Document of
the World Bank

Report No: ICR2245

IMPLEMENTATION COMPLETION AND RESULTS REPORT
(TF-26799, IBRD-47400, IDA-39100, TF-53350)

ON A

LOAN IN THE AMOUNT OF US$30.0 MILLION

AND A

CREDIT IN THE AMOUNT OF SDR 15.7 MILLION
(US$23.9 MILLION EQUIVALENT)

AND A

GLOBAL ENVIRONMENTAL FACILITY GRANT
IN THE AMOUNT OF US$7.5 MILLION

TO THE

REPUBLIC OF INDONESIA

FOR THE

CORAL REEF REHABILITATION AND MANAGEMENT PROJECT (PHASE II)

June 25, 2012

Indonesia Sustainable Development Unit
Sustainable Development Department
East Asia and Pacific Region

CURRENCY EQUIVALENTS

(Exchange Rate Effective December 31, 2011)

Currency Unit = Indonesian Rupiah
IDR 1,000 = US$ 0.11
US$ 1.00 = IDR . 9068

FISCAL YEAR
January 1 – December 31

ABBREVIATIONS AND ACRONYMS

ADB	Asian Development Bank
AIG	Alternative Income Generation
APBD	Local Budgets
APL	Adaptable Program Loan
BAPPENAS	National Development Planning Agency
Bupati	District Head
CAS	Country Assistance Strategy
CBM	Community-Based and Collaborative Management
CCEB	Coastal Community Empowerment Board
CF	Community Facilitators
COREMAP	Coral Reef Rehabilitation and Management Program
CPUE	Catch-per-unit effort
CREEL	Fish Catch Survey
CRITC	Coral Reef Information and Training Center
CRMP	Coral Reef Management Plan
CRMP/RPTK	Village and Coral Reef Management Plans
CTI-CFF	Coral Reefs, Fisheries, and Food Security
Dinas KP	District Fisheries Services
DIPA	National Budget Authorization
DPL	No Take Zones
ERR	Economic Rate of Return
FRR	Financial Rate of Return
GEF	Global Environment Facility
IBRD	International Bank for Reconstruction and Development
ICR	Implementation Completion Report
KKJI	Directorate of Marine and Aquatic Resources Conservation
KKL	National Marine Conservation Area
KKLD	District Marine Protected Area
KP3K	Directorate General of Marine, Coasts and Small Islands
KPI	Key Performance Indicators
LIPI	Indonesian Institute of Sciences
LKM	Community micro saving credit union
MCS	Monitoring, Control and Surveillance
LPSTK	Community Management Unit
M&E	Monitoring and Evaluation
MIS	Management Information System
MMAF	Ministry for Marine Affairs and Fisheries

MoE	Ministry of Education
MoF	Ministry of Finance
MPA	Marine Protected Areas
MTR	Mid-term Review
MCS	Monitoring, Control and Surveillance
M&E	Monitoring and Evaluation
MIS	Management Information System
MMAF	Ministry for Marine Affairs and Fisheries
MoE	Ministry of Education
MoF	Ministry of Finance
MPA	Marine Protected Areas
MTR	Mid-term Review
NPIU	National Program Implementation Unit
NGO	Non-government Organization
NPV	Net Present Value
OED	Operations Evaluation Department
OM	Operational Manual
OP	Operational Policy
PA	Public Awareness
PAD	Project Appraisal Document
PDO	Project Development Objective
Perda	Regional Government Regulation
Perdes	Village ordinance
PHKA	Directorate General of Forest Protection and Nature Conservation at Ministry of Forestry
PIMPRO	Project Manager
PMU	Program Management Unit
PPAR	Project Performance Assessment Report
PROPENAS	GoI's medium-term development strategy
PRA	Participatory Rural Appraisal
QAE	Quality at Entry
RCU	Regional Coordination Units
SETO	Senior Extension and Training Officers
SDR	Special Drawing Rights
SEBME	Socio Economic Benefit Monitoring and Evaluation
SK	Executive Decree
SPP	Sea Partnership Program
TA	Technical Assistance
TF	Trust Fund
TTL	Task Team Leader
VM	Village Motivators

Vice President:	Pamela Cox
Country Director:	Stefan G. Koeberle
Sector Manager:	Franz R. Dress-Gross, Magda Lovei
Project Team Leader:	Marea E. Hatziolos
ICR Team Leader:	Takayuki Hagiwara

INDONESIA

CORAL REEF REHABILITATION AND MANAGEMENT PROJECT (PHASE II)

CONTENTS

A. Basic Information			
Country:	Indonesia	Project Name:	Coral Reef Rehabilitation and Management Program Phase II
Project ID:	P071316, P071318	L/C/TF Number(s):	IBRD-47400, IDA-39100,TF-26799,TF-53350
ICR Date:	05/30/2012	ICR Type:	Core ICR
Lending Instrument:	APL	Borrower:	GOVERNMENT OF INDONESIA
Original Total Commitment:	USD 56.20M, USD 7.50M	Disbursed Amount:	USD 53.92M, USD 7.50M
Environmental Category: B		**Focal Area**: B	
Implementing Agencies: Ministry of Marine Affairs and Fisheries (MMAF), Indonesian Institute of Science (LIPI), Directorate General of Forest Protection and Nature Conservation (PHKA)			
Cofinanciers and Other External Partners: N/A			

B. Key Dates

Coral Reef Rehabilitation and Management Program Phase II - P071316

Process	Date	Process	Original Date	Revised / Actual Date(s)
Concept Review:	01/15/2003	Effectiveness:	01/28/2005	01/28/2005
Appraisal:	01/28/2004	Restructuring(s):		06/30/2010
Approval:	05/25/2004	Mid-term Review:	06/15/2007	04/17/2008
		Closing:	12/31/2009	12/31/2011

Coral Reef Rehabilitation and Management Project II - P071318

Process	Date	Process	Original Date	Revised / Actual Date(s)
Concept Review:	01/15/2003	Effectiveness:	01/28/2005	01/28/2005
Appraisal:	01/28/2004	Restructuring(s):		06/30/2010
Approval:	05/25/2004	Mid-term Review:	06/15/2007	04/17/2008
		Closing:	12/31/2009	12/31/2011

C. Ratings Summary

C.1 Performance Rating by ICR

Outcomes	Moderately Satisfactory
GEO Outcomes	Moderately Satisfactory
Risk to Development Outcome	Substantial
Risk to GEO Outcome	Moderate
Bank Performance	Moderately Satisfactory
Borrower Performance	Moderately Satisfactory

C.2 Detailed Ratings of Bank and Borrower Performance (by ICR)

Bank	Ratings	Borrower	Ratings
Quality at Entry	Moderately Unsatisfactory	Government:	Satisfactory
Quality of Supervision:	Moderately Satisfactory	Implementing Agency/Agencies:	Moderately Satisfactory
Overall Bank Performance	Moderately Satisfactory	Overall Borrower Performance	Moderately Satisfactory

C.3 Quality at Entry and Implementation Performance Indicators

Coral Reef Rehabilitation and Management Program Phase II - P071316

Implementation Performance	Indicators	QAG Assessments (if any)	Rating:
Potential Problem Project at any time (Yes/No):	Yes	Quality at Entry (QEA)	None
Problem Project at any time (Yes/No):	Yes	Quality of Supervision (QSA)	None
DO rating before Closing/Inactive status	Moderately Satisfactory		

Coral Reef Rehabilitation and Management Project II - P071318

Implementation Performance	Indicators	QAG Assessments (if any)	Rating:
Potential Problem Project at any time (Yes/No):	Yes	Quality at Entry (QEA)	None
Problem Project at any time (Yes/No):	Yes	Quality of Supervision (QSA)	None
GEO rating before Closing/Inactive Status	Moderately Satisfactory		

D. Sector and Theme Codes

Coral Reef Rehabilitation and Management Program Phase II - P071316		
	Original	**Actual**
Sector Code (as % of total Bank financing)		
General agriculture, fishing and forestry sector	15	15
General education sector	8	8
Micro- and SME finance	12	12
Other social services	35	35
Sub-national government administration	30	30
Theme Code (as % of total Bank financing)		
Biodiversity	29	29
Decentralization	14	14
Other environment and natural resources management	29	29
Participation and civic engagement	14	14
Rural non-farm income generation	14	14

Coral Reef Rehabilitation and Management Project II - P071318		
	Original	**Actual**
Sector Code (as % of total Bank financing)		
General agriculture, fishing and forestry sector	15	15
General education sector	8	8
Micro- and SME finance	12	12
Other social services	35	35
Sub-national government administration	30	30
Theme Code (as % of total Bank financing)		
Biodiversity	25	25
Decentralization	13	13
Other environment and natural resources management	25	25
Other rule of law	24	24
Participation and civic engagement	13	13

E. Bank Staff		
Coral Reef Rehabilitation and Management Program Phase II - P071316		
Positions	**At ICR**	**At Approval**
Vice President:	Pamela Cox	Jemal-ud-din Kassum
Country Director:	Stefan G. Koeberle	Andrew D. Steer
Sector Manager:	Franz R. Drees-Gross	Mark D. Wilson
Project Team Leader:	Marea Eleni Hatziolos	Pawan G. Patil
ICR Team Leader:	Marea Eleni Hatziolos	
ICR Primary Author:		

Coral Reef Rehabilitation and Management Project II - P071318		
Positions	**At ICR**	**At Approval**
Vice President:	Pamela Cox	Jemal-ud-din Kassum
Country Director:	Stefan G. Koeberle	Andrew D. Steer
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Project Team Leader:	Marea Eleni Hatziolos	Pawan G. Patil
ICR Team Leader:	Marea Eleni Hatziolos	
ICR Primary Author:	Takayuki Hagiwara (FAO)	

F. Results Framework Analysis

Project Development Objectives (from Project Appraisal Document)
The objective of the proposed loan, credit and GEF trust fund grant is to establish viable reef management systems in at least six priority Districts, through a financially sustainable program that is nationally coordinated but decentralized in implementation, in order to empower and to support coastal communities to sustainably co-manage the use of coral reefs and associated ecosystem resources, which will revive damaged or preserve intact coral reef ecosystems and in turn, enhance the welfare of these communities in Indonesia.

Revised Project Development Objectives
N/A
Global Environment Objectives (from Project Appraisal Document)
The global objective is to protect, rehabilitate, and achieve sustainable use of coral reefs and associated ecosystems in eastern Indonesia.

Revised Global Environment Objectives (as approved by original approving authority)
N/A

(a) PDO Indicator(s)

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 1 :	Collaboratively managed fully-protected no-take zones, covering 10%, on average, of reefs in all project managed areas by EOP.			
Value (quantitative or Qualitative)	7.50	10% covered by marine conservation areas	10% covered by fully protected, no-take zones.	15%
Date achieved	05/25/2004	12/31/2009	12/30/2011	12/31/2011
Comments (incl. % achievement)	Includes areas under national, district, and village jurisdiction. The indicator was revised to specify no-take zones which afford more protection than "Marine Protected Areas." Level of management effectiveness of MPAs and MCAs varies by location.			
Indicator 2 :	70 % of operating costs of program activities fully integrated into target district Government Programs and funded independent of COREMAP II by EOP.			
Value (quantitative or Qualitative)	0	70%	N/A	70%
Date achieved	05/25/2004	12/31/2009		12/31/2011
Comments (incl. % achievement)	This indicator is a reflection of project sustainability after EOP. If operating costs are integrated into District budgets prior to EOP, the Project activities and outcomes are more likely to be sustained. Districts had budgeted funds to continue after EOP.			
Indicator 3 :	Awareness about the importance of coral reefs increases to or is maintained at 70 % in all participating districts.			
Value (quantitative or Qualitative)	0	70%	n/a	75%
Date achieved	05/25/2004	12/31/2009		12/31/2011
Comments (incl. % achievement)	Strong anecdotal evidence exists that awareness extends beyond COREMAP communities to the general public as a result of outreach materials, top ten songs and multi-media campaigns.			
Indicator 4 :	Significant improvements in live coral cover in project managed areas relative to non-project areas, in 80 % of samples sites.			
Value (quantitative or Qualitative)	varies by location	5% increase in live coral annually until coverage similar to pristine reefs	Significant improvement in 80% of sample sites	Significant improvement in 71% of sample sites
Date achieved	05/25/2004	12/31/2009	12/31/2011	12/31/2011
Comments (incl. % achievement)	Significant refers to statistically significant positive change in coral cover over time, relative to non-project areas. Although mean trends on COREMAP reefs were largely positive, lack of controls outside C2 sites made interpretation of impact difficult			

Indicator 5 :	Reef fish population improved based on CPUE of fishers using traditional reef fishing gear and/or visual census in selected project sites at EOP in 80% sample sites, compared to expected decline in control areas (outside project areas).			
Value (quantitative or Qualitative)	CPUE at Time 0	35% increase in CPUE for early-breeding indicator species; 10% increase for medium-size indicator species	80% of project sites have increased fish population relative to control areas	29% Increase of reef-fish population by visual census at the sample sites
Date achieved	05/25/2004	12/31/2009	12/31/2011	12/31/2011
Comments (incl. % achievement)	Results via the two different methods (interviewing fishermen for CPUE data on economically important species vs. underwater observations along transect lines of reef fish) were mixed and neither method generated results with confidence.			
Indicator 6 :	Total income of project beneficiary group members increased by 10 % by EOP.			
Value (quantitative or Qualitative)	0	10%	n/a	21%
Date achieved	05/25/2004	12/31/2009		12/31/2011
Comments (incl. % achievement)	On average C2 areas incomes have increased 21% since 2008. Measures were also made against a control group using BPS provincial income data; and findings were that project areas were all above poverty levels. Excellent results were found in Raja Ampat.			
Indicator 7 :	At least 70% of fishers/ beneficiaries in coastal communities in program managed areas perceive the project has had a positive impact on their welfare.			
Value (quantitative or Qualitative)	0%	70%	N/A	84%
Date achieved	05/25/2009	12/31/2009		12/31/2011
Comments (incl. % achievement)	The target of 70% was exceeded by 15% by end of project. An overwhelming majority of those censused by LIPI perceived the project had been beneficial to them.			

(b) GEO Indicator(s)

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 1 :	N/A			
Value (quantitative or Qualitative)				
Date achieved				
Comments (incl. % achievement)				

(c) Intermediate Outcome Indicator(s)

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 1 :	District laws/regulation for enabling co-management of coral reef fisheries/ecosystem and establishment of MCAs enacted and adopted in all program districts.			
Value (quantitative or Qualitative)	0	6 districts	7 districts	7 districts
Date achieved	05/25/2004	12/31/2009	12/31/2011	12/31/2011
Comments (incl. % achievement)	•District law on co-management of coral reef fisheries/ecosystem drafted in 7 districts and legalized in 5 districts. •District Marine Protected Area (MPA) legalized in 6 districts through Bupati decree and MMAF minister's decree			
Indicator 2 :	Coral Reef Management Plans prepared and implemented and DPL established (endorsed Perdes) by at least 70 % of target villages.			
Value (quantitative or Qualitative)	0 CRMP 0 DPL 0 Perdes	291 - CRMP 291 - DPL 291 - Perdes	250 - CRMP 250 - DPL 250 - Perdes	358 – CRMP 317 - DPL 358 - Perdes
Date achieved	05/25/2004	12/31/2009	12/31/2011	12/31/2011
Comments (incl. % achievement)	The original target was 291 villages (70% of 416). The target was reduced to 358 from 416 villages, but the project worked with all 358 to establish Village and Coastal Resource Management Plans (CRMPs/ RPTK), codified in village decrees, "Perdes."			
Indicator 3 :	Collaborative surveillance and enforcement (MCS) established at district level and village level and became operational.			
Value (quantitative or Qualitative)	0	6 districts	7 districts	7 districts
Date achieved	05/25/2004	12/31/2009	12/31/2011	12/31/2011
Comments (incl. % achievement)	MCS was established and maintained at both at district (Dinas KP, PHKA-MoFor, Police, Navy, Court) and village (community conservation group) levels. It remains operational with support from Districts.			
Indicator 4 :	Financial viable alternative income generating (AIG) piloted in at least 75 % target villages.			
Value (quantitative or Qualitative)	0 villages	288 villages (75% of 416)	250 villages (75% of 358)	358 villages (100% of 358)
Date achieved	05/25/2004	12/31/2009	12/31/2011	12/31/2011
Comments (incl. % achievement)	A total of 1,450 AIGs have been piloted throughout the target villages with seed funds. All villages have at least several financially viable enterprises. However, due to the limited amount of seed funds, the revenue from these is low and thus			

	supplemental.			
Indicator 5 :	Number of infringements of park rules and regulation observed per unit of patrolling by park ranger team decreased by end of the project as result of increase of park Management Effectiveness.			
Value (quantitative or Qualitative)	High level of destructive fishing and poaching	Overall reduction in Park infringements and destructive fishing in COREMAP areas	N/A	Results have been dramatic with MCS helping to reduce illegal/destructive fishing practices by about 60% from 2,200 infringements in 2005 to 880 infringements in 2010, with 70% of cases prosecuted successfully. illegal/destructive
Date achieved	05/25/2004	12/31/2009		12/31/2011
Comments (incl. % achievement)	Due to increase in patrolling capacity, the park rangers were able to apprehend more violators and prosecute them. At the same time, because of enhanced MCS and collaborative coral reef management, the number of cases in COREMAP areas has dropped.			
Indicator 6 :	Public awareness campaign, education prepared and implemented.			
Value (quantitative or Qualitative)	Only some environmental education materials about coral reefs available in schools--no local language content.	• Public awareness campaign prepared and implemented annually • 75 % of school have teachers trained and majority of schools have local language content	N/A	• Public awareness campaign prepared and implemented 42 times or six times per district in all participating district • 92 % of school have teachers trained, and nearly all have local language content
Date achieved	05/25/2012	12/31/2009		12/31/2011
Comments (incl. % achievement)	Awareness campaigns have been conducted annually in 7 participating district since 2006 up to 2011. Total number of school in all participating districts is 998. Teachers were trained in 919 of them, or 92 % of the schools.			

G. Ratings of Project Performance in ISRs

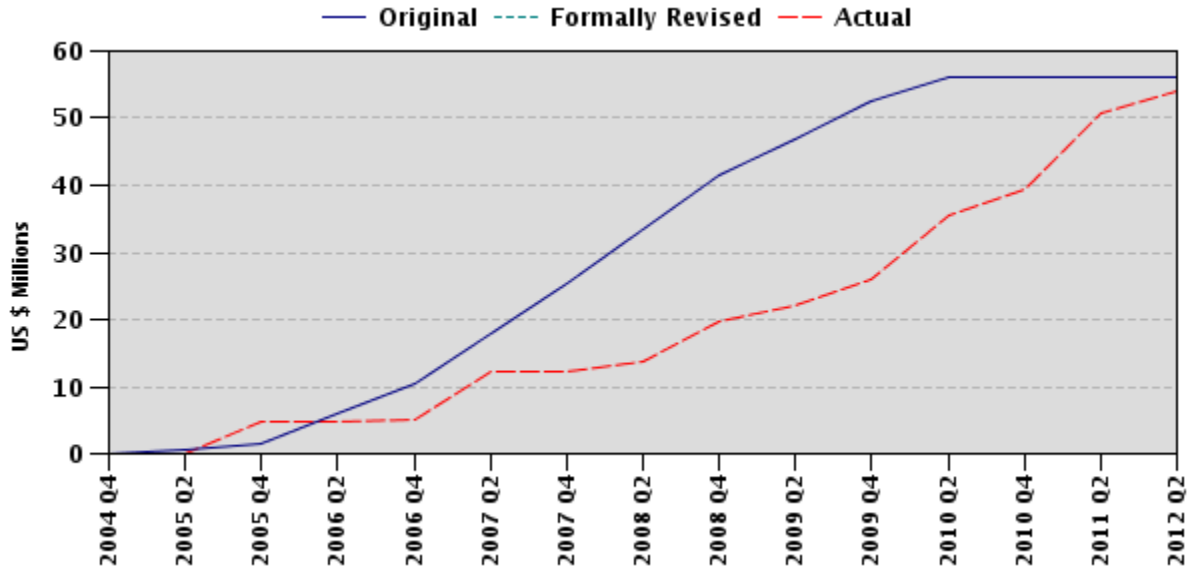
-						
No.	**Date ISR Archived**	**DO**	**GEO**	**IP**	**Actual Disbursements (USD millions)**	
					Project 1	**Project 2**
1	06/28/2004	S	S	S	0.00	0.00
2	11/30/2004	S	S	S	0.00	0.00
3	05/04/2005	S	S	S	0.17	0.00
4	05/24/2006	S	S	S	4.99	0.48
5	01/22/2007	MS	MS	MS	12.09	0.61
6	03/12/2008	MS	MS	MS	15.04	1.13
7	06/30/2009	MS	MS	MS	25.97	1.99
8	01/26/2010	MU	MU	MU	35.48	2.97
9	02/02/2011	MS	MS	MS	50.76	4.89

H. Restructuring (if any)

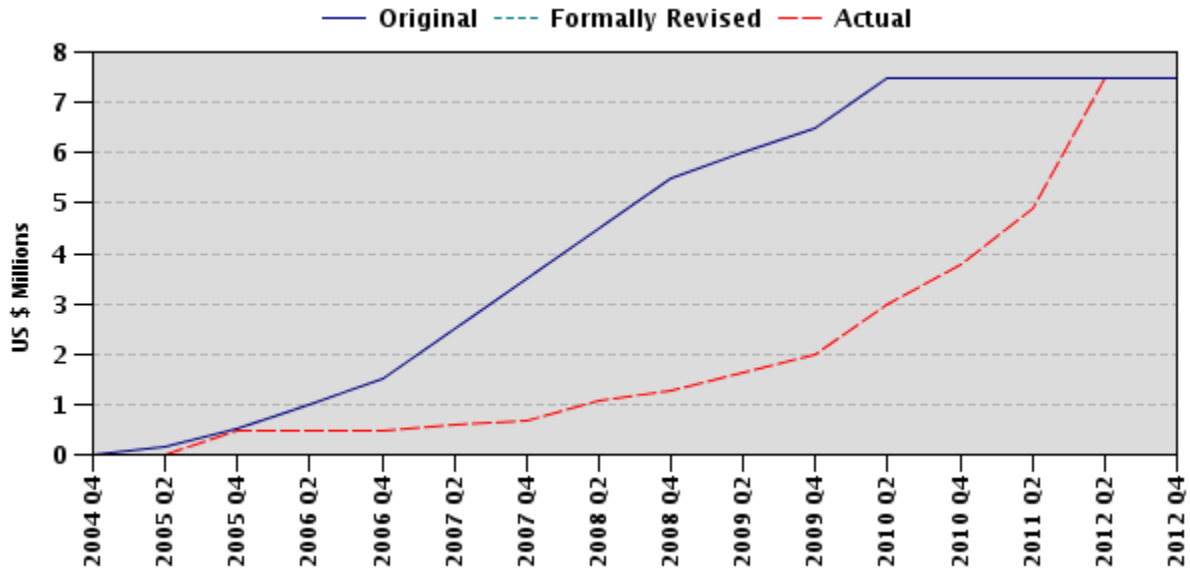
Restructuring Date(s)	Board Approved		ISR Ratings at Restructuring			Amount Disbursed at Restructuring in USD millions		Reason for Restructuring & Key Changes Made
	PDO Change	GEO Change	DO	GEO	IP	Project1	Project 2	
10/30/2009	N	N						Project closing date extended by one year to 12/30/2010.
06/30/2010	N		MU		MU	39.53		A second order restructuring was approved to relieve implementation bottlenecks related to disbursement, institutional arrangements between executing agencies, reducing number of target communities and non-performing field activities. Some KPIs were modified in response to MTR recommendations, but PDO was not revised. A two year extension was also approved to allow project to fully disburse, which it did.
06/30/2010		N		MU	MU		3.05	Restructuring involved extending the project by two years and reallocating budget across activities that were 100% GEF financed to speed up disbursement.

