PROJECT PERFORMANCE ASSESSMENT REPORT

INDONESIA

Coral Reef Rehabilitation and Management Program

Phase II and Coral Triangle Initiative

Report No. 187437
DECEMBER 24, 2024

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Attribution—Please cite the work as follows:
World Bank. 2024. Indonesia—Coral Reef Rehabilitation and Management Program: Phase II and Coral Triangle Initiative. Independent Evaluation Group, Project Performance Assessment Report 187437 Washington, DC: World Bank.

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PROJECT PERFORMANCE ASSESSMENT REPORT

Indonesia

Coral Reef Rehabilitation and Management Program Phase II (IBRD-47400, IDA-39100, TF-53350)

Coral Reef Rehabilitation and Management Program–Coral Triangle Initiative (IBRD-83360, TF-15470)

12/24/2024

Finance, Private Sector, Infrastructure, and Sustainable Development

Independent Evaluation Group

Abbreviations

AIG	alternative income generating
BAPPENAS	Ministry of National Development Planning
BRIN	National Research and Innovation Agency
COREMAP	Coral Reef Rehabilitation and Management Program
COREMAP II	Coral Reef Rehabilitation and Management Program Phase II
COREMAP-CTI	Coral Reef Rehabilitation and Management Program–Coral Triangle Initiative
DGMSM	Directorate General of Marine Spatial Management
E-KKP3K	Effectiveness of Management of Marine, Coastal, and Small Islands Conservation Areas
EVIKA	evaluation tool for the management effectiveness of marine conservation areas
GEF	Global Environment Facility
KKP	Directorate General of Capture Fisheries
LAUTRA	Oceans for Prosperity Project
LIPI	Indonesian Institute of Sciences
METT	Protected Area Management Effectiveness Tracking Tool
MMAF	Ministry of Marine Affairs and Fisheries
MPA	marine protected area
NGO	nongovernmental organization
PDO	project development objective
SEA	Sustainable Enterprises Alliance

All dollar amounts are US dollars unless otherwise indicated.

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Note: IEG = Independent Evaluation Group; PPAR = Project Performance Assessment Report.

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This is a Project Performance Assessment Report by the Independent Evaluation Group (IEG) of the World Bank Group on the Coral Reef Rehabilitation and Management Program Phase II (COREMAP II; P071316) and the Coral Reef Rehabilitation and Management Program–Coral Triangle Initiative (COREMAP-CTI; P127813). This instrument and the methodology for this evaluation are discussed in appendix D. Following standard IEG procedure, copies of the draft Project Performance Assessment Report will be shared with relevant government officials for their review and comment.

Coral Reef Rehabilitation and Management Program Phase II (COREMAP II; P071316)

Basic Data

Country	Indonesia	World Bank financing commitment	$33.20 million (IBRD), $23.90 million (IDA), and $7.50 million (GEF grant)
Global Practice	Urban, Disaster Risk Management, Resilience, and Land	Actual project cost	$66.90 million
Project name	Coral Reef Rehabilitation and Management Program Phase II	Expected project total cost	$74.30 million
Project ID	P071316 (IBRD loan) P071318 (GEF grant)	Actual amount disbursed	$61.35 million
Financing instrument	Adaptable program loan	Environmental assessment category	B
Financing source	IBRD-47400, IDA-39100, TF-26799, TF-53350		

Dates

Event	Original Date	Actual Date
Approval	May 25, 2004	May 25, 2004
Effectiveness	January 28, 2005	January 28, 2005
Restructuring	n.a.	June 30, 2010
Mid-Term Review	June 15, 2007	April 17, 2008
Closing	December 31, 2009	December 31, 2011

Key Staff Responsible

Management	Appraisal	Completion
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Country director	Andrew D. Steer	Stefan G. Koeberle

Coral Reef Rehabilitation and Management Program–Coral Triangle Initiative (COREMAP-CTI or COREMAP III; P127813)

Basic Data

Country	Indonesia	World Bank financing commitment	$47.38 million (IBRD) and $10.00 million (GEF)
Global Practice	Environment, Natural Resources, and Blue Economy	Actual project cost	$57.38 million
Project name	Coral Reef Rehabilitation and Management Program–Coral Triangle Initiative (COREMAP-CTI)	Expected project total cost	$63.12 million
Project ID	P127813 (IBRD loan) P130389 (GEF grant)	Actual amount disbursed	$55.46 million
Financing instrument	Investment project financing	Environmental assessment category	B
Financing source	IBRD-83360, TF-15470		

Dates

Event	Original	Actual
Approval	November 15, 2012	February 21, 2014
Effectiveness	May 1, 2014	June 5, 2014
Restructuring	n.a.	June 5, 2017, and May 8, 2019
Mid-Term Review	November 11, 2016	November 11, 2016
Closing	June 30, 2019	June 30, 2022

Key Staff Responsible

Management	Appraisal	Completion
Project team leader	Harideep Singh, Ina Pranoto	Ambroise Basile Irenee Brenier
Sector manager or practice manager	Nathan Belete	Ann Jeannette Glauber
Sector director or regional director	John A. Roome	Benoit Bosquet
Country director	Rodrigo A. Chaves	Satu Kristiina Jyrintytar Kahkonen

Summary

Background, Context, and Design

Indonesia, the world's largest archipelagic nation, is home to over 17,000 islands, 54,000 kilometers of coastline, and some of the richest marine biodiversity in the world. Its coral reefs host 67 percent of global coral species, which, along with extensive mangrove forests and seagrass beds, sustain diverse marine ecosystems. These marine ecosystems are critical to Indonesia's economy and livelihoods, contributing over 25 percent of the country's GDP through sectors such as fisheries, aquaculture, and coastal tourism. However, these resources face significant challenges, including climate change, pollution, overfishing, and habitat degradation.

Marine protected areas (MPAs) are a key conservation strategy, with the government aiming to designate 10 percent of territorial waters as MPAs by 2030 and 30 percent by 2045. As of 2021, 9 percent of waters were protected, but most MPAs were only minimally managed due to a lack of sufficient regulation and enforcement. In 2023, Indonesia adopted a Blue Economy Roadmap that seeks to advance economic development alongside marine conservation ambitions. Operationalizing the blue economy is complex, requiring interministerial coordination within the government of Indonesia and representation across national, provincial, and district governments to secure benefits for Indonesia's widely dispersed island communities.

The World Bank has supported Indonesia's marine conservation efforts for 25 years through the Coral Reef Rehabilitation and Management Program (COREMAP). This three-phase program aimed to protect and rehabilitate coral reefs while enhancing the welfare of coastal communities. COREMAP I (1998–2005) piloted management frameworks, COREMAP II (2004–12) focused on decentralized reef comanagement, and COREMAP–Coral Triangle Initiative (CTI; 2012–22) aimed to institutionalize MPA management and enhance community livelihoods. The program was significantly affected by political shifts in 2017, which led to restructuring, scaling back objectives, and emphasizing ecosystem monitoring over community-based management.

Building on COREMAP, the Oceans for Prosperity Project launched in 2023 to integrate blue carbon initiatives, MPA development, and livelihood enhancement under Indonesia's Blue Economy Roadmap.

What Worked, What Didn't Work, and Why?

COREMAP provided a strong foundation for Indonesia's marine conservation and blue economy initiatives, achieving significant progress in reef management, institutional capacity building, and ecosystem monitoring.

- COREMAP helped the government of Indonesia establish decentralized comanagement systems in seven districts. This process included the development of 358 community-led Coral Reef Management Plans. These institutional arrangements coincided with a decrease in the incidence of illegal and destructive fishing. The integration of traditional values, such as in Raja Ampat, enhanced the sustainability of comanagement arrangements.
- COREMAP also significantly enhanced Indonesia's capacity for marine ecosystem monitoring. The Coral Reef Health Index and similar tools for seagrass and mangroves provided valuable resources for national decision-making. Funding the establishment of the new National Research and Innovation Agency's research infrastructure and certification programs further strengthened institutional capacity.
- COREMAP helped many provinces develop spatial management plans after the approval of a 2014 law that transferred authority from districts to provinces. The program effectively helped facilitate legislative actions and provided resources for spatial planning, both through COREMAP II and COREMAP-CTI.

However, challenges in community engagement, alternative livelihoods, and robust monitoring highlight the need for improved program design and delivery. Lessons from COREMAP can inform future efforts, such as the Oceans for Prosperity Project, to align with Indonesia's policy priorities and ensure sustainable and inclusive outcomes for marine ecosystems and coastal communities. These challenges included the following:

- Alternative income–generating activities provided monetary benefits to participants, but they fell short of achieving their income diversification and sector sustainability goals. While alternative income–generating activities improved incomes for 21 percent of participants, they provided supplemental rather than alternative income, thus falling short of helping participants diversify into more sustainable sources of income (and thereby reducing pressure on fisheries). Challenges included insufficient feasibility studies to inform the alternative income–generating activities approach, low repayment rates for revolving credit schemes, and unambitious monitoring indicators. Most

initiatives were underfunded and lacked the necessary support to create viable employment alternatives outside of fisheries.

- The effectiveness of comanagement arrangements under COREMAP was shaped by the degree to which communities were engaged and traditional values were integrated. In cases such as the Bird's Head Seascape and Laiya Island, where customary governance and cultural practices were aligned with MPA management, communities demonstrated ownership and a commitment to resource sustainability. However, in some areas, the comanagement model faced challenges in fully incorporating local traditions, such as *sasi*, and fostering inclusive participation. Delays in recruiting village facilitators and varying levels of understanding of comanagement principles among stakeholders further limited the effectiveness of the comanagement approach. Compared with the community-driven development approach used in Indonesia's Kecamatan Development Project, which places communities at the forefront of development processes, COREMAP's model offered fewer opportunities for community leadership and accountability. Drawing on lessons from the community-driven development approach could have strengthened the inclusiveness and effectiveness of comanagement under COREMAP.

- **b** A national evaluation tool for the management effectiveness of marine conservation areas (EVIKA) was used to show that COREMAP sites were "optimally managed." However, site selection was biased toward better-managed marine protected areas, and the monitoring method was not granular enough to allow for an enhanced understanding of the program's contribution to ecosystem health and social well-being. Reported increases in coral cover were promising but lacked robust data to attribute changes to COREMAP interventions. Monitoring of reef fish populations showed some improvements but suffered from inconsistent methodologies. Additionally, the exclusion of sociocultural indicators limited insights into community engagement and welfare impacts.

Lessons

This assessment offers the following lessons:

- **Indonesia's institutional complexity and sociocultural diversity demand tailored and learning-based project design.** Readiness assessments and situational analyses could mitigate capacity gaps and ensure alignment with local contexts. Greater oversight and flexibility during implementation would

help address unforeseen challenges, such as shifting priorities and assumptions about community participation.

- **World Bank project policy contributions in the marine and coastal space can be more impactful if they align with countries' blue economy frameworks.** Enhanced collaboration among donors, development partners, and nongovernmental organizations is also critical to ensure alignment and maximize the impact of ongoing programs with blue economy aims. In Indonesia, leveraging existing partnerships, such as the National Blue Agenda Actions Partnership, and fostering new ones can enhance synergies.

- **A stronger focus on evidence-based design can help substantiate ecosystem recovery claims.** COREMAP made valuable contributions to marine ecosystem monitoring but missed opportunities to demonstrate the effectiveness of conservation strategies due to limited data quality. Future projects should prioritize robust methodologies and clear evidence requirements, linking monitoring outcomes to policy and conservation objectives.

