training and extension activities.

18. Imported cattle faced problems in adapting to the new environment, and their susceptibility to disease was reportedly higher than native livestock. Recipients initially faced difficulties in handling the larger cross-bred animals. Inadequate attention was given to developing sustainable systems for financing animal health and other livestock services; this issue became critical later in the life of the Project.

19. The Puerto Princesa port was generally developed as designed. Typhoon damage necessitated the rehabilitation and expansion of port facilities at Brooke's Point, including the construction of a breakwater facility under the Second Project. Design problems reportedly arose from a lack of consultation with local port authorities during Project preparation. Concerns were expressed about the sustainability of the newly constructed breakwater facilities during the typhoon season because of problems with design and construction materials.

20. The coordinated implementation of the 14 Project components required a complex management and implementation structure that overwhelmed the institutional capacity of the agencies concerned. There may have been good reasons for assuming that a coordinated approach to development would be preferable to individual projects for the irrigation, AID, livestock, credit, land classification and titling, and environmental protection components. The case for integrating these activities with the other social development components, however, was less clear cut; to some degree this may also be true of the transport

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<sup>1</sup> The National Irrigation Administration has indicated that this problem may in future be addressed by ongoing Government efforts on water resources database development and the Agricultural and Fisheries Modernization Act of 1997.

<sup>2</sup> Some farmers have reverted to improving brush-dam facilities and are achieving yields exceeding those of the higher cost systems financed under the Project.

<sup>3</sup> This refers to the cultivation of several crops in the same area at different heights: for example, coconut at the highest level, coffee or cacao at the next level, and perennials at the lowest level.

infrastructure component. Dividing the components into two or more projects may have been more effective.

## **B. Implementation and Operational Performance**

### **1. Irrigation**

21. Project design included the rehabilitation of eight existing irrigation areas and the construction of eight new ones. Following several Project revisions and typhoon damage, five irrigation schemes were rehabilitated and seven new schemes were constructed. Another new scheme, Lamikan Community Irrigation Project (CIP) was 80 percent completed with Project financing when it was destroyed by a typhoon in 1988.<sup>1</sup>

22. Two Project-financed irrigation schemes? Sabsaban CIP and Maasin CIP? had to be substantially rehabilitated and expanded under the Second Project. Only 25 ha of the 500 ha designed capacity of Tigaplan CIP has been irrigated with system-provided water in recent years despite additional local government funding for the repair and rehabilitation of this scheme. Most Tigaplan area farmers have reverted to using water from brush-dams. Other schemes, especially Bonobono CIP, are able to supply only limited water outside the wet season. First season (June-August) flooding and drainage problems are increasing due to ongoing deforestation and deterioration of scheme watersheds, and the availability of second season (September-December) water is declining. Farmers from some of the IAs have signed petitions to the National Irrigation Administration (NIA) to correct design and construction problems with the irrigation schemes.

23. The Provincial Irrigation Office (PIO) estimates that the 12 completed irrigation schemes, with a current service area of 2,730 ha, are being used to irrigate 1,350 ha during the wet season, and to irrigate about 986 hectares for the second season crop as shown in the table below (Appendix 2, Table 1). No crops are grown during the dry season. Cropping intensity is expected to continue to decline over time in the absence of new investments to improve watershed areas, and to rehabilitate diversion weirs and canals.

#### **Estimated Irrigation Area at Full Development**

(hectares)

	<b>AR (Planned)</b>	<b>PCR</b>	<b>PPAR</b>	<b>RES</b>

<sup>1</sup> This scheme was totally redesigned and reconstructed under the Second Project.

Service Area	4,500	3,490	3,905	2,730
Wet Season Irrigation	4,500	1,781	1,710	1,350
Second Season Irrigated Crop	3,465	1,570	1,277	986

AR = Appraisal Report, PCR = Project Completion Report, PPAR = Project Performance Audit Report,  
RES = Reevaluation Study.

Source: Project documents and National Irrigation Administration.

24. The IAs lack the institutional capacity to fully maintain the irrigation facilities developed under the Project. Limited human and financial resources mean that the role of the PIO in supervising the irrigation schemes is limited to the collection of amortization fees. Collection of payments has been poor with only 15 percent of scheduled amortization collected (Appendix 2, Table 2). Farmers resist paying because they are dissatisfied with the design and the quality of construction of irrigation facilities, from which they are not receiving the water they expected. The design weaknesses add to needs for O&M expenditure. Official policy is that first priority for water use revenues collected by the IAs is to make amortization payments to the PIO, but longer term sustainability interests may be better served by giving first priority to O&M. A change in priorities would increase the incentives of IAs and farmers to improve revenue collection. There may also be a case for writing off part of the loans made to the IAs so that they only have to repay the cost of facilities that are actually delivering water. This is already happening in practice? the Tigaplan IA has not paid any amortization since 1991.

## 2. Agriculture Intensification and Diversification

25. The AID component was to increase farm incomes by providing and adapting improved technologies, including the provision of planting material and advisory assistance to promote the development of tree crops using coconut-based multistory cropping systems.<sup>1</sup> A PAC and eight RACs were to be established to produce seeds and other planting materials for distribution to farmers, to undertake field trials, and to increase farmer training and extension activities in support of recommended cropping models. During implementation, Project authorities recognized that the focus on multistory cropping was not appropriate; consequently, the Bank agreed to a Government request to shift to a strategy of perennial crops (specially cashews), with a concomitant expansion in nursery activities.

26. Project facilities were constructed as planned, nurseries were established, and more than 2.4 million seedlings, sufficient to plant 6,700 ha, were distributed by Project completion.<sup>2</sup> However, many of the coffee and cacao plants did not survive because of inappropriate soils, inadequate inputs and management, and climatic conditions and disease. The preliminary impact assessment undertaken in 1991 by the Project Office reported that seedlings had been distributed for the planting of 4,597 ha of new crops and the rehabilitation of 3,427 ha. Most farmers never paid for seedlings, and there was little follow-up on how the

<sup>1</sup> Perennial crops such as coffee and cacao are grown between rows of coconut trees, with annual crops also planted in initial years to provide cash flow until crowded out by the maturing perennials. Coffee and cacao benefit from the shade provided by the coconuts and from the inputs to the annual crops.