I. Disbursement Profile

P071316



P071318



1. Project Context, Development and Global Environment Objectives Design

1.1 Context at Appraisal

Indonesia spans a larger archipelago than any other country, and contains at least 5.1 million hectares of coral reefs. This is roughly 51 percent of the coral reefs in Southeast Asia and 18 percent of the world's coral reefs. The Indonesian coastal and marine sector, and in particular the small-scale fisheries supported by coral reef ecosystems, is a significant productive asset for the country and the millions of poor fishers dependent on them. However, almost two-thirds (65%) of Indonesia's coral reefs are considered threatened from overfishing, and almost half are considered threatened specifically from destructive fishing practices.

In the face of this rapid deterioration of its coral reefs, the government of Indonesia (GoI) identified coral reef ecosystem management as a national priority in the mid-1990s and requested the Bank's assistance to finance a three-phase Adaptable Program Loan (APL), called the Coral Reef Rehabilitation and Management Program (COREMAP). The GoI's medium-term development strategy (PROPENAS) and the Guidelines of State Policy (1999-2004) supported a coastal and marine sector policy which includes efficient and sustainable management of maritime resources, rehabilitation of damaged coastal and marine ecosystems, and improvement of the socio-economic conditions of coastal communities. Moreover, a new Ministry for Marine Affairs and Fisheries (MMAF) was established in 1999 with the mandate to ensure sustainable use of Indonesia's coastal ecosystems.

Following the success of COREMAP Phase I (outcome rated satisfactory by both the ICR and the Independent Evaluation Group), COREMAP Phase II (herein after referred as the project or COREMAP II) was intended to contribute to the GoI's objectives of (i) sustainable utilization of the coastal ecosystem; (ii) decentralized natural resource management; and (iii) raising income levels and improving living standards in the coastal zone and on small islands, particularly in small-scale fishing communities, through marine reserves. Through collaborative management partnerships, the project aimed to help rejuvenate coral reef fisheries and diversify the livelihood opportunities of participating program fishing communities. The Indonesia Country Assistance Strategy (CAS) set the context for the project by shifting focus from an approach of *protecting* the poor to one of *empowering* the poor. With this shift, the CAS sought to address the core issue of governance in Indonesia, as well as achieve two objectives: (i) to improve the investment climate, and (ii) to make service delivery responsive to the poor.

1.2 Original Project Development Objectives (PDO) and Key Indicators (as approved)

The objective of the project is to establish viable reef management systems in at least six priority Districts, through a financially sustainable program that is nationally coordinated but decentralized in implementation, in order to empower and to support coastal communities to sustainably co-manage the use of coral reefs and associated ecosystem

resources, which will revive damaged or preserve intact coral reef ecosystems and in turn, enhance the welfare of these communities in Indonesia.

1.3 Original Global Environment Objectives (GEO) and Key Indicators (as approved)

Formally there was no separate GEO because the global environment objectives were integrated into the PDO. The PAD Data Sheet included only one statement of objectives, which was in turn used for both the GEF grant agreement and the IDA credit agreement. Likewise, there was only one set of key indicators, which applied to the integrated PDO/GEO objectives.

However, it is useful to note that the elements of the statement of objectives most closely related to environmental goals were to help revive damaged reefs, preserve intact reefs, and improve sustainable use of coral reefs and associated ecosystems. These objectives would be achieved through, and in conjunction with, the project objectives of establishing community-based reef management systems, strengthening national capacity and coordination, and empowering and providing benefits to coastal communities.

The seven key performance indicators (KPIs included in PAD's Technical Annex 3) at appraisal were:

Management and Empowerment Indicators

1. Collaboratively managed marine conservation areas cover 10 % of program district reefs by the end of project (EOP).
2. Seventy percent of operating costs of program activities fully integrated into target district Government programs and funded independent of COREMAP II by EOP.
3. Awareness about the importance of coral reefs increases to and/or maintained at 70 % in all program districts.

Biophysical Indicators

4. Live coral cover in program districts increases by 5 % annually until levels are reached and maintained comparable to those of similar reefs in well-managed or pristine areas.
5. Average catch-per-unit-effort (CPUE) for early-breeding indicator species harvested by each of the main sustainable fishing techniques in program districts increases 35% by EOP, while average CPUE for medium-size indicator species harvested by each of the main sustainable fishing techniques in program districts increases by 10% by EOP.

Socio-economic and poverty indicators

6. Total income received from, and the total number of people receiving their income from, sustainable reef-based and reef-substitute activities in program districts increases by 10 % by EOP.
7. At least 70% of fishers/ beneficiaries in coastal communities in program districts perceive the program has had a positive impact on their welfare and economic status by EOP.

1.4 Revised PDO (as approved by original approving authority) and Key Indicators, and reasons/justification

The PDO was not revised. However, because the original Development Credit Agreement and GEF Grant Agreement had used a slightly modified version of the PDO, the language in the legal agreements was amended in the June 2010 restructuring to correspond to the PDO in the PAD. (The variant of the PDO in the original legal documents was "to assist the Borrower in implementing the second phase of COREMAP, in particular, enhancing the welfare of coastal communities through the establishment of viable coral reef management systems consisting of a program aimed at empowering and supporting coastal communities to co-manage, in a sustainable manner, the use of coral reefs and associated ecosystem resources.")

The wordings of KPI 1 and 7 were changed slightly, while maintaining the key concepts. Three of the KPI (4, 5 and 6) were formally revised at restructuring. The target values of two biophysical indicators were unrealistic (i.e., to restore live coral in the entire program district to the level found in pristine ecosystems, and to increase average catch per unit effort of indicator species by 35% by EOP) and/or outside the control of the project (e.g., did not allow for effects of ocean warming and acidification). One socio-economic indicator (KPI 6) was revised and simplified to be more measurable and to fully capture benefits from revolving fund activities (regardless of whether they supported reef or reef-substitution activities). The new indicators were as follows:

1. Collaboratively managed fully-protected no-take zones, covering 10%, on average, of reefs in all project managed areas by EOP.
4. Significant improvements in live coral cover in project managed areas relative to non-project areas, in 80% of samples sites.
5. Reef fish population improved based on catch-per-unit effort (CPUE) of fishers using traditional reef fishing gear and/or visual census in selected project sites at EOP in 80 % of sample sites, compared to expected decline in control areas (outside project areas).
6. Total income of project beneficiary group members increased by 10% by EOP.
7. At least 70% of fishers/ beneficiaries in coastal communities in program managed areas perceive the project has had a positive impact on their welfare.

1.5 Revised GEO (as approved by original approving authority) and Key Indicators, and reasons/justification

The combined GEO/PDO was not revised, but the statement of objectives used in the legal agreements included some minor discrepancies that were corrected to make them fully consistent with the PAD (see Section 1.4).

1.6 Main Beneficiaries

The program's direct target beneficiaries were 358 coastal communities in seven districts: (1) Selayar; (2) Pangkep; (3) Sikka; (4) Buton; (5) Wakatobi; (6) Biak; and (7) Raja Ampat. These districts were selected because they included communities which were

affected by pervasive poverty and extensive degradation of coastal resources. The beneficiaries were highly dependent on small-scale reef fishing for their livelihood, with many claiming that their income from fishing was not sufficient to meet even their basic subsistence needs. Many of the target communities used destructive and illegal fishing methods (cyanide and blast fishing) in an attempt to increase fish catches.

By providing benefits to these communities, the project intended to reduce economic pressures that contributed to unsustainable fishing practices, while also fostering awareness of the longer term economic benefits of sustainable use and building support for improved coral reef management. The environmental outcome of improved reef health and sustainability would not only benefit these coastal communities, but broader local, regional, and global interests as well.

1.7 Original Components (as approved)[1]

Component A: Institutional Strengthening (US$16.6)
The objective of this component was to enhance government institutional responsiveness to meet the needs of coastal communities, in support of collaborative management of marine reserves and other marine protected areas. Key activities under this component include: (i) Program Coordination, M&E, and Training; (ii) Coral Reef Research and Monitoring - CRITC; and (iii) Legal, Policy and Strategy Assistance. This component was designed to enhance capacity of participating institutions while promoting policies on decentralization and co-management of coral reefs and associated ecosystems through technical assistance, human resource development, and legal input to support decentralization in managing coral reefs.

Component B: Community Based and Collaborative Management (US$41.6 million)
The objective of this component was to empower all coastal communities and institutions throughout program districts, through legal means codifying community management plans along with technical and financial assistance, to sustainably co-manage coral reefs and associated ecosystems. This would lead to higher productivity and increased incomes, which would, in turn, enhance community welfare. The project aimed to replace short-term exploitative practices with the tools and knowledge to generate more sustained benefit flows from better management practices. The objective was to empower local governments and coastal communities in the seven districts to manage extensive and bio-diverse coral reef ecosystems in a cost-effective and sustainable way.

The component aimed to build community-based institutions and coral reef co-management capacity among the target communities, while also improving their livelihood base, by (i) setting up Coral Reef Management Committees (LPSTK) at each

[1] **Note: these component totals were identified in the PAD as base costs. They do not include price contingencies for inflation, etc., estimated at 6%, included in the final Loan Agreement.**

village that in turn would support four community groups (*pokmas*) on the topics of production, gender, conservation, and monitoring, control and surveillance (MCS), (ii) preparing and implementing Community-based Coral Reef Management Plans under the leadership of LPSTK and *pokmas*, (iii) providing village grants for building small-scale infrastructure and providing equipments; and (iv) establishing community-based revolving funds for alternative income generation (AIG) activities. At the same time, the project would provide support to develop management capacity of District Marine Conservation Areas and National Marine Parks under the Ministry of Forestry, Directorate General of Forest Protection and Nature Conservation (PHKA).

Component C: Public Awareness, Education and Sea Partnership (US$11.7 million)
The objective of this component was to increase societal awareness of the benefits of coral reef ecosystem conservation and sustainable use, which would in turn lead to behavioral change. It would empower children and youth through an education and scholarship program to help them move away from behaviors destructive to coral reefs, benefit key stakeholders through advocacy, and strengthen local governments and communities through technical assistance and awareness campaigns. Key activities included (i) public awareness campaigns through dissemination of coral reef advocacy information through the media, (ii) education programs to produce coral reef education materials for formal primary and secondary education curriculum in each program district, program district teacher training, and national reef education events for children and youth, and (iii) a Sea Partnership Program for secondary, university and graduate scholarships, and post-education placement to support program activities and expansion of the existing practical field training program to support village-based activities.

1.8 Revised Components

The components were not revised.

1.9 Other significant changes

The project was restructured in October 2009 and June 2010 (both were second-order, approved by the country director). The first restructuring extended the closing date by one year, to December 31, 2010. This was considered an interim extension to allow time to finalize the specifics and complete the processing of a more substantive restructuring to address issues that were delaying implementation progress and to improve the likelihood of fully achieving the project objectives. These included the root causes of delayed disbursement and poor procurement. Among these were delays in allocation of the budget (DIPA) from Central to District Level Government in order to co-finance certain project activities; weak procurement capacity among NCU staff owing to complicated Bank procurement policies which were not aligned with Government policies or the ADB's for that matter, and delays in decentralized financial management accounting and reporting.

The second and more substantive restructuring involved: (i) extending the closing date by another year—through December 2011; (ii) cancelling a portion of the loan ($3,002,374 in IBRD funds) at the request of the GOI and reallocating the remaining

proceeds to streamline implementation; and (iii) modifying some KPIs based on recommendations from the MTR and reinforced by the new Bank Task Team (see section 1.3.1). Another significant change included reducing the total number of villages in which COREMAP II would be implemented from 416 to 357. The revisions were based on recommendations from the MTR which called for reducing the number of new communities to receive COREMAP assistance to the number in which core activities could be successfully rolled out without compromising the quality of implementation. The total number of communities in Eastern Indonesia in which COREMAP II would be implemented via a decentralized approach was agreed to be 357. The number of districts involved increased from six to seven because one of the original districts was split, creating a new, 7th district (Wakatobi).

2. Key Factors Affecting Implementation and Outcomes

2.1 Project Preparation, Design and Quality at Entry

Soundness of background analysis. Background analysis was very robust. As the second phase in an APL, the project incorporated the lessons learned in COREMAP-I as well as the lessons that contributed to the original design of the APL. The first phase was assessed not only through the Bank's normal ICR process, but was also the subject of a detailed review by the Bank's Operations Evaluation Department (OED), and an independent evaluation by the International Union for Conservation of Nature (IUCN). Additional lessons, both positive and negative, were also derived from other Bank and non-Bank projects or initiatives involving community empowerment in general and community participation in natural resources management and conservation in particular. Some of the key design considerations drawn from these lessons were focused on decentralizing resources and decision making to the local level wherever possible, approaching coral reef management as an integral part of community development rather than a compartmentalized problem, and developing transparent and accountable village-based financial management mechanisms.

Assessment of project design. Although the objectives, components, organization, and financing arrangements for the project were well aligned with country priorities and generally well designed, there were some shortcomings related to project complexity and scope that emerged later. These raised questions at the MTR about the realism of design, given the institutional capacity, and implementation environment for decentralized execution of a project this complex.

A key challenge in Phase II was how to scale up the pilot initiatives in Phase I and promote a decentralized development strategy with a community-centered approach, while also involving numerous agencies, and strengthening the capacity of COREMAP districts in order to achieve collaborative management. This challenge was translated into a new set of institutional arrangements involving three implementing agencies at the national level, vertical integration across four levels of government, and seven districts. These included 357 coastal communities, spanning a vast ocean area. The project included 3 components, 12 subcomponents, and 63 distinct activities in a project area

spanning vast distances with the aim of achieving environmental, socio-economic development, and poverty alleviation objectives. The complexity of administrative and financial systems at both the central and district government level added further challenges. Despite seeming to depart from the objective of keeping things simple and decentralized, the implementing agencies ultimately agreed (during the interview at the ICR) that such a complex design was largely unavoidable, and indeed necessary to achieve the project objective.

Areas where the project design could have been strengthened include the definition of KPIs and design of the alternative income generation (AIG) subcomponent. Expectations for the impact of the AIG activity were probably too high relative to the financial and technical resources committed to it. The PAD did not specifically detail the mechanism for delivering AIG improvements among the target communities nor set out a clear guidelines to operate the revolving funds at the village level. In addition, some project KPIs were unrealistic or not clearly defined, especially the biophysical indicators, which led to confusion during implementation about designing methodologies to measure them. The issues are discussed in more detail in other sections.

Government commitment. Government commitment during preparation was very good, both at the national and district levels. Participation in the design of the APL, as well as implementation of the first phase, along with stakeholder consultations, strengthened the foundation for the government's engagement during preparation of phase two. The borrower's views and insights (and in some cases reservations) were valuable in designing phase two, and in particular defining the appropriate institutional arrangements.

Assessment of risks. The PAD lists the number of covenants – Conditions of Negotiations, based on the identified risks. It also covers implementation issues based on lessons learned from COREMAP I and other Bank projects. Critical risks and possible controversial aspects lay out the issues and counter-measures clearly. While assessment of the risks identified was appropriate, the PAD failed to flag implementation risks associated with a project as complex as this one, particularly given the novel implementation arrangements and the challenges inherent in a decentralized approach.

2.2 Implementation

The most notable setback in implementation was the long delay (about two and a half years) in getting meaningful implementation underway. The main factors contributing to this delay were:

Within government and project control:

(i) Change of implementation modality from the first to second phase of the APL. The Indonesian Institute of Sciences (LIPI) implemented COREMAP-I activities and funds as a centrally managing and coordinating project, while COREMAP-II adopted a decentralized mode.

(ii) Lengthy process required for changes to national budget authorizations (known as DIPA) required for release of both counterpart and Bank/donor financing,

combined with disconnect between timing of project and government budget timetables and planning.

(iii) Lack of familiarity with Bank's administrative and procurement procedures by project implementers.

Outside of government and project control:

(iv) Logistical challenges associated with the vast spatial coverage by the project.

(v) High costs incurred to immediate follow-up to solve problems because of distance, poor communication tools available with remote communities and travel requirements.

(vi) Sudden bankruptcy of the consulting firm hired to provide technical assistance to the project.

Project at risk status and corrective action. During the first several years of implementation, ratings in the project status reports were slow to reflect these implementation problems and tended to anticipate near-term improvements in performance that did not materialize. Even after the ratings were lowered, they still did not show the project in problem status, largely due to reasonably good progress on two of the main project components (Institution Strengthening and Public Awareness), which was not matched by convincing progress on the component most closely linked to the project objective (Community-Based Collaborative Management).

As a result, the project did not officially fall into problem status until early 2010, when a short-term extension had already been approved and preparation was well underway on the terms of a restructuring that would help address underlying issues and get the project back on track. This was more an adjustment of the ratings than a change in performance, and came at a time when considerable supervision effort had already been put into the project and performance was actually improving. The mid-term review, conducted toward the end of the initial delays provided a set of good recommendations, which contributed to the restructuring proposal and improvements in project performance. The restructuring, combined with the closing date extensions, gave the project the footing and the time required to recover from its initial delays, provide effective support to the community-based and collaborative coral-reef management (CBM) component, and achieve its objectives.

Key factors that contributed to this turnaround and the project's ultimate success include: (i) proactive attitudes among project implementers to deal with issues; (ii) strong ownership among local stakeholders; (iii) the hiring of an Executive Advisor to handle day to day operations; (iv) the linkage between the promotion of CBM at the village levels and the constant information dissemination through public awareness campaigns and educational programs.

2.3 Monitoring and Evaluation (M&E) Design, Implementation and Utilization

Design: The seven KPIs were designed to measure the PDO's achievements in the three aspects: (i) management and empowerment; (ii) biophysical; and (iii) socio-economic and poverty. In general, the sets of KPIs for the first and last aspects allow a sound validation, but the two biophysical indicators, albeit revised at the restructuring, are not scientifically robust enough to determine whether the changes in coral growth and fish population can be attributed to the project. These two indicators were designed to measure the effects of improved management of coral reefs primarily through (i) establishment of No-Take Zones and elimination of destructive fishing in the project area. Because changes in live coral cover are also influenced by factors outside the control of the project, i.e., environmental factors like sea surface temperature, acidification, bleaching and storm damage (which are related to climate change), it is impossible to ascribe the changes in live coral cover to project interventions without adequate control plots outside the range of interventions to compare changes in coral cover to. On the other hand, it is entirely possible (and quite likely) that coral reefs outside the COREMAP project area actually suffered declines in coral cover as a result of higher incidence of destructive fishing practices on these reefs. Thus the difference in live coral cover between project intervention sites and those reefs outside the Project area—also subject to climate change impacts—might have been even greater than the positive change in coral cover from Time 0 to the end of Project recorded in most COREMAP sites.

For fish population, using visual census and CPUE as methods to measure intervention effectiveness on fish population was also scientifically inappropriate because (i) visual censuses are useful for biodiversity data but less useful for population trends; (ii) sample size of CREEL data were too small to gauge program effectiveness on fishing practices across the entire district; and (iii) CREEL data collection was too inconsistent (e.g., schedule, personnel).

COREMAP II developed an Excel based Management Information System (MIS), Form 28, to monitor the periodic progresses of the project. The flexibility of Excel sheets resulted in inconsistency of the form and data and unnecessary data clearing.

Implementation: The seven KPIs were monitored separately by the NCU and LIPI. The NCU was mainly responsible for monitoring No.1, 2, and 3, while LIPI was responsible for measuring the rest of KPIs. LIPI conducted a baseline survey in 2008 and impact survey in 2010 and 2011.

Each program implementation unit (PIU) had an M&E officer responsible for gathering and compiling data to be sent to the NCU in monitoring the progress of the project. The NCU was then responsible for extracting data from the form to prepare progress reports for the GoI and the Bank. However, the data management at all levels remained weak throughout the project period and the majority of PIUs failed to submit Form 28 to the NCU in time. In addition, the NCU was not able to consolidate the data for analysis and project management due to data inconsistency.

In 2011, with technical support from the Bank and FAO cooperative program, the project reorganized Form 28 and developed: (i) a web-based MIS; (ii) village profiles which store all village-based activities conducted under component 2; and (iii) a set of project progress monitoring formats, which greatly improved the quality and utility of the M&E system, allowing data queries and easy comparisons of outputs and performance across geographic areas as well as within a given district, down to the Village level. This web-based M&E System will be put on a GIS platform in housed in LIPI, and eventually be made available to the public. These improvements in the resolution of performance by geographic area and the ability to correlate behavior change with management interventions, will allow future interventions to be targeted where they are needed most and provided documentation of management effectiveness.

Utilization: M&E implementation, data collection methods, and actual KPI values were regularly reviewed during the Bank's supervision missions, which contributed to improvements in the M&E arrangements themselves, M&E capacity and performance, revision of some KPIs, and other elements of the project restructuring (such as cancellation of some activities and narrower targeting of resources to villages, as well as confidence in the achievability of objectives and justification of closing date extension). Despite the revision of the biophysical indicators, both the counterparts and the Bank recognized that they still had shortcomings even after restructuring. [Design of robust indicators that can ascribe outcomes to project interventions is a key priority in the design of the planned third phase of the APL.]