- **Broader community outreach is essential for sustaining conservation efforts.** While COREMAP's educational initiatives did positively influence participants, extending awareness to the wider community would amplify the project's long-term impacts and legacy.

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1. Background, Context, and Design

Background and Context

1.1 Indonesia is the world's largest archipelagic nation, with over 54,000 kilometers of coastline across over 17,000 islands and an incredibly diverse sociocultural context. The country has some of the richest marine biodiversity in the world and includes approximately 67 percent of the world's coral species, across a coral reef area of approximately 2.5 million hectares (Giyanto et al. 2017). The country is also home to some of the largest mangrove forests in the world and vast seagrass beds that provide habitats for a rich diversity of marine life (World Bank 2021b).

1.2 Like many other Asian countries, Indonesia's marine environment plays a vital role in the daily subsistence and livelihood of its people. The ocean economy contributes over one-quarter of the country's GDP based on economic activities such as capture fisheries, aquaculture, coastal tourism, marine construction, and transportation. Both marine tourism and fisheries (including capture fisheries and aquaculture) provide significant economic and social benefits to Indonesia's many coastal communities. However, both sectors face severe sustainability challenges, including climate change, pollution, overfishing, and habitat degradation.

1.3 Coral reefs are crucial to ecosystem health and marine tourism but are affected by destructive fishing techniques, marine pollution, and climate change (Williams 2018; World Bank 2020). Coral reef systems generate an estimated value of $3.1 billion in tourism per year (Spalding et al. 2017). However, it is estimated that 90 percent of Indonesia's coral reefs are under threat of destruction from climate change, and a major coral bleaching event in 2016 caused widespread damage, with up to 85 percent of the coral cover lost in some regions (Ampou et al. 2017). Rising sea levels and increased storm events also threaten marine ecosystems and coastal communities across Indonesia.

1.4 Marine protected areas (MPAs) are being designated, but effective management is limited due to a lack of zoning systems, management plans, and management bodies. The government of Indonesia has pledged to allocate 10 percent of territorial waters (32.5 million hectares) as MPAs by 2030, expanding to 30 percent by 2045, and to improve MPA management effectiveness by 10 percent by 2030. As of December 2021, the government had established 411 MPAs spanning 284,100 square kilometers, which covered almost 9 percent of Indonesia's waters (Meilana et al. 2023). According to the Marine Protection Atlas, however, only 2 MPAs met the criteria of highly or fully protected, with the remaining areas classified as less protected MPAs. This total area is less than 0.1 percent of the total marine area and consists of just 2 MPAs: Misool Marine

Reserve and Lampung Barat District. Critical gaps include a lack of binding regulation regarding fishing prohibition in no-take areas, which compromises efforts to recover fish stocks and biophysical reef conditions.

1.5 Indonesia has inadequate management effectiveness of its MPAs, further complicated by inconsistencies and weaknesses in evaluation tools. MPAs in Indonesia are managed under two national authorities: (i) the Ministry of Marine Affairs and Fisheries (MMAF), which has dual objectives of biodiversity conservation and sustainable fisheries, and (ii) the Ministry of Environment and Forestry, whose greater focus is on protecting biodiversity. The use of an evaluation tool for the management effectiveness of marine conservation areas (EVIKA) was officially mandated by Decree of the Director General of Marine Spatial Planning (PRL) No. 28 of 2020, and there was an increase in MPAs classified as "optimally managed," indicating improvement since the previous evaluation. However, although such changes suggest a positive trend (as explored in this Project Performance Assessment Report), the approaches used have hindered a full understanding of the current level of management effectiveness.

1.6 The blue economy has been a priority of the government of Indonesia since 2012 and it is an important framing for development programs in the region.[1] The blue economy is fundamental to Indonesia's economic transformation, including to its goal of reaching the centenary target of becoming a high-income country by 2045, and to the country's post-COVID recovery agenda. Indonesia's Blue Economy Roadmap 2023–2045, published in 2023 by the Ministry of National Development Planning (BAPPENAS), aligns with economic development planning and seeks to coordinate activity across separate ministries within a national framework.[2] However, interministerial and cross-department coordination in the Indonesian government is a notable challenge to implementation, as departments within individual ministries operate relatively independently and with evolving remits.

1.7 Implementing the national blue economy approach requires coordination across national, provincial, and local levels—an extremely complicated endeavor. Provincial and local stakeholders, including small-scale fishers and local villages, are so far poorly represented in the nationally led blue economy approach, including in marine spatial planning. Law No. 23 of 2014 provides provincial and local governments with greater responsibilities and autonomy,[3] but this transition is still underway, with further need for processes, regulations, budget, and transfer of assets in coordination with the national government. Better understanding of what a blue economy transition means and how it could be implemented from the national to local levels and with long-term capacity building is essential.

Role of the World Bank

1.8 For nearly a quarter century (1998–2022), the World Bank has supported the Indonesian government in conserving coral reefs and associated ecosystems through the Coral Reef Rehabilitation and Management Program (COREMAP). The World Bank designed COREMAP as a three-phase operation consisting of two adaptable programmatic loans and one investment project financing. The overarching program objective of the three phases of COREMAP was to achieve "the protection, rehabilitation, and sustainable utilization of coral reefs and associated ecosystems in Indonesia, which will, in turn, enhance the welfare of coastal communities" (World Bank 1998b, 77), in alignment with the Sector-Related Country Assistance Strategy (World Bank 1997).

1.9 **b**In the first phase (COREMAP I), the project development objective (PDO) reflected the pilot nature of the program. It aimed to establish a pilot management framework for a national coral reef management system to test approaches and generate lessons that could inform the design of an expanded number of priority coral reef sites in COREMAP II and COREMAP-CTI. Under COREMAP, operations in the western part of Indonesia were funded by the Asian Development Bank, while those in the eastern part of the country were funded by the World Bank.

1.10 COREMAP II aimed to establish a viable reef management system in seven priority participating districts. The project would determine the system's viability based on (i) financial sustainability and (ii) national coordination combined with decentralized implementation. The PDO of COREMAP II had three main elements: (i) empowerment of communities to establish coral reef comanagement systems, (ii) biophysical improvement of the coral reef ecosystem in the project area, and (iii) socioeconomic welfare benefits to coastal communities. The project was that a comanagement approach supported by viable reef management systems would help revive or protect coral reef ecosystems and, in turn, enhance the welfare of these communities. Additionally, COREMAP II supported the establishment of the regional Coral Triangle Initiative on Coral Reefs, Fisheries, and Food Security, which launched in 2009 and is a partnership among six countries: Indonesia, Malaysia, Papua New Guinea, the Philippines, the Solomon Islands, and Timor-Leste.

1.11 In the third phase (COREMAP-CTI), the program intended to focus more strongly on the institutionalization of MPA management at the local level by developing mechanisms and the capacity to enhance community welfare in selected districts, including through the development of alternative livelihoods. However, in 2017, during COREMAP-CTI, the World Bank significantly scaled back its level of ambition relative to the program objective due to the then-minister of MMAF's decision to shut down any

foreign loans for marine resource conservation to promote state sovereignty. This change reflected the new mission of MMAF that was organized around three pillars: sovereignty, sustainability, and prosperity (CEA 2018). The change also led to a hiatus in project activities between December 2015 and July 2016 (World Bank 2023). MMAF was removed from its role as the implementing agency of COREMAP-CTI, with this role passed to the Indonesian Institute of Sciences (LIPI; which MMAF later merged with to establish the National Research and Innovation Agency [BRIN]) and BAPPENAS. MMAF also canceled the Asian Development Bank–funded COREMAP project in West Indonesia and the International Fund for Agricultural Development–supported Coastal Community Development Project. Despite the changes, MMAF committed, through a ministerial letter to BAPPENAS on March 13, 2017, to continue to use Indonesian government funds to carry out some of the activities that were dropped under COREMAP-CTI and stated that they remained committed to the conservation of coastal resources, including coral reefs.

1.12 Under the new implementing agencies (LIPI and BAPPENAS), COREMAP-CTI was restructured in 2017, and the PDO narrowed significantly to focus on institutional capacity requirements for monitoring and research to align with the institutional mandate of LIPI and BRIN, with activities related to community livelihood enhancement removed. New activities added included the development and launch of a new Coral Reef Health Index, the establishment of the National Coastal Ecosystems Monitoring Certification Standard, the provision of scholarships for study abroad for technical staff responsible for subnational ecosystems monitoring, and an investment in upgrading LIPI's facilities.

1.13 Because of the changes in project design, the Global Environment Facility (GEF) temporarily halted the disbursement of the GEF grant to support the improvement of MPA management effectiveness. This led to a second restructuring in 2019, which maintained this scaled-down approach but added "to improve management effectiveness of priority coastal ecosystems" to the PDO. GEF's approval to restart disbursements of the GEF grant to finance the MPA management effectiveness activities enabled the PDO revision. The activities included, for instance, accelerating the implementation of three new National Plans of Action for threatened species, supporting the implementation of MPA management plans, assisting with the implementation of a provincial-level integrated coastal zone management plan, and reintroducing community surveillance and piloting a community rights–based approach by awarding grants to nongovernmental organizations (NGOs) to carry out the plans. Appendix A sets out how the program and project objectives changed over time, with implications for the achievements of COREMAP II and COREMAP-CTI, which are considered in this Project Performance Assessment Report.

1.14 Unlike COREMAP-CTI, COREMAP II was not subject to major restructuring, with only two minor (second-level) adjustments taking place. In October 2009, the project was extended by one year as an interim measure to account for delays in procurement, disbursement, and government funding. The second restructuring in June 2010 extended the closing date by one year, to December 2011; canceled a portion of an International Bank for Reconstruction and Development loan at the request of the Indonesian government; and modified certain results indicators. The changes to the results indicators included reducing the number of villages implementing the COREMAP decentralized approach from 416 to 357 and increasing the number of districts from six to seven due to an administrative change.

1.15 Through COREMAP, the World Bank has been influential on MMAF, specifically the Directorate General of Marine Spatial Management (DGMSM), though it is important to note that DGMSM operates distinctly from the other main department in MMAF, Directorate General of Capture Fisheries (KKP). MMAF receives a significant amount of external support, including through the North American Aerospace Defense Command, the United States Agency for International Development, and the World Bank. The priority work areas of the DGMSM have been informed by COREMAP, reflecting their strong emphasis on environmental protection. This emphasis was reflected in their own blue economy strategy, developed before the 2023 release by BAPPENAS of the national Blue Economy Roadmap, which placed greater emphasis on economic growth. The World Bank also engages heavily with the Indonesia Climate Change Trust Fund (ICCTF) in BAPPENAS, which received COREMAP funding and continues to work with the World Bank on blue financing through the Oceans for Prosperity Project (LAUTRA).

