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PROJECT PERFORMANCE ASSESSMENT REPORT

REPUBLIC OF INDONESIA

CORAL REEF REHABILITATION AND MANAGEMENT PROJECT
PHASE I
(LOAN 43050-IND AND GEF GRANT 28373)

March 31, 2004

Sector and Thematic Evaluation Group
Operations Evaluation Department

Currency Equivalents

Currency Unit = Indonesian Rupiah

1998/1999	1 USD = Rp. 10.600	2002	1 USD = Rp. 7.800
1999/2000	1 USD = Rp. 7.500	2003	1 USD = Rp. 9.000
2000	1 USD = Rp. 5.000	2004	1 USD = Rp. 8.600
2001	1 USD = Rp. 7.800		

Abbreviations and Acronyms

ADB	Asian Development Bank
APL	Adaptable Program Loan
ANDAL	Environmental Impact Assessment (*Analisa Dampak Linkungan)*
AusAID	Australian Agency for International Development
BAPPENAS	National Development Planning Agency *(Badan Perencanaan Pembangunan Nasional)*
CAS	Country Assistance Strategy
CBM	Community-Based Management
COREMAP	Coral Reef Management Program
CRMP	Coral Reef Management Plan
DKP	Department of Marine Affairs and Fisheries *(Department Kelautan dan Perikanan*
ERR	economic rate of return
GEF	Global Environment Facility
GOI	Government of Indonesia
IBRD	International Bank for Reconstruction and Development
ICR	Implementation Completion Report
LIPI	Indonesian Institute of Sciences *(Lembaga Ilmu Ilmu Pengetahuan Indonesia)*
MCS	monitoring, control and surveillance
NGO	nongovernmental organization
OED	Operations Evaluation Department
PAD	Project Appraisal Document
PMO	Project Management Office
Pokja	Working Group (*Kelompok Kerja)*
PPAR	Project Performance Assessment Report

Fiscal Year

April 1 – March 31

Director-General, Operations Evaluation	:	Mr. Gregory K. Ingram
Director, Operations Evaluation Department	:	Mr. Ajay Chhibber
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OED Mission: Enhancing development effectiveness through excellence and independence in evaluation.

About this Report

The Operations Evaluation Department assesses the programs and activities of the World Bank for two purposes: first, to ensure the integrity of the Bank's self-evaluation process and to verify that the Bank's work is producing the expected results, and second, to help develop improved directions, policies, and procedures through the dissemination of lessons drawn from experience. As part of this work, OED annually assesses about 25 percent of the Bank's lending operations. In selecting operations for assessment, preference is given to those that are innovative, large, or complex; those that are relevant to upcoming studies or country evaluations; those for which Executive Directors or Bank management have requested assessments; and those that are likely to generate important lessons. The projects, topics, and analytical approaches selected for assessment support larger evaluation studies.

A Project Performance Assessment Report (PPAR) is based on a review of the Implementation Completion Report (a self-evaluation by the responsible Bank department) and fieldwork conducted by OED. To prepare PPARs, OED staff examine project files and other documents, interview operational staff, and in most cases visit the borrowing country for onsite discussions with project staff and beneficiaries. The PPAR thereby seeks to validate and augment the information provided in the ICR, as well as examine issues of special interest to broader OED studies.

Each PPAR is subject to a peer review process and OED management approval. Once cleared internally, the PPAR is reviewed by the responsible Bank department and amended as necessary. The completed PPAR is then sent to the borrower for review; the borrowers' comments are attached to the document that is sent to the Bank's Board of Executive Directors. After an assessment report has been sent to the Board, it is disclosed to the public.

About the OED Rating System

The time-tested evaluation methods used by OED are suited to the broad range of the World Bank's work. The methods offer both rigor and a necessary level of flexibility to adapt to lending instrument, project design, or sectoral approach. OED evaluators all apply the same basic method to arrive at their project ratings. Following is the definition and rating scale used for each evaluation criterion (more information is available on the OED website: http://worldbank.org/oed/eta-mainpage.html).

Relevance of Objectives: The extent to which the project's objectives are consistent with the country's current development priorities and with current Bank country and sectoral assistance strategies and corporate goals (expressed in Poverty Reduction Strategy Papers, Country Assistance Strategies, Sector Strategy Papers, Operational Policies). *Possible ratings:* High, Substantial, Modest, Negligible.

Efficacy: The extent to which the project's objectives were achieved, or expected to be achieved, taking into account their relative importance. *Possible ratings:* High, Substantial, Modest, Negligible.

Efficiency: The extent to which the project achieved, or is expected to achieve, a return higher than the opportunity cost of capital and benefits at least cost compared to alternatives. *Possible ratings:* High, Substantial, Modest, Negligible. This rating is not generally applied to adjustment operations.

Sustainability: The resilience to risk of net benefits flows over time. *Possible ratings:* Highly Likely, Likely, Unlikely, Highly Unlikely, Not Evaluable.

Institutional Development Impact: The extent to which a project improves the ability of a country or region to make more efficient, equitable and sustainable use of its human, financial, and natural resources through: (a) better definition, stability, transparency, enforceability, and predictability of institutional arrangements and/or (b) better alignment of the mission and capacity of an organization with its mandate, which derives from these institutional arrangements. Institutional Development Impact includes both intended and unintended effects of a project. *Possible ratings:* High, Substantial, Modest, Negligible.

Outcome: The extent to which the project's major relevant objectives were achieved, or are expected to be achieved, efficiently. *Possible ratings:* Highly Satisfactory, Satisfactory, Moderately Satisfactory, Moderately Unsatisfactory, Unsatisfactory, Highly Unsatisfactory.

Bank Performance: The extent to which services provided by the Bank ensured quality at entry and supported implementation through appropriate supervision (including ensuring adequate transition arrangements for regular operation of the project). *Possible ratings:* Highly Satisfactory, Satisfactory, Unsatisfactory, Highly Unsatisfactory.

Borrower Performance: The extent to which the borrower assumed ownership and responsibility to ensure quality of preparation and implementation, and complied with covenants and agreements, towards the achievement of development objectives and sustainability. Possible ratings: Highly Satisfactory, Satisfactory, Unsatisfactory, Highly Unsatisfactory.

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This report was prepared by Andres Liebenthal, who assessed the project in September 2003. The report was edited by William Hurlbut, and Soon-Won Pak provided administrative support.

Preface

This is the Project Performance Assessment Report (PPAR) of the Coral Reef Rehabilitation and Management (COREMAP) Project, which was supported by IBRD Loan No. 43050 in the amount of $6.9 million and Global Environment Facility (GEF) Trust Fund Grant No. 28373 in the amount of SDR 3.1 million (US$4.1 million equivalent). The project was approved on March 31, 1998, and is expected to close on July 31, 2004, following the third extension from its original closing date of October 31, 2001. The project supported the first phase of the Government of Indonesia's Coral Reef Rehabilitation Program, which was also supported by separate projects of the Asian Development Bank (ADB) and the Australian Agency for International Development (AusAID).

This report is based on the draft COREMAP Phase I Final Report, prepared by the borrower, the Project Appraisal Document (Report No. 17333-IND), loan documents, project status reports, project financed studies, and discussions with Bank staff, borrower staff, project consultants, and representatives of civil society organizations and local communities involved in the project. In September 2003, an Operations Evaluation Department (OED) mission visited the project sites in Indonesia in parallel with the final supervision and implementation completion report preparation mission undertaken by the East Asia Region. The collaboration and warm hospitality of Bank operational staff, government officials, civil society and community representatives who assisted the mission are gratefully acknowledged.

Following standard OED procedures, the draft PPAR was sent to the borrower for comments, but none were received. In accordance with the Bank's disclosure policy, the final report will be available to the public following submission to the World Bank's Board of Executive Directors.

Principal Ratings

	*ICR**	*ICR Review***	*PPAR*
Outcome	n.a.	n.a.	Moderately Satisfactory
Sustainability	n.a.	n.a.	Not Evaluable
Institutional Development Impact	n.a.	n.a.	Substantial
Bank Performance	n.a.	n.a.	Satisfactory
Borrower Performance	n.a.	n.a.	Satisfactory

* The Implementation Completion Report for COREMAP-I, which had been scheduled for completion by late 2003, has been postponed in line with the extended closing date of the project.

** The Implementation Completion Report (ICR) is a self-evaluation by the responsible operational division of the Bank. The ICR Review is an intermediate OED product that seeks to independently verify the findings of the ICR.

Key Staff Responsible

Project	*Task Manager/Leader*	*Division Chief/ Sector Director*	*Country Director*
Appraisal	Sofia Bettencourt	Geoffrey Fox	Dennis de Tray
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Completion	Thomas Walton	Mark Wilson	Andrew Steer

Summary

The Government of Indonesia launched the Coral Reef Management Program (COREMAP) in 1998 as a 15-year program with the objective "to protect, rehabilitate and achieve sustainable use of coral reefs and associated ecosystems in Indonesia which will, in turn, enhance the welfare of coastal communities." The program was divided in three phases: (i) a 3-year "Initiation" Phase designed to test and develop viable community-based management (CBM) systems in selected pilot areas; (ii) a 6-year "Acceleration" Phase to build upon and expand CBM systems to other sites; and (iii) a 6-year "Institutionalization" Phase for ensuring the sustainability of program activities. In support, the Bank/GEF COREMAP project has been designed as an adaptable program loan (APL) in three phases that parallel those of the GOI's program. The objective of Phase I of the COREMAP project (COREMAP-I) was "to establish a viable framework for a national coral reef management system in Indonesia."