The output data were closely correlated with the expenditures and the NCU used the expenditure data to understand the level of project outputs. The submission of Form 28 from each implementer was often delayed and the form was not effectively used in project management or data analysis. This is the same for the web-based MIS due to the late completion of this tool. But the process of its development helped the NCU to clean and consolidate the data to be used for the borrower's ICR.

2.4 Safeguard and Fiduciary Compliance

Social and Environmental Safeguards

Compliance with social and environmental safeguards was found **satisfactory**. A training course on safeguard policies held for the government staff proved to be helpful in improving awareness of the importance of compliance with the Bank's safeguard policies. The project had the Environmental and Social Impact Management Framework, which provided a positive and negative list for community infrastructure. Environmentally harmful projects were largely screened out by using the framework. The followings are some of examples that the project handled well:

- LPSTK was established at each village to support participatory development of Village and Coral Reef Management Plans (RPTK). Establishment of Village No-Take Areas (DPLs) on the reef was done with the support of this group, and buy-in by the larger community. In the case of Village Information Centers (VIC),

which required land for construction, the LPSTK consulted with landowners to identify those who might be willing to contribute land voluntarily without compensation for establishment of the VIC. Once agreed, LPSTK issued letters of receipt to the land owners, confirming that the contribution of land was voluntary, and these were filed with the PMU.

- The Bajo community was identified as Indigenous People in the project area. They were well represented in project activities.
- Income generating activities such as sea weed culture and aquaculture were carried out in an environmentally friendly way. Village infrastructure, financed by village grants, was also developed with minimal damage to the surrounding environment.

Procurement

The project's procurement performance is found **moderately satisfactory**. Using the Bank's procurement methods in the national budget authorization (DIPA) context, the district level budgets were often delayed which proved challenging for procurement of goods and services. This was a major challenge for items that required the local counterpart funds. However, the Bank's procurement team and the NCU's procurement committee worked collaboratively to accelerate the procurement process after the mid-term and completed many outstanding issues on procurement by the project closure. Refresher courses on procurement held for Program Management Unit (PMU) staff in early 2011 proved to be helpful in improving the understanding of the important of compliance with procurement policy. However, it may be more efficient in the future (i.e., Phase 3) to avoid local level procurement and focus on building capacity at the level of the NCU.

Financial Management

The project's financial management performance is found **moderately satisfactory**. Initially, the project was: (a) delayed in submission of the project financial reports; (b) slow in progress in resolving the backlogged items; and (c) slow in response in resolving audit findings. These weaknesses were also found in village-grant book-keeping and seed fund management at the community level. This was improved from 2010, after the updated financial management manual was finally issued and additional training was provided to the village coral reef management committee (LPTSK) and village micro saving and credit union (LKM). The project also made efforts to improve the timing of financial reporting, resolve backlogs, and follow up on audit findings. The project audit reports were consistently submitted on time to the Bank.

2.5 Post-completion Operation/Next Phase

The GoI allocated budgets to keep a group of core staff of the NCU for the C3 preparation. The request for C3 has already been submitted to the Bank as well as to the national planning agency (BAPPENAS). Each target district also allocated budgets to

maintain core activities to provide direct support to the target villages. The preparation of C3 is expected to be completed by March 2013.

In parallel with preparation of the COREMAP II ICR, COREMAP III is being prepared based on the lessons and experience gained from COREMAP II. The APL, anticipated a three phase program. COREMAP III aims to institutionalize the decentralized COREMAP model developed under phase II. Building on lessons learned in the acceleration phase of COREMAP (II), the community co-management model for coral reef conservation and sustainable use will be simplified and reduced in cost in Phase III, with an aim to extend the COREMAP model to other districts effectively. In response to the limited impact of AIGs in phase II, COREMAP III will scale up support for alternative livelihoods in conjunction with MPA establishment and zoning and permitting of fishing effort, in light of continued unsustainable levels of fishing pressure on coral reefs. Support will include production infrastructure, technical and financial assistance and market access to accelerate uptake of new income generating opportunities leading to livelihood transformation. It will also continue to strengthen institutions with an emphasis at the District level, and help shape policies at the national and district level to align economic incentives with desired behavioral change by coral reef user groups. Phase III will benefit from improved monitoring and evaluation with adequate controls, and will seek to shift implementation responsibility away from the national level to provincial and particularly District level authorities, to embed the COREMAP model in regional and municipal development plans in coastal hubs across Eastern Indonesia.

3. Assessment of Outcomes

3.1 Relevance of Objectives, Design and Implementation

The project objectives remain highly relevant to the priorities of Indonesia. Under the leadership of the President of Indonesia, Susilo Bambang Yudhoyono, the Coral Triangle Initiative on Coral Reefs, Fisheries, and Food Security (CTI-CFF) was developed with its neighboring five countries in 2009 and set a 10-year plan of action to address the urgent threats facing the coastal and marine resources of one of the most biologically diverse and ecologically rich regions on earth.

Indonesia's GDP has been growing at five to six percent annually since 2002, but nearly half of Indonesia's population is still either poor or have per-capita consumption levels of less than one-third above the national poverty line. As a result, Indonesia may yet fail to reach several of its Millennium Development Goal targets. As such, improving the welfare and livelihoods of the poor, including small coastal communities dependent on degraded natural resources, is still relevant and government's priority.

COREMAP II's design, based on strengthening national capacity for coordinating institutions in implementation to provide technical, administrative and managerial support to the local governments, while supporting GoI's decentralization processes at the district and village levels, remains valid. It is important to note that GOI's commitment to mainstreaming and institutionalizing decentralization and co-management

of coral-reef and associated coastal resources remains a priority. The objective of APL Phase II was decentralization and acceleration. The project design, implementation arrangements and activities under three components were in line with APL's objective and successfully produced a decentralized COREMAP model and established 358 village-based institutions for collaborative coral reef resource -management.

3.2 Achievement of Project Development Objectives and Global Environment Objectives

The project's development and global environment objectives were combined in a single statement of objectives with three main elements that can be summarized as: (a) empowering communities to establish viable reef co-management systems including decentralized local institutions, plans, regulations and MCS; (b) helping to revive and preserve coral reefs and their associated eco-systems through establishing community-implemented Marine Protected Areas (No-Take Zones: DPL); and (c) providing welfare benefits to coastal communities through small-scale community-based infrastructure (village block grants) and supplemental income generation through revolving funds.

Management and Empowerment: Satisfactory

The project was able to establish decentralized and legally codified coral reef co-management systems, including the establishment of community-implemented Marine Protected Areas (No-Take Zones) in all 7 project districts. As shown in **KPI 1**, all districts except for Pangkep managed to establish at least 10% of coral reefs as No Take Zones as represented by areas in National Parks, district marine protected areas (KKLD), and Village No Take Zones (DPL). Fifteen percent of the total project managed areas were designated as DPL (No Take). Furthermore, it was reported that DPL would be further expanded by 3,000 ha in Raja Ampat, Biak, and Sikka, once these Regional Protected Areas are zoned. Within locally managed Marine Protected Areas, local stakeholders were fully involved in the planning and management of the DPLs through LPSTK supported community groups. Local community groups in partnership with local governments established a total of 358 Coral Reef Management Plans of which 251 have so far been approved.

Table 1. No Take Zone Percentage of Project Managed Area

No	District	Total coral area of COREMAP II (ha)	Reef coverage of no-take zones in program-managed areas (ha)				**Total no-take zone coverage (%)**
			National parks (KKL-PHKA)	District marine protected areas (KKLD)	Village no-take zones (DPLs)	Total	
1	Pangkep	167,513	1,148	3,486	362	4,996	**3**
2	Selayar	90,663	2,418	417	6,092	8,927	**10**
3	Buton	20,182	0	2,222	1,614	3,836	**19**
4	Wakatobi	118,648	39,485	0	648	40,133	**34**
5	Raja Ampat	11,841	730	Not Yet	2,307	3,037	**26**
6	Biak	35,598	2,552	Not Yet	1,316	3,868	**11**
7	Sikka	12,778	1,279	Not Yet	3,455	4,734	**37**
Total		**457,222**	**47,612**	**6,126**	**15,795**	**69,533**	**15**

Source: NCU MIS

The decentralized approach, in line with national policy reforms to empower local government to create enabling conditions for sustainable and equitable economic development in remote locations, was a hallmark of the project. The financial sustainability of these coral reef co-management systems was strengthened by the progressive absorption by District Governments (Kabupatens) of project operating costs, such that by EOP 70% of these costs were funded by local government (see **KPI 2**). Anecdotal evidence also shows that all seven districts have allocated budgets to maintain COREMAP II institutions and personnel as well as monitoring, facilitation and surveillance (MCS) operations for 2012.

As seen in **KPI 3**, based on a survey carried out in 2010 in which 420 respondents in target districts and villages were questioned, this indicator was fully met. An average of 75% of the respondents felt that healthy coral reefs were key to their lives. The level of awareness was much higher (86%) compared with the population outside of the target districts. As a result, the incidence of illegal and destructive fishing decreased by 60% across the project districts. These supporting evidences demonstrate the success of the project in meeting the objectives of establishing fully protected, collaboratively managed, decentralized reef management systems.

Biophysical: Moderately Satisfactory

Measurable increases in live coral cover in the majority of reef sites supported by the project (**KPI 4**). Overall, monitoring data showed positive trends and seemed to generally support anecdotal evidences gathered during the ICR mission. As shown in the table below, there was positive coral cover growth in six of the seven districts through LIPI monitoring and four of the seven districts through PMU monitoring.[2]

Table 2. Reef Health (live coral cover) at Permanent Plots of LIPI

No	District	2006	2007	2009	2010	2011	% Increase
1	Pangkep (No Kalmas)	32	30	38	41	38	**+19%**
2	Selayar	32	34	36	43	45	**+40%**
3	Buton	34	36	38	30	41	**+18%**
4	Wakatobi	46	47	47	42	46	**0%**
5	Raja Ampat (No Batang Pele)	22	20	27	29	30	**+33%**
6	Biak	23	28	26	20	18	**-23%**
7	Sikka	18	17	13	21	25	**+42%**
	Average	**30**	**30**	**32**	**32**	**35**	**+17%**
	% of Sites Improved						**71%**

Source: NCU MIS

[2] LIPI set up permanent plots at each district to monitor the reef health (live coral cover), while each PMU at the district monitored the reef health at randomly selected village DPLs. Mean live coral cover in village DPLs was not as high as in the LIPI plots in many districts, nor did it increase as much on average. These differences can be interpreted in several ways, not the least of which is observer bias (inconsistencies in data collection in the DPL plots), or inherent differences in environmental conditions at these sites.

As mentioned earlier (see section 2.3 M&E), although positive trends were observed in the biophysical condition of Project reefs, the two KPIs are insufficient to prove the attribution of outcomes to project interventions. This was due to a combination of sampling design problems and data collection issues. However, anecdotal evidence, data and reports provided by the project suggest that the coral reefs in project sites improved during the course of the Project. Reefs in Project districts showed a positive trend in live coral cover as an indicator of coral reef health. Reefs inside and outside No-Take Zones showed positive overall increases in coral cover in 5 of 7 districts. In the case of Wakatobi, coral cover was already at a maximum for the region so the 0 change in state is actually an indicator of success. Improved management of coral reefs was also demonstrated through a marked decrease in the use of destructive fishing practices (also see **KPI 3 and 7**). Half of reported illegal fishing led to successful prosecutions. There was a strong collaborative MCS effort including community training, formation of community support groups (Pokmas), training for fisheries inspectors, and coordination workshops, and establishment of a radio system to support enforcement activities. Cases of illegal fishing led to successful prosecution rates of: 100% in Buton, Wakatobi, and Sikka; 70% in Pangkep; and 12% in Selayar.

The data on status of reef fish populations **(KP5)** was less clear. Data on Catch per Unit Effort (derived from interviews with fishermen) were not consistently collected over the course of the project, due to seasonal changes in gear, fish abundance, etc, making results difficult to interpret. The data showed stability in catches in three districts, while two districts – Sikka and Raja Ampat – showed significant increase, and one – Buton – showed a decrease in yield. Data on visual census of reef fish abundance, collected along transects of reefs at the same time as live coral cover was monitored, were highly variable and were more a reflection of fish biodiversity than increases in abundance or biomass. However, community members interviewed reported increased numbers of fish in the No-Take Zones, as well as the return of rarer species which had not been seen in years in some places.

Table 3. Fish Population Improvement (based on visual census method)

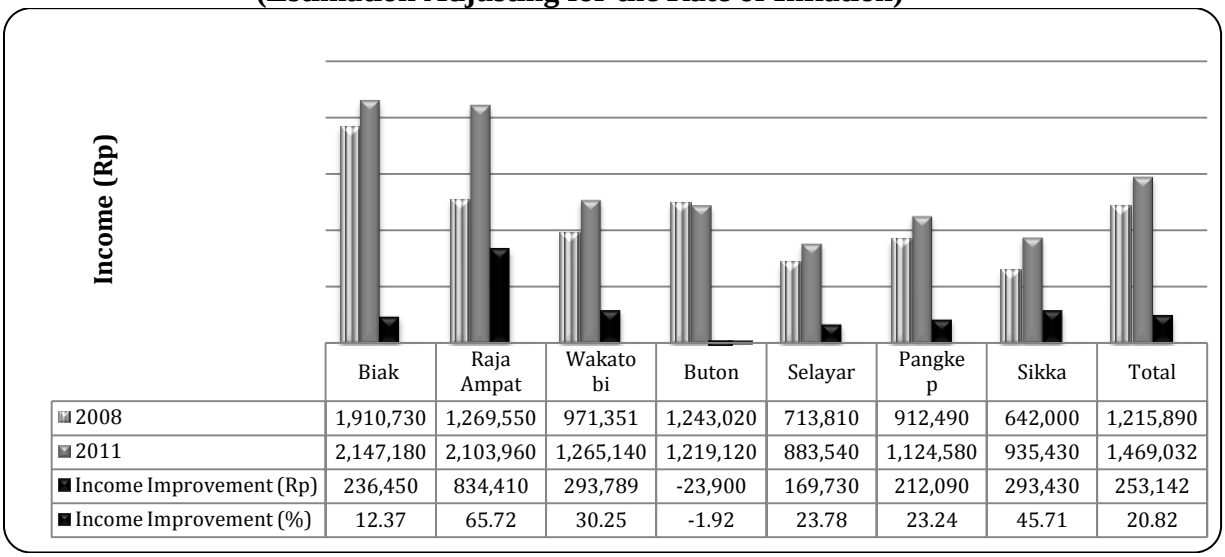
No	District	Baseline (average) 2006	T1 (average) 2011	% of fish population increased
		A	b	C=b/a
1	Pangkep (No Kalmas)	14,982	11,655	-22%
2	Selayar	21,400	7,925	-63%
3	Buton	47,959	98,012	104%
4	Wakatobi	105,726	35,322	-64%
5	Raja Ampat (No Batang Pele)	23,057	51,343	123%
6	Biak	38,534	33,101	-14%
7	Sikka	31,931	19,284	-40%
Average		283,589	256,642	3%

Source: NCU MIS

Socio-economic and Poverty: Satisfactory

Community welfare was enhanced, based on increases in household income and access to better community based infrastructure for target beneficiaries. As shown in **KPI 6**, the results of socio economic benefit monitoring and evaluation (SEBME) conducted by LIPI in 2008 (baseline) and 2011 (impact) shows that the income of beneficiary group members who received LKM funds improved by around 20% on average, in the seven project districts.

Figure 6. Household Income of Beneficiary Group Members by District (Estimation Adjusting for the Rate of Inflation)



	Biak	Raja Ampat	Wakatobi	Buton	Selayar	Pangkep	Sikka	Total
2008	1,910,730	1,269,550	971,351	1,243,020	713,810	912,490	642,000	1,215,890
2011	2,147,180	2,103,960	1,265,140	1,219,120	883,540	1,124,580	935,430	1,469,032
Income Improvement (Rp)	236,450	834,410	293,789	-23,900	169,730	212,090	293,430	253,142
Income Improvement (%)	12.37	65.72	30.25	-1.92	23.78	23.24	45.71	20.82

Source: SEBME 2008 and 2011

In addition, as in KPI 7, in 2009 LIPI's coral reef information and training centre (CRITC) conducted a baseline survey to determine if beneficiaries in coastal communities perceived that the project has had a positive impact on their welfare surveying more than 1,500 respondents from 25 village, 7 districts, both direct and non beneficiaries at the target villages. The value was 70%. In 2011 this study was repeated which showed that over 80% of respondents felt that the project was of benefit to them. This KPI has been surpassed as the objective has been met in all the districts except Pangkep. The reasons given for this were related to the difficulty of reaching some of the most remote islands in the Pangkep District.

3.3 Efficiency:

The project was more cost effective than anticipated at appraisal, as shown by the higher rates of return in the economic, financial, and fiscal analysis presented in Annex 3. It should be noted that the analysis was based primarily on the efficiency of Alternative Income Generating Activities, financed through revolving microcredit funds.

The economic analysis re-estimated the Economic Internal Rate of Return (EIRR) at the district level, which was on average 21 percent compared to 16 percent in the PAD. However, the EIRRs varied considerably– from 5 percent in Biak to 41 percent in Wakatobi – due to differences in the quality of coral reefs and their associated benefits.

These differences were driven by the relative size of the managed coral reef area, the district's effectiveness at curbing illegal fishing practices, and its exposure to adverse external factors, such as cyclone damage and coral bleaching.

The financial analysis showed that most alternative income generation activities (AIGs) provided supplemental income rather than an opportunity to exit the fisheries sector altogether, as the size of the funds was too small ($5,000 per community) relative to the target population, and repayment rates averaged only 60% across Districts. Yet for a few AIGs, such as seaweed culture, the Financial Internal Rates of Return (FIRRs) were up to three times the appraisal estimates. These high FIRRs enabled fishermen in some communities to shift from capture fishing as the major source of income to more profitable but also more risky seaweed culture activities. Additional training in farming techniques and access to good quality cultivars could help improve survival rates in the future and reduce volatility in yields.

Lastly, the fiscal impact of effective and collaborative management of coral reef areas was also re-estimated. Owing to higher fish prices and larger managed coral reef areas, the direct fiscal impact exceeded the appraisal estimate for almost all districts. In addition, the estimates suggest a potential doubling of expected fiscal revenues from tourism, if developed, due to the higher quality of coral reefs.

3.4 Justification of Overall Outcome and Global Environment Outcome Rating

Rating: Moderately Satisfactory

The project achieved the objectives of the combined PDO/GEO with moderate shortcomings in the level of achievement, efficiency, and relevance. It did so despite the challenges of building decentralized capacity and management, and developing and disseminating new concepts around collaborative coral reef management and community empowerment in 358 remote and widely dispersed coastal communities [see map].

All seven KPIs met or exceeded their targets, though there were some limitations in the underlying design or methodologies in target setting, as discussed elsewhere in the ICR, particularly in the case of KPI 5 (fish populations). Project benefits were extended directly to around 12,500 households (project estimate) through village grants and seed funds. Additional benefits from setting up community-owned No-Take Zones are beginning to emerge as fish biomass and marine biodiversity within these Marine Protected Areas are increasing and signs of spillover of fish into adjacent fishing grounds are being observed, suggesting that reef fish stocks in some areas are rebuilding. Positive trends in live coral cover over six out of seven Districts also has implications for maintaining tourism potential and other ecosystem services of healthy coral reefs. Thus, benefits are likely to have extended to all 358 villages (approximately 320,000 beneficiaries) through coral reef collaborative management. The average of economic internal rate of return (EIRRs) at the seven target districts is estimated 20% compared to 16% at appraisal.

Although the project initially experienced substantial delays in implementation, ultimately the steps taken to resolve the underlying problems, combined with the restructuring and extension, allowed the project to be completed without significantly limiting or compromising its efficiency or achievement of outputs or outcomes.

The project completed almost all planned activities, or even surpassed many of the targets covering seven districts. The impacts of the project are seen in areas outside of the project areas. There are several villages outside of project areas that have already started copying the COREMAP CBM models, including LPSTKs, *Perdas*, Pokmas, MCS and DPLs without the project inputs. Information dissemination also brought about very positive impacts not only among the project communities, but also outside of project districts. The adoption of the COREMAP-II education curriculum and textbooks by the MoE, project officials' constant appearances in mass media and the commitment shown by the president of Indonesia to support the CTI - all of these demonstrate how COREMAP-II has been proactive in disseminating the project concept to the whole nation and successful in communicating with the public. Although the project achieved most of its objectives and is viewed quite positively by both the Borrower and the Bank, the overall outcome is rated Moderately Satisfactory rather than Satisfactory mainly because of the conceptual and practical limitations identified in some indicators intended to demonstrate project outcomes, as well as concern over sustainability of the AIGs.

3.5 Overarching Themes, Other Outcomes and Impacts
(a) Poverty Impacts, Gender Aspects, and Social Development

Poverty Impacts

3.5.1 As mentioned above in KPI 6, the project was successful in increasing incomes among the direct LKM fund beneficiaries. The SEBME also found that the average incomes of the beneficiaries were higher (IDR 525,000) than non-beneficiaries (IDR 423,000). In addition, the SEBME also found that household income was also higher in fisheries households (IDR 528,000) than non-fishery households (IDR 229,000). The increase in Household income in each District was adjusted for inflation and HH income among direct Project beneficiaries was significantly above the mean household income for the District as a whole (i.e., not all communities in a District participated in the Project.

Gender Aspect

3.5.2 The project recruited two VM per village and at least one of the VM was always a woman. In terms of benefitting women, the average percentage of women LKM fund borrowers was more than 50% based on the available data from three districts - Buton: 70%; Wakatobi: 62%; and Raja Ampat: 40%.

3.5.3 The project also established a production group and a women's group in each village. The project provided fish processing equipment for the production groups to make boiled fish paste or fish cakes for sale. These activities were mainly carried out by women. However, the role of women's groups appeared not well defined and often merged with the production groups

Social Development

3.5.4 The project carried out social marketing of sustainable coral reef management in all 358 villages. It conducted participatory rural appraisal (PRA) and formed 358 LPSTKs. With four Pokmas groups (production, gender, conservation, and MCS), the LPSTKs played a fundamental role in establishing DPLs, developing RPTK, identifying and implementing sub-projects including VICs and village infrastructure. The processes to involve the community as a whole have improved the level of community ownership and responsibility for the sustainable management of their coral reef and marine based resources. In addition, COREMAP-II's comprehensive approach to outreach (through multi-media, formal and informal education was highly successful, which led to substantial changes in people's appreciation of coral reefs and sustainable use of the resources.