<sup>2</sup> PPAR, para. 31. The PCR (para. 6) reports that "about 1.7 million seedlings of cashew, coffee, cacao, mango, citrus, and other cash crops, enough to cover 19,000 hectares were distributed ....". This implies an unrealistically low planting density even if all plants survived.

seedlings were used. It is now estimated that the area of new tree crops areas established at Project completion may have been only 2,500 ha. Some of the newly established coffee plants (mostly around Brooke's Point) were subsequently uprooted because of poor prices and limited markets for coffee. Most cashew plants, especially south of Narra, are achieving only low yields because of heavy rain during flowering. The main elements of rehabilitation? fertilizers, soil, weed, and pest management? were not sustained following the cessation of Project interventions. However, in addition to tree crop development, some 4,284 ha of annual crops were grown with Project support.

27. The Project reverted to simpler perennial crops with a greater focus on improving mangoes, citrus, and other horticultural crops traditionally grown in Palawan. Mango and other horticultural plants distributed during the later stage of the Project have contributed to increased yields and farm incomes to farmers, and there is continuing strong demand for these plants. The profitability of mango production would be enhanced with the eradication of mango pulp weevil and relaxation of quarantine restrictions on the export of unprocessed mangoes outside Palawan. Institutions strengthened under the Project have reported breakthroughs in developing measures to eradicate the weevil and are hopeful that quarantine restrictions can be soon relaxed.

28. The eight RACs were to be the coordinating points between line agencies concerned and the channel for demonstrating and delivering extension, credit, and other services including the production and distribution of planting materials to farmers. In 1993, the Department of Agriculture (DOA) devolved seven RACs to LGUs. However, except for the RAC at Puerto Princesa, official transfer procedures have not been completed, and these centers have received no, or very limited, budget resources for O&M in recent years. Only the Abo-Abo RAC, which is retained by the DOA, and the Puerto Princesa RAC are being used as originally planned. Three of the RACs (Roxas, Bataraza, and Brooke's Point<sup>1</sup>) have been abandoned and are in poor and deteriorating condition. Some four-wheel drive vehicles, tractors, and other equipment have not been operational since the early 1990s.<sup>2</sup> The RAC at Quezon was transferred for college use. The other RACs (Narra and Aborlan) are being maintained and staffed by LGUs, but receive inadequate resources to implement activities as originally planned. LGUs argue that until DOA finalizes the transfer of facilities and equipment to the LGUs, they are legally constrained from making any expenditure on these facilities. This issue needs to be resolved urgently to avoid further deterioration of facilities and equipment.

29. The PAC, along with the RAC at Abo-Abo, is integrated with the DOA program, and is being maintained and utilized. The PAC continues to produce and distribute tree and annual crop plants and seeds; support the Sloping Agricultural Land Technology program; and undertake soil analysis, crop protection research, and field trials and demonstrations. It is receiving adequate financing to sustain its activities. Some PAC facilities are also being used by the agriculture component of the Second Project.

<sup>1</sup> Brooke's Point RAC had been one of the most successful RACs in nursery development and in promoting multiple story cropping. The laboratory at Brooke's Point is being partially utilized and maintained under arrangements with the Philippine Coconut Authority.

<sup>2</sup> Most equipment at Bataraza RAC has not been operated since the early 1990s. The initiative of the Brooke's Point RAC staff in maintaining equipment without a regular budget is to be commended.

### 3. Livestock

30. The LRC was established on a smaller scale than planned. The imported foundation Brahman cattle did not arrive until six weeks prior to Project completion. The artificial insemination program was not successful because of a lack of resources? most critically the lack of reliable supplies of liquid nitrogen for storing semen? and was suspended.<sup>1</sup> Thus, no progress was made with the breeding program during Project implementation. The imported animals were used to sustain a livestock improvement program after Project completion, but fertility rates have been low and mortality high. Low productivity reflects the problems of imported animals adapting to the new environment, management problems, turnover of trained staff, and nutrition constraints. The LRC continues to maintain a herd of about 150-180 cattle and more than 100 goats for distribution.

31. At Project completion, some 2,836 cattle and 48 goats had been distributed. The offspring of another 786 cattle had been collected (as repayment for the original stock) and redispersed to other farmers by the end of 1990 (Appendix 3). Since then, livestock services have been devolved to LGUs. Monitoring of ongoing collection is now weak, and aggregate statistics are not available. Some LGUs continue to collect offspring of distributed cattle, but collection and redispersal have fallen substantially. LGUs typically fund only one livestock officer and very limited operational expenditure. Vaccines and other animal health inputs are only available on an ad hoc basis. Reported on-farm mortality rates are high and calving rates low. Low productivity reflects poor animal health services, poor nutrition, and inadequate distribution of bulls in some areas, as well as incentives to report high mortalities to avoid paying for distributed livestock by returning some of their offspring.

32. Livestock auction centers were constructed, but not to original specifications. The structures were very basic and were poorly located away from existing commercial centers and roads. They were never used, did not generate any economic benefits, and are now overgrown. No progress was reported on the bee-keeping subcomponent.

33. Despite these deficiencies, the livestock component did increase the wealth of farmers that received livestock, and the impact of the cross-breeding can be seen in the Project area. Cross-bred cattle are generally larger, continue to be bred in the Project area, and attract premium prices at local markets.

### 4. Credit

34. The credit component was poorly utilized because of institutional weaknesses, a lack of a clearly defined strategy for credit use, limited adoption of multiple cropping systems, and the mid-1980s crisis in the Philippine banking system. Lending targets were progressively reduced over the Project period. Some \$2.1 million (15 percent of the originally approved amount) was utilized, but only after relaxation of eligibility rules to allow loans for rice milling

<sup>1</sup> The artificial breeding program was resumed at the LRC and surrounding localities in 1997 with national funding, Project equipment, and an artificial insemination technician trained under the Project. Liquid nitrogen and semen are shipped by air to Palawan.

equipment and farm machinery. The Project did not succeed in developing sustained improvements in credit availability.

## 5. Roads

35. Included in the Project's scope were the improvement/construction of 159 km of main roads, 160 km of feeder roads, and six bridges on the main east-west link road (between Abo-Abo and Quezon). At the time of postevaluation in 1992, one bridge along the Quezon to Aramaywan road (the Iwahig bridge) still had to be completed. This was eventually completed in 1996 and upgraded from a Bailey<sup>1</sup> to reinforced concrete. The delay in the completion was due to several changes needed to correct the faulty original design and specifications that made the concrete piles too shallow to withstand flash floods. The performance of the contractor and shortage of counterpart funds also contributed to the cumulative delay of over six years in the completion of the bridge after Project completion.