The outcome of the project is rated moderately satisfactory. While the project's relevance is substantial and its efficiency is high, it was only modestly effective in establishing a viable framework for national coral reef management in Indonesia. The key elements of a supportive legal framework have been drafted but not officially approved and enacted. An institutional capacity for coral reef management has been established at the Indonesian Institute of Sciences (LIPI), but its transfer to the Department of Marine Affairs and Fisheries (DKP), and its extension to the district and community levels is still under way and is fraught with risk. The CBM approach was implemented in two pilot sites, but the design needs to be substantially revised to ensure its sustainability for the long term and demonstrate its viability.

The institutional development impact of the project is rated substantial. The project created the institutional framework needed to implement the program, including the national PMO, district working groups, and village community groups. While there are still areas for improvement, and some of the capacity will be lost in the transition from LIPI to DKP, and from Phase I to Phase II, this architecture is consistent with the decentralization strategy of the GOI, replicable as COREMAP expands, and adaptable to local customs and circumstances.

The sustainability of the project is not evaluable at this time. While the economic justification for COREMAP is robust, because of the high global benefits of protecting Indonesia's coral reef diversity, insufficient information is available to judge the resilience to risk of the other major factors that need to be considered.

The Bank's performance is rated satisfactory. The preparation of the project was underpinned by extensive analysis, and GOI ownership was strong. The design of the project was unusually complex, but responded to the needs of the strategy and the lack of a robust institutional counterpart. Supervision focused on development impact and responded flexibly to drastic changes in institutional and country conditions.

The borrower's performance is rated satisfactory. The GOI committed in the mid-1990s to a community-based coral reef management strategy, and supported it steadfastly while slowly creating the policy and institutional framework needed to implement it.

Nevertheless, progress in the approval and enactment of the policy, strategy, and legal framework has been slow, with attendant risks for the sustainability of the program, and donor coordination was inadequate.

Four lessons emerge from the experience of the project:

- *Importance of Adaptability and Caution for Pilot Projects:* As the pilot for a three-phase APL, the subject project was designed with ample allowances for flexibility and learning. Even so, the project required three extensions from its original completion date, and several key requirements for the long-term success of COREMAP remain incomplete and untested. In addition, the sustainability of the CBM-centered strategy has not been demonstrated. This points to the need for adaptability and caution in regard to the expansion of the COREMAP program in Phase II, until the viability of the approach has been established.

- *Need to Integrate Project Activities with Impact Data Gathering and Monitoring:* A major flaw in project implementation was the lack of coordination between project activities and the baseline surveys and monitoring provisions. Unless this is corrected, it will not be possible to determine project impact and validate the rationale for the CBM strategy, even in the long term. This unsatisfactory state of affairs could have been avoided with the assignment of managers with geographical responsibilities to ensure that the different components are effectively integrated at all locations.

- *Need to Assign Full-Time Staff for Project Implementation:* The PMO's extensive reliance on part-time staff weakened the control and direction of the technical aspects of the project, and encouraged a situation where most of the work was done by consultants and contractors. This contributed to delays in project implementation, inadequate technical supervision of and integration between project components, and limited transfer of knowledge from consultants to national staff. Many of these problems could have been avoided with the appointment of full-time staff for project implementation.

- *Need to Provide Technical Guidance to Community-based Decisions:* While community empowerment is central to CBM, it can lead to poor decisions, as indicated by the findings about the poor biodiversity quality in one of the sanctuaries, the failure of seaweed culture projects, and investments in unviable electrification schemes. This points to the need to ensure that community-based decisions are informed by sound technical guidance.

Gregory K. Ingram
Director-General
Operations Evaluation

Background

1. Indonesia is the world's largest archipelago, with more than 17,000 islands and an 81,000-kilometer coastline rich in coral reefs, seagrasses, and mangroves. Its marine environment is one of the richest of the world, with about 2,500 species of mollusks, 2,000 species of crustaceans, 6 species of sea turtles, 30 of marine mammals, and more than 2,000 species of fish. It has approximately 42,000 square kilometers of coral reefs, or 16 percent of the world's total. With over 70 genera and 450 species recorded, Indonesia lies at the center of the world's coral reef diversity.

2. Coral reefs are a major productive and aesthetic asset, playing a key role in fisheries, marine tourism, and coastal protection. Healthy reefs are an important source of food and economic opportunities for some 67,500 coastal villages in Indonesia. Coral reefs also play an important role in marine-based tourism, attracting divers and providing white sand for beaches. In addition, fringing coral reefs dissipate wave energy, thereby protecting coastal lands from storms and wave erosion.

3. Despite their importance, Indonesia's coral reefs are under serious threat from poison and blast fishing, overfishing, sedimentation, and pollution. In a 1994 survey, the Indonesian Institute of Sciences (LIPI) found 70 percent of the sites to be in poor to fair condition. The only known study of coral reef degradation over time, in Pulau Seribu off Jakarta Bay, shows a steady decline of 3-6 percent a year in live coral reef cover since 1969. Urgent management interventions were therefore needed to protect Indonesia's reefs.

4. The key issues for coral reef management were identified as: (i) poor management of existing threats; (ii) unclear institutional mandates and inadequate institutional capacity; (iii) a weak policy and legal framework; and (iv) insufficient information. The major threats — overfishing and destructive practices (blast and poison fishing) — are exacerbated by a high demand for marine products, opportunities for substantial private gains, weak enforcement of existing laws, and an open-access regime that discourages community action. Responsibility for managing Indonesia's marine areas was dispersed through numerous government agencies. Policies and regulations followed sectoral priorities, and failed to properly address coastal issues. Legal loopholes such a prohibiting cyanide (poison) fishing but allowing cyanide use to tranquilize fish made it extremely difficult to enforce existing laws. Finally, information required for marine management was fragmented and difficult to access.

SECTOR STRATEGY

5. The community-based management (CBM) approach was chosen based on the realization that government agencies cannot effectively manage the extensive coral reef areas without the close involvement of coastal villages. The CBM design is based on the following lessons gained from similar programs in the region: (i) habitat management in the form of reef sanctuaries (no-take zones) is generally more effective than management aimed at specific stocks; (ii) reef management has been most successful where communities have been organized and empowered to manage local reef resources; (iii) reef management systems need to be flexible and adaptable, building upon local

ecological knowledge and traditional management systems; (iv) external threats need to be addressed through effective enforcement; (v) reef management has been most successful when local stakeholders derive quick and direct economic benefits from reef management; and (vi) local support should be established first for a limited set of clear and achievable goals of direct interest to local people.

6. It was also realized that the CBM approach could not be successful without a supporting framework to contain external threats. This framework needed to include: (i) an effective national strategy for coral reef management; (ii) secure user rights for coastal communities; (iii) effective enforcement to protect communities against external threats; (iv) increased awareness among decision makers of the threats facing the reefs; and (v) strengthened management capacity.

PROJECT OBJECTIVES AND COMPONENTS

7. The Government of Indonesia (GOI) launched the Coral Reef Management Program (COREMAP) in 1998 as a 15-year program with the objective "to protect, rehabilitate and achieve sustainable use of coral reefs and associated ecosystems in Indonesia which will, in turn, enhance the welfare of coastal communities." The program was divided in three phases: (i) a 3-year "Initiation" Phase designed to test and develop viable CBM systems in selected pilot areas; (ii) a 6-year "Acceleration" Phase to build upon and expand CBM systems to other sites; and (iii) a 6-year "Institutionalization" Phase for ensuring institutional (administrative, economic, and financial) sustainability of program activities. In support, the Bank/GEF COREMAP project has been designed as an adaptable program loan (APL) in three phases that parallel those of the GOI's program. COREMAP has also been funded by loans from the ADB and grants from AusAID.

8. The development objective of Phase I of the COREMAP program was "to establish a viable framework for a national coral reef management system in Indonesia." In support, the specific objectives of the Bank/GEF COREMAP I project were to:

(a) Strengthen the national policy, strategic planning and legal framework for coral reef management;

(b) Strengthen the institutional capacity for coral reef management sufficiently to enable expansion of the COREMAP program;

(c) Design and test pilot CBM in two sites (Taka Bone Rate National Park in South Sulawesi and Lease Islands in Maluku);

(d) Test and evaluate models of coral reef monitoring, control and surveillance (MCS) systems at the national level and in target provinces; and

(e) Design and launch national and local public awareness campaigns for coral reef management.

9. The Bank/GEF project was coordinated with parallel projects by other donors:[1]

(a) A national coral reef information, research, and monitoring system and Coral Reef Information and Training Centers (funded by ADB);

(b) National capacity building and training (funded by AusAID);

(c) Pilot CBM and enforcement in Senayang Islands, Riau (funded by ADB), and Kupang Bay, East Nusa Tenggara (funded by AusAID); and

(d) Initial CBM activities in six provinces (funded by GOI).

10. These objectives did not change. However, political turmoil and poor security conditions led to the termination of initial CBM activities in Maluku and Kupang, and their substitution by new pilot CBM sites in the Padaido Islands in Papua (funded by the Bank), and Maumere Bay in East Nusa Tenggara (funded by AusAid).

Assessment

OUTCOME

11. The outcome of the project is moderately satisfactory. While the project's relevance is substantial and its efficiency is high, it was only modestly effective in establishing a viable framework for national coral reef management in Indonesia. The key elements of a supportive legal framework have been drafted, but not officially approved and enacted. An institutional capacity for coral reef management has been established with LIPI, but its transfer to the Department of Marine Affairs and Fisheries (DKP), and its extension to the district and community levels is still under way and is fraught with risk. The CBM approach and the MCS component have been implemented in two pilot sites, but the design needs to be substantially revised to ensure their sustainability for the long term and document its benefits.