(b) Institutional Change/Strengthening

The institutional strengthening was substantial, especially at the district and village levels. COREMAP-II was nationally coordinated but decentralized in implementation. The COREMAP-II approach to build community based institutions for coral reef CBM was new to the project districts and villages; the establishment and operationalization of LPSTK and four functional Pokmas at each of all 358 villages was unprecedented. The creation and maintenance of DPLs at the majority of COREMAP-II communities especially require behavioral changes and enforcement of agreed rules among fishers. In addition, the construction of VICs and successful implementation of sub-projects also proves the capacity of LPSTK and Pokmas to manage community based small-scale projects and community procurement.

In COREMAP-II, unlike COREMAP-I, all project expenditure followed the national fund disbursement system. This required capacity as well as responsibility of planning, fund and project management at the district levels. As a result, each district is now capable of planning and executing complex projects such as COREMAP-II. The responsibility borne by the government staff at all levels to implement the complex project and meet the needs of their communities did contribute to increased sustainability and ownership of the project among implementers – when there were problems in fund disbursement, for example, it was the government who took the leadership to solve the issues through negotiations and issuing decrees and administrative ordinances. As shown during the last three years' project performance, once major implementation obstacles were addressed, the system began to function smoothly and executing units were able to catch up from the initial delay and achieve their output targets.

(c) Other Unintended Outcomes and Impacts (positive or negative)

The impacts are already seen in several non- COREMAP-II communities. In total, 6 villages and 2 districts have started copying the COREMAP-II CBM approach without COREMAP-II support. In addition, the adoption of the COREMAP-II educational material by the MoE as their formal curriculum on coral reefs was an unintended positive outcome. The ADB also adopted the educations materials produced by the Project for use in their sites in Western Indonesia.

COREMAP-II's public awareness and education program was highly successful. Directly and indirectly, the general public's awareness of the need for coral reef conservation has increased as a result of COREMAP-II's award-winning multi-media campaign.

3.6 Summary of Findings of Beneficiary Survey and/or Stakeholder Workshops
N/A

4. Assessment of Risk to Development Outcome and Global Environment Outcome

Rating: Substantial

The two main sustainability risks identified in the PAD are: (i) maintenance of community institutions created by the project; (ii) lack of substantial AIG activities among COREMAP communities to sustain community support.

Maintenance of community institutions will require additional support from the government, ideally the district governments. Although the target communities are aware of benefits to conserve coral reefs for increasing fish population, which would subsequently increase fishers' incomes, there is a need to reinforce conservation efforts through benefits that would flow to communities over the near term. District governments have committed to supporting community-based co-management through sustaining many of the costs for extension and outreach to communities in maintaining their DPLs, including ramped up monitoring, control and surveillance. This will be stepped up under COREMAP III through institutional strengthening to village (LPSTK) and District level governance units, active dissemination of best practices in sustainable fisheries management and the piloting of rights-based and other incentive systems for community stewardship of coastal resources. Enforcement of zoning and other regulations governing resource use in Marine Conservation Areas (KKLD) will also help control illegal fishing practices beyond the control of local communities.

The alternative income generation (AIG) subcomponent was a weakness of the project. The LKM (revolving fund) was established in all 358 villages and remained operational even after the project ended. The original design was intended to create AIGs through providing micro-credits to beneficiaries in the form of revolving funds. However, this expectation was unrealistic as the amount given to each village represented only Rp 50 million or about US$ 5,500 over a period of five years. The LKMs provided over 20 types of AIGs. As of the end of 2010, around 1,450 AIGs received funds from the project, of which about 880 were non-fisheries/non-aquaculture, while the rest, 570, were related to fisheries/ aquaculture. These non-fisheries/non-aquaculture activities include (i) kiosk; (ii) small-item trading; (iii) small-scale cottage industries for local markets. However, these alternative income generating schemes provided supplemental income for the most part, rather than sustaining alternative livelihoods through alternative forms of income generation. Only seaweed farming (and in some cases grouper culture), with additional inputs from outside the project proved profitable enough to cause some fishers to switch to aquaculture. The lack of profitable alternatives puts fishers at risk of returning to old habits dominated by unsustainable capture fishing, rather than developing alternative means of using marine ecosystem goods and services sustainably.

This risk will be mitigated under C3, with the introduction of a substantially scaled up Alternative Livelihoods component, based on promising eco-business opportunities that depend on healthy and productive coral reef and mangrove ecosystems. The guiding principle for such nature-based AIGs will be the delivery of benefit streams to communities through the capture of resource rents from healthy, well managed coral reef ecosystems, thus sustaining eco-system services and building community wealth and welfare.

An additional risk to the sustainability of outcomes not present at the time of the PAD, are the Government's competing priorities for significantly increasing fisheries production, announced in 2010. The ambitious targets for increasing the contribution of fisheries production to GDP over the short term, could jeopardize the longer term and less directly measurable economic benefits of sustainable management of fisheries resources. COREMAP III can play a significant role in helping to develop a more sustainable fisheries production strategy where the emphasis is on maximizing economic benefits from the fisheries sector rather than focusing on production targets that emphasize biomass and volume of yields. The latter will accelerate the decline and ultimate depletion of stocks already fully exploited or lead to negative environmental externalities from aquaculture which exceeds local carrying capacity.

5. Assessment of Bank and Borrower Performance

5.1 Bank Performance

(a) Bank Performance in Ensuring Quality at Entry

Rating: Moderately Unsatisfactory

The project design was very ambitious, although it was considered necessary for a sustainable coral reef management and livelihoods effort integrated through three layers of government. The project development objectives were closely aligned with both Government and Bank strategies on protected areas and decentralized natural resource management. However, shortcomings in the identification of risks related to complexity of the project and the implementing environment led to substantial delays in getting the project off the ground.

The project design benefitted from an extensive preparation period which drew lessons from Phase 1 and other projects in the Bank's portfolio. Nevertheless, stemming in part from its complex scope, the project exhibited some weaknesses at entry in four areas. First, the project encountered a two-year delay at entry due to the inability by the Bank and the Government to come to an agreement on the conditions of the loan. Second, even upon agreement of the terms of the loan, design issues led to KPIs that poorly reflected the objectives and potential achievements of the project. Third, the complexity of the GoI's administrative and financial system at both the central and district levels was underestimated, leading to delays in project implementation. Fourth, there was an unrealistically high expectation about the impact of AIGs on the economic and social welfare of communities.

(b) Quality of Supervision
Rating: Moderately Satisfactory

The Bank's supervision and missions were generally proactive, providing technical assistance and advice. This was particularly true following restructuring of the project. The mid-term review was extensive and provided a sound basis for project restructuring. Most importantly, the restructuring and other steps taken at a critical juncture in implementation were instrumental in turning around a project that was at risk of closing in problem status. The Bank established a complete team presence in Indonesia to maintain a close communication between the GoI, NCU and the Bank. Each supervision mission was conducted by the task team leader (TTL) and/or co-TTL based in Indonesia with support from the procurement, financial, safeguard, anti-corruption action plan, community/micro finance specialists in country. Although the project had three different Task Team Leaders over the course of implementation, which did affect team continuity and efficiency at times, the transition in leadership was also used as an opportunity to reassess the direction of the project and the need for mid-course corrections. The presence of a dedicated Bank management team had direct effects on the quality of supervision and led to improvements in project implementation post-restructuring. Some additional examples of support that the Bank provided to the project include:

- Review of the Project Management Manual, the Project Technical Guidance, the Financial management Manual, Procurement Plans, and Procurement Manual;
- Independent review and analysis of ecological and socio-economic data to determine statistical significance of trends and the extent to which results could be attributed to the Project
- Improvement of the MIS to support the M&E function and to address the weakness in data retrieval and reporting identified in supervision missions;
- Links with the international coral reef research community to strengthen collaboration and capacity in science-based management of coral reefs
- Provision of training for the NCU team on procurement and safeguards;
- Reviews of procurement plans and procedures to address issues;
- Advice on technical aspects of the project to improve implementation quality; and
- Direct implementation of ACAP for the NCU.

Although initial ISRs did not reflect the impact of lengthy initial implementation delays and their underlying causes early enough, Bank management was, nevertheless, aware of these issues and was actively seeking solutions. Two full supervision missions per year were held regularly from the start of restructuring until the project ended. Comprehensive Aide Memoires were prepared and fully vetted with government to document project status, flag issues and agree on time-bound action plans. The last ISR was archived nearly a year before closing, and while it accurately reflected the project status at that time (MS), substantial improvements in performance were achieved over the course of the year prior to closing, with many aspects rated Satisfactory. This was the result of substantial improvements in coordination between the GOI and the WB Project Teams. Although these gains were reflected in the final Aide Memoire, an additional ISR should have been

archived before the project ended to capture these improvements and the stronger achievement of objectives described in the ICR (even though the overall outcomes were still considered to be in the MS range).

(c) Justification of Rating for Overall Bank Performance
Rating: Moderately Satisfactory

5.1.4 As noted above, the Bank task team regularly conducted supervisory field missions and accessed additional Bank resources to increase the level of supervision after restructuring to move the project out of problem status. The borrower felt that Bank's technical inputs added significant value and helped improve the quality of project implementation. Although the Bank's procurement procedures were considered unnecessarily cumbersome by the GOI in comparison with those used for ADB financed activities in Western Indonesia, the Bank Team worked with the GOI to resolve these bottlenecks and provided strong support to the government in achieving the PDO. Perhaps most importantly, the Bank helped the GOI establish a successful model for decentralized co-management of coral reef resources involving local government and coastal communities that will be institutionalized in the final phase of COREMAP.

The Bank's overall performance is rated MS on the basis of MU performance at entry, MS performance in supervision, and the MS rating for overall project outcomes.

5.2 Borrower Performance
(a) Government Performance
Rating: Satisfactory

The government had a strong commitment to support the project throughout preparation, implementation, and even after closing. The Government's willingness to borrow substantial amounts on IBRD terms over the course of a three-phase APL speaks to this high level of commitment. Coral reef conservation and sustainable development of marine resources have been declared priorities of the central government for many years; new commitments have been made in line with International Declarations and Plans of Action to conserve marine biodiversity to gazette 20 million hectares of coral reefs under Marine Conservation Areas. In addition, the GoI's proactive role in the CTI has been strongly supported by the president of Indonesia. Linking support for COREMAP with achieving objectives under the National CTI Plan of Action is strategic and fully endorsed by the Ministry of Marine Affairs and Fisheries (MMAF).

Government support for COREMAP notwithstanding, the Project encountered early delays related to the Central Government's national budgeting process, the DIPA. This highly bureaucratic process posed a challenge to timely disbursement and implementation of Phase II. The Project also faced delays in implementation of social funds due to changing policy decisions on revolving funds. As noted above, however, these implementation issues were eventually overcome and the GOI remains committed to COREMAP, with plans to invest in a third phase.

(b) Implementing Agency or Agencies Performance
Rating: Moderately Satisfactory

At the National Level, the Project was implemented by MMAF, with support from two other implementing partners: LIPI and PHKA. Implementation was further supported by strong coordination at the regional level with the five provinces and seven districts involved, who provided legal and policy support, personnel, budgetary and in-kind resources. MMAF was responsible for coordinating overall implementation from the national level, through the provincial level down to the district level, and ultimately to the Community level with the deployment of Village Motivators and Senior Extension and Technical Officers. A National Coordination Unit was set up within the Ministry of Marine Affairs and Fisheries to facilitate and oversee this decentralized management structure, and to bring in needed technical expertise from LIPI and PHKA in capacity building and project monitoring and evaluation. Of the three executing agencies at the national level, MMAF and LIPI (which had been the implementing agency for COREMAP Phase 1) succeeded in overcoming early implementation delays due to budget (DIPA) and disbursement issues, although data collection for certain indicators remained a problem, limiting interpretation of results. PHKA, responsible for capacity building in Marine Park management, was less able to fulfill the activities assigned to it, in large part due to budget coordination issues which prevented the timely allocation of counterpart funds for the disbursement of GEF grant funds—and the implementation of certain activities within the agreed time frame. This required reallocation of remaining grant funds in the final year of the project to activities that were fully financed by the GEF. Implementation of these activities by PHKA was successful, but disbursement delays related to the DIPA, suggested a very real constraint on the agency's ability to co-implement such projects in the future.

(c) Justification of Rating for Overall Borrower Performance
Rating: Moderately Satisfactory

Implementation was delayed and the project required restructuring and a two year extension. However, the borrower was successful in carrying out a highly complex but comprehensive project, achieving the PDO, enhancing decentralization in implementation and improving capacities of the COREMAP-II districts in meeting the needs of target communities. The GoI's commitments to sustainable coral reef management now go beyond COREMAP-II as shown in the GoI's leadership in creating the CTI. COREMAP III is envisioned as Indonesia's principal contribution to the CTI going forward. Although many aspects of the implementing and executing agencies' performance were less than fully satisfactory, together they succeeded in implementing the project in a decentralized and coordinated manner, achieving the PDO and reaching beneficiaries in remote islands despite the complex and multilayered implementation challenges of the Project.

6. Lessons Learned

The lessons learned listed below should be considered for the COREMAP III design.

- **Select KPIs that accurately reflect project objectives and are measurable, and monitoring and evaluation methods that allow for continuous feedback on project performance and discrimination of project effects (i.e., allow attribution of outomes to the project).** Due to the lack of controls set up at the outset of the project and inconsistencies in data collection, the monitoring data on KPI 4 and 5, were of limited use in assessing the project's contribution to the changes observed. Live coral cover is a status indicator and only one of several indicators of coral health and is not typically a linear response to environmental factors. Assessment of changes in coral reef health would have been enhanced if a related 'process indicator' (e.g., juvenile coral recruitment rate) was also measured, allowing a fuller and more accurate picture of likely future outcomes. CREEL can be a useful tool for examining livelihoods aspects of fishermen and engaging local fishermen in dialogue about fisheries and their own livelihoods. LIPI successfully carried out its role in providing training, technical manuals, and tools to collect CPUE data. However, the collection of data by local units was sporadic and the data inconsistent, and therefore could not be verified. Finally, monitoring controls need to be established in order to better evaluate project effectiveness.

- **Supporting organizational structure and reinforcing institutional arrangements at all levels of government and strong ownership by local stakeholders are key to decentralized collaborative management**. The project was able to instil a strong sense of ownership to local governments and other stakeholders, particularly local communities. This not only contributes to strong engagement during the period of the project but also beyond the project's life.

- **COREMAP-II's comprehensive approach using awareness, training, education, economic and social welfare, research and monitoring, and proactive management led to its success in accomplishing the objectives.** If any one of these areas had been ignored, the project may not have had the degree of success in accomplishing a strong decentralized and community-based collaborative management, although it imposes a big challenge for all implementers.

- **AIG activities must be accompanied with adequate technical and financial support.** COREMAP-II livelihood support helped to increase supplemental incomes, but not for substantial AGIs. Any AGI activities have to incorporate technical assistance programs and well designed financial support systems.

- **Project design must realistically incorporate logistical, financial, and capacity factors that may present challenges in the field.** The project may have been quite ambitious in its design to: cover more than 457,222 ha of marine

areas in the remotest parts of Indonesia; 416 villages in its original design; institutionalize collaborative management practices in villages that have limited infrastructure and education capacity; operationalize routine communication and management activities where weather conditions and geographic isolation pose severe logistical problems; among others. Future efforts should be focused on: 1) raising awareness at the broadest level possible to reach as many villages as possible; but 2) developing a basic COREMAP model for extension to other coastal communities across districts in Indonesia that is easy to execute and scalable. Ideally, such a model would incorporate key institutional arrangements, financial incentives and community buy in to deliver desired environmental actions at district and community levels that are mutually reinforcing and sustainable.

- **Streamlining Government and Bank financial administrative and disbursement system is absolutely critical for project success/failure**. Although this project succeeded in spite of the central government's rigid, complex, and cumbersome financial and administrative system, delays and disproportionate attention and effort by the project team toward administration led to frustration and mistrust by local stakeholders.

- **Awareness raising and education can be a low-risk, cost effective way to strengthen support and ownership of project objectives and improve outcomes.** The realization by community members of the connection between coral reef health and human welfare is a revelatory event. The fact that the project was able to carry this forward in an exponential manner was a major success. The Sea Partnership component was also a strong success resulting in massive numbers of university studies and degrees focused on coral and marine science, leading to a cadre of knowledgeable scientists that can increase the capacity to sustainably manage and monitor Indonesia's seascape and its resources.

- **Revolving funds may not be the best mechanism to channel needed financing for livelihood transformation.** Although intensive efforts to train and socialize community members in the concept of revolving loan funds, there was misunderstanding and misuse of the funds in some cases, and poor overall rate of repayment (60%). Globally, revolving funds have had limited success, and their sustainability is being revisited. Future efforts toward poverty alleviation through grant funds and credit must be designed in a way in which there is greater ownership and accountability by community members and adequate technical assistance to optimize use of these funds.

7. Comments on Issues Raised by Borrower/Implementing Agencies/Partners

(a) Borrower/implementing agencies

See annex 7.

(b) Cofinanciers

(c) Other partners and stakeholders
(e.g. NGOs/private sector/civil society)

N/A

Annex 1. Project Costs and Financing

(a) Project Cost by Component (in USD Million equivalent)

Coral Reef Rehabilitation and Management Program Phase II - P071316 (Loan/Credit)			
Components	**Appraisal Estimate (USD millions)**	**Actual/Latest Estimate (USD millions)**	**Percentage of Appraisal**
INSTITUTIONAL STRENGTHENING	**16.6**	**17.89**	**108**
COMMUNITY BASED AND COLLABORATIVE MANAGEMENT	**41.6**	**35.45**	**85**
PUBLIC AWARENESS,EDUCATION AND SEA PARTNERSHIP	**11.7**	**13.56**	**116**
Total Baseline Cost	**69.9**	66.90	96
Physical Contingencies	0.328	-	-
Price Contingencies	4.05	-	-
Total Project Costs	74.27	66.90	90
PPF	0.00	-	-
Front-end fee IBRD	0.332	0.17	50
Total Financing Required	**74.61**	67.7[3]	90
Coral Reef Rehabilitation and Management Project II - P071318 (GEF)			
Components	**Appraisal Estimate (USD millions)**	**Actual/Latest Estimate (USD millions)**	**Percentage of Appraisal**
INSTITUTIONAL STRENGTHENING	**same as above**		
COMMUNITY BASED AND COLLABORATIVE MANAGEMENT			
PUBLIC AWARENESS,EDUCATION AND SEA PARTNERSHIP			
Total Baseline Cost			
Physical Contingencies			
Price Contingencies			
Total Project Costs			
PPF			

[3] /Figures exclude non-portion GOI contributions (fully financed by the Borrower)

Front-end fee IBRD			
Total Financing Required			

(b) Financing

P071316 - Coral Reef Rehabilitation and Management Program Phase II				
Source of Funds	**Type of Financing**	**Appraisal Estimate (USD millions)**	**Actual/Latest Estimate (USD millions)**	**Percentage of Appraisal**
Borrower		10.9	8.39[4]	77
International Bank for Reconstruction and Development		33.20	30.03	90
International Development Association (IDA)		23.00	23.89	104
P071318 - Coral Reef Rehabilitation and Management Project II				
Source of Funds	**Type of Financing**	**Appraisal Estimate (USD millions)**	**Actual/Latest Estimate (USD millions)**	**Percentage of Appraisal**
Global Environment Facility (GEF)		7.50	7.5	100

[4] /Figure exclude non-portion GOI contributions (fully financed by the Borrower)

Annex 2. Outputs by Component

Component 1. Institutional Strengthening

This component was aimed at enhancing government institutional responsiveness to meet the needs of coastal communities and to support community-based coral reef management. The subcomponents included: (1.1) program coordination, monitoring and evaluation, and training; (1.2) Coral reef research and monitoring by the Coral Reef Information and Training Center; and (1.3) Legal, policy, and strategy assistance.

The project was successful in strengthening the participating institutions at all levels. The level of the achievement in this component was found to be substantial. The successful implementation of this complex and comprehensive project proves high level of staff capacity, which was built through project training and implementation. As a result, the project was able to support sustainable coral reef management and to improve the welfare of 358 coastal communities.

1.1. Program Coordination, M&E and Training

This subcomponent was aimed at establishing and sustaining institutional structures for national program coordination and decentralized program management. This included establishing appropriate bodies/units across different governmental levels (i.e., national, provincial, district, village) through Decision Letters (SK), workshops, and training sessions.

The NCU, the body responsible for the coordination and implementation of the project, was established in 2005 and included key government bodies and other stakeholders across sectors and levels (i.e., national, provincial, district, village). At the national level, the key bodies included: (1) National Steering Committee; (2) National Technical Committee; and (3) NCU. The NCU under the direction of MMAF's Directorate General of Marine, Coasts and Small Islands (KP3K), Directorate of Marine and Aquatic Resources Conservation (KKJI) was responsible for overall Project coordination, supervision and implementation. Implementation by the NCU at the national level was supported by two NPIUs: LIPI for scientific support, and PHKA for marine park support.

At the provincial level, implementation was undertaken by five Regional Coordination Units (RCU) led by the provincial fisheries services (Province *Dinas* KP) located in South Sulawesi, Southeast Sulawesi, Papua, West Papua, and Nusa Tenggara. At the district level, implementation was led by seven PMUs under the district fisheries services (District *Dinas* KP) located in Pangkep, Selayar, Buton, Wakatobi, Raja Ampat, Biak, and Sikka. In each of the Project's 358 villages, project implementation was carried out by a Coral Reef Management Committee (LPSTK) in coordination with Village Heads.

The Project's operational structure was conveyed through SK (Decision Letters) by Ministers, Governors, District Heads, and Village Heads. Follow-up SKs detailing assignment of personnel and duties were issued annually by the respective directors for the NCU and NPIUs, Provincial *Dinas* KP Heads for RCUs and District *Dinas* KP Heads for PMUs. All PMUs were established in a timely manner, adequately staffed and

functioned well. They were able to properly execute their duties and fulfill assigned responsibilities. PHKA was able to carry out project objectives, though restructuring within PHKA and budget changes within a complex central government financial system led to some delays.

A Monitoring & Evaluation (M&E) Feedback Unit, established in 2007, was responsible for implementation progress and other national level reports. The unit developed a manual and monitoring tool, and trained RCUs and PMUs in its use, as well as a Village Profile form and a Complaint Handling System. In 2010, a Management Information System (MIS) was developed but it has yet to be fully operational.

1.2 Coral Reef Research and Monitoring - CRITC

This subcomponent was aimed at providing research, monitoring results and management information to support collaborative coral reef management. This included: monitoring training; baseline surveys and monitoring; and dissemination of educational and monitoring results material.