36. All roads constructed under the Project are in use, but their condition varies. Most are passable on utility vehicles, but in several patches the ride is rough. At least one patch had its gravel surface eroded by floods. In at least two spots drains need to be replaced. All Bailey bridges are in need of repairs, and in two, extensive replacement of parts is necessary. It is reported that heavier cargo trucks on occasion traverse this transport infrastructure designed for vehicles weighing less than five tons.

37. Three Project roads are especially prone to flash floods, erosion and inundation: the Brooke's Point-Bataraza road, Quezon-Punta Baja road, and Quezon-Aramaywan road. Recommended actions to repair the road include rechanneling of waterways, installation of additional drainage structures, raising of grade, construction of slope protection structures, and installation of additional culvert pipes. Current allocations for maintenance of gravel roads are about two thirds of the actual requirements, as gravel roads require periodic reshaping. Given the impossibility of policing the use of Bailey bridges by vehicles within permissible load limits and the heavy expenses on the O&M of such bridges which keep them out of commission for extended periods, it is best to replace Bailey bridges with concrete ones.

## 6. Ports

38. Some 10 percent (\$5.7 million) of actual Project costs were expended on developing ports at Puerto Princesa and Brooke's Point. The Puerto Princesa port was largely completed and is operational, but not all facilities have been transferred to the Philippine Ports Authority. Ports development at Brooke's Point was marked by contractual disputes, design problems, and typhoon damage during construction (para. 19). Additional financing for the redesign, rehabilitation, and expansion of this port were provided under the Second Project.

<sup>1</sup> A through type of bridge in which the roadway is carried between two steel girders with wooden panels tinned together end to end.

39. The volume of cargo handled at the port of Puerto Princesa exceeded Project projections, increasing at around 12 percent per annum since completion of Project facilities. Cargo throughput has exceeded the without-Project capacity since 1989 and, without the Project, the Puerto Princesa port would now have become severely congested with increased ship turnaround times and cargo handling costs. Strong growth in throughput at the Puerto Princesa port continues, and the port capacity utilization will soon exceed 80 percent of technical capacity. Additional investments will be required soon to further expand the port.

40. The pier approach developed under the Project at the Brooke's Point port is being used to provide access to the pier landing and reinforced concrete roll-on/roll-off ramp and turnaround constructed under the Second Project. Following strong growth throughout the 1980s, growth in cargo handling at Brooke's Point subsequently stagnated until the construction of improved and expanded facilities under the Second Project.

41. While increased throughput has contributed to increase revenue performance, the Puerto Princesa port authority continues to operate at a loss, with total expenses of P20.8 million in 1997 (including P5.3 million in depreciation), compared with the revenue of P18.4 million. The long-term viability of the ports will depend on improvements in financial performance. The issue is especially important given that Puerto Princesa port will soon require additional capacity. Financial sustainability needs to be considered carefully in plans for future expansion and tariff structures adjusted accordingly. More generally, there is a need to ensure that future development is consistent with a longer term strategy for transport and ports development throughout Palawan.

42. The Philippine Ports Authority noted that concerns had been expressed about the handling of dangerous goods (mainly inflammable products) at a port located near the commercial center of Puerto Princesa City. Any assessment of future expansion plans should address the need for shifting the handling of such goods to a less densely populated area.

## **7. The Malaria Control Program**

43. By Project completion, malaria had been reduced by 58 percent against the appraisal target of 70 percent. The PPAR reported lower achievements in the later part of Project implementation, when there were management problems and an influx of malaria-vulnerable immigrants. The REM found that there were shortcomings in the malaria education campaign and inadequate delivery of health services in some remote areas. The Integrated Community Health Program under the Second Project continues to support the Government's ongoing malaria program throughout Palawan.

44. Activities that have continued include the multiplication of larvivorous fish in the fish ponds established under the Project<sup>1</sup> and the provision of these fish to communities for seeding streams. In the year 1997, 386 streams were seeded against the target of 456 streams. Because of insufficient funds to pay volunteers, 276 km of streams were cleared in 1997 against

<sup>1</sup> Ninety fishponds have been provided with concrete lining under the Second Project although new ones are not being constructed.

a target of 456 km, but in some areas the program is still effective. The target of spraying houses every six months has been reduced by 50 percent, from 60,000 houses in 1990 to 30,000 houses in 1997. There is a new program to impregnate mosquito nets with insecticide free of cost every six months<sup>1</sup> by volunteers<sup>2</sup> and beneficiaries who have been trained and supplied with chemicals. Impregnation of nets is a low-cost activity; the cost of impregnating 1,000 nets is in the range of P1,250-P1,650. In some areas, up to 40 percent of the population has also been provided the nets free of cost. In places where government funds are not available for the purpose, donations have been raised or local funds mobilized to pay microcopists for malaria detection. On the negative side, the supply of anti-malaria drugs to rural health centers has been drastically curtailed, reportedly by up to 95 percent.

45. The incidence of malaria has reportedly gone down from 57 reported cases per 1,000 population at appraisal, and 29/1,000 at postevaluation, to 10.08/1,000 as of December 1997: an 82 percent drop. Palawan has moved down from being the most malarious province in the country to being the second most malarious province behind Sulu. However, malaria still ranks as the fourth leading cause of morbidity and mortality in Palawan, and in some areas it is the leading cause of morbidity.

## 8. Rural Water Supply and Sanitation

46. A total of 456 level I rural water supply schemes comprising deep and shallow tubewells and four level II systems that provide community taps were developed under the Project against the appraisal target of 430 and 2, respectively. One of the four level II schemes was upgraded to level III by the provision of domestic connections. At postevaluation, about half of the level I tubewells were not being operated due to mechanical failure and turbidity. This was despite the revision of the scope of this component in 1998 to include repair and maintenance of wells already constructed; introduction of filter box on wells with high iron and manganese content; and repair and rehabilitation of filter boxes. The REM was advised that a recent inventory of 386 tubewells<sup>3</sup> shows that only 95 are still operating and yielding potable water, while 291 schemes are not functioning. In 74 of these, the pumps need major repairs; 193 pumps need repairs; and in 24 cases the water yielded is not potable because it has high iron and manganese content. Fifteen rocking filters were installed in wells with high iron and manganese content<sup>4</sup> and make their water potable. All the tubewells that are functional are those where use of the alternative sources of water is uneconomical or inconvenient due to the distance involved.