1.16 After the World Bank–funded COREMAP-CTI closed in June 2022, the World Bank began supporting a succeeding project, LAUTRA (P173391), supported by PROBLUE and the Indonesian Oceans Multi-Donor Trust Fund, alongside other loans. LAUTRA is a combination of loan (five years) and grants (one grant for ICCTF lasts two-and-a-half years), $2 million loan, and $10 million grants, with ICCTF using 50 percent of the grant to implement blue finance. The four components of LAUTRA are implemented through MMAF (two components [MPA infrastructure development and blue carbon] by DGMSM and livelihoods, communities, and villages across 15 MPA locations by KKP and DGMSM), component 3 on a framework for blue finance by BAPPENAS (ICCTF), and project management by KKP and across BAPPENAS. LAUTRA built on the legacy of COREMAP operations and reinstated the community livelihood–enhancement activities under component 2 after these were reduced during the 2017 restructuring due to the change in MMAF leadership and the ministry's subsequent withdrawal from COREMAP implementation.

Program Theory of Change

1.17 The Independent Evaluation Group reconstructed a combined theory of change for COREMAP II and COREMAP-CTI to illustrate how the projects planned to establish viable comanagement systems of coral reefs and associated ecosystems that would, in turn, enhance the welfare of coastal communities. As shown in the "Outcomes" section of the combined theory of change (figure 1.1), the overall expected program outcomes from COREMAP II and COREMAP-CTI included

- Community-based coastal resources management systems established;
- Evidence-based coral ecosystem management adopted;
- Marine protected areas management effectiveness improved;
- Biophysical improvement of the coral reef ecosystems (including live coral cover increased and reef fish populations increased);
- Income from sustainable reef-based and reef-substitute activities increased; and
- Socioeconomic welfare benefits to coastal communities.

1.18 The theory of change helps structure the evaluation of the contribution of activities across COREMAP II and COREMAP-CTI to the overall objectives, in addition to how the project restructuring and reduction in the program scope—particularly in terms of alternative income–generating (AIG) activities—affected the delivery of expected outcomes and results in relation to benefits for coastal communities.

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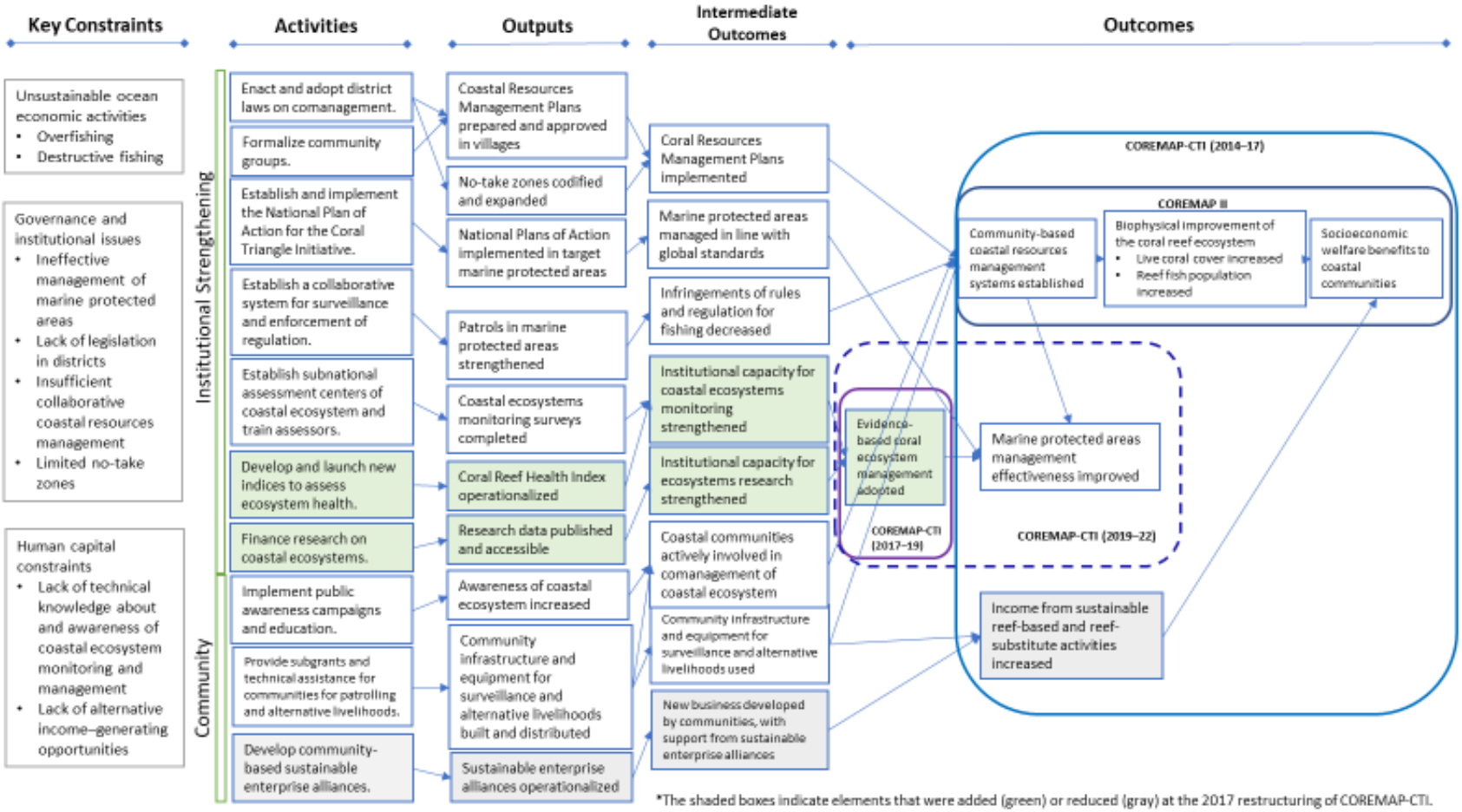
[1] For more information, see https://coraltriangleinitiative.org/news/indonesian-president-reaffirms-cti-leadership-and-pushes-blue-economy-rio20-summit-sidelines.

[2] Indonesia's economic planning follows a 20-year development plan, spanning from 2005 to 2025. It is segmented into 5-year Medium-Term National Development Plans, called the RPJMN (Rencana Pembangunan Jangka Menengah Nasional), each of which has different development priorities.

[3] Through the Act of the Republic of Indonesia No. 23 of 2014 on the Local Government and Law Number 6 of 2014 concerning villages (the Village Law).

Figure 1.1. Combined Theory of Change of COREMAP II and COREMAP-CTI



Source: Independent Evaluation Group.
Note: COREMAP-CTI = Coral Reef Rehabilitation and Management Program–Coral Triangle Initiative

2. What Worked, What Didn't Work, and Why?

2.1 The following sections assess the contribution of COREMAP, guided by evaluation questions and the outcome indicators included in the COREMAP II and COREMAP-CTI results framework (appendixes B and C).

The Establishment of Viable Community-Led Comanagement Systems for Coral Reefs

2.2 To successfully involve and engage local communities in the development and implementation of marine management initiatives, individuals should be well informed so they understand the requirements, implications, and value of any management activities and are more likely to engage in them. Effective participation can promote buy-in from local communities, providing a sense of ownership and responsibility, and should incorporate local knowledge and traditions, which will improve the likelihood of successful implementation of management strategies.

The Decentralization, Sustainable Resourcing, and Implementation of Coral Reef Management Plans

2.3 COREMAP-CTI supported the development of processes and capacity building for delivering spatial management at the provincial and district levels in coordination with MMAF. Indonesia has 34 provinces, all of which are required to develop local or provincial marine spatial plans under the Law of the Republic of Indonesia No. 23 of 2014 and the Regulation of the Minister of Marine Affairs and Fisheries No. 34 of 2014 concerning planning management of coastal areas and small islands (which amended Law no. 27/2007 related to the same issue). Most management capacity previously resided in districts, and many provinces have not yet developed their own capacity for this expanded role. As a result, many provincial governments are still building the capacity required to implement spatial plans, and they face challenges caused by insufficient trust between beneficiary communities, a lack of human and financial resources, and complications in the transfer of assets. COREMAP II initially emphasized district-level implementation, but after Law No. 23 of 2014, authority for marine conservation was moved from districts to the provincial level, so COREMAP II and COREMAP-CTI focused more strongly on working at the provincial level to support the establishment of appropriate legislation and budget arrangements.

2.4 Decentralized and legally codified coral reef comanagement systems were established in all seven project districts. As reported in the COREMAP II Implementation Completion and Results Report, Coral Reef Management Plans, approved by the district governments, were established in 358 communities, of which

251 were approved by the closure of COREMAP II (World Bank 2012a). The established Coral Reef Management Plans were supported by district governments (Kabupatens), which covered a high proportion of the operating costs related to these new management plans. Although the full picture of the outcomes of implementing these management plans is unclear, the project successfully decreased the incidence of illegal and destructive fishing across the project districts.

Development of Comanagement Arrangements

2.5 The contribution to effective comanagement arrangements through COREMAP was highly influenced by context, the approach taken, and the success in engaging relevant communities. Where existing traditional values were integrated into the creation and implementation of MPA management structures in COREMAP, the efficacy and sustainability of marine resource management improved. In the Bird's Head Seascape initiative—supported through COREMAP, classified as an MPA network under Regulation of the Minister of Marine Affairs and Fisheries No. 13 of 2014, and covering the tourism destination of Raja Ampat—communities took on the active management of resources themselves, likely a consequence of customary governance structures nested within formalized MPA management regimes (Fidler et al. 2022). On Laiya Island, another COREMAP site, the communities continued protecting the no-take area because it has sacred value in their local traditions (Baitoningsh 2016).

2.6 Elsewhere, the comanagement model developed through COREMAP was a largely "top-down," government-led coastal resource management program. COREMAP gave insufficient attention to existing customary law institutions, including the concept of *sasi*, which refers to the cultural practice of conservation by community, and communities were not effectively included in decision-making. Delays in the recruitment of village facilitators and a lack of understanding of the comanagement model and approach by new members of the Coral Reef Resource Management Agency also affected the development and implementation of comanagement approaches.

2.7 The COREMAP comanagement model was less inclusive and accountable than the community-driven development approach used by the government of Indonesia and the World Bank in the Kecamatan Development Project. The community-driven development approach places communities at the head of the development process; for example, community members control the planning, design, implementation, and monitoring of project activities in their communities. However, within COREMAP, the voluntary community groups that were established for coral reef conservation were not incentivized or encouraged to take up this type of role. Moreover, approaches developed during the Kecamatan Development Project to combat corruption at the village level were not implemented during COREMAP, weakening the approach.

Integrating learning from the community-driven development model could have been used in the development of the approach to comanagement in COREMAP.

2.8 Delays in the project activities to strengthen comanagement were reported in COREMAP-CTI's Mid-Term Review in 2016. Reasons given in the review for the delays included the prolonged process for recruiting village facilitators (42 percent [or 89 villages of the total of 210 targeted villages] recruited village facilitators) and a lack of understanding of the comanagement approach by new members of the Coral Reef Resource Management Agency.

Awareness Raising, Community Outreach, and Knowledge Transfer During the Development and Implementation of Coral Reef Comanagement Initiatives

2.9 Awareness-raising initiatives and educational materials made a lasting impression on COREMAP participants and schoolchildren. Awareness raising and community outreach continued throughout COREMAP II and COREMAP-CTI, building on the progress made in phase I. Efforts included printing elementary school textbooks and pamphlets to use in conjunction with the coral reef education curriculum taught in public schools. Several interviewees who attended elementary schools during the implementation of these awareness-raising activities indicated that they learned about the importance of coral reef conservation and COREMAP operations in their classes. Furthermore, on Selayar Island in the South Sulawesi province, five out of nine community advocates of antidestructive fishing indicated that their defining moments were related to COREMAP activities such as participating in ecological awareness training and the Community Committees for Coastal Resource Management (Abdurrahim et al. 2022).