Relevance

12. The relevance of the project is substantial. Its objectives are more consistent with past CAS objectives, which gave higher priority to sustainable resource management, than those of the current CAS, which focus on improving the climate for investment and making service delivery responsive to the needs of the poor. Nevertheless, the project's focus on policy and legal reform, strengthened enforcement, creating demand for good governance at the local level, and close collaboration with other donors and NGOs is supportive of the current CAS. In addition, the project is also consistent with the three broad objectives of the Bank's Environment Strategy: (i) improving people's quality of life, (ii) improving the prospects for and quality of growth; and (iii) protecting the quality

1. These activities are mentioned for context only and are not evaluated in the report.

of the regional and global environmental commons. Finally, the project is consistent with the GEF's Operational Strategy, in particular the Operational Program on Marine, Coastal and Freshwater Ecosystems.[2]

Efficacy

13. The efficacy of the project is modest. Following a slow start, remarkable progress was achieved under difficult circumstances. A national strategy, and the key elements of the supportive legal framework, have been drafted and discussed, but they are yet to be officially approved and enacted. An institutional capacity for implementing the COREMAP program has been established with LIPI, but its transfer to DKP, who will be responsible for Phase II, is still underway, and the transition is fraught with risk. A lot has been learned from the implementation of the CBM approach in the two pilot sites, but the design needs to be revised to ensure its sustainability in the long term and replicability in other sites. The MCS component was successfully implemented in the two pilot sites, but much remains to be done to make it financially sustainable. The following sections review the efficacy of the project to achieve specific project objectives.

Objective (a): Strengthen the Policy, Strategy, and Legal Framework for Coral Reef Management

14. The project supported the objective of strengthening the national policy and strategy framework by drafting a National Policy and Strategy for Coral Reef Management in Indonesia, and sponsoring a series of national and provincial consultative workshops for its preparation. The draft addresses key issues and highlights the importance of community-based management. The DKP is reviewing the document for eventual adoption as national policy. At this point, it is still awaiting official endorsement in the form of a ministerial letter recommending the implementation of the strategy to relevant agencies.[3]

15. The strengthening of the legal framework for coral reef management was pursued through the preparation of 7 drafts of legislation and 12 legal papers. At the national level, the most important were inputs provided to DKP for the drafting of the revised Fisheries Act and the Coastal Zone Management and Small Islands Act, both of which are being discussed with legal experts from relevant agencies and the State Secretariat (*Sekretariat Negara)* in preparation of their submission to the National Legislature (*Dewan Perwakilan Rakyat*). A major focus was the strengthening of provisions to curb illegal and destructive fishing practices (such as blasting and poisoning), and the clarification and coordination (cross-authorization) of enforcement jurisdictions in coastal areas.

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2. Taking the diversity of country, sector and global (GEF) strategies into account, the relevance of the specific objectives can be rated as follows: (a) strengthen the national policy, strategic planning and legal framework for coral reef management – substantial; (b) strengthen the institutional capacity for coral reef management – substantial; (c) design and pilot CBM – high; (d) test and evaluate models of MCS – high; and (e) design and launch public awareness campaigns for coral reef management – substantial.

3. This is one of the output indicators for effectiveness of Phase II.

16. At the district level, the proposed legal reforms focused on the coordination of the enforcement of fisheries and coastal zone regulations and on securing user rights for coastal communities. These reforms were pursued in both pilot areas.

17. In South Sulawesi, this effort concentrated on the preparation of a district law for the coordination of monitoring, control, and surveillance (MCS) activities for the Taka Bone Rate National Park and surrounding areas in Selayar District. Extensive consultations were held with all key stakeholders, including local representatives of the Fisheries and Marine Affairs Agency, the National Parks Authority, Police, Navy, district legislature, NGOs, village and subdistrict heads, and representatives of local communities. The end product, a draft district law on "The Utilization of the Conservation Area in Taka Bone Rate National Park" has been submitted to the Selayar District Legislature for approval.

18. In Papua, the legal reform effort aimed at the institutionalization of local rules and customs for marine resource management in the traditional villages of Padaido Islands and East Biak, in Biak District. After three and a half years of extensive consultations with representatives of the local communities and churches, village and sub-district heads, local NGOs, members of the Biak Customary Council and district legislators, a draft District Law has been prepared and submitted to the Biak District Legislature for approval.

19. Overall, the project made substantial progress in conceptualizing, drafting, disseminating, and gaining acceptance for key elements of the legal framework needed to support the implementation of a CBM-centered strategy for coral reef management. The fact that the entire set of draft legislation has been produced in a participatory manner and proceeded to the point of being submitted to the legislative bodies is a major accomplishment.[4] On the other hand, as long as the needed legislation has not been enacted, there is no assurance that the key language will be incorporated in the national laws and the complementary local laws will be passed. The project's efficacy in pursuing this objective was modest.

Objective (b): Strengthen Institutional Capacity for Coral Reef Management

20. The specific objective for Phase I was to develop sufficient institutional capacity for coral reef management to enable the expansion of the program in Phase II at the national and local levels, and its eventual mainstreaming into line agencies. The approach taken was to establish a national Program Management Office (PMO) at the Indonesian National Institute of Sciences (LIPI) in Jakarta, and provincial and district-level working groups (*Pokjas*) made up of relevant agency representatives coordinated by the provincial and district planning bureaus (BAPPEDAs), supplemented by staff from local NGOs and universities. In 1999, a decision was made to transfer responsibility for COREMAP Phase II to the newly created DKP, but leave LIPI in charge of Phase I until its conclusion.

4. The output indicator is that the draft legislation be completed and submitted to the National Legislature.

21. At the national level, by the end of Phase I the PMO included a full-time Director, part-time Assistant Directors to manage the technical teams for monitoring, control, and surveillance (MCS), public communications, the Coral Reef Information and Training Centers (CRTICs), and CBM, and part-time staff seconded from LIPI and DKP for the technical teams. The extensive reliance on part-time staff significantly reduced the ability of managers and staff to maintain control and direction over the technical aspects of the project, and encouraged a situation where most of the work was done by consultants and contractors with little integration between consultants and PMO technical staff. This resulted in significant delays in project implementation, inadequate integration between different project components, and limited transfer of knowledge from consultants to national staff.

22. At the local level, COREMAP working groups (*Pokjas*) had been established in the district governments with staff from relevant agencies and local NGOs involved in the project. By the time of the mission, the two pilot districts of Selayar (for Taka Bone Rate) and Biak (for Padaido) had active *Pokjas* with a track record of regular meetings, effective inter-agency coordination, project management, progress reports, support from the District Chiefs (*bupatis*) and positive engagement with the District Legislatures.

23. Another issue relates to the fact that the PMO was organized along thematic lines, with assistant directors and technical teams responsible for MCS, CRTICs, CBM, and public communications for the entire COREMAP program, without geographical responsibilities. This contributed to inadequate integration of the program components, with the result that, as found by the mission, there was no coordination between CBM and MCS activities at the two pilot sites with the socioeconomic and reef health surveys conducted by the CRTICs at the same locations. This result could have been avoided with the assignment of managers with geographical responsibilities who could have ensured that the different components are effectively integrated at all locations.[5]

24. Overall, while Phase I has shown the feasibility of its organizational model for project implementation, the sustainability of this approach as a model for capacity building remains to be demonstrated, given the high turnover rate of participating agency staff, at the national and district levels, and the fact that most of these efforts were supported by consultants and financed by project funds. The mainstreaming of institutional capacity for coral reef management in relevant line agencies at the national and district levels remains a major issue to be addressed in Phase II. On this basis, the project's efficacy with this objective is rated modest.

5. The assignment of a "provincial coordinator" was attempted in South Sulawesi, but his effectiveness was hampered by the GOI's institutional framework at the time, which gave the provincial government little authority to coordinate across sectoral ministries. Following the recent decentralization of the GOI, the authority of provincial and district governments to coordinate sectoral activities in their jurisdictions is much greater.

Objective (c): Design and Implement Pilot Community-Based Management in Two Sites

25. *The CBM Process:* The design and implementation of the CBM approach in two pilot sites was the central objective of the project. This involved a complex series of steps including the development of CBM guidelines, the contracting of a local NGO to implement the approach at each site, and for each participating village: (i) the participatory formation of community groups and selection of community-based motivators; (ii) the participatory development of a coral resources management plan (CRMP) and proposals for the utilization of village grants (for example, for village infrastructure) and establishment of seed funds; (iii) the approval, implementation, and management of the CRMPs, and village proposals for infrastructure and seed funds; and (iv) the establishment of baselines and monitoring arrangements for coral reefs and socioeconomic development. Participating villages would be eligible for block grants (up to a total of Rp. 150 million per village), with 30 percent payable upon approval of the CRMP, 30 percent upon approval of the village grant utilization proposal, and the remainder upon implementation of the CRMP.

26. By the time of the assessment mission, in September 2003, the CBM approach had been nearly fully implemented at the five villages in Taka Bone Rate but, due to a delayed start, only partly implemented at six villages in Padaido. Each participating village had elected three motivators, formed three community groups (for reef conservation, production activities, and women), formulated a CRMP with an identified sanctuary (no-take zone) and community-based "reef watchers" to monitor fishing activities in village waters and report on violations of the sanctuary or illegal activities (blasting and poisoning). In Taka Bone Rate, the villages had also largely implemented their block grant proposals. In Padaido, they were still at the preparation and review stage and the block grants had not yet been disbursed.