47. Appraisal documents envisaged detailed investigation prior to selection of the source of water for a particular area, the training of beneficiaries, and the formation of rural water associations (RWAs) prior to drilling wells. The RWAs were expected to contribute 10 percent of the cost of the system in cash or in kind and be responsible for O&M. But it

<sup>1</sup> Schedules for impregnation have been prepared for *barangays* with prioritization for areas with higher actual parasite index.

<sup>2</sup> Volunteers are paid an honorarium between P50 and P280 per month although P100 is standard, plus travel expenses.

<sup>3</sup> Seventy tubewells were not inventoried apparently because they are nonexistent or abandoned, and ostensibly beyond reclamation.

<sup>4</sup> Of the 95 operating wells.

appears that in the level I schemes trial and error was the only method used to investigate the source of water prior to site selection. Furthermore, some of the wells were not dug to recommended depths and did not have the benefit either of technical supervision or of technical inspection before takeover. Training did not serve its purpose.<sup>1</sup> The RWAs have not functioned except where the well was the only source of water;<sup>2</sup> and no contribution was made in cash by the RWAs. The tubewells have generally not been maintained, except for voluntary cleaning around the well; in rare cases early in the Project, some users contributed spare parts and helped with repair. Attempts to revive RWAs under the Second Project have not been successful. Repairs have been carried out occasionally by the Department of Public Works and Highways at the request of villagers, though there is no clear policy on this.

48. It is proposed that (i) pumps that cannot be used or repaired should be written off and cannibalized, (ii) 24 more wells should be provided with rocking filters to make water potable, and (iii) the rest should be repaired. The functioning tubewells should be privatized or contracted out to individuals.

49. Of the 123 sanitary latrines provided under the Project, the 76 provided in schools and the one being maintained by the LGU at Brooke's Point are functional. The rest, 31 in public places and 16 in private residences, are not functional due to lack of maintenance.

## 9. Land Classification and Titling

50. The target of the land classification component of the Project was to support the Government's program to speed up delineation of alienable and disposable land. This, in turn, would facilitate the issue of land ownership titles in areas under cultivation but still officially classified as forest land. This component was implemented essentially as designed<sup>3</sup> and achieved its objective of correcting land classification records.

51. The target for cadastral survey preceding land titling under the Project as appraised was 71,605 ha. This was revised down to 69,787 ha and reported accomplished by 12 January 1989. The initial target of 8,539 isolated surveys was revised to 13,545 isolated surveys. Of these, 13,493 (99.6 percent) were accomplished.

<sup>1</sup> The extent of training provided, reportedly three individuals per well, is disputed. Institutional arrangements for utilization of the trainee's services do not appear to have been made. The REM could not locate any trainee in the schemes it visited.

<sup>2</sup> The Preliminary Impact Study undertaken by the Project Office in 1991 reported that only 29 percent of the well users affirmed membership in these associations.

<sup>3</sup> The PCR reported that the component's operational targets were fully accomplished. Classification of the targeted 108,000 ha of cultivated land and subclassification of 449,000 ha of forest lands was completed.

52. The appraisal target for titling, i.e., the issue of 33,270 titles, was overestimated. This was revised downwards to 27,000, of which 18,308 titles for 5 ha and below were approved and signed by 1990. The figure of approvals was the same at postevaluation.<sup>1</sup> Subsequently another 4,272 titles were approved and signed and sent to the Register of Deeds for distribution. Figures of distribution are not available, as no monitoring of distribution of titles was done after 1990.

53. The rest of the titles are still to be approved and issued. The delay in the distribution by the Register of Deeds is reportedly because the assessment of realty taxes and declaration of taxes, which is to be initiated by the awardee, has not started. Or, it may be due to nonpayment of overdues assessed on the land by the Provincial Assessor's office and/or nonpayment of cadastral survey costs. Or it may be due to lack of interest by the awardees in the distribution of such titles.<sup>2</sup> The Provincial Environment and Natural Resources Office has difficulties in monitoring the approval and issue of the remaining titles.<sup>3</sup>

54. The authority for approval of titles for lots in excess of 5 ha was and is vested in the Department of Environment and Natural Resources (DENR) in Manila. The REM was unable to find out the number of cases processed for approval by the DENR or of such approvals granted, if any.

55. Most of the areas within Project limits declared alienable and disposable are already occupied and cultivated, but there are areas, such as 4,000 ha in Quezon released for distribution in 1990, that remain to be titled. There are encroachments on land that is not alienable and disposable despite the survey of the boundaries of the occupation done by the land classification authorities.

56. Approval of titles for the remaining lots needs to be expedited. Approval and signatures of the lots over 5 ha in DENR need to be monitored, as does distribution of all titles. Where approval of titles is pending, the causes of delay need to be determined and redressed.

## **10. The Environment Sector Components**

### **a. The Upland Stabilization Program**

57. On the interface of agriculture and environment, the USP was designed for the development and implementation of an integrated program for controlling shifting cultivation and assisting tribal minorities to settle through the provision of physical and social infrastructure, farm development, reforestation, and community organization and training. Under the USP, settled cultivation was encouraged through the issue of certificate of stewardship contracts; farm

<sup>1</sup> There was a lull in the approval (or signing) of titles in 1989 and 1990 due to the change in the authority for issuing titles 5 ha and below from the Community Environment and Natural Resources Offices in the districts to the Provincial Environment and Natural Resources Office.

<sup>2</sup> It was also suggested that paucity of funds with the Register of Deeds could be a constraint.

<sup>3</sup> Under the latest instructions, titles would be distributed even without collection of overdues but with their encumbrance. The awardee will not be able to alienate, dispose, or mortgage the land until the overdues are cleared.

models were demonstrated; and off-farm income generation activities were introduced. A handbook was also prepared.<sup>1</sup>

58. The appointment of Manila-based managers for this component hampered its implementation until 1986, but thereafter a satisfactory program was developed that took into account the agricultural and social requirements for persuading tribal minorities to change from shifting cultivation to settled cultivation with sustainable cropping patterns of annual and perennial crops. Three targeted tribal minority groups (489 households) settled under the program. In all three areas, settled agriculture became the dominant activity. In two areas, slash-and-burn practices stopped altogether. The program was experimental, and it succeeded in generating useful information about how to convert slash-and-burn farmers to settled cultivators.<sup>2</sup>

59. Because of the experimental nature of the USP, it took on only a small portion of the problem of erosion and the needs of tribal people in upland watershed areas. Its immediate results remained local. The problems addressed under the USP persist, and are apparently worsening (para. 84).<sup>3</sup>