2.10 Although substantial effort was undertaken to raise awareness throughout the duration of the COREMAP program, local knowledge relating to community-based MPAs in some COREMAP-targeted provinces was found to be low. During interviews by the Independent Evaluation Group team, local government officials within certain provinces explained that there was limited awareness that COREMAP had contributed to the development and implementation of community-based management. This information supports earlier findings that showed that even though those who were directly involved in COREMAP activities knew something about the community-based MPA, a large percentage of those not involved were not even aware there was an MPA nearby (Glaser et al. 2010). This finding indicates a need to recognize the importance of not only awareness-raising activities but also ways to consider and facilitate knowledge transfer to ensure the continued success of program initiatives after completion.

Increased Welfare Within Coastal Communities

2.11 Coastal communities in many locations around the world face a growing degree of insecurity as a result of poverty and high dependence on natural resources, and this insecurity is felt acutely across Indonesia's provinces as well. This vulnerability is often compounded by declining resources, limited alternative livelihoods, and unsustainable land-use practices and development. Programs aimed at alleviating some of these pressures and improving community welfare must seek to understand the diversity of coastal people and communities, especially in relation to their livelihood strategies and sociocultural norms.

Increasing Community Welfare and Addressing Gender Inequalities

2.12 Creating socioeconomic benefits for local communities was a key project aim, though the project had mixed results, particularly in relation to gender equality. The assumption stated in the combined theory of change (figure 1.1) was that providing seed funds for microenterprises, establishing community groups (*Pokmaswas*) for aquaculture and fish processing, and offering technical and business training to community groups would result in increased household incomes and improved access for women to finance and productive facilities. The project anticipated that these outputs would help alleviate poverty and empower women.

2.13 Misconceptions regarding existing cultural norms compromised progress in increasing community welfare and reducing gender inequalities. The project made assumptions regarding women's ability to commit to additional activities outside of their cultural roles and believed that the dominant powers would support efforts to empower women. In addition, suitable compensation (for example, income gains, changes in household care workload) was not provided for the increased time burden women experienced. Research has shown that women are rarely involved in conservation activities because it is customary that they seek approval to participate (Susilowati 2021), and these traditions are stronger in the eastern part of the country, where the World Bank was operating. This finding indicates the complexities in seeking to drive behavior change in the context of existing social structures and norms. It should also be noted that the implementation of national laws and regulations aimed at addressing gender inequalities have still not been fully implemented at the local government level in Indonesia, which has limited progress as well.

2.14 Ensuring sufficient local engagement to engender the trust and leadership needed in the context of a large-scale project is challenging, but more investment of staff time in the field would have been beneficial. The evaluation team noted the limited World Bank presence at the district level, particularly compared with other organizations, indicating the need for strong and consistent engagement with

communities to secure long-term benefits. Coordination with NGOs might have supported this engagement and enhanced management, given their greater staff numbers in the field across project sites. Many of these issues could have been addressed during the design phase of the program if detailed feasibility studies had been undertaken to understand the local sociocultural context. Additionally, the Capturing Coral Reef and Related Ecosystem Services project published research findings specific and relevant to COREMAP target communities (see, for example, Abdurrahim et al. 2018), but the findings were not exploited to inform community engagement strategies in COREMAP-CTI.

Alternative Income–Generating Activities

2.15 Alternative livelihood programs are often used during the implementation of MPAs as incentives, compensation for lost opportunities, or intervention strategies to alleviate poverty. It is important to understand the processes involved in the implementation of these new livelihood activities and how they contribute to the expected outcomes of providing an alternative income and therefore reducing a community's dependency on the sea while improving marine conservation and protection.

Design and Implementation of Sustainable and Practicable Alternative Income–Generating Activities

2.16 The alternative income-generating (AIG) activities likely resulted in a positive increase in income for participating communities but did not achieve the intended outcome of encouraging people to diversify away from fishing. The AIG scheme developed through COREMAP II was used by all project communities, exceeding the target of 75 percent, and supported the development of several small businesses in each community (World Bank 2012a). Results from socioeconomic benefit monitoring and evaluation surveys showed that during COREMAP II, all groups that participated in the AIG activities saw an increase in their income of 21 percent between 2008 and 2011 (World Bank 2012a), though there was not a control group in this survey (that is, whether communities that did not take part in AIG activities also noted increased income). Evidence also showed that 84 percent of community members stated that AIG activities—and thus COREMAP—had been beneficial to them (World Bank 2012a).

2.17 However, several challenges arose during the implementation of AIG activities, including the following:

- There was a lack of feasibility studies associated with the design phase of AIG activities, resulting in a failure to identify key challenges associated with planned activities.

- The repayment rate of the community revolving credit pilot schemes reached only 63 percent due to the failure of three seaweed culture subprojects and the community's lack of understanding about the revolving fund system and the repayment requirement (World Bank 2004c).
- The unambitious indicator targets used to measure achievements of the AIG activities weakened the development and application of results monitoring.
- A lack of good facilitators to work with communities resulted in inadequate support during the initiation and operational phases of AIG initiatives.

2.18 Although COREMAP successfully supported design and implementation of AIG activities, communities remained almost entirely dependent on fishing for their livelihoods. COREMAP supported infrastructure development (including pier development and wave breakers), conservation and rehabilitation activities (including mangrove planting and capacity-building activities), training for tourist guides, and coral reef assessment, but local communities still primarily depended on fishing as their primary source of income. Only seaweed farming (and, in some cases, grouper culture), with additional inputs from other initiatives, proved profitable enough to cause fishers to switch to aquaculture under COREMAP. This finding indicated that project design and implementation were not properly planned (or funded) to ensure the creation of employment opportunities outside the fisheries sector and that the project did not provide the coastal communities with sufficient incentives to quit unsustainable capture fishing.

2.19 Although the Sustainable Enterprises Alliance (SEA) program was reported as a highlight of the COREMAP-CTI project at appraisal, its slow progress by the Mid-Term Review resulted in its cancellation during the 2017 restructuring. The SEA program aimed to establish alliances of community-based businesses that focused on the sustainable use of marine-based ecosystems (World Bank 2014a). The allocation for the activities under this pilot program that were set up to test the development of an SEA ($12.5 million), mostly from the loan portion, was significant when compared with the allocation for other activities. Although the SEA was a major subcomponent of COREMAP-CTI, there was only limited understanding of the concept by the local governments and the communities at the selected pilot sites (namely, the districts of Biak, Selayar, and Sikka). In Biak, there had been little or no action on any activity identified under the SEA. An SEA manual, which was a condition for disbursements of community grants, was not completed after two-and-a-half years of implementation, attributed to the change in the policy within the MMAF and the suspension of the project (World Bank 2016).

Increased Institutional Capacity to Undertake Coastal Ecosystems Monitoring

2.20 When addressing issues associated with marine ecosystem recovery and protection, a robust scientific approach must be developed and implemented. This approach must include clear methods linked to site-selection criteria, monitoring techniques and data analysis, and management approaches. Without a robust and consistent approach to science-based studies, it will not be possible to evaluate and demonstrate change. In addition, initiatives to monitoring ecosystem change must be adequately resourced in relation to equipment, expertise and budgets.

Program Restructuring and Changing Program Focus

2.21 COREMAP activities were significantly refocused, from institutionalization of community-based management approaches to a focus on increasing government capacity for undertaking ecosystem monitoring. Approaches developed during the first phase of COREMAP that aimed to institutionalize a community-based approach to the management of marine and coastal resources changed significantly. New activities developed during COREMAP II and COREMAP-CTI instead focused on increasing capability to undertake ecosystem monitoring through the development of new infrastructure (specifically at BRIN), the development of the Coral Reef Health Index, and the creation of training and certification schemes. The establishment of BRIN in 2019, which plays an important role in long-term monitoring of ecosystems and marine research, was in part supported by the funding of COREMAP which assisted in the development of the research center.

2.22 COREMAP's program legacy includes the provision of both intellectual and physical assets. Intellectual assets include a contribution to the development of the Coral Triangle Initiative, oceanography research and associated data, an oceanography database, operational management and ecosystem health indices and metrics, the development of a data collection application, the certification of researchers and surveyors, and training and capacity-building materials. Physical assets necessary to support the ongoing monitoring and management of marine ecosystems include office buildings and research centers for BRIN, surveillance boats and sampling equipment, and infrastructure linked to AIG initiatives.

Development of a Scientifically Robust Ecosystem-Based Monitoring Program to Assess Change

2.23 COREMAP contributed to the development of the Coral Reef Health Index of Indonesia, as well as the creation of similar tools for seagrass and mangroves. The project originally intended to measure coral reef health status at the project sites via a

new Coral Reef Health Index by monitoring and managing coral reefs and associated ecosystems (see appendix C). This index was based on over 20 years of biological and physical research and monitoring data collected throughout Indonesia by LIPI with support from COREMAP. The index measures the percentage of live coral cover, rubble, targeted fish biomass, fleshy seaweed, and resilience potential, with values ranging from 1 to 10 (where 1 is "very bad" and 10 is "very good"). Although index outputs were not used to measure the health status of reefs, it is noteworthy that only a few countries in the world have a fully developed and operational Coral Reef Health Index based on monitoring data that are collected and analyzed in a consistent manner, which allows countries to make comparisons across both space and time. The development of this index also informed the creation of similar tools in Indonesia for other protected and biodiverse habitats, including seagrass and mangroves. The current strategy of BRIN has three components: (i) marine ecosystem health, (ii) integrated ocean monitoring, and (iii) smart aquaculture. This strategy includes the ongoing development of indicators for the marine ecosystem (such as coral reefs and mangroves), which has been supported by COREMAP so far and is supported by LAUTRA in an ongoing capacity.

Sustaining Coral Reef Ecosystems

2.24 Coral reefs are among the most productive and biodiverse ecosystems on Earth and provide a multitude of valuable ecosystem services. Moreover, the resources derived from coral reefs are essential to the food security of millions of people living within tropical coastal communities. Unfortunately, the impacts of anthropogenic activities such as fishing and climate change place an unsustainable burden on these resources, leading to the degradation of coral reef ecosystems. Anthropogenic activities that are known to affect the health of coral reef ecosystems must be sustainably managed, and reef systems should be monitored and assessed in a scientifically robust manner to quantify changes and help develop future coral reef management strategies.

Program Contribution to Increased Coral Cover

2.25 There is insufficient evidence to attribute increases in coral reef cover or reported decreases in coral health directly to COREMAP due to data collection and monitoring program design issues. Most reef sites supported by COREMAP showed measurable increases in live coral cover and positive trends in biophysical condition. By using permanent plots for annual measurement, the project estimated that coral cover had increased by 17 percent during the project period, with only one district showing negative growth (World Bank 2014b). However, it is not possible to attribute these results directly to COREMAP activities due to data collection and monitoring program design issues.

2.26 The project lacked biophysical indicators to determine changes in coral cover and the reef fish population. During COREMAP II, biophysical indicators to determine whether the changes in coral growth and fish population could be attributed to the project activities were found to be lacking (World Bank 2012a). This lack of indicators resulted in the inclusion of a PDO indicator within COREMAP-CTI to measure coral reef health status at the project sites via the newly developed Coral Reef Health Index. However, during the 2017 restructuring, the indicator was revised to merely count the number of sites where the new index was applied, resulting in no assessment of coral health being undertaken as part of COREMAP-CTI. In addition, the original PDO indicator to measure the reduction in destructive fishing was also removed during the program restructure in 2017. The revisions in the results frameworks of COREMAP II and COREMAP-CTI are explained in detail in appendix C.