27. *Preliminary Results:* Overall, while the project has largely succeeded in designing the CBM approach and implementing it in the two pilot sites, its efficacy is modest, as it is still too early to establish if the piloted design is sustainable and will yield the expected benefits in terms of village development and coral reef protection. In Taka Bone Rate, 12 of the block grants were invested in village improvements such as community meeting places, clean water reservoirs, and diesel-based electrification schemes. While these choices reflect clear village priorities, the electrification schemes have not been designed to adequate technical standards, and are not being managed in a financially sustainable way.[6] They pose shock and fire hazards, and are certain to fail. In hindsight, it is evident that such investments should not have passed the technical review process of the NGOs and PMOs, and that alternative approaches, including solar photovoltaic home systems, would have been more appropriate.[7]

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6. E.g., tariffs do not cover operating costs, and there is no provision for equipment maintenance, repair and replacement.

7. Some lessons may be learned from the experience with similar systems in remote Pacific island countries. See: Solar Energy: Lessons from the Pacific Island Experience, by A. Liebenthal, S. Mathur and H. Wade, World Bank Technical Paper 244 – Energy Series, Washington, 1994.

28. The experience with the use of seed funds for the establishment of community revolving credit schemes has been much more favorable. The funds have been used by groups and individuals for a variety of purposes, including the purchase of nets and other fishing tools, establishment of small shops, seaweed culture, and fish storage and transport. Simple but sound record keeping systems were established in every village, with the individual loans and repayments displayed in village community centers to provide transparency and accountability. In most of the villages, a portion of the interest income has been set aside as a contribution to support coral reef conservation and monitoring activities (that is, pay for the reef-watchers). The repayment rate has reached 63 percent, with most of the shortfall due to the failure of three seaweed culture projects[8] (in one village) and lack of realization that that the funds were to be repaid (in one village).

29. On the conservation side, the mission identified several critical issues that need to be addressed in the follow-on Phase II project:

(a) *Lack of Integration Between Project Activities and Baseline Data:* The mission found that there was no correlation between the sanctuaries identified in the village CRMPs and the stations (line intercept transects) used for the reef health status baseline surveys. Without coordination between baseline observation stations, reef sanctuary locations, and control sites, it will not be possible to determine the impact of the COREMAP, even in the long term.

(b) *Incomplete Program Baselines:* A review of the baseline socioeconomic and biophysical surveys[9] indicates that they did not include information about the fishing pressure being exerted in the waters surrounding the pilot sites,[10] and about the quality of the coral reefs as a whole, rather than just at specific stations.[11] Without such baseline data, the critical mass of scientific information needed to establish whether COREMAP will be achieving its expected benefits over time does not exist.

(c) *Inadequate Quality Control of Sanctuaries:* One of three sanctuaries inspected by the mission covered an area where the coral had already been destroyed. That is, it had no biodiversity value.[12] This again (see para. 27) points to weaknesses in the

8. Due to poor site selection and unsuitable cultivation techniques.

9. The baseline socioeconomic and biophysical surveys were undertaken under a complementary project funded by the ADB and managed by the COREMAP PMO through the establishment of district and national-level Coral Reef Information and Training Centers, as noted in para 9.

10. E.g., such information as fish stocks, number of active fishermen; number, size and type of fishing vessels; type size and number of fishing gear used; fish species sought and caught, and market prices for different types of fish.

11. E.g., such information as species diversity, species distribution, identification of habitat types, and overall quality of the reef. There is also the issue that most of the line intercept transect stations were located at the reef edge, which tends to be the area richest in biodiversity, but do not constitute a representative sample of the coral reef as a whole.

12. In principle, a degraded site is not necessarily a bad choice for a sanctuary, as it can serve as a demonstration site for how quickly corals and fisheries recover following their closure. But given the absence of baseline data on the sanctuary such a rationale is not supported by the evidence. Rather, in the

technical guidance provided by the local NGO, and in the technical review process of the PMOs.

Overall efficacy of this objective is rated as modest.

Objective (d): Design and Implement Pilot Coral Reef Monitoring, Control, and Surveillance Systems

30. This objective was pursued by designing and piloting a MCS model that involved: (i) the organization and empowerment of community-based "reef watchers" to patrol the reefs and act as the eyes and ears of the system, and (ii) back up by law enforcement agencies to capture and prosecute the violators. The implementation of this approach required coordination with the CBM component, which underpinned the community's support of the reef-watcher program, and the relevant enforcement agencies, including DKP, the coastal police, the navy,[13] and the park guards (in the Taka Bone Rate National Park).[14] For the two pilot sites, these units were provided with equipment, including speedboats, transport vessels, radar, radios, Global Positioning Systems (GPS), and cameras, as well as operational manuals, guidelines, and training. At the national level, the MCS component was managed from 2000 by the DKP's Directorate General of Surveillance.

31. By the time of the mission, this model appeared to be functioning reasonably well at the local level, and its efficacy is rated substantial. Of particular note were the successful arrests, prosecution, and jailing of illegal fishers at both Taka Bone Rate and Padaido, and a reported reduction by MCS of illegal bombing and cyanide fishing. The main issue relates to the financial sustainability of this approach, since the district governments only have the budget to keep MCS activities going at a much reduced scale after the project is completed. There is also a problem with the GOI budget process, which results in no operation and maintenance funds being available at the start of the fiscal year, thus causing the MCS operations to cease for several months every year and reducing the credibility and effectiveness of the program. The efficacy of this objective is rated as substantial.

Obejctive (e): Design and Launch a Public Awareness Campaign for Coral Reef Management

32. The project financed a public awareness campaign to promote the need for sustainable coral reef management and encourage the adoption of positive behavior. Its efficacy was substantial. The campaign involved numerous activities, including two live national television shows, pamphlets, mobile displays at six national exhibitions, production of popular songs, radio and TV spots, teacher kits and training, on the job

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absence of technical guidance, it is quite possible that the community simply chose the site so they could benefit from COREMAP funds with minimum loss of fishing revenue.

13. In general, the coastal police have jurisdiction within 4 nautical miles (nm) of the coast, the DKP between 4 and 12 nm, and the navy beyond 12 nm.

14. The park guards have jurisdiction within the boundaries of the (Taka Bone Rate) national park.

training and thesis support for university students, and contests and games for elementary school students. The quality of the campaign was recognized by its receipt of a Golden Quill Award from the International Association of Business Communicators in 2002, and its effectiveness was documented by before and after surveys in target areas. The mission was particularly impressed by the high level of activities that continued following the completion of the consultant contract (in November 2002), a good indication of the sustainability of the campaign. OED rates efficacy for this objective high.

Efficiency

33. The efficiency of the project is high. Its appraisal was underpinned with an unusually thorough and detailed economic analysis of coral reef degradation in Indonesia,[15] which was updated for the (draft) appraisal of the Phase II project (see Annex B). The analysis considered the potential net benefits of healthy coral reefs in the form of sustainable fisheries, coastal protection (erosion control), tourism and recreation, and estimates the extent to which these benefits will be affected by ongoing damage trends, including poison fishing, blast fishing, coral mining, sediments (from logging and mining activities), and overfishing. The analysis also considered the sensitivity of these benefit estimates to assumptions about fish yields over time, which will depend on the effective enforcement of CRMPs. On this basis, the region (in its draft ICR) estimates that the economic rate of return (ERR) for the Taka Bone Rate site is 19 percent, with a 'high' estimate of 49 percent and a 'low' one of 1 percent. The ERR for the Padaido site is 12 percent, with a 'high' of 23 percent and a 'low' of 1 percent. The ERR for the Taka Bone Rate site is comparable to that obtained at appraisal, of 17 percent in the 'standard' scenario.[16]

34. In the view of the assessment mission, the ERR methodology is exemplary and represents a model for other biodiversity projects, for which economic analyses have been sparse, mainly due to the difficulty of obtaining adequate data. Faced with this same difficulty, the project team searched the literature for applicable data and identified necessary and defensible assumptions. While some of the data and assumptions can be questioned, their strengths and weaknesses are transparently discussed in the project's appraisal document, and partially taken into account for the sensitivity analyses. Finally, the fact that the ERR is based on 'local' benefits, and does not include the 'global' benefits of coral biodiversity protection, for which some estimates are higher by an order of magnitude,[17] suggests that the ERRs are conservative.

35. It is, nevertheless, unfortunate that the baseline surveys and monitoring arrangements for the project have not contributed the information needed to update and

15. See Cesar, H. S. J., (1996): *Economic Analysis of Indonesian Coral Reefs.* Working Paper Series "Work in Progress", World Bank, Washington DC.

16. The appraisal has no estimate for the Padaido site, which was added later.

17. See Ruitenbeek, J. (1999): *Blue Pricing of Undersea Treasures – Needs and Opportunities for Environmental Economics Research on Coral Reef Management in South East Asia.* Paper presented to the 12th Biannual Workshop of the Environmental Economics Program for South East Asia, Singap[ore, 11-14 May, IDRC, Singapore.

validate the economic rationale for the COREMAP program. This points again to the importance of establishing baselines of and monitoring information about the fishing pressure being exerted in the waters surrounding the pilot sites, and about the quality of the coral reefs as a whole, as discussed in para. 28.