#### **b. The Integrated Environmental Program**

60. The integrated environmental program (IEP) component of the Project included formulation and carrying out of an integrated environmental planning study, and follow-up monitoring and evaluation activities relating particularly to soil conservation, forest management, and water resources. The SEP was formulated and recommended a watershed development approach as most practical in terms of conservation, control, and implementation. Although much delayed, the SEP provided rational guidelines for future development of the province. In 1992 the Republic Act 7611<sup>4</sup> adopted the SEP "to guide the local government of Palawan and the government agencies concerned in the formulation and implementation of plans, programs, and projects affecting the said province."<sup>5</sup>

61. The watershed approach has become the guiding principle of planning. Thus, the IEP component of the Project established a sound basis for sustainable development and protection of natural resources. However, implementation of the SEP's recommendations under later national and other development cooperation projects has been slow. There has been little success in addressing environmental deterioration due to weaknesses in the implementation of SEP.

<sup>1</sup> "A Handbook on Upland Stabilization Farming Techniques and Soil Stabilization Technologies." DENR, et. al.

<sup>2</sup> The pilot operation was carefully monitored under the project benefit monitoring and evaluation system. In that context, limited indicators to measure effects of the program on the environment were mentioned as a concern.

<sup>3</sup> However, the outcome of this Project component has been useful to more recent programs like the Palawan Tropical Forestry Protection Program, which continues the work in other areas, and the emerging community forestry projects, which are expected to promote upland-based livelihood projects that will support the objectives of the USP. The Palawan Tropical Forestry Protection Program is also making use of the seedlings produced at nurseries developed under the AID component of the Project.

<sup>4</sup> An act adopting the strategic environmental plan for Palawan, creating the administrative machinery for its implementation, and converting the Project Office to its support staff. 19 June 1992.

<sup>5</sup> The support mechanisms to SEP, under the law, include (i) the environmental monitoring and evaluation system; (ii) environmental research; and (iii) environmental education and extension. The main strategy of SEP is the Environmentally Critical Areas Network.

62. Project components relating to the environment were not an end in themselves. They were intermediate goals to provide the means for the protection of the environment in Palawan. Despite the availability of the tools, the legal and policy infrastructure, physical facilities, processes and procedures, and trained human resources, the environment in Palawan continues to deteriorate. This is due to the lack of replication and multiplication of USP pilot project schemes; the slow operationalization of SEP; the continued in-migration of people who are occupying land and pushing tribal people upland; and increasing encroachments and use of slash-and-burn techniques. The situation appears to be fast becoming critical.

## 11. The Environmental and Project Benefit Monitoring System

63. The Project benefit monitoring and evaluation system was developed and made operational as an impact-focused monitoring and evaluation system, despite the unavailability of computers at the time and limited access to electricity. Benchmark surveys were conducted in 1983 for baseline information about the physical profiles of the target areas and the socioeconomic conditions of beneficiaries for all components except land classification and titling. A second survey was undertaken in 1987 as a Project review, and the third in 1991 in the form of preliminary impact studies (eight regular components and one each for the three groups of irrigation schemes).<sup>1</sup> However, many of the monitoring recommendations remained unheeded. It took an unusually long time to resolve implementation problems.

64. The environmental monitoring and evaluation system under the SEP includes databases for environmental baselines, trends, and critical areas. The physical facilities for environmental monitoring are adequate, and the human resources are qualified and professional, but the financing is clearly insufficient to allow the appropriate expansion to address the environmental monitoring and management needs.<sup>2</sup>

65. The environmental and project benefit monitoring of this Project has had a limited impact. It was successful in terms of creation of facilities and activities, but its direct contribution to environmental protection has not been significant. The benefit monitoring database was inadequate to quantify the full benefits and costs of most Project components. In particular, the permanent environmental and data management operations need to be strengthened to provide a consistent framework and baseline data for different development projects. Otherwise, the management of those important ecological resources will remain inconsistent.

## C. Socioeconomic Impact

<sup>1</sup> Monitoring surveys for each component were also carried out during the period 1986-1989, and a second monitoring survey for three components and one group of irrigation schemes was conducted in 1988.

<sup>2</sup> The databases maintained by PCSD library include most of the sectors listed as components of Environmental Monitoring and Evaluation System in the original SEP (1985). However, the coverage is thin.

66. The Project has had a positive socioeconomic impact in its area of coverage, but this impact was considerably less than originally expected. There was considerable positive impact from the ports, roads, malaria control, and land classification and titling components, though the sustainability of these impacts requires continuing inputs as well as benefits monitoring. The impact of the irrigation, AID, livestock, credit, and the rural water supply and sanitation components has been particularly disappointing. The environment component of the Project failed to arrest the continuing deterioration of the environment.

67. The expansion in crop area, yields, and production due to Project-financed irrigation facilities has raised farm incomes, but to a level much lower than planned. These increases are not fully sustainable with declining water availability due to deteriorating watersheds and siltation, and because of poor maintenance of facilities. Some 700 farm families are still active in the Project-supported IAs, compared with the 2,625 families projected at appraisal and the 3,880 farmers reported in the PCR. An unknown number of farmers incurred losses when they invested in developing irrigation land but never received the promised supplies of water for irrigation.

68. Relatively few farmers adopted or benefited from the input-intensive, multistory technologies originally promoted by the Project. Some of those who did adopt them subsequently abandoned them at a loss to themselves. There are large discrepancies between the various estimates of the areas of tree crops newly established and rehabilitated under the Project (para. 26). There is no data on what percentage of these crops survived to maturity and no reliable data on impacts on yields and farm income, though the component has clearly contributed to increased income from tree crops, especially fruit trees near Puerto Princesa City.

There is a continuing demand for seedlings produced by Project nurseries, and the PAC and the Puerto Princesa RAC continue to research new varieties of horticultural crops and improved pest management techniques. Research undertaken by the centers has resulted in new technologies being adopted by farmers.

69. Some RACs (including those at Narra and Aborlan) are being extensively used for community health and other social training programs? a positive impact not originally envisaged in the Project design. The LGU at Puerto Princesa recently funded the development of a second RAC to provide service to farmers in the southern part of the municipality using the Project-financed RAC as a model.