Monitoring Coral Reef Fish Populations

2.27 The project attempted to monitor trends in fish population, but results are too inconsistent to be used with confidence. Data related to reef fish populations was collected using two different methodologies: (i) interviews with fisherfolk to gather catch-per-unit effort data on economically important species, and (ii) underwater observations along transect lines of reef fish (World Bank 2012a). Catch-per-unit effort data collected recorded a 35 percent increase for early-breeding indicator species and a 10 percent increase for medium-size indicator species by 2009, whereas visual census data recorded a 29 percent increase in the reef fish population by 2011 (World Bank 2012a). Due to differences in result verification methodologies and a lack of confidence in the approaches taken, the project was not fully able to appraise these outcomes before the end of the project. Although different methodologies were used, both outcomes demonstrated an increase in reef fish populations, with community members reporting increased numbers of fish in no-take zones and the return of rarer species. Fish population recovery rates in relation to coral reef recovery must also be considered, as it may be too early for increased coral cover to have a positive effect on reef fish populations. No further data were reported during the remainder of the program.

2.28 A decline in destructive fishing trends was reported during joint patrols consisting of the Department of Fisheries and registered community surveillance groups (*Pokmaswas*). During patrols undertaken in the Pangkep district, the patrol teams collected sufficient quantitative data to show a significant decline in bomb fishing. Qualitative data collected from the remaining six districts also indicated a similar trend in the reduction of destructive fishing methods.

Research and Policy Development

2.29 COREMAP had a strong focus on enhancing marine ecosystem research and resulted in extensive published outputs with evidence of policy influence. COREMAP made positive contributions to ecosystem monitoring and research, including on policy and legislative development. BRIN (formerly LIPI) and research grant recipients published 131 scientific research papers (World Bank 2023), which were used to inform policies including the presidential regulation (No. 83 of 2018) and the environmental regulation (No. 142 of 2019) on marine debris. Habitat-mapping data produced by COREMAP and compiled by BRIN have been included in annual reports and is used by the Indonesian government for policy decisions, including to inform marine spatial planning and zoning plans. In 2023, MMAF became custodians of the coral reef, seagrass, and mangrove data, with BRIN continuing to provide capacity development and monitoring.

2.30 COREMAP increased the capacity of the government of Indonesia and wider stakeholders to undertake ecosystem research through a range of activities. Activities included training individuals in research techniques, establishing a National Coastal Ecosystems Monitoring Certification Standard to strengthen technical capacity for coastal monitoring, and improving institutional systems for demand-driven coastal ecosystems research (World Bank 2014a, 2017, 2019). Other activities linked to capacity building included the establishment of a regional training and research center at BRIN, which has supported training across Indonesia on monitoring mangroves using the Mangrove Health Index, and capacity-building workshops for participants from Archipelagic and Island States Forum countries. Training is provided on request to participants, including NGOs, and includes training individuals to become trainers themselves.

2.31 Monitoring MPA management effectiveness has continued, although project funding associated with COREMAP-CTI has ended and is an important legacy. Annual activities enable the country to assess and monitor the effectiveness of MPAs using EVIKA and provide evidence and data for monitoring trends. Using the Coral Reef Health Index, BRIN is developing a national network of coastal monitoring as a platform to coordinate all coastal ecosystem data. The development of this network was considered part of the COREMAP "exit strategy."[1]

Data Management and Increased Capacity

2.32 COREMAP has supported significant contributions to data management and accessibility in Indonesia through the development of web-based systems and associated protocols. COREMAP enabled the updating of the Coral Reef Management Information System to increase data accessibility and integration with existing systems, including

those developed and managed by the Research Center for Oceanography. COREMAP also focused on improving data integration and quality assurance procedures through partnerships with the Indonesian Academy of Sciences, district administrations, and the National Coordination Unit. In the first years of the project, the system functioned poorly, as district administrations were slow in submitting data and the coordination unit was overwhelmed by the collation task. A radical improvement took place in 2011 due to interventions by the World Bank and the Food and Agriculture Organization that included the new project progress formats and a web-based information system, which greatly improved the quality and timeliness of monitoring data submission, coordination, and use. This web-based system also served as a foundation for the development of the BRIN (formerly LIPI) geographic information system platform and database that are currently used to manage and monitor oceanographic data.

Improvement in Marine Protected Areas' Management Effectiveness

2.33 A well-designed and effectively managed network of MPAs is vital to ensuring the long-term health of the marine species and habitats, which provide a range of ecosystem goods and services to all sectors of society. The management of MPAs must be effective to address both anthropogenic and environmental challenges and realize the benefits that protected areas can provide. "Management effectiveness" refers to the degree to which a protected area achieves its goals and objectives. Performance evaluation plays a critical role in providing for and demonstrating long-term positive impacts on biodiversity and the human communities that depend on these resources. Evaluating management effectiveness should ultimately lead to improved project planning, accountability, and adaptive management, including the ability to change management as needed due to unanticipated impacts and changes outside the scope of the MPA.

The Assessment of Management Effectiveness

2.34 The newly developed tool EVIKA was used to assess management effectiveness during COREMAP II and COREMAP-CTI, though the outcomes were unclear. To assess the management effectiveness in protected areas, the Ministry of Environment and Forestry used the globally recognized International Union for Conservation of Nature and Natural Resources's Protected Area Management Effectiveness Tracking Tool (METT), while MMAF used its own tool, Effectiveness of Management of Marine, Coastal, and Small Islands Conservation Areas (E-KKP3K), which was replaced with an updated version (EVIKA) in 2021 after a review of the weaknesses of E-KKP3K.[2] The use of EVIKA was officially mandated by a Decree of the Director General of Marine Spatial Planning (PRL) No. 28 of 2020, which stated that EVIKA would be used to monitor the management effectiveness of MPAs in line with the Indonesian MPA Vision Road Map

2020–24. Since EVIKA was adopted, there has been an increase in the number of MPAs classified as "optimally managed," indicating improvement from previous evaluations using E-KKP3K that showed a poor classification of MPAs as "initiated," "established," and "managed minimally" in 2019 (Ford 2020). However, although these findings suggest a positive trend, they are likely due to the selection of sites for evaluation that already had been given a high management effectiveness score. The status of the wider MPA network is unclear.

2.35 Sociocultural indicators are not included in EVIKA, meaning that no assessment was carried out in relation to sociocultural aspects linked to the designation and effective management of MPAs. The METT analysis includes questions such as the following that could have provided a more detailed insight into sociocultural outcomes:

- Are local communities involved in management decisions?
- Do local communities living near the protected area have input into management decisions?
- Are programs to enhance local community welfare consistent with MPA values?
- Is there open communication and trust among local communities, stakeholders, and MPA managers?
- Does the protected area provide sustained livelihood benefits to local communities?

2.36 The LAUTRA results framework also uses EVIKA to assess management effectiveness, which could compromise the inclusion and assessment of sociocultural aspects of MPA management effectiveness during the lifetime of the LAUTRA project. This concern should be addressed to ensure that sociocultural indicators are used in the future and incorporated into any future MPA management effectiveness assessments.

2.37 Indonesia needs further support to ensure that approaches are aligned and there is funding for the assessment of sites beyond nationally managed MPAs. The newest United States Agency for International Development project, Kolektif (2023–28), is focused on improving management effectiveness in several MPAs and provides guidance to MMAF (KKP),[3] while investing in MPA management effectiveness is a key objective of the World Bank's LAUTRA project (which also spans 2023–28).

Improving the Management Effectiveness of Marine Protected Areas

2.38 Based on results from the management effectiveness assessments undertaken using EVIKA, COREMAP identified priority areas that would benefit from greater

support and lead to an improvement in management effectiveness. The results led to a focus on infrastructure and community surveillance program development in addition to addressing priority actions for endangered species and marine spatial plans. As a result, all four MPAs that were assessed exceeded the project target relating to the blue rating. These four MPAs also exceeded four intermediate indicators associated with improving management effectiveness (see appendix C), including the development of small ecotourism assets as per MPA management plans; the number of registered community surveillance groups carrying out regular patrols; the implementation of provincial integrated coastal zone management action plan activities; and the implementation of the National Plan of Action for sharks, cetaceans, and manta rays in target MPAs.

2.39 The selection of MPAs for assessment of management effectiveness was biased toward high-performing sites and therefore provides insufficient evidence of improvement. The areas supported by COREMAP (that is, Savu Sea TNP KKPN, KKPN SAP Raja Ampat Islands, and KKPN SAP West Waigeo's islands) already had some of the highest MPA management effectiveness scores measured within national conservation areas. The inclusion of sites with existing EVIKA scores that were more aligned with in-country averages of 38.5 percent would have provided a better opportunity to demonstrate how program interventions had improved management effectiveness across a wider range of MPA management scenarios.

2.40 The development and implementation of a successful and innovative financing initiative in Raja Ampat through COREMAP represents a positive outcome and model for future MPA management. Through this initiative, environmental maintenance service fees were collected from visitors to the marine park to provide revenue for future management and conservation efforts. In 2019, the Raja Ampat Marine Park Authority and Management Unit recorded 24,131 visitors which included 3,056 domestic ones, who paid 18.1 billion rupiah ($1.25 million) as environmental maintenance service fees (Mulyanto 2022). Although it has not been confirmed to what extent revenues from the environmental maintenance service fees have contributed to positive changes in coral reef health, this initiative demonstrated how MPAs can become sustainably resourced by generating income to support effective management into the future.

3. Conclusions and Lessons

Conclusions

3.1 The restructuring of the program changed how COREMAP played out and what outcomes it achieved. Given the highly political context, there is likely little the World Bank could have done to secure a different outcome, and it adapted well to continuing

the work of COREMAP in line with the mandate of the new implementing agencies. Proactively engaging with ministries and departments beyond those directly involved with the program areas (such as BAPPENAS and MMAF) could enhance resilience during such changes, which often follow government elections and shifting priorities. The blue economy the focus on economic sectors (that is, fishing and tourism) are likely to remain priorities through different administrations; setting projects within this context is beneficial and is more evident in LAUTRA. Despite restructuring, the World Bank continued to support important initiatives through COREMAP in Indonesia, including capacity building for the new research institution, BRIN. Although capacity building was not part of the initial project design, such initiatives have enhanced the capacity for monitoring and research in Indonesia and continue to support government decision-making in Indonesia today.

3.2 COREMAP could have done more in the design phase to ensure the legacy and sustainability of such a large-scale conservation and development project. Programs need to consider how activities and strategies will have the necessary resources in the future, especially in relation to AIG activities and the development of comanagement initiatives. In addition, a more in-depth assessment of potential consequences of actions (such as providing infrastructure and equipment) should have been conducted to define responsibilities and manage expectations in usage and maintenance. The long-term institutional capacity requirements and needs are significant and must be addressed to ensure that activities can continue even after the project ends. A greater program presence—including staff and offices at COREMAP sites—could have also facilitated the integration of experience and technical expertise from past projects into COREMAP.