INSTITUTIONAL DEVELOPMENT IMPACT

36. The institutional development impact of the project was substantial. The project supported the GOI's decision to designate the newly created DKP as the agency responsible for the equitable and sustainable management of coral reef resources, where there had been none before. The project also created the entire institutional framework needed to implement the program, including the national PMO, the district *pokjas*, and the village community groups. While there are still areas for improvement, and there is a risk that some of the capacity will be lost in the transition from LIPI to DKP, and from Phase I to Phase II, this architecture is consistent with the institutional decentralization strategy of the GOI, replicable as COREMAP expands, and adaptable to local customs and circumstances. It constitutes a major achievement.

37. The full impact of the strengthened legal and policy framework for coral reef management is not evaluable at this time, since it has not yet been officially enacted, and the baseline information is inadequate. For the MCS component, indications are that enforcement pressure has increased. In 2003, the MCS program has been successful in apprehending and prosecuting 10 violators in Taka Bone Rate and 9 in Padaido. Other apprehensions have been made, but turned over to village authorities in the belief that the application of customary (*adat)* sanctions would be more effective than a jail term. For the CBM component, there is some evidence that the participatory CRMPs, village grant proposals and implementation, and revolving fund credit schemes have strengthened community-based decision-making processes, and involved them in lobbying for community user rights with the district legislature.

38. The impact of the project is also reflected in the abandonment of plans for an oil refinery on Selayar, about 50 miles from Taka Bone Rate National Park. When a proposal to establish a 150,000-barrel-per-day refinery was announced in 1999, the Chairman of LIPI, on behalf of the COREMAP program, wrote to the President of Indonesia to inform him of the legal requirement for a prior environmental assessment (ANDAL), and of the need to involve COREMAP as a stakeholder. The COREMAP team invited the Bank to comment on the ANDAL, which it found to be seriously deficient. The project sponsors were then reported to be planning a new ANDAL, to international standards. A year later, the proposed site for the refinery was moved to another part of Sulawesi.

SUSTAINABILITY

39. The sustainability of the project is not evaluable at this time. Overall, while the economic justification for COREMAP is robust, not only because of the local benefits but also because of the high global benefits of protecting Indonesia's coral reef diversity, insufficient information is available to judge the resilience to risk of the other major factors that need to be considered. This is not surprising, considering that the project was

only designed to support the first ('Initiation') phase of a long-term program, but it points to a number of areas where urgent action is needed to ensure that benefits of the program will be sustainable.

40. The technical and environmental sustainability of the project cannot be evaluated in the absence of adequate baseline surveys that are coordinated with the impact and control areas of the project, both for the CBM and MCS components, and cover the critical mass of scientific information needed to establish the benefits of the COREMAP program. Given the long timeframe required for the expected benefits (in terms of reef health, village incomes, etc.) to materialize, these baselines need to be established as soon as possible.

41. The fiscal and financial sustainability of the program cannot be evaluated, since COREMAP's transfer to DKP and the district and village governments is still under way. While each of the entities has expressed an interest in the continuation of the program and a willingness to share in its costs, the adequacy of the budgetary provisions, particularly for the enforcement support component of the program, has not been established. At the community level, the continued operation of the revolving credit schemes appears to be consistent with local customs and capacities, but the electrification schemes are unviable and need to be replaced with more appropriate approaches.

42. The social support for COREMAP was effectively developed at the national level by the public awareness campaign, and in the participating communities by the empowerment arising from the recognition of the villages' role and rights in managing their coastal resources, as well as the immediate benefits of the village infrastructure investments and the revolving funds. The sustainability of this support will, however, greatly depend on the continuation of the national campaign, the enactment of the national and local laws recognizing the communities' role and rights, and the stream of benefits derived from the village grants. Should these decline because of lack of political resolve, inadequate budgets, or financial failure, the communities' support for coral reef conservation will also be at risk.

43. The resilience of the institutional and policy support framework for COREMAP will depend largely on the final approval and enactment of the draft legislation prepared by the project at the national and district levels. Without the proposed legal reforms, the bans on blasting, poisoning, and other illegal fishing practices, and the allocation of fishing rights to local communities, will be difficult to enforce, and the community reef watchers could be subject to challenge and retaliation.

BANK PERFORMANCE

44. The Bank's performance was satisfactory. The preparation of the project was underpinned by extensive analytical papers and surveys, and GOI ownership was strong. The design of the project was unusually complex, but responded to the needs of the proposed strategy and the lack of a robust institutional counterpart. Supervision focused on development impact and responded flexibly to drastic changes in institutional and country conditions, although donor coordination could have been better.

Quality at Entry

45. The project was solidly grounded in an extensive body of biodiversity assessment and policy papers that grew out the 1992 Rio Conference on Environment and Development. Both the Indonesia Biodiversity Action Plan (1993) and Indonesia's Agenda 21 (1996) emphasize community-based marine resources management. The Bank was one of the key agencies that launched the 1995 *Global Representative System of Marine Protected Areas (MPAs)* initiative, which identified Indonesia among the world-wide priorities for MPA intervention. The Bank's *Marine Markets Transformation Initiative* was also launched to find solutions for the live reef fish trade, one of the most important threats to Indonesia's reefs. The 1996 *Economic Analysis of Indonesian Coral Reefs*[18] supported project preparation. The preparation of the project was also assisted by the GOI's establishment of an inter-agency preparation team in 1995, which commissioned and funded extensive socioeconomic and ecological surveys of priority program sites.

46. The design of the project as an adaptable program loan (APL) was appropriate, given the need for flexibility and learning while pursuing a balance between conservation and development in a very inadequate policy and institutional setting. The project design was unusually complex, as it needed to organize and empower widely dispersed and remote island communities in the absence of supportive legal, policy and institutional frameworks. The appraisal of the technical and economic aspects of the project was as thorough as could be expected, given the limitations of the scientific understanding of coral reefs, their interaction with local fisheries, and the nature of destructive threats.

Supervision

47. *Flexible and Effective Response to Problems:* This was an extraordinarily challenging project to supervise. Aside from an intricate design involving policy reform and institutional capacity strengthening at different levels, and community development in two remote and dispersed project sites, the project had been launched shortly after the 1997 financial crisis in a period of economic and political upheaval, and was severely affected by civil conflict, the creation of DKP in 1999, and the 2001 "big bang" decentralization of the GOI. That the project still managed to deliver on many of its objectives is largely a tribute to the quality of supervision and the government's commitment to the project.

48. Serious ethnic and religious conflict in Maluku made it impossible to implement the pilot project in the Lease Islands, and led to its replacement by the Padaido site, which had been under preparation for Phase II. This site is now progressing well, following some initial delays.

49. The creation of the DKP in 1999 led to a crisis for the project, due to the transfer of several of its best staff from the PMO to the new agency. While this was a logical development that would help the program in the long term, the uncertainties surrounding the fate and ownership of the program, and the shortage of staff contributed to serious

18. Cesar (1996) *op.cit.*

delays in project implementation. The lack of progress was vigorously pursued by the supervision team, noted in the PSR's with a series of unsatisfactory project ratings until the problem was resolved about two years later.

50. *Focus on Development Impact:* The decentralization of government functions entailed a major transfer of budgetary, development, and enforcement responsibilities from the national to the district levels. The supervision team took this challenge as an opportunity to shift project ownership and responsibility as much as possible to the district level, where DKP was also represented. Unfortunately, the financial management aspects remained centralized with LIPI, which led to extensive delays between community-level decisions, district-level reviews, and central-level approvals. This was the most important source of complaints noted by the assessment mission. This discrepancy between decentralized decision-making and centralized approvals is expected to be resolved for the Phase II project.

51. Even before decentralization became the norm, the risks of excessive top-down management had become apparent in the implementation of the CBM component in Taka Bone Rate, where serious conflicts were observed. Under pressure to meet contractual deadlines, the NGO facilitators had attempted to rush decisions with community groups without adequate consultation with traditional village decision-makers. This led to allegations of favoritism and lack of support for CRMPs and village grant proposals by village and district authorities, and required the replacement of the facilitators.

52. *Compliance with Safeguards:* The project's compliance with the Bank's safeguard policies had been uneventful from the time of appraisal until the 7th supervision mission, in May 2001, when the mission learned of the resettlement of 12 families from Latondu Kecil island in Taka Bone Rate, following its designation as a no-go sanctuary by the National Parks Department in 1998. Since the resettlement had not been carried out through COREMAP, the supervision team concluded that the Bank's OD 4.30 on Involuntary Resettlement had not been violated. Nevertheless, the team followed up with the park manager and the CBM facilitator to ensure that the GOI had taken the necessary actions to restore their living conditions at least to pre-resettlement levels, and to facilitate their benefiting from COREMAP's community development aspects.

53. Despite these arrangements, a spot check by the assessment mission found that the resettled families had not yet benefited from the CBM program, and their living conditions were below average for the host island (Latondu Besar). While the mission concurs that the Bank's involuntary resettlement policy had not been violated, it also recommends that, since the resettlement was a consequence of the type of activity that COREMAP supports (that is, the creation of coral reef sanctuaries), and it was important to establish a model of good practice for the future, the project needed to ensure that this reservoir of dissatisfaction was addressed by ensuring that the resettled group is involved in and benefits from ongoing CBM activities on the same island. The supervision team is following up on this recommendation.