70. The impact of the livestock component was much less than expected, but the impact of imported cattle (both Project and privately financed) continues to be seen in the larger cross-bred animals in the Project area. Most of the benefits from the livestock component are believed to have accrued to farmers with larger land holdings, and most of the credit was directed to farmers with adequate collateral (the financially better-off farmers) and to agroprocessing industries.

71. The ports development has had a positive socioeconomic impact in facilitating strong growth in trade and passenger traffic. Improved road infrastructure contributed to some diversion of cargo revenue from coastal shippers to road transporters, but the extent of this impact has not been quantified. Roads constructed under the Project have reduced distance traveled and travel time,<sup>1</sup> but their impact now is lower than what it was earlier in the life of the Project.

72. The malaria eradication component of the Project raised consciousness about the disease among the residents of the Project area and led to substantial decline in the incidence of malaria, but the benefits in terms of enhanced productivity and improvement in the quality of life are difficult to quantify. The health benefits of the rural water supply and sanitation component have been sustained at levels much lower than expected.

#### **D. Impact on Women**

73. Very little gender-disaggregated data is available; thus, it is difficult to assess the impact of the agricultural components of the Project on women. The ownership of land by women has traditionally been limited. This constrains the direct flow of the individual benefits of several Project components to women. The general social benefits are not gender sensitive. However, there was a relatively high proportion of women staff employed in Government and Project-support activities.

#### **E. Environmental Impact**

74. Although Bank procedures did not require an environmental impact assessment when the Project was appraised, environmental concerns were addressed during the design and implementation of the Project, and no significant adverse environmental consequences initially resulted from its various components. However, improved access to upland virgin forest is controversial in light of the Bank's current policies, even if its purpose is to improve the living conditions of indigenous peoples. In the context of Palawan, such improved access poses a deepening environmental risk. As it is, upland farming development involves in-migrants from other parts of the country. Another concern is the lack of marine pollution control facilities and plans in the harbors, and in the coastal areas with valuable biodiversity or tourism resources. Harbors need facilities to receive solid wastes and oil residue from ships, and equipment to control accidental oil spills, in order to protect the environmentally sensitive coastline of Palawan.

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<sup>1</sup> The Impact Study undertaken by the Project Office in 1991 indicated that the feeder road component of the Project had resulted in improved marketing practices in that the proportion of transactions with agents and contract buyers had declined from about 46 percent to 29 percent, and the percentage of sales with retailers and wholesalers had correspondingly increased. Sales of surplus commodities outside the *barangays* had increased in terms of volume.

## **F. Economic Reevaluation**

75. The REM concurs with the PPAR that inadequate monitoring of Project impacts during Project implementation? especially monitoring of the impacts of the AID, livestock, and road transport components? means that it is not possible either to make a formal benefit-cost analysis of these components or reestimate the EIRR for the Project as a whole. The usual difficulties in isolating Project impacts on agricultural growth are compounded by the impact (on areas cropped and adoption of new technologies) of inward migration to the Project area of farmers from more technologically advanced agricultural areas of the Philippines.

76. The REM reestimated the EIRR for the irrigation and ports components (Appendix 4). The estimated EIRR for the irrigation component was only 3.9 percent, compared with estimates of 18 percent in the PCR and 6 percent in the PPAR. The main reason for the decline is the fact that the actual area being irrigated as a result of Project-financed investments is considerably less than that envisaged earlier. The area irrigated by the Project would have to exceed that used in this analysis by almost 60 percent to secure an EIRR of 10 percent.

77. The EIRR for the ports component was reestimated at 8.9 percent, close to the postevaluation mission estimate, but well below the PCR estimate of 18 percent. Throughput at Puerto Princesa port exceeded appraisal expectations and projections at the time of postevaluation, but design problems and typhoon damage substantially reduced the benefits from the investment in the Brooke's Point port.

## **G. Sustainability of Project Benefits**

78. There are concerns about the sustainability of a number of Project outputs. Water catchment areas in the Project area continue to deteriorate due to siltation problems at the diversion weirs. Some cables have been removed from weir head gates, and some water canals are deteriorating due to inadequate maintenance. Without further investment to improve watershed management and increased expenditure on O&M of canals, the total area irrigated by the Project-financed infrastructure will continue to decline.

79. Delays in finalizing arrangements for the turnover of remaining facilities to LGUs is a major concern, with three of the RACs abandoned and three others only partially utilized because of constraints on LGU funding. Research facilities developed at the PAC and some of the RACs, most notably the Puerto Princesa RAC, continue to play a substantial role in agriculture development.

80. The livestock and credit components initiated by the Project have largely wound down, although there continues to be some limited distribution of cattle. The impact of improved breeds continues to be seen in the Project area, and the artificial breeding program was resumed in 1997 using Project equipment and expertise.

81. The benefits from the port development at Puerto Princesa are physically sustainable with periodic dredging and other maintenance. Given the strong growth in cargo throughput and passenger traffic at the Puerto Princesa port, additional capacity will be required in the near future, and there is a growing need for roll-on/roll-off ramps at the port. Additional investments were required under the Second Project to repair, improve, and expand the Project-financed facilities at Brooke's Point Port. The Philippine Ports Authority still has concerns about the sustainability of the breakwater facility at Brooke's Point and claims that more effective dredging is needed. The financial performance of the ports needs to be improved to ensure the sustainability of the benefits of the port component.

82. The poor condition of the roads, and specially that of the Bailey bridges, means that less time is saved in travel, and fares are higher. The problem will persist unless Bailey bridges are replaced by concrete ones and funds for road maintenance are increased.

83. Despite the steep decline in its incidence, malaria is still a leading cause of morbidity and mortality in Palawan. The drastic reduction in the supply of antimalaria drugs to the RHCs could potentially be a setback to antimalaria efforts. The sustainability of the rural water supply component is poor at present, but could pick up with some investment and improved institutional arrangements.

84. There was no replication of the pilot program under USP to control shifting cultivation and settle minority groups. Watershed deterioration has continued due to the in-migration into Palawan. Combined with the unstable character of the watercourses, and the effects of the El Niño phenomenon, it has resulted in dry rivers and led to a dramatic increase in fires. The problems expected to be addressed by USP have persisted and in fact have gotten worse. The operationalization of the SEP and its contribution to arresting the deterioration of the environment in Palawan has been limited.

85. Overall, the sustainability of Project benefits has been low. Given that little action was taken on the recommendations of either the PCR or the PPAR, it is difficult to be optimistic about the chances of the recommendations of this RES being acted upon. Consequently, improvement in the sustainability of Project benefits is uncertain.