3.3 The contribution of COREMAP was supportive, but there is a view in the country that World Bank projects should have a more expansive scope and do more to guide policy and management decisions. Government departments need to address multiple potentially conflicting objectives, and development partners must do what they can to support integration, supported by the blue economy policy approach. Although COREMAP focused on MPAs' management and protection, working across multiple levels and integrating comanagement were important to the project and would benefit the mainstream approach to blue economy development in Indonesia. Ensuring that indicators used in the evaluation align with the developing approach to measuring progress toward achievement of the blue economy more broadly would ensure relevance of outputs and improve the robustness of measures used in policy delivery.

3.4 The multitude of donors, development partners, NGOs, and others working alongside each other demands better coordination that recognizes distinct and shared objectives, as well as the strengths and weaknesses of different organizations. Collaboration with the United States Agency for International Development and the

Asian Development Bank was effective during COREMAP's design and implementation, including joint field missions, and this remains the case with LAUTRA as well. The World Bank could potentially collaborate with other partners as well, particularly given the role of other organizations in the region (such as the United Nations Environment Program) and mechanisms such as the National Blue Agenda Actions Partnership. Wider collaboration has occurred (for example, in 2013, the World Bank supported the Food and Agriculture Organization, alongside other partners, in launching the Blue Growth Initiative, with Indonesia as one of the focal countries)[4] but has not been very common in recent years.

3.5 Indonesia presents a challenging context for delivering development programs, and many challenges were evident and compromised outcomes during COREMAP. Institutional complexity is higher in Indonesia than it is in many other countries—for instance, multiple ministries have mandates for designating and managing MPAs at the national level (Ministry of Environment and Forestry and MMAF), and there is a changing balance of authority and engagement across the provincial and district levels. While difficult to influence and navigate, more action could be taken by the World Bank (and other development partners) to support the coordination and integration of approaches across departments and levels, both horizontally and vertically. For instance, they could make sure that work in the field at MPA sites is complemented by national policy engagement and advocacy to ensure a supportive policy framework, the allocation of funding, and coordination in delivery.

3.6 **b** This would include integrating standardized approaches to a baseline system understanding into country diagnostics and embedding rapid assessments in project development and implementation. More detailed readiness and needs assessments may have helped mitigate program delivery issues such as the lack of capacity at a local level, which led to the delayed start and delivery of program objectives; the capabilities and needs of the communities involved to ensure the effective development of AIG initiatives; and the assumptions made regarding socio-cultural context that compromised the contribution of comanagement activities to gender equality outcomes.

3.7 Greater oversight and technical support could be provided during the design and delivery of complex projects such as COREMAP. Such support could enable the project to manage unforeseen changes in key policy and legal frameworks, delivery partners, and funding models. Clarifying key assumptions and testing them throughout the project would have exposed inaccuracies (for example, misconceptions about local communities' willingness and desire to reduce fishing effort and develop alternative income streams). It might be necessary to reflect on whether the World Bank's approach to monitoring and evaluation processes for such projects is appropriately structured to support this contextualized learning. There also a need for clear program targets and

defined indicators to successfully monitor and evaluate project outcomes. Without these features, it has not been possible to state with confidence how successful interventions have been in addressing COREMAP's high-level objectives and program outcomes.

3.8 When addressing issues associated with marine ecosystem recovery and protection, there is a need to develop and implement a robust scientific approach towards selection, monitoring and adaptive management. This approach must include clear methods linked to site-selection criteria, monitoring techniques, and data analysis and management approaches. A vital step in MPAs' design and management is demonstrating that they are improving ecosystem health and meeting their conservation, sociocultural, and economic objectives. During COREMAP II and COREMAP-CTI, a significant focus was placed on supporting and enabling the monitoring of coral reef ecosystems using a range of newly developed ecosystem health indices. Unfortunately, due to program restructuring, none of the data collected were used to demonstrate whether management approaches were successful and had a positive effect on ecosystem health. If evidence requirements were considered before the design of monitoring research programs, they may have been able to demonstrate the successful development and implementation of MPA management strategies and how these strategies contributed to national conservation and blue economy commitments.

3.9 Awareness-raising and outreach programs are essential to changing attitudes and behavior toward marine conservation and protection. More emphasis on awareness-raising and outreach efforts during COREMAP II and COREMAP-CTI would have benefited program delivery by ensuring that not only those directly involved in COREMAP understood the approaches being taken and the importance and value of (in this case) MPAs. Without stronger outreach and awareness-raising efforts, program legacy is limited due to a lack of knowledge transfer with local communities, as demonstrated by the COREMAP experience.

Lessons

3.10 Indonesia's institutional complexity and sociocultural diversity demand tailored and learning-based project design. Readiness assessments and situational analyses could mitigate capacity gaps and ensure alignment with local contexts. Greater oversight and flexibility during implementation would help address unforeseen challenges, such as shifting priorities and assumptions about community participation.

3.11 World Bank project policy contributions in the marine and coastal space can be more impactful if they align with countries' blue economy frameworks. Enhanced collaboration among donors, development partners, and NGOs is also critical to ensuring alignment and maximizing the impact of ongoing programs with blue

economy aims. In Indonesia, leveraging existing partnerships (for example, the National Blue Agenda Actions Partnership) and fostering new ones can enhance synergies.

3.12 Projects need a stronger focus on evidence-based design to substantiate ecosystem recovery claims. COREMAP made valuable contributions to marine ecosystem monitoring but missed opportunities to demonstrate the effectiveness of conservation strategies due to limited data quality. Future projects should prioritize robust methodologies and clear evidence requirements, linking monitoring outcomes to policy and conservation objective.

3.13 Broader community outreach is essential for sustaining conservation efforts. COREMAP's educational initiatives did positively influence participants, but extending awareness to the wider community would amplify the project's long-term impacts and legacy.

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[1] BRIN, interview conducted by IEG, August 23, 2023.

[2] Learn more about EVIKA at https://www.coraltrianglecenter.org/2021/02/17/evika-a-refined-evaluation-tool-for-mpas-in-indonesia/.

[3] More information about Kolektif can be found at https://www.usaid.gov/indonesia/fact-sheets/usaid-kolektif-advance-indonesias-marine-protected-areas-management-effectiveness.

[4] More information about the Blue Growth Initiative can be found at https://unfccc.int/news/the-blue-growth-initiative-building-resilience-of-coastal-communities#:~:text=The%20Food%20and%20Agriculture%20Organization,sustainable%20management%20of%20living%20aquatic.

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Appendix A. Program Development Objectives of COREMAP

Program	COREMAP		
PDO	The protection, rehabilitation, and sustainable use of coral reefs and associated ecosystems in Indonesia, which will, in turn, enhance the welfare of coastal communities.		
Project	**COREMAP I (FY1998–2005)**	**COREMAP II[a] (FY04–12)**	**COREMAP-CTI (FY12–22)**
PDO original	To establish a viable framework for a national coral reef management system that promotes the protection, rehabilitation, conservation and sustainable use of coral reefs and associated ecosystems.	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 comanage, in a sustainable manner, the use of coral reefs and associated ecosystem resources.	To institutionalize the COREMAP approach of a viable, decentralized, and integrated framework for sustainable management of coral reef resources, associated ecosystems, and biodiversity for the welfare of the communities in the selected districts of the respective provinces in Indonesia.
First PDO revision	n.a.	Viable reef management systems are established in at least six priority Participating Districts, through a financially sustainable program that is nationally coordinated but decentralized in implementation, to empower and to support coastal communities to sustainably comanage the use of coral reefs and associated ecosystem resources, which will revive damaged or protect intact coral reef ecosystems and, in turn, enhance the welfare of these communities in Indonesia (2010 restructuring).	To strengthen institutional capacity in coastal ecosystems monitoring and research to produce evidence-based resource management information (2017 restructuring).
Second PDO revision	n.a.	n.a.	To strengthen institutional capacity in coastal ecosystems monitoring and research to produce evidence-based resource management information, and to improve management effectiveness of priority coastal ecosystems (2019 restructuring).
Global environmental objectives	n.a.	To protect, rehabilitate, and achieve sustainable use of coral reefs and associated ecosystems in eastern Indonesia.	Same as PDO and was revised twice under the restructurings.

Source: World Bank 1998, 2004, 2004, 2010, 2012, 2014.
Note: COREMAP II = Coral Reef Rehabilitation and Management Program Phase II; COREMAP-CTI = Coral Reef Rehabilitation and Management Program–Coral Triangle Initiative; n.a. = not applicable; PDO = project development objective.
a. The PDO based on the Project Appraisal Document (World Bank 2004). At appraisal, the PDO formulation was different between the Project Appraisal Document and the Development Credit Agreement dated June 30, 2004. In 2010, the legal agreements were amended to restate the PDO formulation to match the Project Appraisal Document (World Bank 2010).

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Appendix B. Results and Outcomes from COREMAP II and COREMAP-CTI

COREMAP

Long-Term Objective of COREMAP
Establish viable, operational, and institutionalized coral reef management systems in priority coral reef sites in Indonesia.

COREMAP II

Outcome Area 1
The establishment of viable community-led comanagement systems for coral reefs

Outcome indicators

1. Collaboratively managed, fully protected no-take zones, covering 10 percent, on average, of reefs in all project-managed areas, with an emphasis on fully protected no-take zones.

2. Seventy percent of operating costs of program activities fully integrated into target district government programs and funded independent of COREMAP II.

3. Awareness of the importance of coral reefs increases to and/or maintained at 70 percent in all participating districts.

Intermediate outcome indicators

1. District laws/regulation for enabling comanagement of coral reef fisheries/ecosystem and establishment of marine conservation areas enacted and adopted in all program districts.

2. Coral Reef Management Plans prepared and implemented, and no-take zones established and endorsed in Perdes by at least 70 percent of target villages.

3. Operational collaborative surveillance and enforcement established at the district and village levels.

4. Financially viable alternative income–generating programs piloted in at least 75 percent of target villages.

5. Number of infringements of park rules and regulation observed per unit of patrolling effort by park ranger teams decreases by 5 percent per year over the period of the program.

6. Training/local awareness campaigns conducted annually for target groups in program districts and coastal villages, and 75 percent of teachers in coastal villages/regions of program districts attend training workshops and receive credit points.

Evaluation comments

Targets were exceeded for outcome indicators 1 (target of 10, achieved 15) and 3 (target of 70 percent, achieved 75 percent). Intermediate targets associated with outcome indicator 3 were also mostly achieved or exceeded, which resulted in the adoption of district laws and regulations to enable the comanagement of coral reef ecosystems, the production of Coral Reef Management Plans, the development and implementation of district- and village-level surveillance plans, the piloting of alternative income–generating activities, and a decrease in park infringements. Intermediate outcome indicator 6, which included two subindicators, was mostly achieved, though issues related to the accessibility (not translated into local languages) of awareness-raising information were mentioned. Targets for outcome indicators 2 and 4 were successfully achieved.

Outcome Area 2
Sustaining the coastal reef system

Outcome Area 2

Outcome indicators

4. Live coral cover in program districts increased by 5 percent annually until levels are reached and maintained comparable to those of similar reefs in well-managed or pristine reefs.

5. Reef fish population improved based on catch-per-unit-effort of fishers using traditional reef-fishing gear and/or visual census in selected project sites in 80 percent of sample sites, compared with expected decline in control areas (outside project areas).