BORROWER PERFORMANCE

54. The borrower's performance has been satisfactory, but only marginally so. The GOI, specifically BAPPENAS, committed in the mid-1990s to a community-based coral reef management strategy, and steadfastly supported this concept while slowly creating the policy and institutional framework needed to implement it. The preparation and implementation of the project was adequately supported with counterpart funds during a period of major economic crisis and rapid political and institutional change. Nevertheless, LIPI's oversight of key areas has been weak. Also, progress in the approval and enactment of the policy, strategy, and legal framework, for which DKP has been responsible, has been slow, with attendant risks for the sustainability of the program, and donor coordination was inadequate.

55. GOI ownership of the project was strong, as demonstrated by its funding of preparatory surveys, but the implementation arrangements were risky, since they centered on LIPI, a scientific institute with limited field presence and little community orientation. At appraisal, this was understood to be a temporary arrangement in the presence of an institutional vacuum for coral reef management. Eventually, in 2000, the mandate was given to the DKP. However, since DKP will only be responsible for the project from Phase II, the Phase I project is left in a slow and delicate transition from one agency to the other, with limited ownership and commitment on both sides. The transition has also resulted in losses of institutional learning and capacity.

56. LIPI's ownership of the project has been less firm, as indicated by the fact that, until 2001, it had only assigned a part-time director to the PMO, with attendant weak leadership and oversight. A more important consequence is that the project failed to deliver in key areas where LIPI should have been expected to excel, such as the coordination of baseline surveys with project impact and control zones, and the provision of technical guidance to participating villages in regard to seaweed culture and coral reef sanctuary selection.

57. The full extent of DKP's ownership and commitment to the COREMAP strategy remains to be demonstrated. While some hesitation may be understandable in light of DKP's recent creation and LIPI's responsibility for Phase I, the mission has seen little indication of DKP's effort toward endorsing the draft National Policy and Strategy for Coral Reef Management, the incorporation of the recommended inputs into the new Fisheries Act and the Coastal Zone Management and Small Islands Act, and the assignment of full-time qualified and enthusiastic staff to COREMAP activities. This is an area where timely action would be important to ensure the sustainability of the results of Phase I, and the success of Phase II.

58. In addition, while COREMAP was designed and appraised as an integrated program with components funded by the Bank/GEF, ADB, and AusAID, the coordination of the donors in the course of implementation has been inadequate, even though they were all managed by the same PMO. This is likely to have been mainly due to the weak leadership indicated above and the fact that the PMO was organized along thematic lines, with nobody responsible for coordination of all components at a specific project site. As a result, there has been a serious lack of integration between the CBM and MCS activities

funded by the Bank/GEF, and the baseline surveys of reef and socioeconomic conditions funded by ADB.

LESSONS

59. The main lessons that emerge from the experience of the project point to the need to proceed with caution with the expansion of the program in Phase II in order to allow workable and sustainable arrangements to be established for the implementation of the strategy, the integration of project activities with impact data gathering and monitoring, and the provision of technical guidance for community-based decisionmaking.

Importance of Adaptability and Time for Pilot Projects

60. As the pilot for a three-phase APL, the subject project was designed with ample allowances for flexibility and learning. Even so, the project required three extensions from its original completion date, and several key requirements for the success of COREMAP, such as the internal organization and implementation arrangements within DKP, the integration of project activities with data gathering and impact monitoring, and the provision of technical guidance to local communities, remain incomplete and untested. In addition, the sustainability of the CBM-centered strategy has not been demonstrated. This points to the need for adaptability and caution in regard to the expansion of the COREMAP program in Phase II, until the viability of the approach has been established. It also points to the advisability of extending the APL beyond the 15-year horizon envisaged at appraisal.

Need to Integrate Project Activities with Impact Data Gathering and Monitoring

61. A major flaw in project implementation was the lack of coordination between the CBM and MCS activities and the baseline surveys and monitoring provisions carried out under a complementary project funded by the ADB. Without close integration between baseline surveys, sanctuary creation, and surveillance activities, it will not be possible to determine the impact and validate the rationale for the COREMAP strategy, even in the long term. This unsatisfactory state of affairs appears to be largely due to the PMO's having been managed by a part-time director for the first three years of the project, and it being organized along thematic lines, with assistant directors and technical teams responsible for MCS, CRTICs, CBM, and public communications for the entire COREMAP program, without geographical responsibilities. The ensuing lack of integration could have been avoided with the assignment of managers with geographical responsibilities and the duty to ensure that the different components are effectively integrated at all locations.[19]

19. Another approach would be to have critical parts of the program funded by pooled funds, which would require close coordination between donors.

Need to Assign Full Time Staff for Project Implementation

62. The PMO's extensive reliance on part-time staff significantly reduced the ability of managers and staff to maintain control and direction over the technical aspects of the project, and encouraged a situation where most of the work was done by consultants and contractors with little integration between consultants and PMO technical staff. This contributed to significant delays in project implementation, inadequate integration between different project components and limited transfer of knowledge from consultants to national staff. Many of these problems could have been avoided with the appointment of full-time staff for the implementation of the project.

Need to Provide Technical Guidance to Community-based Decisions

63. While community empowerment was a vital element of the COREMAP strategy, it can lead to poor decisions, as indicated by the findings about the quality of biodiversity in one of the chosen sanctuaries, and investments in unviable electrification schemes. The failure of the seaweed culture projects was particularly unfortunate, given LIPI's expertise in this area. This points to the need to ensure that community-based decision-making processes be informed by sound technical guidance to ensure that mistakes are avoided.

FUTURE DIRECTIONS

64. Based on the project's experience, it is possible to identify additional directions that could enhance the benefits from the COREMAP strategy, and deserve to be considered for Phase II and future projects.

Potential for Local Fisheries Development

65. The commercial and artisanal fisheries in the project areas appear to be far from being fully and efficiently developed, but the project has done little to examine how the local communities could extract additional benefits from the fishery resources around them. While the communities have been given full authority over village grant and seed funds, their decisions often have not been informed by adequate expertise on technical and commercial aspects. In light of the ample fishery resources in the project areas, the provision of additional expertise on technical and market issues to aid their sustainable development by the local communities would seem to be an area worth considering to enhance the local benefits of the program.

Potential for Renewable Energies Development

66. Three of the five Taka Bone Rate villages where CBM has been fully implemented chose to invest one of their three village grants in a diesel-based electricity supply system. While this choice reflects village priorities, it was clear to the mission that the electrification schemes have not been designed to adequate technical standards, and

are not being managed in a financially sustainable way.[20] The installations are precarious, unsafe, and certain to fail, and should not have passed the technical review process of the NGOs and PMOs. In light of the limited capacity of the villages to manage and maintain an electrification scheme, it would appear that simpler, more decentralized approaches, including solar photovoltaic home systems, should also be considered.[21]

Potential for Greater Empowerment of Participating Villages

67. Based on the experience of the project, there seem to be additional opportunities to pursue the COREMAP objective empowering the coastal communities as owners and managers of local reef resources. The potential to transfer further project responsibilities to the community level, and the need to supplement the village entities' sources of revenue present two directions that deserve to be pursued.

68. While the project has already engineered a major transfer of budgetary, development, and enforcement responsibilities from the national to the district levels, the financial management aspects remains centralized, with extensive delays between community-level decisions, district-level reviews, and central-level approvals. This was the most important source of complaints noted by the mission. The need to address this issue would seem to offer the opportunity to transfer greater authority and responsibility for project implementation to the villages.

69. The sustainability of village support for the CBM and MCS components of the strategy will require greater attention to enhancing the communities' sources of revenue. The development of a user charge system that would enable the villages to collect and retain license fees from fishing boats, divers and tour operators would seem to be appropriate. Some such user charges already exist, but they are far from reflecting the economic value of the resource, and the revenues are sent to the central government.

20. E.g., tariffs do not cover operating costs, and there is no provision for equipment maintenance, repair and replacement.

21. Some lessons may be learned from the experience with similar systems in remote Pacific island countries. See: Solar Energy: Lessons from the Pacific Island Experience, by A. Liebenthal, S. Mathur and H. Wade, World Bank Technical Paper 244 – Energy Series, Washington, 1994.

Annex A. Basic Data Sheet

CORAL REEF REHABILITATION AND MANAGEMENT PROJECT
(LOAN 4305-IND)

Key Project Data *(amounts in US$ million)*

	Appraisal estimate	*Actual or current estimate*	*Actual as % of appraisal estimate*
Total project costs	12.8	14.0	109
Loan amount	6.9	6.9	100
Cofinancing	4.1	4.1	100
Cancellation		0.0	

Cumulative Estimated and Actual Disbursements (as of 9/9/03)

	FY99	*FY00*	*FY01*	*FY02*	*FY03*	*FY04*
Appraisal estimate (US$M)	1.00	5.00	6.90	6.90	6.90	6.90
Actual (US$M)	0.50	1.23	3.56	4.13	4.44	5.89
Actual as % of appraisal	50	25	52	60	64	85
Date of final disbursement:	Revised closing date is 07/31/2004.					

Project Dates

	Original	*Actual*
Initiating memorandum	07/11/1995	07/21/1995
Negotiations	09/18/1996	01/19/1998
Board approval	12/16/1996	03/03/1998
Signing	02/14/1997	05/01/1998
Effectiveness	04/15/1997	06/30/1998
Closing date	10/31/2001	10/31/2003

Staff Inputs (staff weeks)*

	FY95	*FY96*	*FY97*	*FY98*	*FY99*	*FY00*	*FY01*	*FY02*	*FY03*	*FY04*	*Total*
Preappraisal	12.4	25.6	46.5	27.2							111.7
Appraisal				23.5							23.5
Negotiations				6.5							6.5
Supervision				4.0	42.4	41.2	18.6	21.3	17.7	25.5**	170.7

*According to Bank's accounting system, consultant weeks were recorded only until Fiscal Year 1999. Consultant staff weeks
*fees were already included in the input values starting Fiscal year 2000.
**includes estimates for ICR mission.