## V. KEY ISSUES

### A. The Environment, Agriculture Development, and Poverty Alleviation

86. While the environmental component of the Project was generally implemented as planned, the degradation of forests and coastal environments remains the most important constraint to sustainable economic development in Palawan. The continuing degradation of forests in the Project area is having a serious adverse effect on water catchments, resulting in greater extremes in water flows, increasing soil erosion, siltation of irrigation facilities, and deterioration in water supply.

87. There is an inherent conflict between different development objectives being pursued in the Project area. The authorities have encouraged inward migration and expansion of cropping areas with the aim of promoting economic development. Rain-fed and irrigated areas are being developed in increasingly marginal areas. Marginal lands formerly used by tribal groups are being developed for commercial agricultural production, and titles are being issued for private ownership of this land. As part of the USP, some tribal people have shifted to a permanent system of agriculture, but others have sold their land and moved further into even steeper forestland. This has exacerbated environmental damage, and threatens the sustainability of agriculture as watersheds are destroyed. The authorities recognize the problem, but more action is needed to resolve the conflict between increasing migration and expansion of agriculture areas on the one hand and environmental protection on the other.

88. The Project focused on the economic benefits from agriculture production, with little direct attention to the potentially important role of services and rural industries in reducing poverty and promoting sustainable development of Palawan. A broader approach would have implications for development planning, especially in terms of planning public infrastructure. For example, tourism development as an important element of Palawan's development strategy needs to be directly reflected in all public investment planning, including environmental protection and transport planning. Protection of coastal and forest environments is critical to tourism development, and tourism development will increase the economic returns to protecting the environment and thus the economic incentives for stronger action in this area. Tourism also has the potential to boost employment, thereby reducing pressures for further encroachment of agriculture into marginal areas.

## **B. Institutional Arrangements for Sustainability and Cost Recovery**

89. Several Project facilities are underutilized and deteriorating for want of appropriate O&M, due either to weak institutional support systems or to inadequate financing, or a combination of both. The most prominent examples of this are the RACs, which are supposed to have been devolved to LGUs. Requisite procedures to effect the handover have not been completed despite the passage of several years, with the result that the devolved RACs are not receiving adequate financial support. Their buildings are deteriorating, their equipment is in disuse, and their land is lying fallow. In some cases, the buildings and equipment have been abandoned; in others, the buildings are being put to other uses. All this despite the fact that the RACs were providing a needed service. Similarly, livestock services were devolved to LGUs, but limited funds mean that these services are now only available on an ad hoc basis. Clearly, the devolution has been undertaken without finalizing the necessary technicalities, without due consideration of its financial implications, and without administrative and technical preparation of the receiving LGUs.

90. Irrigation schemes, saddled as they are with overdesign and technical flaws, are supplying a decreasing amount of water and are subject to increasing flooding. The O&M necessary to sustain their performance even at reduced levels is lacking due to insufficient funds.<sup>1</sup> The very limited funds collected from IAs (which are not very effective) are applied for amortization, with nothing left for O&M. The failure to allocate funds for O&M will gradually dry up whatever is being received and thus reduce amortization payments received over the life of the Project's irrigation facilities.

91. Other Project components where sustainability is suspect due to poor O&M are roads and especially the Bailey bridges; the rural water supply pumps for lack of adequate institutional support mechanisms; and the malaria control program, which is faced with declining supply of antimalaria drugs.

92. Part of the problem with institutional arrangements for sustainability is that cost recovery has been very poor in most Project components, e.g., irrigation facilities, seedlings, livestock, and rural water supply. It has been inadequate in parts. The causes vary, but institutional weaknesses are common across the board.

## **C. Agricultural Credit**

93. Agricultural credit was poorly utilized. There is a continuing demand for credit, but no models have yet been established in Palawan for the effective and sustainable provision of credit for the rural poor. Formal institutions lend mainly to larger farmers, where transaction costs and financial risks are lower. Moneylenders, traders, and other informal suppliers are the main sources of credit for small farmers, but generally at high cost. It is desirable to develop

<sup>1</sup> In some cases IAs and farmers are unofficially mobilizing some resources for O&M to keep the systems going, without reporting this to NIA. The situation would otherwise be worse.

lower cost options for farmers, including options that improve access to both savings and credit. Lessons from appropriate and sustainable savings and credit schemes elsewhere in the Philippines, such as those operated through nongovernment organizations, may be relevant.<sup>1</sup>

#### **D. Project Interventions with Unclear Justification**

94. The Appraisal Report never clearly identified what market failure was being addressed, or provided any other economic rationale for the Project to intervene in the production decisions of farmers. The apparent justification in the Appraisal Report for intervention in livestock production (para. 60) was that "There are large tracts of underdeveloped and underutilized private and public lands which are highly suited for grazing animals." There was no attempt to analyze whether this situation resulted from market failures, or whether it was the result of economically rational decisions by farmers given local prices, markets, and alternative economic options. Had such an analysis been done, the Project might have focused its interventions in applied research, training, and extension, rather than directly intervening in input production and distribution.

#### **E. Project Supervision, Benefit Monitoring, and Follow-up Action**

95. There was a failure in Project supervision and monitoring in that the design problems were not identified early enough. No attempt was made at reformulating the Project despite there being a clear case for it. The monitoring of Project benefits has been poor, and there has been virtually no action on the recommendations contained in earlier Bank reports. There was inadequate follow-up action by Bank staff on these issues despite the opportunity offered by the implementation of the Second Project.

### **VI. CONCLUSIONS AND RECOMMENDATIONS**

#### **A. Overall Assessment**

96. The most significant benefits of the Project are from the ports and the malaria control components. Both the ports developed under the Project have led to strong growth in cargo traffic and contributed to furthering economic activities in the province. The Project resulted in the reduction of the incidence of malaria by 58 percent, with benefits in terms of quality of life and greater productivity. The roads component provided savings in distance traveled and travel time, though road maintenance is weak. The land classification and titling

<sup>1</sup> Bangko Sentral ng Pilipinas has pointed out that there are six different programs of rural and agricultural credit operating in the Philippines, including Palawan. The Mission's view is that these are not effective in Palawan.

component has clarified the status of land in public records and provided increased land security as an incentive to sustained investment by landowners. Tree crops were established on 2,500 ha. The impact of imported livestock is visible in the Project area. The environmental components achieved their intermediate goals of pilot testing and developing an institutional framework.