Coral reef research and monitoring was led by the Coral Reef Information and Training Center (CRITC-LIPI). CRITC-LIPI had three related functions: (a) monitor coral cover at select permanent plots as well as the selected communities for socio-economic impact analysis; (b) provide training to CRITC-PMUs and community members in reef health (PIT) and fisheries (CREEL) monitoring techniques; and (c) disseminate the results of monitoring efforts through annual workshops and its website. LIPI began collecting baseline information on coral cover in 2006 at their permanent plots and later at DPLs. LIPI monitored reef health at permanent transects, while the CRITC-PMUs collected monitoring data at DPLs. Educational and training material included: monitoring guidelines; marine atlases; mangrove-related material; tsunami preparedness guidelines; local education materials for grades 1-12; and teacher training manuals.

Overall, monitoring data showed positive trends and seemed to generally meet output indicators. There was positive coral cover growth in six of the seven districts through LIPI monitoring and four of the seven districts through PMU monitoring. However, there were significant differences between LIPI and PMU monitoring results due to differences in monitoring regimes.

Reef fish populations through LIPI visual census method showed an increase in two of the seven districts. Visual census was not used at DPLs. Visual census method did show an overall increase of reef fish population of 3%. Catch Per Unit Effort (CPUE) surveys of reef fish harvested by traditional gear were carried out in adjacent fishing grounds using the fish catch survey (CREEL) method in 75 villages in 2008-09. The data showed stability of catches in three districts, while two districts (Sikka, Raja Ampat) showed significant increase, and one (Buton) showed a yield decrease. However, the CREEL data collection was inconsistent and effectively could not be used to evaluate whether project intervention played a role in fish yield increase/decrease.

The project chose to monitor reef health by examining live coral cover and use growth in live coral cover, and growth of fish population as indicators of project effectiveness. Concerns in using these indicators are as follows. Using coral growth rates as an indicator of coral reef health may not be appropriate in sites where coral reefs are in mature states or are subject to eutrophication and sedimentation. Expecting wide-scale coral growth from project activities may be unrealistic. Live coral cover and fish population growth may not necessarily reflect improvements through project efforts, although project efforts may have contributed to greater coral health. Inconsistent (i.e., CPUE) and infrequent (i.e., coral reef monitoring) monitoring regimes presented sample problems. Lack of control plots to compare sample plot results meant that comparison between project trends and trends in other sites could not be made, thus potentially underestimating the positive trends in live coral cover if coral cover in non COREMAP reefs declined significantly during the same period. Finally, while visual censuses are useful for biodiversity data they are less useful for population trends.

The monitoring training component was generally carried out well. Overall, a large number of community members were trained – 192 and 101 people in CREEL and PIT methods, respectively. However, the transition from training to actual use in the field needed more time and stronger coordination. The data collected by community members were inconsistent, not done in a timely manner, and questionable in quality. As a result, LIPI had to discard data from some villages. This said, however, engaging community members in training and actually having them collect data was a major achievement.

In addition to monitoring coral reef data, LIPI collected socio-economic data to better gauge project interventions on enhanced community welfare of coastal communities in target districts. Baseline surveys were carried out in 2006, and subsequent surveys were carried out in 2008 and 2011 in a total of 1,605 households across seven districts. Household income of project beneficiary groups increased by 34% across the seven districts, and in Raja Ampat there was an 80% increase. Furthermore, data showed that household income increase was greater in project target villages as compared to other villages within target districts. Household income (adjusting for inflation) improved by 21% in beneficiary groups. A large majority (85%) of community members in target villages, as evidenced by these survey results, felt that the project had positive impacts on their welfare.

1.3. Legal, Policy and Strategy Assistance

This subcomponent was aimed at legalizing program structures, formalize community authority to collaborative manage coral reef and associated ecosystems and support the development of key national strategies. This included: organizing program structures across different government levels through SKs; developing and implementing strategic plans and laws; and socializing COREMAP-II through workshops and training sessions.

Structurally, management units were formed at all levels including national, provincial, district, and village. A National Strategy for Sustainable Coral Reef Fish Management was produced. Provincial PMUs were established and functioned well. Each district established a Coastal Community Empowerment Board (CCEB) and enacted a District

Marine Resources Strategic Plan (*Renstra*). All 358 target villages formed a Coral Reef Management Committee (LPSTK) that contained community support groups with specific functions/issues (e.g., production, gender, conservation, and Micro Finance Unit (LKM)). The RPTKs were drafted and endorsed through Village Head authority (*Perdes*).

2. Community Based and Collaborative Management

This component was aimed at empowering coastal communities and institutions in project target districts to sustainably manage coral reefs and associated ecosystems to increase community welfare and incomes. The subcomponents included: (2.1) community empowerment; (2.2) community-based coral reef management; (2.3) community development; (2.4) district marine conservation management; and (2.5) marine park support. Activities included: Participatory Rural Appraisals (PRA); Coral Reef Management Plans (RPTK) including village-level No Take Zones (DPL); district-level Marine Protected Areas (KKLD); a Monitoring, Control and Surveillance (MCS) program.

As a result of decentralization, community-based and collaborative management (CBM) has perhaps been the most important change in protected areas and natural resource management in Indonesia for the past decade. The role of communities and local government has been strengthened, while the role of the central government has shifted more toward coordination. The approach is to engage local communities and other stakeholders (e.g., local government, civil society, private sector) to be integrally involved in the planning and execution of protected areas and natural resource management.

Within the context of Indonesia and its history, political changes, project coverage area, logistical difficulties (e.g., lack of infrastructure, equipment, high cost of fuel), very low level of education and awareness in many of the districts, this component was the most difficult and ambitious. As a result, this component was project's most complex, costly and time-consuming element. Despite these highly difficult conditions, results from this component were successful. However, it is important to note that a key assumption that revolving funds (LKM) would lead to alternative incomes, reduction of destructive practices and poverty reduction was unrealistic given the level of intervention in both financial and technical inputs. Although income trends in target districts were positive, attributing this increase to the LKMs may be unwarranted. It appeared that increase or decrease in income may have been due to factors unrelated to project interventions (e.g., decrease of income in Buton due to decline of economically important small fish resources base *ikan teri*). Furthermore, it appears that the amount of LKM funds were too small for the size of the target population. As a result, the funds were mainly used for supplemental income generation activities such as small scale trading, kiosks, and buying additional equipment for traditionally existing economic activities.

2.1 Community Empowerment

This subcomponent was aimed at organizing and empowering communities to undertake collaborative management of coral reefs and associated ecossystems. This included: training key personnel at the district and community levels; conducting PRAs and sketch maps to better understand village and resource use profiles; conducting awareness and socialization campaigns; establishing Village Information Centers (VIC); and providing communication equipment and establishing a communication network.

This was achieved successfully. COREMAP-II's decentralized and step-wise approach of empowering communities led to successful CBM at the target districts. Field teams including Senior Extension and Training Officers (SETO), Community Facilitators (CF), and Village Motivators (VM) were recruited and trained at district-level workshops. Overall, the project employed 662 field staff (i.e., 48 SETOs, 147 CFs, 468 VMs) which was below the PAD's envisaged target of 1,090 field team members but these numbers were appropriate for the geographic and jurisdictional conditions. 'Self Learning Packs' in CD and book formats were used as a key training tool for SETO's, CFs, VMs, RCUs, and PMUs.

As a first step, PRAs and sketch maps to gather baseline information about communities, coral reefs and local fisheries were conducted. Next, each village formed an LPSTK with subsections for production, gender, MCS and) LKM. An extensive awareness and socialization campaign was conducted in all target villages and districts. Awareness efforts used meetings, television, radio, and print media to promote awareness and behavioral changes related to coral reefs and fisheries practices. VICs were established to serve as a place for community training, education, after-school activities, and discussions. A communication network was established in about 90% of target communities. FM radio stations were established in Pangkep, Wakatobi and Selayar, while the other districts had collaborative program with existing radio stations. FM/AM radio access was available in virtually all villages. For daily outgoing communications, either cell phones (available in 65% of all COREMAP-II coastal villages) or walkie-talkies (available in 85% of all COREMAP-II villages).

Based on a survey carried out in 2010, an average of 75% of the respondents in target districts and 86% of in target villages felt that healthy coral reefs were key to their lives, respectively. Responses by local government staff and community members in the ICR field interviews were overwhelmingly positive toward the awareness component of the project.

2.2 Community Based Coral Reef Management

This sub-component was aimed at supporting communities to formulate and implement collaborative management of coral reef and associated ecosystems. This included: awareness campaigns; RPTKs including a village-level No Take Zones (DPL); Monitoring, MCS program; and a socialization program for CBM.

The project succeeded in increasing the level of awareness concerning coastal and marine-related natural resource management and setting in motion community-based actions to strengthen community-based coral reef management. Extensive awareness campaigns and PRAs led to village-level Coral Reef Management Plans (RPTK). At the end of the project, all 358 villages produced RPTKs which required them to establish a village-level No Take Zone (DPL). COREMAP-II villages produced a total of 317 DPLs totaling 15,794.8 ha. Implementation of RPTKs also included: a MCS program; installation of DPL marker buoys; dissemination of DPL coordinates to communities; posting of schematic maps at VICs; and socialization of plans through community meetings, public announcements, and media coverage.

MCS, designed to better monitor and deter illegal fisheries activities, deserves a special mention as improved surveillance and interdiction in COREMAP supported sites was one of the most successful parts of the project. MCS helped to reduce illegal/destructive fishing practices by about 60% from 2,200 infringements in 2005 to 880 infringements in 2010. Furthermore, follow-up legal activities led to 70% successful prosecution. Some of the key success factors responsible for this result include: (a) strong support by the Village MCS Unit [*Pokmaswas*]; (b) availability of MCS radio communication systems; (c) a patrolling system by law enforcement officers; and d) increased public awareness. The PAD envisaged pilot decommissioning of destructive fishing gears in selected villages. However, this was not found to be necessary as District *Dinas* KP already had programs in place to halt the use of compressor diving, bombing and poisoning activities.

2.3 Community Development

This subcomponent was aimed at increasing and diversifying coastal communities' incomes through transparent, accountable and financially viable livelihood opportunities with greater access to capital. This support came in the form of: (a) training in financial management for LPSTKs and LKM; (b) provision of seed funds through LKM; (c) village social infrastructure grants; (d) district block grants; and (e) AIG financial and technical support.

A need to obtain a Ministry of Finance (MoF) for LKM led to a +/- two-year delay. Upon approval from MoF and training (e.g., bookkeeping, financial reporting), all 358 villages engaged in LKM activities including: seaweed and fish cage culture; fish capture; baking goods; and other small business operations. Each village received about US$ 5,500 over a period of five years. As of the end of 2010, around 61% of the loans of the 1,450 loans were for non-fisheries/aquacultural activities. About half of the borrowers were women, exceeding the project target of 30% women involvement. It was felt that these funds were not adequate in building a strong alternative income generation (AIG) base. Globally, revolving funds have had mixed results because they require extensive training and socialization, and enabling community conditions to make these funds sustainable.

Villages also received village social infrastructure grants, which were an integral part of the RPTKs and were decided through community meetings. These grants (approximately

US$ 1,100) typically supported the purchase/installation of public toilets, freshwater wells, small surveillance boats, village gates, walkways, and boundary markers.

District Block Grants, designed to support AIG activities of a larger scale at the district level, did not achieve its aim. Only about half of the funds allocated was used. Difficulties in implementation stemmed from: (a) low level of understanding of the concept; (b) MoF restrictions; (c) difficulty in deciding on appropriate projects; and (d) low technical capacity at the district level. These difficulties applied to other concepts that were introduced in the PAD but, in the end, were not implemented: (a) credit guarantee scheme; and (b) employment outside the village. The project did undertake a pilot project in two districts for management and certification of aquarium fish. However, these were relatively unsuccessful due to lack of buyer support.

2.4 District Marine Conservation Management

This subcomponent was aimed at strengthening and supporting Marine Conservation Areas (MCA) through collaborative management of coral reef and associated ecosystems in participating districts. This included: forming CCEBs; PMUs; developing *Renstra*'s; and legalizing MCAs at the district level.

CCEBs and PMUs were established in a timely manner by District Heads (*Bupati*) through formal Decision Letters (*SK Bupati*). CCEBs played an effective role in promoting greater awareness and coordination among stakeholders such fishers, police, navy, women's groups and NGOs. The PMUs, as set out in the *SK Bupati,* were quickly established and generally functioned well, and were able to effectively undertake project activities. In some cases, where counterpart funds from local budgets (APBD) were needed, delays in the beginning of the project did occur due to the late arrival of APBD funds. The PMUs also benefited in later years as the local governments became more adept in early release of APBD resources.

Each District *Dinas* KP produced a *Renstra.* These *Renstra*'s, used to enable legislation, and provided coverage of +/- 300 DPLs and 12 district-level MCAs. Although considerable work still remains to make district-level MCAs truly effective, their development under the project has been effective in gaining greater representation of marine and coastal ecosystems in target districts and forming a MCA network.

2.5 Marine Park Support

This subcomponent was aimed at strengthening the authority of participating marine park/protected area to effectively engage in collaborative management. The project supported PHKA in general for its role of marine protected area management and in specific to promote collaborative management for training, workshops, conference attendance, buildings, equipment, and operational support including socialization of local communities. Management authority by PHKA originally included six areas (Taka Bone Rate, Wakatobi, Raja Ampat, Kepulauan Padaido, Teluk Maumere, and Kepulauan

Kapoposang) but management of all but Taka Bone Rate and Wakatobi national parks were transferred to KKP in 2009.

In general, the marine park support subcomponent was achieved. PHKA was able to conduct MPA training at the central and regional offices, and form National Park Collaborative Forums. These contributed to participatory park zoning, their involvement in CCEBs, collaborative management workshops with communities, socialization of park programs, and production of awareness material. From 2009 to 2011, overall MPA Scorecards showed a 20% gain indicating a significant improvement in COREMAP-II area park management. All sites, except Kepulauan Kapoposang, showed improvement. Biak, in particular, showed an exceptional gain of 115%.

This said, however, PHKA's-Ministry of Forestry (MoFor) complex financial and administrative system, leading to delays and low financial and human resource capacity in the field, represented significant challenges. Slow transfer of funds from MoF to PHKA and PHKA institutional re-structuring in 2009 led to significant delays. Ultimately, PHKA was not able to absorb the allocated grants. Lack of counterpart funds and low funds for non-national park areas were a serious problem.

3. Public Awareness, Education and Sea Partnership

This component was aimed at promoting societal awareness of the benefits of coral reef conservation and sustainable use that leads to behavior change. The subcomponents included: (3.1) public awareness campaigns; (3.2) education program; (3.3) Sea Partnership Program; (3.4) program support communications. This component was highly satisfactory in its performance.

3.1 Public Awareness Campaigns

This subcomponent was aimed at supporting behavioral change for sustainable coral reef collaborative management through public awareness (PA) materials, campaign and advocacy. This included: VICs; media campaigns (e.g., TV, radio, print); CD; events; exhibits; and joint programs with the private sector.

Although public awareness campaigns are not new to Indonesia, the scale at which the project carried out public awareness deserves special mention. COREMAP-II's public awareness used television, radio, and print media to promote awareness and behavioral changes related to coral reefs and fisheries practices. This awareness campaign included 12 television features, 16 radio programs that aired 2,700 times over three years, appearances by the project staff in 50 television and radio talk shows, and 50,000 print media products. PA provided technical support and materials for numerous events/ exhibitions both within and outside the project. Importantly, as part of its advocacy program, PA helped to initiate Forjubi (*Forum Jurnalis Bahari Indonesia*) to serve as a support group of television and radio journalists. In addition, all seven districts either had its own radio station or went into partnership with existing radio stations to broadcast COREMAP-II messages. All participating villages established VICs as the center to

display all material for public awareness. In addition, the Education Program and the Sea Partnership contributed to improved community awareness. Based on a survey in target districts in 2010, an average of 75% of the target district respondents and 86% of the target village respondents, respectively, felt that healthy coral reefs were key to their lives. Responses by local government staff and community members in the ICR field interviews were overwhelmingly positive toward the awareness component of the project.

3.2 Education Program

This subcomponent was aimed at mainstreaming coral reef conservation and sustainable use concepts into participating districts' educational systems. This included: developing educational material; increasing capacity of educational institutions; and stimulating support by the Ministry of National Education (*DikNas*) and district level educational institutions.

Results far exceeded the Output Indicators. It was estimated that approximately 130,000 students attended coral reef education classes (95,000 – primary; 20,000 – middle; 15,000 – high). The project developed, produced and distributed local coral reef and marine education materials (*mulok*) for elementary, junior and senior schools. These materials were officially accepted by DikNas' Curriculum Center and therefore can be used for all Indonesian schools. The PAD expected to only reach elementary schools, but the project exceeded this target by including middle and high schools. A total of 32,700 books were produced and distributed (17,360 – primary; middle – 10,095; high – 5,345). In 2011 electronic book versions were included on the *DikNas* website for downloads. To raise institutional capacity, 1,225 teachers were directly trained (645 – primary; 327 – middle; 253 – high) and a Training of Trainer approach trained an estimated additional 4,400 local teachers. In total about 90% of all COREMAP-II districts coastal schools received teacher training and materials. COREMAP-II also developed and distributed additional documents such as teachers' manuals, syllabuses and other supporting materials. Non-formal education was supported through national reef education events, media promotions and assistance and scientific consultation for students.

3.3. Sea Partnership Program

This subcomponent was aimed at piloting a system to provide technically qualified human resources to program districts to support collaborative management. This included: supporting the developing of the Sea Partnership Program (SPP); providing national and international advisory services and technical support; scholarships for university and secondary school students; and internships for government staff and university faculty.

The project was able to utilize KKP's existing SPP to increase Indonesia's technically qualified human resource base. The initial support to build the SPP was critically important, allowing the SPP to organize and build programs. Perhaps the most important impact of the SPP was the large number of scholarships awarded to students (over 1,500 students of which 600 were bachelors/masters/Ph.D., and 900 high school) which can

help build a cadre of Indonesian scientists that can better study and manage Indonesia's seascape and its resources. Furthermore, approximately 666 students distributed coral reef management information in coastal villages reaching an estimated 8,000 people. With SPP support, districts were able to strengthen their fisheries departments through the use of 84-seconded experts from universities.

3.4 Program Support Communication

This subcomponent was aimed at effectively communicating the project's philosophy, objectives, activities, outputs and outcomes to program staff, partners, and key stakeholders. This included: communication protocols; staff media training; project information sheets, newsletters, information kits and press releases; public relations campaign; events; and media awareness workshops and conferences.

> To achieve this it developed communication protocols, trained Project staff how to interact with the media, produced Project info sheets, newsletters and bulletins, made information kits and press releases on sensitive issues and ran a public relations campaign. The physical production, dissemination of material, and communication of key messages were carried out without difficulty. Although training workshops and material were useful, regular interaction with the media were most useful in using newly learned skills. Under the PA subcomponent, collaborative arrangements and consultative meetings were conducted to design and develop a communication strategy for the program. The program consulted experts on how best to develop of a Massive Integrated Public Awareness Services plan. The resulting strategy paved the way on how to communicate the Project at national, provincial and districts level with the private sector, NGOs and the media industry.

Annex 3. Economic and Financial Analysis

(including assumptions in the analysis)

A. Economic Analysis

The **Cost Benefit Analysis of the PAD** captured the following key benefits of the project: (i) improved fisheries, (ii) local products derived from sustainable coral reef activities, and (iii) associated ecosystem uses, namely tourism. Global biodiversity and coastal protection benefits, which are considered to be large for rehabilitated coral reefs, could however not be accounted for, as they are difficult to measure. The economic internal rate of return (EIRR) is thus a lower bound estimate of the total benefits associated with the project, since it only compares the quantifiable benefits of the program to its costs. In particular, the first step is to compute the values of fisheries, local products, and tourism over 25 years for the case with and without the project. Second, the net benefit of the program is computed by comparing the two scenarios and is then discounted by 10 percent to obtain its net present value (NPV). Third, the net benefit and cost of the project program (both expressed in NPV) are used to calculate the EIRR for each target district – Pangkep, Selayar, Buton (which split into Buton and Wakatobi in 2003), Raja Ampat, Biak, and Sikka.

The EIRRs computed for the PAD (2005) varied considerably depending on the relative size and health of the reefs. For instance, the EIRR for Sikka was merely 8 percent due to its small and low quality coral reefs, whereas Raja Ampat's EIRR estimate was 22 percent given the healthy state of its coral reefs at the time (Table 3.1). The PAD also carried out a sensitivity and risk analysis of the 'central' scenario to test how much the results depend on the assumed discontinuation of illegal and destructive fishing practices and the associated quantifiable benefits of healthy coral reefs. This analysis showed that the results are quite sensitive to these assumptions, leading to very low EIRRs if illegal and destructive fishing practices continue (the 'low' scenario). In contrast, the EIRR increases substantially in the 'high' scenario, where improvements in reef quality are assumed to be much higher than in the conservative 'central' estimate.

Table 3.1: Economic Rates of Return for the 6 Project Districts at Appraisal ('central', 'high', and 'low' estimate)

	Pangkep	Selayar	Buton	Raja Ampat	Biak	Sikka
EIRR (%)						
'central'	13	20	20	22	13	8
'high'	25	44	40	51	26	16
'low'	undefined	undefined	4	1	undefined	undefined

The **Cost Benefit Analysis of the ICR** followed the same methodology as the PAD. In particular, the EIRRs were computed for each target district from the re-estimated NPV of improved fisheries, local products, and tourism as well as program costs. These calculations used the actual data for 2005 to 2011 and 'central' scenario predictions for all subsequent years. Nonetheless, reproducing the PAD's calculations was challenging due to (i) loss of the original calculations; (ii) lack of data; and (iii) poor quality and

inconsistency of the existing data. The following data and approach were thus used for the cost benefit analysis.[5]

- District program costs were computed based on the GOI and loan disbursement data for each district and province between 2005 and Q3 of 2011.
- The computation of the fisheries value did not use the catch and reef quality data collected under the project given the aforementioned quality and consistency problems. Instead annual fisheries production data were collected from the district fisheries offices. The main problem with these data is that they capture the district's entire landing data, which include the catch from the coral reefs but also the fish caught farther out at sea. Consequently, the annual production of coral reefs had to be approximated by scaling the landing data with the district's share of coral reefs in its total ocean area. The value of fisheries with and without the project was then computed for each district using updated average price information and the PAD's assumptions on profit margins, multiplier effects, and fishery yields for the 'central' and 'without' scenario.[6]
- The value of tourism was calculated using two district-level datasets: tourism revenues and GDP figures. The value of tourism with and without the project was calculated for each district using assumptions on profit margins, multiplier effects, and trends in the tourism sector for the 'central' and 'without' scenario from the PAD and its background documents, most notably Cesare (1996).[7] Since there were missing data for a few districts in the revenue data, an average was calculated to obtain the final estimate.