Mission Data

	Date (month/year)	No. of persons	Staff days in field	Specializations represented	Performance rating	
					Impl. Progress	Dev. Obj.
Identification/ Preparation	04/26/1995	6	15	TTL-NAT.RES.ECON. (1); ENV. (1); TRAD.MNGT./USER RIGHTS SPC. (1) INST.SPC.		
	10/12/1995	6	15	TTL-NAT.RES.ECON. (1); COASTAL ZONE MGT.SPC. (1); ENV.(1) TRAD.MGT./USER-RIGHTS SPC.(1)		
	09/06/1996	5	15	TTL-NAT.RES. ECON. (1); VILG.GRANT SPC. (1) ; BIODIVERSITY .SPC. (1); COASTAL ZONE .SPC. (1); MICRO-ENTERPRISE SPC.(1)		
	04/22/1997	4	14	TTL-NAT.RES.ECON (1); VILG.GRANT.SPC (1);CNTR.PROG. CORD. (1);SR.COORD. ENV.(1)		
	07/25/1997	9	33	TTL-NAT. RES.ECON.(1); ENV.ECON. (1); VILG.GRANT SPC. (1); COASTAL MGNT.SPC(1);ENFOR. SPC.(1);MONITOR. SPC.(1); LAWYER (1); PROC. (1);DISB. (1)		
Appraisal	12/19/1997	9	16	TTL-NAT.RES.ECON. (1); ENV.MGNT (1); PROJ.ECON. (1); CONFLICT. RESOLUTION SPC. (1); ENV.SPC. (1); AUDIT &ACCTN. (1); PROC. (1); VILG.GRANT SPC. (1) ; DISB. (1)		
Supervision	09/07/1998	7	12	SR. ENVIR. SPC. (1); SR. NAT. RES. ECO./TTL (1); PROJ. MGN SPC/FACILIT. (1); PROJ. ECONOMIST (1); DISB/FINANC/REPORT. (1); PROCUREMENT (1); EXT. AFFAIRS/MEDIA (1)	S	S
	03/05/1999	5	12	TTL-NAT. RES. ECONO. (1); CO-TTL-ENVIRON. SPC. (1); SURVEILLANCE SPC. (1); FINANCIAL SPECIALIST (1); PUBLIC AWARENESS SPC. (1)	S	S

	Date (month/year)	*No. of persons*	*Staff days in field*	*Specializations represented*	*Performance rating*	
					Impl. Progress	*Dev. Obj.*
	10/13/1999	5	12	CO-ML COASTAL MNG SPC. (1); CO-ML ENVIRON. SPC. (1); SURVEILLANCE SPC. (1); AWARENESS SPC. (1); FINANCIAL MNG SPC. (1)	S	S
	03/07/2000	6	10	CO-TTL (COASTAL MNG) (1); CO-TTL (ENV. MNG) (1); MCS SPECIALIST (1); POLICY+STRATEGY SPEC. (1); FINANCIAL (PART-TIME) (1); AWARENESS (PART-TIME) (1)	U	U
	08/11/2000	3	9	CO-TTL (COASTAL MGMT; CO-TTL (ENV. MGMT); MCS SPECIALIST	S	S
Midterm Rev.	11/07/2000	5	16	CO-TTL (COASTAL MGMT; CO-TTL (ENV. MGMT); FIN. MGMT; PROJECT MGMT.	S	S
	05/10/2001	2	15	CO-TTL (ENV. MGMT.); MCS SPECIALIST	S	S
	11/16/2001	4	34	TASK TEAM LEADER (ENV); CO-TASK TEAM LEADER (RES. ECON); FINANCIAL MANAGEMENT (1); MCS EXPERT (1)	S	S
	02/28/2002	5	18	TTL (LEAD ENV. SPECIALIST); CO-TTL (ECONOMIST); SR. BIODIVERSITY SPEC. ;MCS SPEC.	S	S
	10/07/2002	3	12	TTL/LEAD ENV. SPECIALIST (1); ECONOMIST (1); MCS SPEC. (1)	S	S
Completion	10/03/2003	6	15	TASK TEAM LEADER (1); COMMUNITY-BASED MGMT. (1); DECENTRALIZATION (1); FISHERIES/CBM (1); INSTITUTIONS (1); MCS (1)	S	S

Annex B: Economic Analysis of COREMAP Program[22]

Coral reefs form the core of the livelihood for hundreds of thousands of Indonesian subsistence fishers, and a source of food security in times of agricultural hardship. They also provide a natural barrier against wave erosion, thereby protecting coastal dwellings, agricultural land, and tourism beaches. They are a potential source of foreign exchange from divers and other marine tourists. In addition, because of their unique biodiversity, they are of great interest to scientists, students, pharmaceutical companies, and others. These and many other functions give coral reefs an important and growing value. A recent World Resources Institute paper[23] estimated the potential sustainable annual economic net benefits of healthy reefs in Southeast Asia. The results per square kilometer of reef are given in Table B-1.

Table B-1: Potential Sustainable Annual Economic Net Benefits per km^2 of Healthy Coral Reef in Southeast Asia

RESOURCE USE (DIRECT AND INDIRECT)	*PRODUCTION RANGE*	*POTENTIAL ANNUAL NET BENEFITS (US$) (RANGE)*
Sustainable fisheries (local consumption)	10 – 30 t	$12,000 – 36,000
Sustainable fisheries (live fish export)	0.5 – 1 t	$2,500 – 5,000
Coastal protection (erosion prevention)		$5,500 – 110,000
Tourism and recreation	100 – 1000 persons	$700 – 111,000
Aesthetic/biodiversity value (WTP)	600 – 2000 persons	$2,400 – 8,000
Total (fisheries & coastal protection only)		$20,000 – 151,000
Total (including tourism potential)		$23,100 – 270,000

Source: Reefs at Risk in Southeast Asia (Burke et al. 2002)

Yet, despite their high potential values, the quality of coral reefs in Indonesia is declining rapidly. Even remote reefs in unpopulated areas are not free from man-induced deterioration. At the moment, only 29 percent of Indonesian reefs are in good condition (that is, with more than 50 percent live coral cover). In most areas, a variety of human-induced threats are responsible for the degradation of reefs. The relative importance and the type of threats vary tremendously by location. Powerful economic forces are driving the observed destructive patterns of coral reef use, often rendering short-term economic profits, sometimes very large, to selected individuals.

Measures for coral reef protection are often presumed to conflict with economic development, and are said to require a sacrifice of economic growth. However, this perception stems mainly from a failure to recognize the magnitude of costs to the present and

22. This analysis has been prepared by Herman Cesar as Annex 12 of the PAD for the COREMAP Phase II project.

23. Burke, L., E. Selig and M. Spalding. 2002. Reefs at risk in Southeast Asia. World Resources Institute. 72 pp.

future economy resulting from reef degradation. Table B-2 adapted from Cesar et al. (1997) shows the benefits to individuals and losses to society from each square kilometer of coral reef destruction, providing an economic rationale for preventive or remedial efforts. For coastal protection and tourism losses, both "high" and "low" scenario estimates are presented, depending on the types of coastal construction and tourism potential. "High" cost scenarios are indicative of sites with high tourism potential and coastal protection value. "Low" cost scenarios are indicative of sites with low tourism and coastal protection value.

Some of the most important values of coral reefs, such as those to future generations and intrinsic values, cannot be quantified. However, since the economic benefits from reef destruction often are used to justify continuation of these destructive practices, quantifying the costs associated with coral reef degradation is important to make a balanced assessment of the benefits and costs of various threats.

The analysis is mainly based on observable data, such as the value of the decline of fish catch or expenditures by hotels on infrastructure to temporarily prevent beach erosion. Total costs should thus be interpreted as rough estimates of the lower range of true costs associated with reef destruction. The numbers in Table B-1 are generated on the basis of available data, using hypothetical examples of sites subject to one individual threat.

Table B-2: Total Net Benefits and Losses due to Threats of Coral Reefs in SE Asia (Net Present Value[24] in US$ 000 per km^2)

	Net benefits	**==========Net losses to society ==========**				
Threats	Total net benefits to individuals	Fishery	Coastal protec-tion	Sustainable tourism	Others (e.g. biodiveristy)	Total net losses (quantifiable)
Poison Fishing	33	37	n.q.	3-409	n.q.	40-446
Blast Fishing	15	80	8-170	3-450	n.q.	91-700
Coral Mining	121	87	10-226	3-450	> 67	167-830
Sediment (logging)	98	81	n.q.	192	n.q.	273
Overfishing	39	102	n.q.	n.q.	n.q.	102

Source: Adapted from H. Cesar et al., "Indonesian Coral Reefs -- An Economic Analysis of a Precious but Threatened Resource," AMBIO 26, 1(1997): 345-358.
Notes: -- n.q. = not quantified.

The data presented above are for Southeast Asia (Table B-1) and for Indonesia (Table B-2) as a whole. For the program, a cost-benefit analysis (CBA) was carried out for the 6 target districts. The advantage of an analysis at a district level is the actual use of real site data, rather than having to rely on country averages.

24. The Net Present Value (NPV) provides a summary of the value of the resource, by aggregating annual benefits over a 20 year time period, but gives greater weight to the near future by using a "discount rate" of 10% per year, which means the current benefits of a future good is reduced by 10% for each year into the future.