97. However, lower than anticipated Project impact and the low sustainability of some Project benefits reflect important design weaknesses such as inadequate information and database, inadequate consideration of existing farming systems, limited consultation with intended beneficiaries and other stakeholders, and the failure to recognize sociological and institutional constraints and the risks of a sudden shift to high-technology, multistory cropping systems. The irrigation, AID, and livestock components were not technically and economically feasible. Parts of the port and the rural water supply and sanitation components had technical problems. The credit component was not delivered. The environment component did not achieve its potential and the environment of Palawan continues to deteriorate. The integrated area development approach placed a management and coordination overload on the concerned agencies. There are institutional weaknesses including problems of O&M, cost recovery, and financing. Some of the objectives of the Project that were achieved were not achieved cost effectively. The operational success and the impact on farm incomes of the outputs of the irrigation, AID, and livestock components were below targets and continue to decline. Because of data constraints it is not possible to calculate the EIRR for the Project as a whole. The socioeconomic impact of the Project, though positive, has been less than expected and the prospects for its sustainability are not bright. Project benefits declined from completion to postevaluation. This trend has continued from postevaluation to reevaluation. It would be optimistic to expect better prospects in the future.

98. The ports and the malaria eradication components of the Project were by and large successful. The roads, land classification, USP, IEP, and environment and benefit monitoring components were partially successful. The irrigation, AID, livestock, credit, and rural water supply and sanitation components were unsuccessful. Overall, the Project is rated as partly successful, though at the lower end of the category.

## **B. Lessons Learned**

99. The following lessons have been learned from the Project.

- (i) Basic information on existing farming systems, agriculture potential, water and other natural resources, and market potential, are critical in designing interventions where the main economic benefits are to be derived from increased agricultural production.
- (ii) In particular, a careful assessment of water availability and water catchments is a minimum requirement for designing irrigation projects. In areas where hydrological data is deficient, alternative sources of information? including farmers and other local expertise? should be

consulted closely during feasibility studies. Where it is difficult to confirm water availability, feasibility studies should make conservative assumptions.

- (iii) The need for interventions to ensure effective protection of water catchment areas should be explicitly addressed, and appropriate measures adopted, when designing and implementing irrigation developments.
- (iv) A rapid transformation by smallholder farmers from low-input, extensive agriculture systems to technologically complex, high-input, unproven, and risk-prone cropping systems, is a risky assumption in planning an agriculture development project. In recommending technical improvements to farming systems, there is a need to explicitly address the economic incentives (including risk) faced by farmers in adopting "improved" farming systems.
- (v) Planners of publicly financed agriculture projects should assume that farmers generally make rational decisions. Where market failures need to be addressed, the nature of these failures should be explicitly stated to more appropriately focus the interventions.
- (vi) The availability of water and its potability need to be determined for water supply projects.
- (vii) The institutional arrangements for O&M and for handover of facilities to appropriate agencies need to be clearly defined before a Project is implemented.
- (viii) In designing future rural development projects, it may be advisable to focus on sets of closely interrelated sectors in order not to overload coordinating agencies beyond their capabilities.
- (ix) The midterm Project review now required by the Bank needs to be rigorous and open-minded, especially for high-risk projects. The review should specifically address whether the Project needs to be redesigned to reflect lessons learned during initial implementation.

### **C. Recommendations for the Government**

100. Recommendations for the consideration of the Government include the following:

- (i) First priority in allocating water use fees should be O&M of existing facilities. Amortization payments should only be made after adequate resources are allocated to sustaining irrigation facilities.<sup>1</sup>
- (ii) Given the recognized design deficiencies and reduced water flows in some of the irrigation areas, there is a case for reviewing and possibly renegotiating a reduced amortization schedule for the IAs. Consideration should be given to directly involving IAs in measures to improve watershed management to the extent practicable and to strengthening them. Of all community groups, they should have the strongest economic incentives to maintain the watershed areas.
- (iii) More clearly defined policies are needed to take action against farmers who do not pay dues even when they receive water, and on reallocation of scarce water resources to farmers who are willing to pay. The impact of the new collection policies adopted by the Malatgao Community Irrigation Project should be studied as a possible model for other IAs.
- (iv) Responsibility for ownership and O&M of Project facilities needs to be clarified as a matter of urgency. If LGUs have inadequate resources to utilize facilities and equipment, opportunities for disposing of remaining facilities and equipment should be examined before further deterioration.
- (v) There is need to reassess the role of government in supporting livestock development in Palawan and strategies that are most likely to benefit the poor. The experiences of the Second Project may be useful in making such a reassessment.
- (vi) Effective arrangements need to be made to deliver institutional credit to the rural poor in Palawan. Current Bank-supported arrangements elsewhere in the Philippines may serve as a model.
- (vii) Bailey bridges cannot support continuous heavy truck traffic; concrete bridgework is needed. The allocation criteria for O&M of gravel roads needs to be reconsidered.
- (viii) Plans for further expansion of ports should include a review of navigation and marine safety arrangements, an environmental impact assessment, a review of arrangements for handling ship wastes, and the formulation of contingency plans to deal with emergencies such as oil spills. Port

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<sup>1</sup> During the negotiations of the Southern Philippines Irrigation Sector Project, expected to be considered by the Board of Directors of the Bank on or around 18 December 1998, it was agreed that within six months after the effective date, the Government will complete a comprehensive review of the application of the irrigation service fee and submit to the Bank a written report which will include recommendations for improvement of existing irrigation service fee policies and procedures. No later than one year after submission of such written report (or such later date as the Government and the Bank may agree), Government, in consultation with the Bank, will implement appropriate and effective measures in order to promote 100 percent O&M cost recovery for each National Irrigation Administration-owned irrigation scheme.

development plans should be formulated within the framework of a provincial transport development strategy.

- (ix) Dysfunctional water supply schemes should be restored to operation where possible. Effective institutional arrangements including possibly privatizing and contracting out their O&M should be made.
- (x) The supply of antimalarial drugs should be continued in adequate quantities, and the proper use of these drugs should be monitored. Insecticide for mosquito net impregnation should continue to be provided. Drug resistance by mosquitoes should also be monitored.
- (xi) Issuance of land titles should be monitored along with other important Project benefits.
- (xii) Attention needs to be paid to the effects of in-migration on the environment of Palawan, and the policy on in-migration needs to be reconsidered. Other aspects of environmental protection, including protection of the vulnerable coastal areas and full-scale implementation of the SEP and its regular updating, should be considered.

**APPENDICES**

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