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[5] It is important to note that missing data and obvious inconsistencies were corrected through linear interpolation for all datasets used in this analysis.

[6] The updated price is based on an average of 2011 prices for snapper, grouper, yellow tail fish, and rabbit fish, which was discounted with the consumer price index to 2005. The following assumptions of the PAD were used: (i) the net value of fisheries is 80 percent of its gross value/revenue; (ii) fishery has a local multiplier effect of 2 given the high level of underemployment in all target districts; (iii) the 'central' scenario assumes that after the initial decline yields per reef area will grow at 3 percent for 7 years and then stabilize.; and (iv) the 'without' scenario assumes that yields will decline by 3 percent annually until they reach 50 percent and local fisheries collapse.

[7] The following assumptions were used to compute the net value of tourism based on the revenue data: (i) 50 percent of 'other' expenditures of tourists are added to revenue; (ii) the net value of tourism is 40 percent of its gross value/revenue; (iii) 30 percent of all tourism is related to coral reefs; (iv) tourism has a local multiplier effect of 2; (v) the 'central' scenario assumes that tourism will grow at 5 percent annually due to the enhanced attractiveness of the target districts; and (vi) in the 'without' scenario tourism is assumed to remain constant.

To scale the GDP data, the share of tourism in GDP was computed for 2003, using the tourism value figures of the PAD. Note that the share for Buton and Wakatobi is in addition scaled by their respective share in total reef area. The computed shares are in line with the national average of 5% and the numbers of tourists visiting each district. Assumptions (v) and (vi) are used to predict the GDP-based tourism data in the 'central' and 'without' scenario respectively.

- The value of other local products and AIGs is approximated by the benefit transfers – the village and district grants – as in the PAD. The value of other local products and AIGs with and without the project was also calculated for each district using the trends assumed for the 'central' and 'without' scenario of the PAD.[8] However, as has already been pointed out in the main report, the expectations regarding AIGs and other local products were unrealistically high at appraisal, which is why their net value is much lower than originally anticipated.

The re-estimated EIRRs are broadly in line with the estimates computed for the 'central' scenario of the PAD and range from 5 percent in Biak to 41 percent in Wakatobi (Table 3.2). The discrepancies in the estimates can partly be explained by the differences between the area treated during the program and the appraisal estimates. Some districts were also less successful at curbing illegal fishing practices, leading to lower than expected quantifiable benefits and EIRRs.

Table 3.2: Economic Rates of Return for the 7 Project Districts and Treatment Area at End of Project ('central' estimate)

	Pangkep	Selayar	Buton	Wakatobi	Raja Ampat	Biak	Sikka
EIRR (%)							
ICR	19	12	39	41	16	5	13
PAD 'central'	13	20	20	NA	22	13	8
Coral reef ($km^{2)}$							
C2 managed area	1,675	907	202	1,186	118	356	128
C2 no take zones	50	89	34	401	42	49	26
Total PAD area	374	1,098	1,402	NA	1,300	424	128

- Pangkep experienced some difficulties in reaching out to its communities due to its remoteness and lack of wide community involvement in LPSTKs. However, its EIRR is still higher than expected, since a coral reef area four times the appraisal estimate was actually managed, translating into higher than anticipated fisheries values and associated benefits.
- Selayar has an EIRR of only 12 percent compared to the 20 percent estimate of the PAD. This result is driven by lower than expected fisheries values, as illegal fishing practices declined at a much lower rate in Selayar than in other districts – 30 percent versus an average of 60 percent and a maximum of 100 percent in Sikka. This trend is partly driven by weak enforcement. For example, only 12 percent of illegal fishing cases were prosecuted in Selayar compared to 70 percent in Pangkep and 100 percent in Buton, Wakatobi, and Sikka. However, the situation is expected to improve, since a new district police head was appointed

[8] The following assumptions were used to predict the net value of local products and AIGs: (i) the 'central' scenario assumes that after the initial decline yields per reef area will grow at 3 percent for 7 years and then stabilize; and (ii) the 'without' scenario assumes that yields will decline by 3 percent annually until they reach 50 percent and local fisheries collapse.

recently, who has been specifically tasked by provincial and district authorities to prosecute illegal and destructive fishing cases more actively.

- The EIRRs for Buton and Wakatobi are twice as large as the PAD's 'central' estimate for Buton and indeed in line with its 'high' scenario estimate. This good performance can be explained by the large national park in Wakatobi, which led to a significant replenishment of fish stocks according to CREEL estimates. This has particularly benefited fishery yields and tourism revenue in neighbouring Buton and substantially increased tourism revenues in Wakatobi.
- The EIRR for Raja Ampat takes into account the entire coral reef area of the district, as it is of particular high quality according to the live coral cover estimates. These healthy reefs translate into high fisheries values and tourism revenues, yielding an EIRR of 16 percent. The fisheries value might even be an underestimate, as the total coral reef area only constitutes 3 percent of the district's vast ocean area, leading to a significant scaling down of the annual fisheries production figures.
- The EIRR for Biak is also much lower than expected. The district's coral reefs suffered extensive damage during the program period due to cyclones, bleaching, and the continued practice of blast fishing. This has lowered the fisheries values and EIRR significantly.

B. Financial Analysis

The **Financial Analysis of the PAD** was carried out for the AIGs likely to be supported by the project. The detailed analysis estimated requirements for (i) capital investment and working capital; (ii) profit and loss statement; and (iii) financial planning cash flow. The estimated financial internal rates of return (FIRR) were high, ranging from 16 to 59 percent with a 29 percent average for a representative package of microenterprise investments. Furthermore, the analysis indicated that revenues would have to decrease by 15 percent and investment costs increase by 70 percent, before the activity were no longer profitable to pursue.

The **Financial Analysis of the ICR** followed the same steps of the PAD trying to assess the financial viability of AIGs. Around 1,450 AIGs were funded through LKMs; a number, which is five times higher than the original target indicator of 268 (Table 3.3). However, the size of the funds relative to the target population was generally not sufficient to allow fishermen to move out of the sector completely. According to a socio-economic survey conducted by LIPI in 2011, only 6 percent of households obtained loans that were larger than their net income. The majority received loans that were less than 30 percent of their net income. Therefore, the resources were mainly used for supplemental income generation activities, such as small scale trading and kiosks (40 percent) and additional equipment for fishing activities, including the purchase or repair of fishing gear, body boards, boat engines, and fishing capital (36 percent).

Table 3.3: Number AIGs Initiated by District and Composition of AIGs by Sector and District

	Pangkep	Selayar	Buton	Wakatobi	Raja Ampat	Biak	Sikka
Number of AIGs	110	157	269	126	187	427	174
Share by Sector							
Trade	39%	60%	44%	56%	29%	38%	32%
Fishing activities	46%	18%	32%	32%	45%	52%	17%
Aquaculture	9%	2%	10%	9%	0%	0%	29%
Livestock	4%	2%	2%	3%	0%	3%	16%
Other	4%	15%	6%	4%	2%	28%	3%

These supplemental income generation activities did not necessarily lead to the hoped for income gains. For example, sales only increased for 41 percent of economic businesses after receiving revolving funds, while 48 percent experienced no change and 11 percent even suffered a decline. In contrast, net income from fisheries is substantially higher for households that purchased additional fishing equipment. This shows that the low levels of fisheries production prevalent in the target districts may be increased substantially through the purchase of additional equipment, giving fishermen greater access to fish stocks beyond the reef. The data is however not sufficient to identify how these purchases have affected catch per unit of effort.

Aquaculture activities, on the other hand, usually enabled fishermen to leave the capture fishing sector with FIRRs that were often considerably larger than the PAD's estimates. For example, a detailed financial analysis of a seaweed culture revealed that the FIRR was three times higher than the appraisal estimate – with a benefit-cost ratio of 3.96:1 vs. 1.42:1. The main reasons for the difference are (i) lower investment and fixed costs, as depreciation rates were lower than expected; and (ii) higher income, since seaweed could be harvested up to 5 times a year, thus increasing revenue considerably (see Table 3.4). However, despite their high levels of profitability, aquaculture activities are generally more risky. According to the LIPI survey, only 34 percent of the supported businesses were still operating at the end of the project as compared to 70-80 percent for the other sectors. It will thus be crucial to ensure that entrepreneurs receive training to build their skills and are insured against adverse external impacts.

Table 3.4: Financial Analysis of a seaweed culture business – comparison between PAD and ICR estimates

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
PAD (in million Rupiahs)						
Total Investment	7.82	4.88	4.92	5.12	4.92	4.61
Total Income	19.50	19.50	19.50	19.50	19.50	19.50
Total Variable Costs	8.13	8.13	8.13	8.13	8.13	8.13
Total Fixed costs	2.77	5.45	5.45	5.45	5.45	5.45
Net Cash flow	3.48	6.42	6.37	6.17	6.37	6.69
ICR (in million Rupiahs)						
Total Investment	6.39	0.05	2.15	0.13	2.15	-1.12
Total Income	60.75	60.75	60.75	60.75	60.75	60.75
Total Variable Costs	13.39	13.39	13.39	13.39	13.39	13.39
Total Fixed costs	0.88	1.69	1.69	1.69	1.69	1.69
Net Cash flow	40.91	47.25	45.15	47.17	45.15	48.42

C. Fiscal Impact Analysis

The **Fiscal Impact Analysis of the PAD** argued that each district is likely to derive significant positive fiscal benefits from effective collaborative management of coral reef resources. It compared the yields each district will derive from degraded fisheries compared to the yields and benefits associated with sustainably managed fisheries (Table 3.5). The analysis assumed that annual yields per square kilometer of reef would increase from 5 tons per square kilometer to 30 tons per square kilometer, translating into sizeable benefits. Large fiscal advantages were also expected from increased tourism revenues if marine protected areas are managed effectively. The expected increase was estimated at over 220% over 25 years.

Table 3.5: Estimated Reef Fisheries Benefit and District Fiscal Impact Resulting From Effective Collaborative Management of Resilient Marine Conservation Areas at Appraisal

	Reef & related ecosystem area (km^2)	Degraded fisheries yield per year ($5T/km^2$)	Managed fisheries yield per year ($30T/km^2$)	Approximate $ Benefit from managing fisheries (25T @ $1,972/T)
Pangkep	374	1,870	11,220	22,125,840
Selayar	1,098	5,490	32,940	64,959,844
Buton	1,402	7,010	42,060	82,944,844
Raja Ampat	1,299	6,495	38,970	76,851,178
Biak	424	2,120	12,720	25,084,603
Sikka	128	640	3,840	7,572,710

The **Fiscal Impact Analysis of the ICR** updates this analysis using the actual project managed coral reef area and updated average price information used in the analysis above. Note that the average price information is scaled by the local multiplier of 2 to capture spillover effects as was done for the PAD (Table 3.6). Given the higher price information and aforementioned changes in the area treated, the approximated benefits rise for all districts apart from Raja Ampat with particularly large increases for Pangkep, Wakatobi, and Biak. However, these results come with an important caveat. The predicted increase in managed fisheries yields used at appraisal seems overly optimistic. Using the average catch measurements collected during project implementation, the estimated average annual yields range from 0.04-18.3 tons per square kilometer of coral reef. Given the data quality and inconsistency problems, these figures should not be taken at face value. However, they suggest that an increase of 30 tons per square kilometer seems unlikely, leading to lower than expected fiscal benefits.

Table 3.6: Estimated Reef Fisheries Benefit and District Fiscal Impact Resulting From Effective Collaborative Management of Resilient Marine Conservation Areas at End of Project

	Reef & related ecosystem area (km^2)	Degraded fisheries yield per year ($5T/km^2$)	Managed fisheries yield per year ($30T/km^2$)	Approximate $ Benefit from managing fisheries (25T @ $3,236/T)
Pangkep	1,675	8,376	50,254	135,518,017
Selayar	907	4,533	27,199	73,346,367
Buton	202	1,009	6,055	16,327,238
Wakatobi	1,186	5,932	35,594	95,986,232
Raja Ampat	118	592	3,552	9,579,369
Biak	356	1,780	10,679	28,798,782
Sikka	128	639	3,833	10,337,402

In contrast, the collected tourism revenue and GDP data indicates that the expected benefits from tourism could be even higher than anticipated at appraisal. The estimates range from an increase of 240 percent in Pangkep and Selayar to 500 percent in Buton and Wakatobi and even 1,500 percent in Raja Ampat.

In terms of the fiscal sustainability of the program, the project has developed an exit strategy at all levels to insure continuance of selected activities after the project's closing date. In particular, each district has committed to ensure that project activities are fully integrated into district programs and funded independently of either donor or national government resources. The district budget levels provided, cover at least 70 percent of the PMU's operating costs. This level of funding will allow most project activities to continue unimpeded. At the national level, most activities are being maintained either by being mainstreamed into existing programs or having special allocations. For example, it is expected that special allocations will allow CRITC, MIS, and the MPA Scorecards to be maintained without interruption. Moreover a COREMAP-III design team will continue working with the Bank. The COREMAP-III request has already been submitted to the Bank as well as to BAPPENAS and preparations is expected to be completed by the end of 2012.

Annex 4. Bank Lending and Implementation Support/Supervision Processes

(a) Task Team members

Names	Title	Unit	Responsibility/ Specialty
Lending			
Pawan Patil	TTL	EASIN	Economist
John Virdin	Co-Management	ARD	Environmental Specialist
Thomas Walton	Safeguards	EASES	
Kathy MacKinnon	Biodiversity	ENV	
Karin Nordlander	Lawyer	LEGEA	
Anthony Toft	Lawyer	LEGEA	
Giovanna Doreq	NRM Institutions	EASES	
Robin Broadfield	EAP GEF Focal Point	EASES	
Rajiv Sondhi	Financial Management	EACIF	
Rizal Rivai	Procurement	EACIF	
William Hardi	Procurement	EACIF	
Yogana Prasta	Disbursmenet	EACIF	
Kasper Svarrer	Governance	EASRD	
Steve Burgess	Governance	EASRD	
Shobha Shetty	Economist	EACIF	
Cecilia Belita	Program Assistant	EASRD	
Cynthia Dharmajaya	Program Assistant	EASRD	
Sri Asih Wohon	Team Assistant	EACIF	
Karen A. Jones	Program Assistant	LEGEA	
Rahul Raturi	Sector Manager	EASRD	
Marea Hatziolos	Peer Reviewer	ENV	
William Lane	Peer Reviewer	AFTS2	
Supervision/ICR			
Anita Kentjanawati Tuwo	Procurement Spec.	EAPCO	
Arip Syaman Sholeh	Consultant	EAPFM	
Benedicta R. Sembodo	Program Assistant	EACIF	
Bisma Husen	Senior Procurement Specialist	EAPPR	
Christina I. Donna	Financial Management Specialist	EAPFM	
Eka Zarmen Putra	Operations Officer	EACIF	
Erman A. Rahman	Operations Officer	EASIS	
Esther Regina Victoria Pormes	Program Assistant	ENVCI	
Harjunani Kumoloraras	Consultant	EASIS	
Hongjoo Hahm	Senior Economist	EASIS	
Ina Pranoto	Senior Environmental Specialist	EASIS	
John Virdin	Sr Natural Resources Mgmt. Spec.	ENV	
Marea Eleni Hatziolos	Senior Environmental Specialist	EASER	Task Team Leader
Micah Fisher	Consultant	EASIS	

Muhammad Fedi Alfiadi Sondita	Consultant	EASIS	
Pawan Patil	Senior Economist	EASER	
Cynthia Dharmajaya	Program Assistant	EASER	
Sri Asih	Program Assistant	EACIF	
Unggul Suprayitno	Sr Financial Management Spec.	EAPFM	
William Leeds Lane	Consultant	MNSAR	
Yulita Sari Soepardjo	Team Assistant	EACIF	
Stefanie Sieber	Economist	EASER	

(b) Staff Time and Cost

Stage of Project Cycle	Staff Time and Cost (Bank Budget Only)	
	No. of staff weeks	USD Thousands (including travel and consultant costs)
Lending		
FY01	4.65	14,406.26
FY02	24.76	125,012.91
FY03	16.03	104,363.77
FY04	38.3	249,778.53
Total:	83.74	493,561.57
Supervision/ICR		
FY05	16.32	60,271.03
FY06	39.45	150,081.14
FY07	20.48	100,832.29
FY08	17.42	93,285.79
FY09	19.44	83,305.22
FY10	26.4	14,219.36
FY11	17.57	118,090.14
FY12	18.02	120,209.83
Total:	175.1	866,294.80
Grand Total	258.84	1,359,856.37

Annex 5. Beneficiary Survey Results *(if any)*

N/A

Annex 6. Stakeholder Workshop Report and Results *(if any)*

N/A

Annex 7. Summary of Borrower's ICR and/or Comments on Draft ICR

EXECUTIVE SUMMARY

The Coral Reef Rehabilitation and Management Program (COREMAP) promotes sustainable use of Indonesia's coral reefs and associated ecosystems (i.e., fisheries, mangroves, sea grass). The Program utilizes funding from the Government of Indonesia (GOI) and the World Bank (Bank) for Eastern Indonesia; and the Asian Development Bank (ADB) for Western Indonesia. In 2011, COREMAP World Bank and ADB together had activities in a total of 8 provinces, 14 districts and 415 villages. The number of community residents directly reached by the Project is estimated at 12,500.

The Bank funded Coral Reef Rehabilitation and Management Project, Phase II (referred to as COREMAP II, Project or COREMAP-II) is the second (i.e., acceleration) phase of a three part Adaptable Program Loan (APL). The project was built on Phase I's wealth of examples, workable models and lessons to expand COREMAP's geographic and technical scope. COREMAP II's design is based on the nation's sustainable marine resource use, decentralization and poverty alleviation goals. The project assisted GOI at national, provincial and district levels to empower coastal communities to manage coral reefs and thereby enhance community welfare. Expectation is that COREMAP, Phase III (COREMAP-III) will be designed in 2012 and implemented from 2013 to 2018. COREMAP-III will build on lessons learned under Phases I and II, incorporate latest scientific findings, use socially oriented implementation mechanisms and expand further COREMAP's geographic reach.

COREMAP-II's loan, credit and grant agreements were signed on 30 June 2004 with an effective date of 28 January 2005. However, due to delays caused by the need for GOI to fulfill 14 loan/credit/grant effectiveness conditions, provide counterpart funding, acquire office space and put in place operational agreements, activities under the Project began in earnest in 2006. In part due to the delayed startup, the original loan closing date of 31 December 2009 was extended by 2 years to 31 December 2011.

COREMAP II's development goals of equal importance and implemented simultaneously are to:

1. Insure biodiversity conservation and sustainable management of coral reef ecosystems and related resources;
2. Strengthen the capacity of communities and institutions to manage coral reef ecosystems and resources; and
3. Lower the incidence of poverty in the Program's coastal communities.

The Project is undertaken at national, provincial, district and village levels. At the Project's apex is its Executing Agency the Ministry of Marine Affairs and Fisheries (KKP). The KKP Minister authorizes organizational structures, operating procedures and staffing for the national elements of the Project including the: (i) National Steering

Committee; (ii) National Technical Committee; and (iii) National Coordinating Unit (NCU). The NCU under the direction of KKP's Directorate General of Marine, Coasts and Small Islands (KP3K), Directorate of Marine and Aquatic Resources Conservation (KKJI) is responsible for overall Project coordination, supervision and implementation. Implementation by the NCU at the national level is supported by 2 National Program Implementation Units (NPIUs):

- Indonesian Institute of Sciences (LIPI) for scientific support; and
- Ministry of Forestry's, Directorate of Forest Protection and Conservation (PHKA) for marine park support.

At the provincial level, implementation is undertaken by 5 Regional Coordination Units (RCUs) lead by the provincial fisheries services (Province *Dinas* KP) located in South Sulawesi, Southeast Sulawesi, Papua, West Papua and Nusa Tenggara. At the district level, implementation is provided by 7 Project Management Units (PMUs) lead by the district fisheries services (District *Dinas* KP) located in Pangkep, Selayar, Buton, Wakatobi, Raja Ampat, Biak and Sikka. In each of the Project's 358 villages, the project implementation is handled by a Coral Reef Management Committee (LPSTK) in coordination with Village Heads.

COREMAP II is comprised of 3 major components: (1) Institutional Strengthening; (2) Community Based and Collaborative Management; and (3) Public Awareness, Education and Sea Partnership. The NCU assists across all components with primary responsibility for Institutional Strengthening, Public Awareness and Sea Partnership Program. NPIU LIPI undertakes scientific monitoring (coral reef; socio economic) and Education. NPIU PHKA implements marine park support. PMUs implement most of Community-Based and Collaborative Management. RCUs focus on all project elements that relate to provincial levels activities.

The Project measures its performance against two types of indicators:

- Key Performance Indicators (KPIs); and
- Output Indicators.

KPIs measure the Project's implementation success against 7 high level outcomes representing management/empowerment, biophysical and socio economic/poverty targets. The KPI's were originally presented in the Project Appraisal Document (PAD); and subsequently updated in the Bank's Restructuring Plan (January 2010). The Project has successfully met all of the KPIs, which are under its direct control. Detailed status of KPIs including remarks, issues to be addressed and related lessons learned appear in Annex 2.

Details of project implementation success are also measured against 42 Output Indicators. Output Indicators represent human resource and physical targets. Like the KPIs, the Output Indicators originally appeared in the PAD. About 20% of the original Output Indicators were modified in the Bank's Restructuring Plan. Generally, the Output

Indicators are easily measurable and readily quantifiable. Details of Output Indicator performance, comments, issues to be addressed and lessons learned are shown in Annex 3. The Project has successfully fulfilled 90%; and partially fulfilled all of the Output Indicators. Of the partially fulfilled indicators, the most challenging relate to CBM finance at the village level. For example, the Output Indicator specified a village micro saving/credit unit (LKM) repayment rate of 75%. In actuality, it averages +/- 60%.

A summary of implementation success described by component finds:

A. Institutional Strengthening

Institutional Strengthening's intent is to enhance government institutional responsiveness to meet the needs of coastal communities and to support coral reef management. The formation and legalization of program structures at the national, provincial and district levels proceeded smoothly and reinforced COREMAP II implementation. A target of 30% involvement of women was set and has been met for most project activities. The Project's operational structure has been promulgated through the issuance of SKs by Ministers, Governors and *Bupatis*. Follow up SKs detailing assignment of personnel and duties have been issued annually by the respective directors for the NCU and NPIUs, Provincial *Dinas* KP Heads for RCUs and District *Dinas* KP Heads for PMUs. Consequently, the NCU, NPIU LIPI, most RCUs and all PMUs were established in a timely manner, adequately staffed and functioned well. They were able to properly execute their duties and fulfill assigned responsibilities. NPIU PHKA staff, skills and motivation are excellent; and as a consequence, the project objectives were generally attained. Nevertheless, more could have been accomplished with marine park support if financial constraints had not occurred.