Evaluation comments

Outcome indicator 4 was not successfully achieved, as annual increases of 5 percent of line coral coverage were not observed. However, this indicator was later revised to significant improvements in live coral cover in project-managed areas relative to nonproject areas, in 80 percent of sample sites. This was also not achieved. Outcome indicator 5 could not be assessed, as verification methods used were different from those described in both the original indicator and revised indicator definitions. An increase in reef fish was observed, but only using visual census methods and not calculated CPUE values from within and outside managed areas.

Outcome Area 3

Increased welfare within coastal communities

Outcome indicators

6. Total income of project beneficiary group members increased by 10 percent.

7. At least 70 percent of fishers/beneficiaries in coastal communities in program-managed areas perceive the project has had a positive impact on their welfare.

Evaluation comments

Outcome indicators 6 and 7 were both exceeded, with the income of project beneficiaries increasing by 21 percent, which exceeded the target of 10 percent, and a perceived increase of 84 percent in fisheries' benefits within project-based coastal communities, which exceeded the target of 70 percent.

COREMAP-CTI

Outcome Area 1

Increased institutional capacity to undertake coastal ecosystem monitoring

Outcome indicators

1. The coral reef health status of COREMAP-CTI areas improved (measured by Coral Reef Health Index); the target was set at 31 and then increased to 39 (at sites where the Coral Reef Health Index was applied).

2. Coastal ecosystem area was under continuous monitoring; the target was set at 11,241,404 hectares.

Evaluation comments

Indonesia's new Coral Reef Health Index was applied to 39 sites, meeting the target of 39 sites. There were 12,719,840 hectares of coastal ecosystems area under continuous monitoring according to defined criteria, exceeding the target of 11,241,404 hectares.

Outcome Area 2

An improvement in MPA management effectiveness

Outcome indicators

1. Management effectiveness improved in relation to marine conservation zones, with an existing blue score of > 75 percent (target set at four MPAs).

Outcome Area 2

Evaluation comments

Outcome 2 was achieved, with management effectiveness improving at four MPAs with existing blue scores of > 75 percent. Four intermediate indicators (which included the development of small ecotourism assets as per the management plan, the number of registered community surveillance groups carrying out regular patrols, the implementation of provincial integrated coastal zone management action plan activities, and implementation of the National Plans of Action for sharks, cetaceans, and manta rays in target MPAs) exceeded their targets of 8, 18, 14, and 9, achieving 9, 22, 17, and 21, respectively.

Outcome Area 3

Increased institutional capacity to undertake ecosystems research

Outcome indicators

1. Coastal ecosystems scientific research papers published by BRIN and research grant recipients that meet the need for evidence-based resource management information—target set to 38.

Evaluation comments

The target was adjusted to 57, which was exceeded, with 131 achieved. Two intermediate indicators (which included number of researchers trained by BRIN in coastal ecosystem research techniques and demand-driven coastal ecosystems research grants awarded by BRIN) exceeded their targets of 340 and 30 by achieving 504 and 60, respectively.

Note: BRIN = National Research and Innovation Agency; COREMAP = Coral Reef Rehabilitation and Management Program; COREMAP II = Coral Reef Rehabilitation and Management Program Phase II; COREMAP-CTI = Coral Reef Rehabilitation and Management Program–Coral Triangle Initiative; CPUE = catch-per-unit effort; = marine protected area.

Appendix C. Results Framework with Revised Outcomes and Indicators (COREMAP II and COREMAP-CTI)

Coral Reef Rehabilitation and Management Program Phase II (P071316)

Long-Term Objective: Establish viable, operational, and institutionalized coral reef management systems in priority coral reef sites in Indonesia.

Original PDO: 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 comanage, in a sustainable manner, the use of coral reefs and associated ecosystem resources.

Revised PDO: Viable reef management systems are established at least six priority Participating Districts, through a financially sustainable program that is nationally coordinated but decentralized in implementation, to empower and to support coastal communities to sustainably comanage the use of coral reefs and associated ecosystem resources, which will revive damaged or protect intact coral reef ecosystems and, in turn, enhance the welfare of these communities in Indonesia.

Outcome Areas	Original Indicators	Revised Indicators	Baseline/Target/Actual
(i) Establishing a viable management system for the coral reefs through empowering and supporting coastal communities to comanage the reefs	**Outcome Indicator 1.** Collaboratively managed MCAs cover 10 percent of program district reefs by EOP (%).	The indicator was revised to "Collaboratively managed fully protected no-take zones, covering 10 percent, on average, of reefs in all project managed areas by EOP (%)." The emphasis was made that fully protected no-take zones were the target of the program.	Baseline: 7.5 Target: 10 Actual: 15 (**target exceeded**)
	Outcome Indicator 2. Seventy percent of operating costs of program activities fully integrated into target district government programs and funded independent of COREMAP II by EOP (%).	No change	Baseline: 0 Target: 70 Actual: 70 (**target achieved**).
	Outcome Indicator 3. Awareness about the importance of coral reefs increases to and/or maintained at 70 percent in all participating districts (%).	No change	Baseline: 0 Target: 70 Actual: 75 (**target exceeded**)
	Intermediate Indicator 1. District laws/regulations for enabling comanagement of coral reef fisheries/ecosystem and establishment of MCAs enacted and adopted in all program districts (number).	Target increased from 6 to 7.	Baseline: 0 Target: 7 Actual: 7 (**target achieved**)

	Intermediate Indicator 2. CRMPs prepared and implemented, and DPLs established and endorsed in Perdes by at least 70 percent of target villages (number).	Target decreased from 291 to 250, which corresponded to 70 percent of 416 and 358 villages, respectively.	Baseline: 0 CRMPs; 0 DPL; 0 Perdes Target: 250 CRMPs; 250 DPLs; 250 Perdes Actual: 358 CRMPs; 317 DPLs; 358 Perdes (**target exceeded**)
	Intermediate Indicator 3. Collaborative surveillance and enforcement established at district and village levels and became operational (number).	Target increased from 6 to 7.	Baseline: 0 Target: 7 Actual: 7 (**target achieved)**
	Intermediate Indicator 4. Financially viable AIG programs piloted in at least 75 percent of target villages (number).	Target decreased from 288 to 250.	Baseline: 0 Target: 250 Actual: 358 (**target exceeded**)
	Intermediate Indicator 5. Number of infringements of park rules and regulations observed per unit of patrolling effort by park ranger teams decreases by 5 percent per year over the period of the program (number)	The indicator was revised to "Number of infringements of park rules and regulations observed per unit of patrolling effort by park ranger teams decreased by end of the project as result of increase of park management effectiveness (number)." The explicit reference to the percentage of annual decrease was removed.	Baseline: 2,200 infringements in 2005 Target: No numerical target in the ICR; target in 2010 was 1,702 infringements, based on the calculation mentioned in the original indicator Actual: 880 infringements in 2010 (**target exceeded**)
	Intermediate Indicator 6. Two indicators for the component on public awareness, education, and sea partnership. 6.1. Training/local awareness campaigns conducted annually for target groups in program districts and coastal villages (number). 6.2. Seventy-five percent of teachers in coastal villages/regions of program districts attend training workshops and receive credit points (%).	The two indicators were merged and revised to "Public awareness campaign, education prepared and implemented. The first subindicator's target was revised to "6.1. Public awareness campaign prepared and implemented annually (number)." The second subindicator's target was revised to 6.2. Seventy-five percent of school have teachers trained, and majority of schools have local language content (%)." The focus shifted from the number of teachers to the number of schools.	Baseline: only some environmental education materials about coral reefs available in schools; no local language content. Target: 6.1. Public awareness campaign prepared and implemented annually (number). 6.2. Seventy-five percent of school have teachers trained, and majority of schools have local language content (%). Actual: 6.1. Public awareness campaign prepared and implemented 42 times, or 6 times per district in all participating districts. 6.2. Ninety-two percent of schools have teachers trained, and nearly all have local language content (**target achieved**).
(ii) Sustaining the coastal reef ecosystem	**Outcome Indicator 4.** Live coral cover in program districts increased by 5 percent annually until levels are reached and maintained comparable to those of similar reefs in well-managed or pristine reefs (%).	Revised to "Significant improvements in live coral cover in project-managed areas relative to nonproject areas, in 80 percent of samples sites (%)."	Baseline: varies by location Target: 80 Actual: 71 (**target not achieved**)

	Outcome Indicator 5. Average CPUE for early-breeding indicator species harvested by each of the main sustainable fishing techniques in program districts increased by 35 percent by EOP, while average CPUE for medium-size indicator species harvested by each of the main sustainable fishing techniques in program districts increased by 10 percent (%).	Revised to "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 percent of sample sites, compared with expected decline in control areas (outside project areas)." The visual census was added as an alternative method to assess improvements in reef fish population.	Baseline: CPUE at time 0. Target: Eighty percent of project sites have increased fish population relative to control areas. The verification method was assumed to be a complete survey covering both target and control areas. Actual: Twenty-nine percent increase in reef fish population. The verification method was visual census of reef fish population in target areas on sample basis. The **actual was not comparable to the target** due to the difference in the verification methods.
(iii) Enhancing the welfare of the coastal communities	**Outcome Indicator 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 of project beneficiary group members increased by 10 percent by EOP (%).	The indicator's formulation was simplified to read "Total income of project beneficiary group members increased by 10 percent by EOP (%)."	Baseline: 0 Target: 10 Actual: 21 (**target exceeded**)
	Outcome Indicator 7. At least 70 percent of fishers/beneficiaries in coastal communities in program-managed areas perceive the project has had a positive impact on their welfare and economic status, by EOP (%).	Revised to "At least 70 percent of fishers/beneficiaries in coastal communities in program-managed areas perceive the project has had a positive impact on their welfare (%)." The mention of economic status was removed.	Baseline: 0 Target: 70 Actual: 84 (**target exceeded**)

Source: Independent Evaluation Group, based on World Bank 2004a, 2004b, 2012, 2014b.
Note: AIG = alternative income–generating; CRMP = coral reef management plan; COREMAP II = Coral Reef Rehabilitation and Management Program Phase II; COREMAP-CTI = Coral Reef Rehabilitation and Management Program–Coral Triangle Initiative; CPUE = catch-per-unit-effort; DPL = no-take zones; EOP = the end of the program; ICR = Implementation Completion and Results Report; MCA = marine conservation area; PDO = project development objective; *Perdes* = village ordinance.

Coral Reef Rehabilitation and Management Program–Coral Triangle Initiative (P127813)

Long-Term Objective: Establish viable, operational, and institutionalized coral reef management systems in priority coral reef sites in Indonesia.

Original PDO: Institutionalize the COREMAP approach of a viable, decentralized, and integrated framework for sustainable management of coral reef resources, associated ecosystems, and biodiversity for the welfare of the communities in the selected districts of the respective provinces in Indonesia.
PDO Revision 1: Strengthen the institutional capacity in coastal ecosystems monitoring and research to produce evidence-based resource management information.
PDO Revision 2: Strengthen institutional capacity in coastal ecosystems monitoring and research to produce evidence-based resource management information and to improve management effectiveness of priority coastal ecosystems.