The CBA at the district level captures the three main quantifiable benefits: fisheries, other local products derived from coral reefs and recreation/tourism. Program benefits are carried forward 25 years, which is the evaluation time horizon for the analysis. Below, the main assumptions behind the three main quantifiable benefits are presented and data are given for each of these benefits for each of the districts. Data on the category "other local products" were not collected locally, but instead come from benefit transfers from Ruitenbeek.[25]

Main benefits are expected to come from the fisheries sector: the closure of reef areas is expected to stabilize yields compared to the "without program" scenario where yields are expected to gradually decline over time (see Figure B-1). The graph gives both a central case as well as a more optimistic and a more pessimistic case, to mimic the uncertainties regarding the benefits of no-take zones.

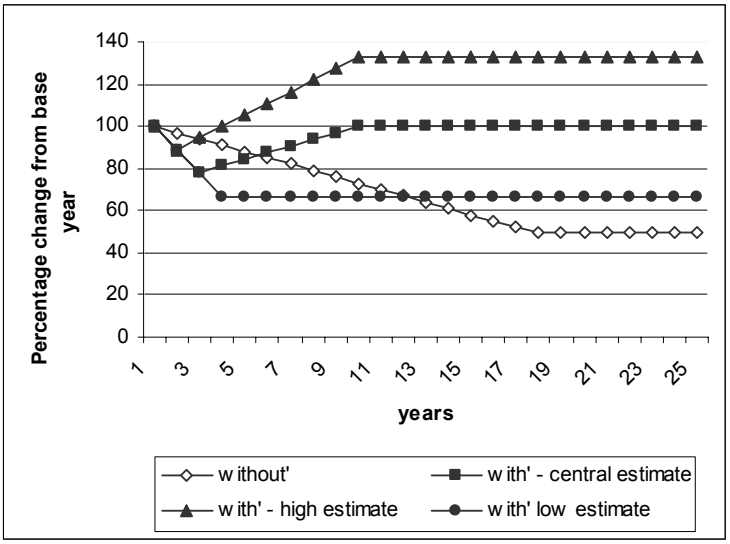

Figure B-1: Fisheries benefits assumed in economic analysis

The central estimate (Figure B-1) is in line with the recent literature on the economics of no-take zones, as summarized in Roberts et al. (2001). Village grants and associated alternative income generating activities are assumed to ensure that fishing pressure in the areas outside the no-take zones is not increasing with the closure of specific areas.

We have conservatively hypothesized that in the "central" estimate, the current yields will be maintained over time, after an initial drop due to the introduction of no-take zones. In the "without" program scenario, the fisheries benefits are supposed to decline gradually over time to 50 percent of current levels. Due to lack of reef fisheries yield data, these data were calculated based on total reef area per district, local reef quality and assumed yields per level of reef quality. The latter ranged from 1 to 4. Levels were obtained per *kecamatan* based on expert judgment by consultant team members. It was assumed that a low level of 1

25. Ruitenbeek (2002) is basically Ruitenbeek's annex to the ADB COREMAP Project. There is no official quotation for it.

corresponded with a catch of 5 mt/km2/yr, while a levels 2, 3, and 4 corresponded with catches of 15, 25, and 35 mt/km2/yr, respectively. This was partly based on the literature [26] and on expert judgment from the fisheries consultant in the team.

Table B-3: Cost and Benefit Estimates for the 6 program Districts

	Pangkep	Selayar	Buton	Raja Ampat	Biak	Sikka
District Program costs[a]	7.5	7.9	13.3	8.5	9.0	7.6
Fisheries Value (2003)	2.4	8.1	7.3	17.2	3.6	0.8
Local Products (2003)	1.5	4.4	5.6	5.2	1.7	0.5
Tourism Value (2003)	0.1	0.4	1.6	0.2	0.1	0.2
Reef Area (km2)	374	1098	1402	1300	424	128
Reef quality index	1.8	2.0	1.6	3.2	2.3	1.7
Number of fishers	35,000	18,100	60,700	10,700	unknown	4,300

[a] excluding district Coral Reef Information and Training Centers.

Tourism levels were estimated for each of the districts. Tourism was assumed to increase at 5 percent per year in the "central" estimate based on the enhanced attraction of the area due to the marine parks and marine tourism parks in the districts. Benefit transfer was used to estimate "other local products" (Ruitenbeek, COREMAP-ADB, 2002). In order to arrive at actual value-added figures per year from tourism and fisheries, it was assumed that the average price of fish is 2750 Rp./kg and that value added in local fisheries is 80 percent of gross value (Cesar, 1996). For tourism, current expenditures on hotels and diving/snorkeling trips were collected for the six districts. Additionally, 50 percent was added for "other" expenditures of these tourists during their stay. It was assumed that net value of tourism is 40 percent of gross value. For fisheries and tourism, a multiplier effect of 2 (i.e., 100 percent) was assumed, given the large underemployment situation in each of the sites. The results are summarized in Table B-3.

The COREMAP program involves nearly 5,000 square kilometers of some of the most pristine reefs in Indonesia. Hence, apart from quantifiable benefits, there are a host of other benefits, such as global biodiversity. These have not been used in the estimates. However, an estimate by Ruitenbeek puts this level at US$ 8.5 thousand per hectare, far more than the use values given in Table B-3 above.

The detailed BCA results for the base case are given in Table B.4 for the case of Buton. This indicates the annual benefit and cost streams associated with the program for the case of Buton. The resulting NPV at a 10 percent discount rate is US$ 15.6 million while the economic internal rate of return (EIRR) is estimated at 18 percent in the base case. Other districts have similar patterns of annual costs and benefits.

26. McAllister, D. E., (1988) "Environmental, Economic and Social Costs of Coral Reef Destruction in the Philippines". Galaxea, Vol. 7, pp. 161-178.

Table B-4: Summary Table of Economic Analysis for Buton District (million US$)

year:	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**25**	**NPV (10%)**
Quantifiable benefits 'with'												
Fisheries	7.3	6.5	5.7	5.9	6.1	6.3	6.6	6.8	7.0	7.3	7.3	61.2
Local Products	5.6	5.0	4.4	4.6	4.7	4.9	5.1	5.3	5.4	5.6	5.6	47.3
Tourism	1.6	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	5.0	21.4
Net benefits AIG*	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	1.8
Total quantifiable benefits	14	13	12	12	13	13	14	14	15	15	18	132
Quantifiable benefits 'without'												
Fisheries	7.3	7.0	6.8	6.6	6.4	6.2	5.9	5.7	5.5	5.3	3.6	51.9
Local Products	5.6	5.4	5.3	5.1	4.9	4.8	4.6	4.4	4.3	4.1	2.8	40.1
Tourism	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	14.2
Total quantifiable benefits	14	14	14	13	13	13	12	12	11	11	8	106
Incremental benefits (25 yrs.)	0	-1	-2	-1	0	1	2	3	4	5	10	26
Intervention Costs (COREMAP Phase II)												
Buton COREMAP PhaseII Costs	3.4	2.0	2.0	2.0	2.0	2.0	0.0	0.0	0.0	0.0	0.0	9.9
Net Benefits	**-3.2**	**-2.8**	**-3.7**	**-2.8**	**-1.9**	**-1.1**	**1.8**	**2.7**	**3.6**	**4.5**	**10.1**	**15.6**
EIRR	**18%**											

*AIG are Alternative Income Generating Activities.

The results from the cost-benefit analysis for the other districts is given in Table B-5. As is clear from the table, quantifiable economic internal rates of return range from 6 percent in Sikka to 21 percent in Raja Ampat. The differences can largely be explained from the relative size and health of the reefs in the different districts. As the benefits vary much more than the costs of addressing the problems, program management of the relatively smaller, less intact reefs has a much lower rate of return than larger, more pristine areas.

Table B-5: Economic Rates of Return for the 6 Program Districts ('central' estimate)

	Pangkep	Selayar	Buton	Raja Ampat	Biak	Sikka
EIRR 'central' (%)	11	19	18	21	12	6

The estimates are rather sensitive to the assumptions, especially those related to trends in fish yields over time. If the no-take zones are less effective, for example, because of illegal fishing in these areas, the rates of return drop significantly. This also highlights the importance of credible enforcement of the no-take zone regulations. See also the sensitivity analysis discussed below.

Program Beneficiaries: Over 100,000 fishers in the area are involved in reef-related fishing. These fishers will directly benefit from the activities under the program. There incomes will

be stabilized compared to the "without program" case where these would decrease with 50 percent or more over the coming 25 years.

Financial Analysis Results: Under program preparation, no separate financial analysis was carried out. However, under the ADB part of COREMAP Phase II, a detailed financial analysis was carried out and a financial internal rate of rate (FIRR) of 16.7 percent was calculated for the alternative income generating activities among others.

Sensitivity Analysis: The estimates are necessarily rather sensitive to the assumptions, especially those related to trends in fish yields over time. If the no-take zones are less effective (for example, because of illegal fishing in these areas), the rates of return drop significantly. This also highlights the importance of credible enforcement of the no-take zone regulations. This is shown in Table B.6.

Table B.6: Economic Rates of Return for the 6 Program Districts ('central' estimate and sensitivity)

	Pangkep	Selayar	Buton	Raja Ampat	Biak	Sikka
EIRR 'central' (%)	11	19	18	21	12	6
EIRR high (%)	22	40	37	49	23	14
EIRR low (%)	Undefined	1	3	Undefined	1	Undefined

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