The national Coral Reef Information and Training Center (CRITC LIPI) provided support to the 7 district CRITCs (CRITC PMUs). The implementing agency for the national CRITC is NPIU LIPI; and those of the district CRITCs the respective PMUs. CRITC LIPI monitored reef health at permanent transects, trained local CRITC staff and upgraded community skills in coral reef and fish health monitoring. All CRITC LIPI work products (i.e., books, training manuals, atlases, research findings, website) were of very good quality; and their production executed in a professional and timely manner. NPIU LIPI's management of staff, meetings and budgets is outstanding. CRITC LIPI was able to effectively train CRITC PMUs and community stakeholders. CRITC PMUs conducted reef and fish surveys, disseminated information to Village Information Centers (VICs), trained local stakeholders and helped with collection of reef health, fish census and socio-economic data. CRITC PMUs generally were able to perform their tasks and provide useful information for area decision makers and stakeholders. However, CRITC PMUs only began monitoring operations in 2008; and are still in need of CRITC LIPI support to insure high quality, reliable results. Coordination between CRITC LIPI and PMU CRITCs could be improved. CRITC PMUs report to, receive budgets from and contract through the PMUs - and not through CRITC LIPI. As a result, the linkage between CRITC LIPI and CRITC PMUs for implementation of district level activities is

inconsistent. Also CRITC LIPI did not play the research role, international outreach or scientific monitoring of marine protected areas as envisaged in the PAD.

Provincial level support was not included in the PAD. It was added in 2006 when it became apparent that selected activities and coordination amongst districts were best handled by provinces. RCUs, with the exception of West Papua, were adequately legalized, staffed and budgeted. RCU West Papua was formed in a new province; and, as a result of provincial startup, required about 2 years before its office was fully operational. The MIS Unit, as strengthened by the GOI and the Bank in 2010, is operating well; and is expected to have a very positive impact in public dissemination of information in the future.

There are 358 villages included in the project. Each village has a Coral Reef Management Committee (LPSTK) created under Village Head decrees. No major problems were encountered with LPSTK formation. LPSTKs needed to be formed gradually as villages were added to the project and after proper socialization and support from Community Based Management (CBM) teams. Village Heads have issued 329 village ordinances (*Perdes*) mostly to formalize community management plans (RPTKs) and measures, such as the establishment of DPLs. The project also initiated the creation and then assisted in the intermediate and final drafting of the district regulations (*Perda*), which serve as the main instrument enabling passage of District Coral Reef Strategic Plans (*Renstra*).

An extensive training program has been undertaken at all project levels. In general, each year, the NCU and NPIUs have offered 4 workshops and 4 training sessions to their staff, the RCUs about the same number and the PMUs 10 training sessions and 5 workshops. The NCU also assisted with Terms of Reference and helped coordinate activities related to implementation of a sustainable live ornamental fish trade in Pangkep and Buton.

B. Community Based and Collaborative Management

Community Based and Collaborative Management's intent is to empower coastal communities and institutions in project districts to sustainably manage coral reefs and associated ecosystems to increase community welfare and incomes. This component has conformed to the strategy laid out in the PAD; and been generally successful in implementing its objectives. Community Based and Collaborative Management was project's most complex, costly and time consuming element. However, it also reached the most people, an estimated 10,000 stakeholders. Each district established a Coastal Community Empowerment Board (CCEB), which proved to be a useful vehicle to promote understanding of the Project to civil society and external stakeholders such as fishers, police, navy, women's groups and NGOs. The PMUs were quickly established and generally functioned well. In some cases, where counterpart funds from local budgets (APBD) were needed, delays did occur due to the late arrival of APBD funds. However, these delays were mostly encountered in the early years of the Project. As the PMUs gained implementation skills, they were able to manage their programs to anticipate and accommodate the late arrival of APBD funds.

On average, PMUs used a 95 person Field Team (7 Senior Extension Training Officers (SETOs); 21 Community Facilitators (CFs); 67 Village Motivators (VMs)) to provide outreach to the district villages. Each village formed a Coral Reef Management Committee (LPSTK) with 4 subsections (*Pokmas*): production, gender, conservation and monitoring control and surveillance (MCS). Later a village micro saving/credit unit (LKM) was independently formed. Obtaining Ministry of Finance (MOF) approval for LKMs required comprehensive documentation and a lengthy series of negotiations, which resulted in a +/- 2 year delay in LKM implementation. The credit granting process is ongoing and has been running according in accordance with Project and MOF directives. About 1,450 AIGs have been realized using LKM funds. However, care needs to be exercised that these initiatives are truly for alternatives to capture fisheries; and not just providing supplementary income. Supplementary income provision can even have an adverse impact allowing for continued unsustainable fishing pressure on reefs. Also, despite the LKMs following the PAD and GOI guidelines, long term LKM financial sustainability at current repayment rates (+/- 60%) remains in question.

Based on the Rapid Rural Assessments (RRA) analysis, Coral Reef Management Plans (RPTKs) were drafted. The RPTKs include at least one protected area No Take Zone (DPL) in each village. The RPTKs have all been sanctioned by Village Head endorsements (i.e., *Perdes*). The Project's villages are now much better able to manage and control coral reefs. Social infrastructure investments are included in the RPTKs and were funded by the Project. Typical investments included public toilets, freshwater wells, small surveillance boats, village gates, walkways and boundary markers.

COREMAP II MCS is one of the most successful Project initiatives. A cost-effective, decentralized system MCS system has been supported in the project villages. Village MCS units (*Pokmaswas*) have received training and radio communications equipment. The goal for each village to be connected by radio to the existing law enforcement system has been 85% met. COREMAP-II MCS trained civil law enforcement officer (17 Fisheries – PPNS in 2007; 27 Fisheries Inspectors in 2010). Results have been dramatic with the project MCS helping to reduce illegal/destructive fishing practices by about 60% from 2,200 infringements in 2005 to 880 infringements in 2010. MCS legal performance has been excellent too with 70% of recorded illegal/destructive fishing cases prosecuted.

The project supported PHKA and later KKP in marine protected area management. Until 2009, PHKA areas included two marine national parks and four marine protected areas. In 2009, the 3 KSDA areas (Raja Ampat, Padaido, Kapoposang) were transferred to KKP. Funding was provided to PHKA for training, workshops, conference attendance, buildings, equipment, and operational support including socialization of local communities. KKP park management only received technical support for MCS and MPA Scorecards. From 2009 to 2011 overall MPA Scorecards showed an impressive 20% gain indicating a significant improvement in COREMAP-II area park management. All areas, except Kapoposang KSDA, have shown improvement. Biak showed an especially strong gain of 115%. Kapoposang's deficiencies are now being addressed by KKP.

COREMAP II played a key role in the development of 12 District Marine Protected Areas (KKLDs). The establishment of these KKLDs added a total 1 million ha of marine protected areas; and approximately 90,000 ha of No Take Zones. The amount of KKLD No Take Zones is expected to increase even further as additional zoning takes place in Sikka, Raja Ampat and Biak. Although considerable work is still remaining to make KKLD's truly effective, their development has been particularly effective in expanding the potential area under marine protection. KKLDs were not envisaged in the PAD but were successfully taken up by the Project. District Marine Resources Strategic Plan (*Renstra*) have been made in each district. The *Renstra*'s are based on the protected areas of +/- 300 DPLs and 12 KKLDs. The *Renstra* by its very nature serves to form a network of marine conservation areas (MCAs).

District Block Grants designed to support AIG activities of a larger scale at the district level were only partially successful. Only about 50% of the funds allocated was able to be used. Difficulties in implementation stemmed from (i) lack of familiarity and understanding of the concept; (ii) Ministry of Finance restrictions; (iii) difficulty to locate appropriate projects; and (iv) lack of sophisticated institutions and financial expertise at the district level. These same difficulties were faced by 2 other concepts, which appeared in the PAD but were not taken up: (i) Credit Guarantee Scheme; and (ii) Employment Outside Village. COREMAP-II did undertake two pilot projects, one in Pangkep and one in Buton, for the sustainable management and certification of aquarium fish. Ultimately, the initiative can only be considered partially successful. Pangkep decided to establish a sustainable live ornamental coral reef fish certification program; but it was cancelled in Buton due to lack of buyer support.

C. Public Awareness, Education and Sea Partnership

Public Awareness, Education and Extension's intent is to promote societal awareness of the benefits of coral reef conservation and sustainable use that leads to behavior change. This component uniformly met with success; and each of the 4 subcomponents exceeded PAD targets.

Public Awareness (PA) very effectively communicated COREMAP-II messages. Due to project PA efforts, a 2010 COREMAP II survey, showed that over 75% of Project area residents were aware of the importance of coral reefs. PA implemented a strategic media, public relations and advocacy program to obtain the maximum positive impact by targeting activities towards key stakeholders. PA campaigns offered directed messages to promote behavior change such as prevention of destructive fishing, habitat protection, sustainable fisheries, community programs and regulations. At both national and local levels, television, radio and print media campaigns were employed to increase the level of public awareness. Examples include 12 major televisions features, 16 half hour radio programs (aired +/- 2,700 times over 3 years) and more than 50 TV and radio talk show appearances by key project managers. Over 50,000 print items such as brochures, books, pamphlets, manuals, stickers, information kits and calendars were produced per year. PA even conceptualized; developed and produced a song album entitled "*It's Umbu Time*" and then socialized its use at national, provincial, district and village levels. PA provided

technical support and materials for numerous events/exhibitions both within and outside the Project. Importantly, as part of its advocacy program, PA helped to initiate Forjubi (*Forum Jurnalis Bahari Indonesia*) to serve as a support group composed of television and radio journalists.

COREMAP-II's PA products have been well received; and are especially appreciated at the community level. In the villages, community wall newspapers, public announcement billboards, banners and locally developed public awareness materials were very successful in increasing the level of awareness and knowledge of the general public. The VICs, although simple, were stocked with useful materials and serve as popular meeting places. Public relations outreach and advocacy activities with government organizations, community groups and private organizations also contributed to supporting Project goals. In this regard, the involvement of well-known artists, government authorities and community leaders in the PA campaigns has proven to be invaluable.

The Education subcomponent has also far exceeded the Output Indicators. It is estimated that approximately 130,000 students attended coral reef education classes (95,000 – primary; 20,000 – middle; 15,000 – high). Education used a three pronged approach: (i) developing education materials; (ii) increasing capacity of school institutions and (iii) increasing support from key stakeholders, particularly from the Ministry of National Education (*Diknas*) and its offices at the district level. The Education team developed, produced and distributed local coral reef and marine education materials (*mulok*) for elementary, junior and senior schools. These materials were officially accepted by *Diknas'* Curriculum Center. Therefore, all the books have already fulfilled the National Education Standard, and can be used for schools throughout Indonesia and the results included in the students' reports/certificates. The PAD expected to only reach elementary schools; but the Project exceeded this goal by including middle and high schools. In all 32,700 books were produced and distributed (17,360 – primary; middle – 10,095; high – 5,345). In 2011 electronic book versions were included on the *Diknas* website for downloading throughout the country. To insure the curriculum was properly covered, 1,225 teachers were directly trained (645 – primary; 327 – middle; 253 – high). The training followed a Training of Trainer modality so expectation is this core group was able to train an additional 4,400 local teachers. In total about 90% of all project districts coastal schools received teacher training and materials. Education also developed, produced and distributed additional documents, such as teachers' manuals, syllabuses and other supporting materials. Non formal education was supported through national reef education events, media promotions and assistance and scientific consultation for students.

The project was able to utilize KKP's existing Sea Partnership Program (SPP) to dramatically expand Indonesia's technically qualified human resource base. Support was provided to the National Sea Partnership office and its programs. Six months of national and international advisory services were given at the national level helped to build the SPP. However, probably the most important impact of the SPP was the large number of scholarships given at all levels from the high school to Ph.D. In total over 1,500 students (600 bachelors/masters/Ph.D; 900 high school) received financial assistance to pursue

their studies. The positive impact of the enhanced marine education of these individuals will be felt for generations to come. During breaks in their university studies, approximately 666 students distributed coral reef management information in coastal villages. It is estimated that these materials reached about 8,000 people. With SPP support, districts were able to strengthen their fisheries departments through the use of 84 seconded experts from universities and also by applying the results of 51 responsive research findings.

Program Support Communications provided Project staff, and to a lesser extent, external partners and stakeholders, an understanding of COREMAP-II. It was able to communicate COREMAP-II's philosophy, objectives, activities, outputs and outcomes. To achieve this it developed communication protocols, trained Project staff how to interact with the media, produced Project info sheets, newsletters and bulletins, made information kits and press releases on sensitive issues and ran a public relations campaign. The physical production and dissemination of materials such as logos, letterheads, info sheets, bulletins and press releases was successfully and relatively easily accommodated. Similarly, Program Support Communications effectively interacted with external partners through organization of events, workshops and conferences.

Comments by Borrower on issues related to procurement delays and reliability of biophysical data raised in Draft ICR

A. On Procurement:

(i) Lack of familiarity with Bank's administrative and procurement procedures by project implementers contributed to project implementation delays.

(ii) Communication between the borrower and the Bank's Task Team at the begining of COREMAP II was weak. More proactivity on the part of the Bank in helping the implementing agencies address procurement issues—e.g., by providing clear guidance and instructions on how to correct problems—would have prevented some of these delays.

B. On Indicators:

(i) To avoid data reliability issues in the future in the measurement of coral reef health—e.g., using live coral cover and coral fish population abundance under COREMAP III, it is suggested that:

- LIPI and District level monitoring should adopt photographic surveys because this is the most reliable and replicable methods for objectively describing coral reefs. The photos taken from years before can be archived for reference to the following years of monitoring, and are also very useful for detailed analyses. In a survey site, a photo should be taken on permanent transect by applying a quadrat frame, equiped with a digital camera.

- Also, populations of coral reef fish can be surveyed by underwater visual censuses combined with digital photography along the transect line. Fishes that have been succesfully photographed can then be calibrated

into their actual length. Using a known relationships between length and weight, the body weight/mass of each fish can be estimated. Summing each fish mass across all fishes surveyed along the transect line provides an estimate of total biomass of the fish assemblage, and allows one to express fish species abundance in grams per square meter.

Annex 8. Comments of Co-financiers and Other Partners/Stakeholders

Not applicable.

Annex 9. List of Supporting Documents

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World Bank and Government of Indonesia, June 2010. Extension of closing date; cancellation of proceeds and reallocation of proceeds of the Loan;
and amendment for Loan No.4740-IND (Project Restructuring)

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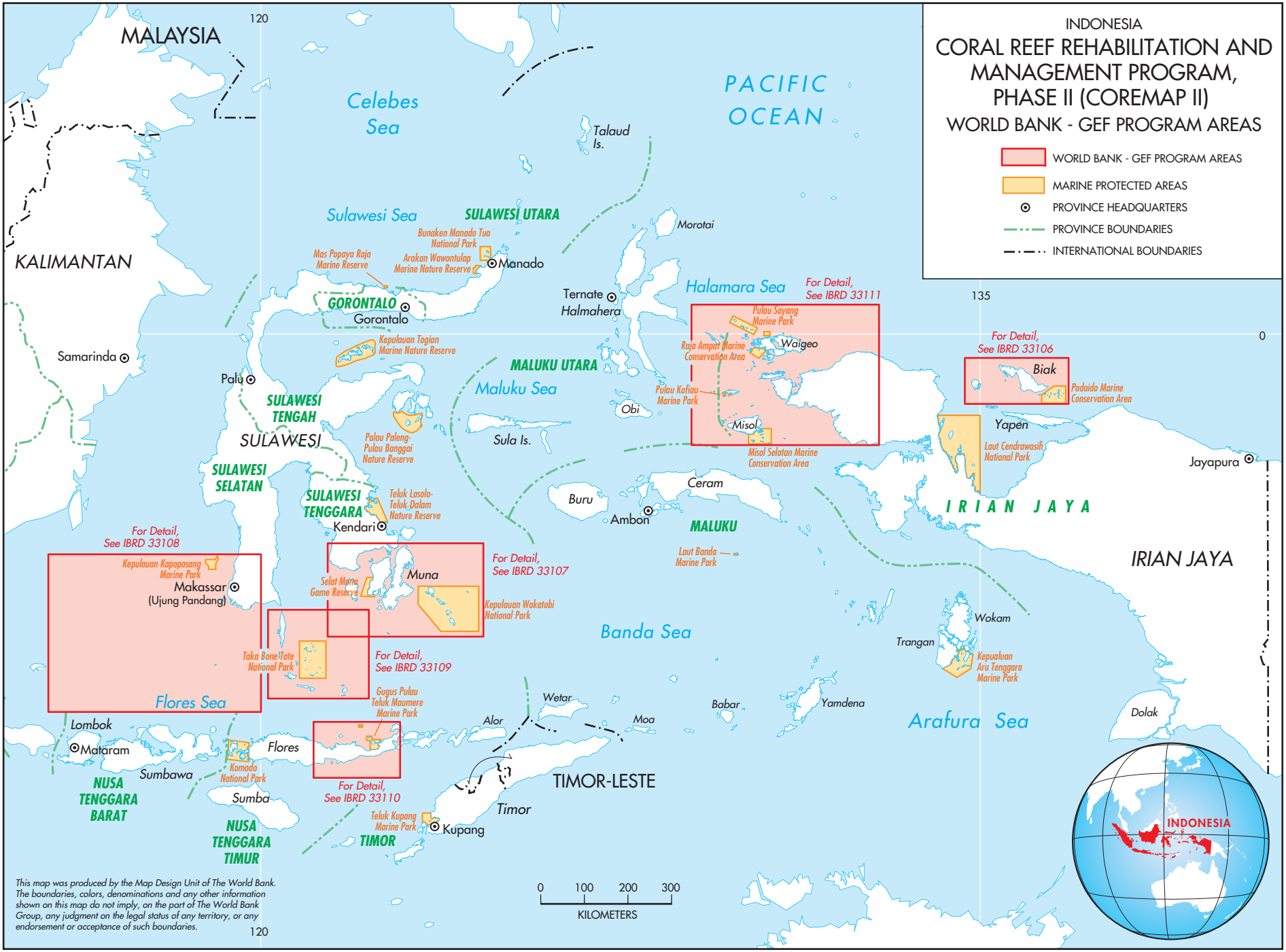
INDONESIA
CORAL REEF REHABILITATION AND MANAGEMENT PROGRAM, PHASE II (COREMAP II)
WORLD BANK - GEF PROGRAM AREAS
WORLD BANK - GEF PROGRAM AREAS
MARINE PROTECTED AREAS
PROVINCE HEADQUARTERS
PROVINCE BOUNDARIES
INTERNATIONAL BOUNDARIES
MALAYSIA
KALIMANTAN
SULAWESI
PACIFIC OCEAN
Celebes Sea
Sulawesi Sea
Halamara Sea
Maluku Sea
Banda Sea
Flores Sea
Arafura Sea
Talaud Is.
Morotai
Ternate
Halmahera
Sula Is.
Obi
Buru
Ceram
Ambon
Waigeo
Misol
Biak
Yapen
Jayapura
IRIAN JAYA
Wokam
Trangan
Babar
Yamdena
Dolak
Wetar
Alor
Moa
Lombok
Mataram
Sumbawa
Flores
Sumba
Timor
TIMOR-LESTE
Kupang
Samarinda
Palu
Gorontalo
Manado
Kendari
Muna
Makassar (Ujung Pandang)
SULAWESI UTARA
GORONTALO
SULAWESI TENGAH
SULAWESI SELATAN
SULAWESI TENGGARA
MALUKU UTARA
MALUKU
IRIAN JAYA BARAT
NUSA TENGGARA BARAT
NUSA TENGGARA TIMUR
TIMOR
Bunaken Manado Tua National Park
Mas Popaya Raja Marine Reserve
Arakan Wawontulap Marine Nature Reserve
Kepulauan Togian Marine Nature Reserve
Palau Paleng-Pulau Banggai Nature Reserve
Teluk Lasolo-Teluk Dalam Nature Reserve
Kepulauan Kapoposang Marine Park
Selat Mpana Game Reserve
Kepulauan Wakatobi National Park
Taka Bone Rate National Park
Gugus Pulau Teluk Maumere Marine Park
Komodo National Park
Teluk Kupang Marine Park
Pulau Sayang Marine Park
Raja Ampat Marine Conservation Area
Pulau Kofiau Marine Park
Misol Selatan Marine Conservation Area
Padaido Marine Conservation Area
Laut Cendrawasih National Park
Laut Banda Marine Park
Kepualuan Aru Tenggara Marine Park
For Detail, See IBRD 33108
For Detail, See IBRD 33107
For Detail, See IBRD 33109
For Detail, See IBRD 33110
For Detail, See IBRD 33111
For Detail, See IBRD 33106
120
135
0
0 100 200 300
KILOMETERS
INDONESIA
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JUNE 2012
IBRD 33105R

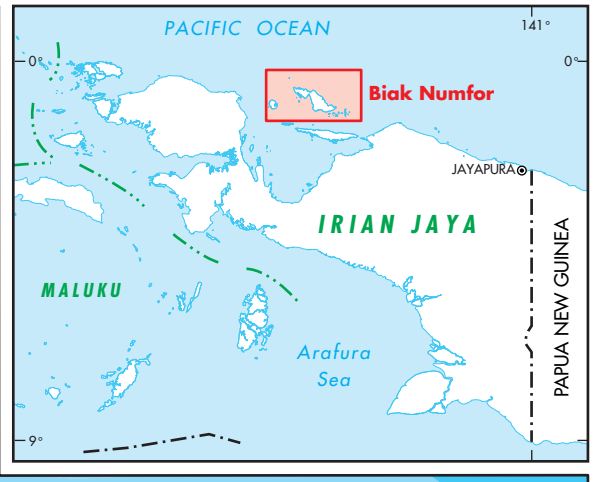
INDONESIA

CORAL REEF REHABILITATION AND MANAGEMENT PROGRAM, PHASE II (COREMAP II)

BIAK NUMFOR DISTRICT

BIAK NUMFOR COREMAP AREA
MARINE PROTECTED AREAS
CORAL REEFS
MAIN ROADS
SECONDARY ROADS
AIRPORTS
PORTS
DISTRICT (KECAMATAN) CAPITALS
REGENCY (KABUPATEN) CAPITAL

DEPTHS IN METERS:
10
200
1000
2000
3000
4000



136°E
135°E
1°S

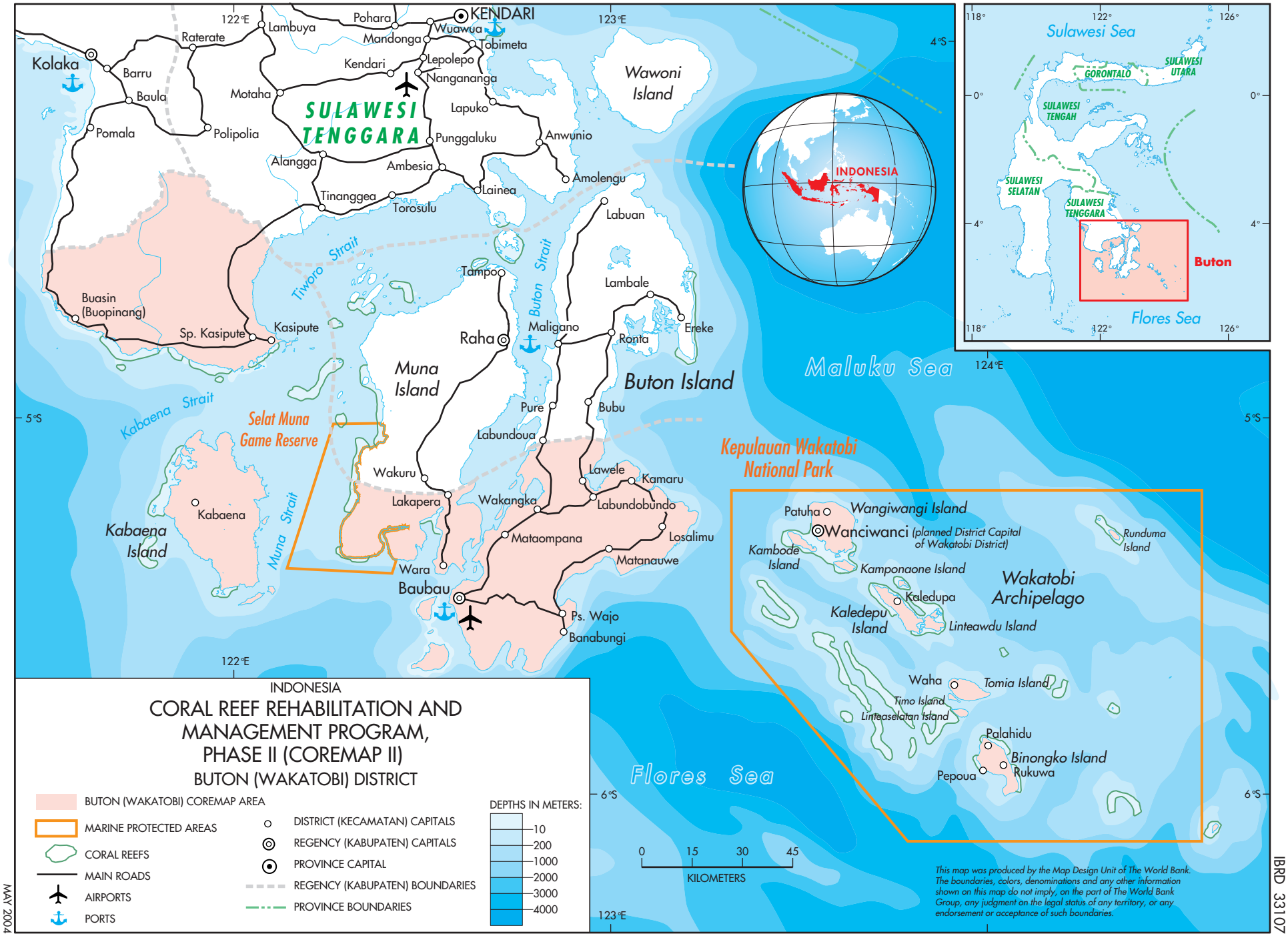
Pandi Island
Wundi Island
Puri Island
Jenggerboi
Sorendiweri Bay
Wandos
Warsa
Ababiadi
Wambrisau
Korido
Korido Bay
Sorendori Bay
Nukori Island
Insobabi Island
Rani Island
Biak Island
Korem
Sorindiweri
Serbinwar Bay
Abraididori Bay
Wardo
Malurber
Junction
Adaki
Marau
K. Baru
Biak
Bosnik
Mokmer
Numfor Island
Auki Island
Pai Island
Padaido Island
Bronsi Island
Workbondi Island
Awai Island
Pasi Island
Pakriki Island
Nukori Island
Dauwi Island
Rurbasbedar Island
Rurbasbeba Island
Wurki Island
Mangwandi Island
Nusi Island
Wamsoi Island
Padaido Marine Conservation Area
Miosnum Island
Yapen Strait
Yapen Island

0 10 20 30
KILOMETERS

INDONESIA

MAY 2004

IBRD 33106


INDONESIA
CORAL REEF REHABILITATION AND MANAGEMENT PROGRAM, PHASE II (COREMAP II)
BUTON (WAKATOBI) DISTRICT
BUTON (WAKATOBI) COREMAP AREA
MARINE PROTECTED AREAS
CORAL REEFS
MAIN ROADS
AIRPORTS
PORTS
DISTRICT (KECAMATAN) CAPITALS
REGENCY (KABUPATEN) CAPITALS
PROVINCE CAPITAL
REGENCY (KABUPATEN) BOUNDARIES
PROVINCE BOUNDARIES
DEPTHS IN METERS:
10
200
1000
2000
3000
4000
0 15 30 45
KILOMETERS
MAY 2004
IBRD 33107
SULAWESI TENGGARA
KENDARI
Kolaka
Raterate
Lambuya
Pohara
Wuawua
Mandonga
Tobimeta
Kendari
Lepolepo
Nangananga
Barru
Baula
Motaha
Lapuko
Pomala
Polipolia
Punggaluku
Anwunio
Alangga
Ambesia
Amolengu
Tinanggea
Lainea
Torosulu
Labuan
Tiworo Strait
Tampo
Buton Strait
Lambale
Buasin (Buopinang)
Sp. Kasipute
Kasipute
Raha
Maligano
Ereke
Ronta
Muna Island
Buton Island
Kabaena Strait
Selat Muna Game Reserve
Pure
Bubu
Labundoua
Wakuru
Lawele
Kamaru
Kabaena
Lakapera
Wakangka
Labundobundo
Kabaena Island
Muna Strait
Mataompana
Losalimu
Matanauwe
Wara
Baubau
Ps. Wajo
Banabungi
Wawoni Island
Maluku Sea
Flores Sea
Kepulauan Wakatobi National Park
Patuha
Wangiwangi Island
Wanciwanci (planned District Capital of Wakatobi District)
Runduma Island
Kambode Island
Kamponaone Island
Wakatobi Archipelago
Kaledupa
Kaledepu Island
Linteawdu Island
Waha
Tomia Island
Timo Island
Linteaselatan Island
Palahidu
Binongko Island
Rukuwa
Pepoua
Sulawesi Sea
Flores Sea
GORONTALO
SULAWESI UTARA
SULAWESI TENGAH
SULAWESI SELATAN
SULAWESI TENGGARA
Buton
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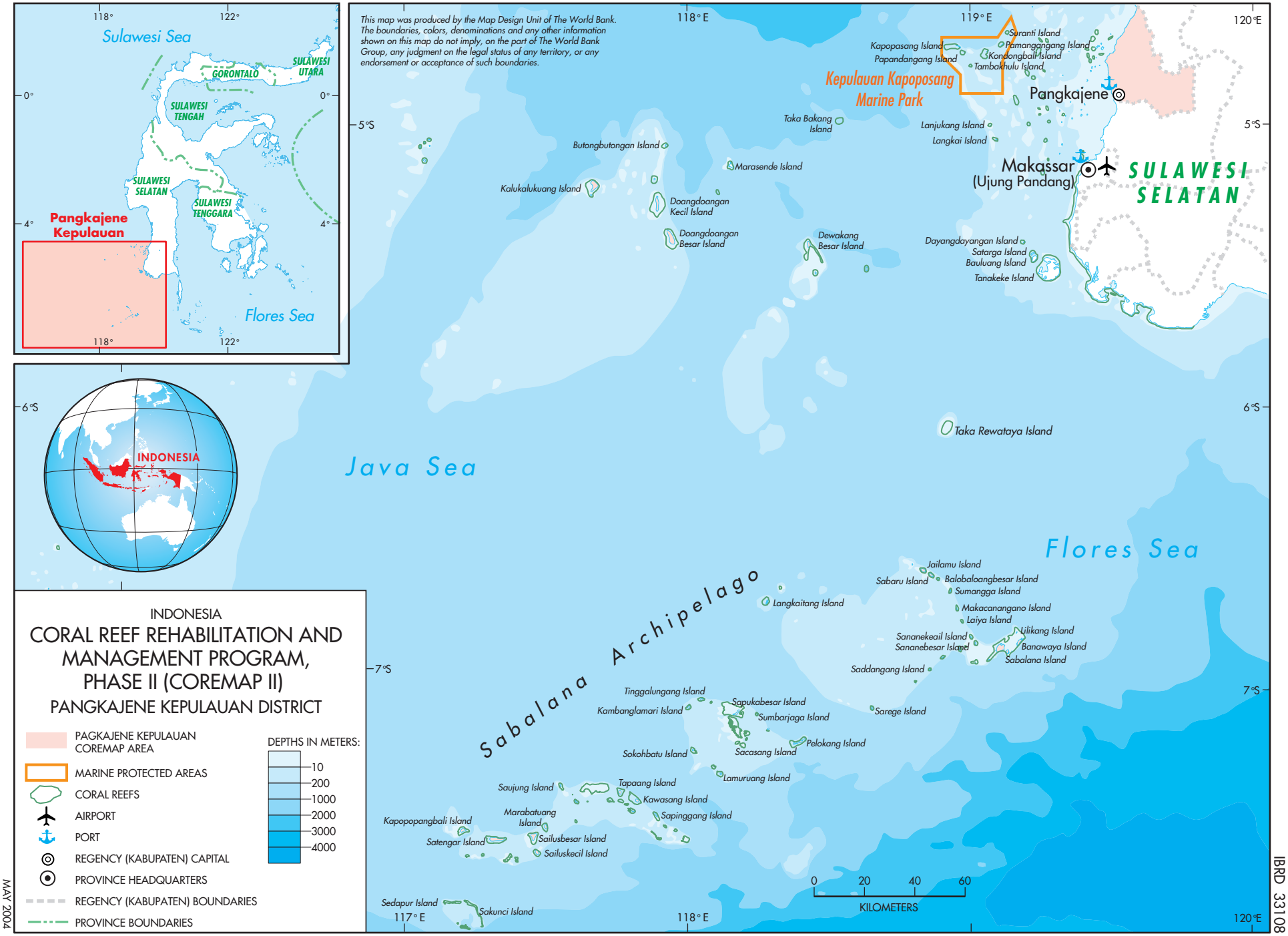
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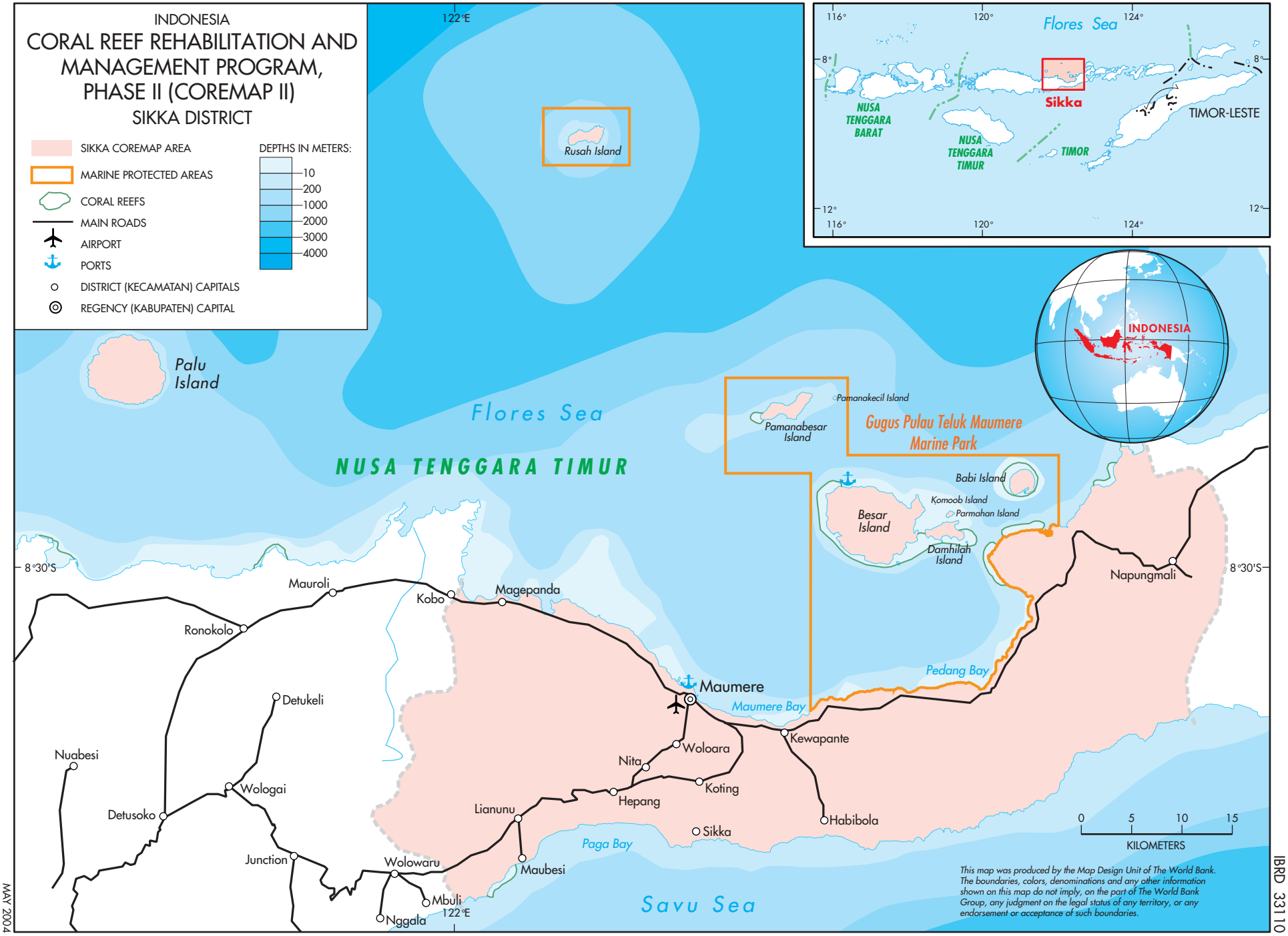
Sulawesi Sea
Flores Sea
GORONTALO
SULAWESI UTARA
SULAWESI TENGAH
SULAWESI SELATAN
SULAWESI TENGGARA
Pangkajene Kepulauan
INDONESIA
Java Sea
Flores Sea
Sabalana Archipelago
Kepulauan Kapoposang Marine Park
Pangkajene
Makassar (Ujung Pandang)
SULAWESI SELATAN
Kapopasang Island
Papandangang Island
Suranti Island
Pamangangang Island
Kondongbali Island
Tambakhulu Island
Taka Bakang Island
Lanjukang Island
Langkai Island
Butongbutongan Island
Marasende Island
Kalukalukuang Island
Doangdoangan Kecil Island
Doangdoangan Besar Island
Dewakang Besar Island
Dayangdayangan Island
Satarga Island
Bauluang Island
Tanakeke Island
Taka Rewataya Island
Jailamu Island
Sabaru Island
Balobaloangbesar Island
Sumangga Island
Langkaitang Island
Makacanangano Island
Laiya Island
Sananekeail Island
Sananebesar Island
Lilikang Island
Banawaya Island
Sabalana Island
Saddangang Island
Tinggalungang Island
Kambanglamari Island
Sapukabesar Island
Sumbarjaga Island
Sarege Island
Pelokang Island
Sacasang Island
Sokohbatu Island
Lamuruang Island
Saujung Island
Tapaang Island
Kawasang Island
Sapinggang Island
Kapopopangbali Island
Marabatuang Island
Satengar Island
Sailusbesar Island
Sailuskecil Island
Sedapur Island
Sakunci Island
118° E
119° E
120° E
117° E
5°S
6°S
7°S
0
20
40
60
KILOMETERS
INDONESIA
CORAL REEF REHABILITATION AND MANAGEMENT PROGRAM, PHASE II (COREMAP II)
PANGKAJENE KEPULAUAN DISTRICT
PAGKAJENE KEPULAUAN COREMAP AREA
MARINE PROTECTED AREAS
CORAL REEFS
AIRPORT
PORT
REGENCY (KABUPATEN) CAPITAL
PROVINCE HEADQUARTERS
REGENCY (KABUPATEN) BOUNDARIES
PROVINCE BOUNDARIES
DEPTHS IN METERS:
10
200
1000
2000
3000
4000
MAY 2004
IBRD 33108

INDONESIA

CORAL REEF REHABILITATION AND MANAGEMENT PROGRAM, PHASE II (COREMAP II)

SIKKA DISTRICT



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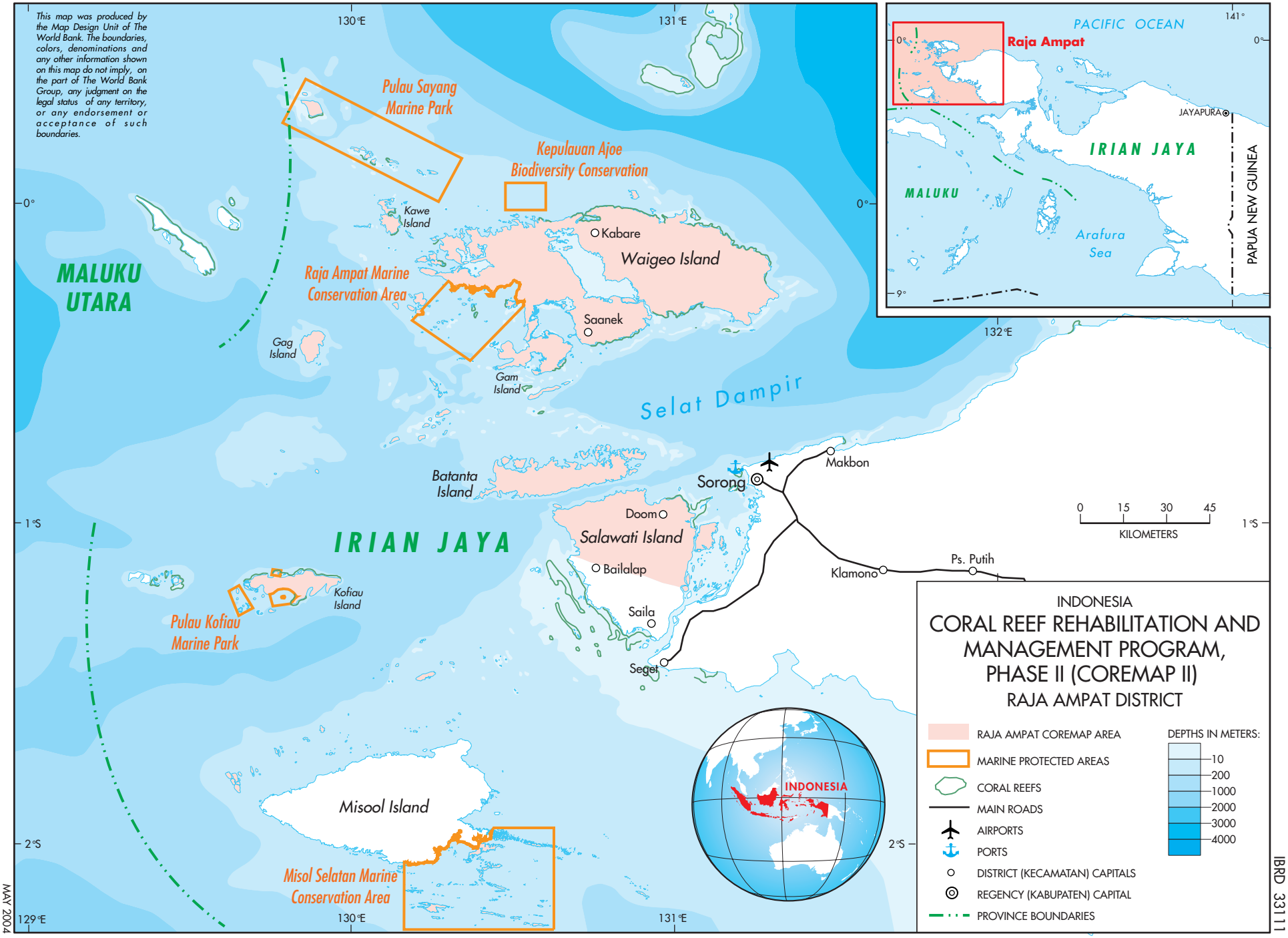
MAY 2004

IBRD 33110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130°E
131°E
132°E
129°E
0°
1°S
2°S
MALUKU UTARA
IRIAN JAYA
Pulau Sayang Marine Park
Kepulauan Ajoe Biodiversity Conservation
Raja Ampat Marine Conservation Area
Kawe Island
Kabare
Waigeo Island
Saanek
Gag Island
Gam Island
Selat Dampir
Batanta Island
Sorong
Makbon
Doom
Salawati Island
Bailalap
Saila
Seget
Klamono
Ps. Putih
Kofiau Island
Pulau Kofiau Marine Park
Misool Island
Misol Selatan Marine Conservation Area
0 15 30 45
KILOMETERS
PACIFIC OCEAN
Raja Ampat
JAYAPURA
IRIAN JAYA
MALUKU
Arafura Sea
PAPUA NEW GUINEA
141°
9°
INDONESIA
CORAL REEF REHABILITATION AND MANAGEMENT PROGRAM, PHASE II (COREMAP II)
RAJA AMPAT DISTRICT
RAJA AMPAT COREMAP AREA
MARINE PROTECTED AREAS
CORAL REEFS
MAIN ROADS
AIRPORTS
PORTS
DISTRICT (KECAMATAN) CAPITALS
REGENCY (KABUPATEN) CAPITAL
PROVINCE BOUNDARIES
DEPTHS IN METERS:
10
200
1000
2000
3000
4000
MAY 2004
IBRD 33111