Outcome Areas	Original Indicators	Indicators Revision 1 (2017)	Indicators Revision 2 (2019)	Baseline/Target/Actual

(i) "Improved health of coastal ecosystems and biodiversity protection at appraisal"; revised to "Institutional capacity for coastal ecosystems monitoring strengthened."	**Outcome Indicator.** Coral reef health status in COREMAP-CTI areas improved (measured by Coral Reef Health Index).	Revised to "Sites at which Indonesia's new Coral Reef Health Index is applied (number)." Target set to 31.	Target increased to 39.	Baseline: 0 Target: 39 Actual: 39
	Outcome Indicator. Destructive fishing shows a declining trend (measured by a composite indicator).	Dropped	n.a.	
	None at appraisal.	**Outcome Indicator.** Added "Coastal ecosystems area under continuous monitoring according to defined criteria (hectacres)." Target set to 9,235,028.	Target increased to 11,241,404.	Baseline: 0 Target: 11,241,404 Actual: 12,534,357
	Intermediate Indicator. Village development plans include line item for support of coastal resource management (number).	Dropped	n.a.	
	Intermediate Indicator. Coral reef management at local level institutionalized (number).	Dropped	n.a.	
	Intermediate Indicator. Marine areas brought under biodiversity protection (hectacres).	Dropped	n.a.	
	Intermediate Indicator. Improved management plans prepared or regulations for protection of threatened species promulgated (number).	Dropped	n.a.	
	Intermediate Indicator. Community rights–based fisheries management piloted (number).	Dropped	n.a.	
	None at appraisal.	**Intermediate Indicator.** Added "Coastal ecosystems monitoring surveys completed (number)." Baseline was 16. Target set to 93.	Target decreased to 78.	Baseline: 16 Target: 78 Actual: 78
	None at appraisal.	**Intermediate Indicator.** Added "Specific coastal ecosystems schemes for which BRIN is accredited as the national certification entity (number)."[a] Target set to 5.	No change.	Baseline: 0 Target: 5 Actual: 6

	None at appraisal.	**Intermediate Indicator.** Added "Assessors and surveyors certified in coastal ecosystems monitoring by BRIN (number)." Target set to 250.	Target increased to 500.	Baseline: 0 Target: 500 Actual: 639
	None at appraisal.	**Intermediate Indicator.** Added "Subnational assessment centers established by BRIN (number)." Target set to 7.	Target increased to 10.	Baseline: 0 Target: 10 Actual: 11
	None at appraisal.	**Intermediate Indicator.** Added "Subnational data nodes within existing institutions established by BRIN (number)." Target set to 7.	Target increased to 10.	Baseline: 0 Target: 10 Actual: 8
	None at appraisal.	**Intermediate Indicator.** Added "BRIN coastal monitoring and research infrastructure assets upgraded (number)." Target set to 8.	Target decreased to 7.	Baseline: 0 Target: 7 Actual: 6
	None at appraisal.	No change.	**Intermediate Indicator.** Added "Technical staff awarded master's degree scholarships in coastal ecosystems monitoring and management (number)."	Baseline: 0 Target: 20 Actual: 15
(ii) "More effective management of MCAs and their resources through the introduction of an ecosystem-based approach" at appraisal; revised to "MPA management effectiveness improved."[b]	**Outcome Indicator.** MCA management effectiveness improved (number of MCAs).[b]	Revised to "Target MPAs with a Blue-Level Management Effectiveness Score of at least 75 percent (number of MPAs)." Target set to 4.	No change.	Baseline: 0 Target: 4 Actual: 4
	Intermediate Indicator. Joint patrols for MCAs between navy, district, and community-based groups (number).	Dropped.	n.a.	
	None at appraisal.	No change.	**Intermediate Indicator.** Added "Small ecotourism infrastructure assets, built in target MPA areas, as per MPA management plans (number)."	Baseline: 0 Target: 8 Actual: 9
	None at appraisal.	No change.	**Intermediate Indicator.** Added "Registered community surveillance groups (*Pokmaswas*) that are carrying out regular surveillance patrols in target MPA areas (number)."	Baseline: 0 Target: 18 Actual: 22
	None at appraisal.	No change	**Intermediate Indicator.** Added "Provincial ICZM action plan activities	Baseline: 0 Target: 14

			implemented in and around target MPA areas (number)."	Actual: 17
	None at appraisal.	No change.	**Intermediate Indicator.** Added "Number of management activities from MMAF's National Plans of Action that have been implemented for sharks, cetaceans, and manta rays in target MPA areas (number)."	Baseline: 0 Target: 9 Actual: 21
(iii) "Sustainable, community-based enterprise development and alternative livelihoods" at appraisal; dropped in 2017.	**Outcome Indicator.** Income of COREMAP-CTI beneficiaries increased (%).	Dropped.	n.a.	
	Outcome Indicator. Female beneficiaries' participation (%).	Dropped.	n.a.	
	Intermediate Indicator. Project-affected persons supported through SEAs (number).	Dropped.	n.a.	
(iv) "Institutional capacity for ecosystems research strengthened" added in 2017.	None at appraisal.	**Outcome Indicator.** Added "Coastal ecosystems scientific research papers published by BRIN and research grant recipients that meet the need for evidence-based resource management information (number)." Target set to 38.	Target increased to 57.	Baseline: 0 Target: 57 Actual: 131
	None at appraisal.	**Intermediate Indicator.** Added "Researchers trained by BRIN in coastal ecosystems research techniques (number)." Target set to 240.	Target increased to 340.	Baseline: 0 Target: 340 Actual: 503
	None at appraisal.	**Intermediate Indicator.** Added "Demand-driven coastal ecosystems research grants awarded by BRIN (number)." Target set to 20.	Target increased to 30.	Baseline: 0 Target: 30 Actual: 60

Source: Independent Evaluation Group, based on World Bank 2014a, 2017, 2019, 2023.

Note: BRIN = National Research and Innovation Agency; COREMAP = Coral Reef Rehabilitation and Management Program; COREMAP-CTI = Coral Reef Rehabilitation and Management Program–Coral Triangle Initiative; ICZM = integrated coastal zone management; MCA = marine conservation area; MPA = marine protected area; n.a. = not applicable; PDO = project development objective; *Pokmaswas* = registered community surveillance groups; SEA = Sustainable Enterprises Alliance.
a. In September 2021, the Indonesian Institute of Sciences merged with BRIN.
b. MCAs are more popularly called MPAs at the time of the Project Performance Assessment Report, whereas when the program was developed in 2014, both words were used interchangeably in the Implementation Completion and Results Report (World Bank 2023).

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Appendix D. Methods and Approaches

This report is a Project Performance Assessment Report. This instrument and its methodology are described at https://ieg.worldbankgroup.org/methodology/PPAR.

This assessment builds on the project documentation, including Project Appraisal Documents, Implementation Completion and Results Reports, and Implementation Completion and Results Report Reviews. The Independent Evaluation Group (IEG) conducted a field mission to Indonesia between August 21 and September 8, 2023, during which semistructured individual and group interviews were conducted with key stakeholders, including former and current members of the World Bank's project task teams, government authorities (at the national, provincial, districts, and village levels), technical staff from key ministries and agencies, nongovernmental organizations, and community groups to gather technical data and feedback. These interviews were supplemented by visits, interviews, and focus group discussions with recipients of seed funds and training for community development and alternative livelihood with five subproject beneficiary groups. These interviews allowed IEG to test assumptions and report on distributional benefits among several groups of people (fishers, nonfishers, men and women, elders and youths, and ethnic groups and migrants) and explore the extent and sustainability of outcomes from subprojects.

Part I: Desk Review and Key Informant Interviews in Washington, DC

a. Conducted a desk review of literature and analytical work that are relevant to the Coral Reef Rehabilitation and Management Program (COREMAP). Reviewed project documentation (for example, Project Appraisal Documents, Implementation Status and Results Reports, aide-mémoire, procurement plans, Mid-Term Reviews, Implementation Completion and Results Reports, and Implementation Completion and Results Report Reviews).

b. Reviewed project documentation of projects relevant to COREMAP (for example, preceding, parallel, and succeeding projects funded by the World Bank, the Asian Development Bank, and other development partners and nongovernmental organizations) with a focus on coastal resource management, community-based management, and the blue economy in Indonesia. The relevant World Bank projects included the Oceans for Prosperity Project—LAUTRA (P173391), Capturing Coral Reef and Related Ecosystem Services (P123933), Integrated Infrastructure Development for National Tourism Strategic Areas (Indonesian Tourism Development Project; P157599), and Kecamatan Development Project (P045337). Other key relevant projects included the Asian Development Bank–funded Coral Reef Rehabilitation and Management Program–Coral Triangle Initiative (COREMAP-CTI). Conducted the subproject analysis.

c. Conducted key informant interviews with relevant World Bank staff and subject matter experts based on project documentation and literature reviews. Used snowball sampling methods to identify potential interviewees.

d. Reviewed scientific literature regarding coastal ecosystems, ocean health, and marine and coastal resources conservation and livelihoods. Conducted scoring analysis of the Management Effectiveness Tracking Tool; the evaluation system for Effectiveness of Management of Marine, Coastal, and Small Islands Conservation Areas (E-KKP3K); and the evaluation tool for the management effectiveness of marine conservation areas(EVIKA).

   Developed a Concept Note with two evaluation questions as follows:
   Evaluation question 1: To what extent did COREMAP contribute to enhancing the decentralization of coastal and marine management?
   Evaluation question 2: How effectively did COREMAP support the strengthening of marine and coastal resource monitoring, control, and surveillance in Indonesia?

e. Held the Before Action Review meeting that was attended by the manager, the task team leader of the blue economy thematic evaluation, and the task team leader of the clustered Project Performance Assessment Reports on marine spatial planning, among others. Refined the evaluation design based on the comments received.

Part II: Key Informant Interviews in Jakarta

IEG carried out key informant interviews in Jakarta, Indonesia, between August 21 and 25, 2023. Interviews were conducted with World Bank staff who worked on COREMAP,

officials from relevant government ministries and agencies, and representatives of other development partners.

Part III: Field Assessment and Informant Interviews of Project Beneficiaries and Stakeholders

IEG conducted a field assessment between August 28 and September 8, 2023. Criteria for site selection included (i) successful (continued World Bank intervention) or less successful (discontinued World Bank intervention); (ii) geographical distribution; (iii) district-level marine protected area (MPA) or national-level MPA; and (iv) extent of support from other development partners.

a. Conducted site visits, interviews, and focus group discussions in four provinces (South Sulawesi, Southeast Sulawesi, Maluku, and East Nusa Tenggara), 20 organizations, seven villages (Benjina, Karey, Waha, Liya, Lifuleo, Wuring, and Wolomarang), a community with Indigenous Bajo people, and a beneficiary elementary school. Visited the MPAs covered by the projects, along with surrounding communities.

b. Conducted semistructured interviews with key stakeholders, including provincial governments (Ministry of Marine Affairs and Fisheries), district governments (fishery agencies, tourism and creative economy agencies), Kupang National Water Conservation Area, Wakatobi National Park office, nongovernmental organizations (for example, World Wildlife Fund, Yayasan Konservasi Alam Nusantara, The Nature Conservancy), and academia (Universitas Nusa Nipa).

c. Interviewed approximately 150 individuals and focus group discussants (about 55 percent of whom were female). The interviewees included representatives from project beneficiaries (for example, surveillance groups, microfinance groups, women's groups), community and village representatives (for example, village heads, traditional leaders, religious leaders), and representatives from nonproject beneficiaries (for triangulation of results). In focus group discussions, female discussants formed separate groups from male discussants.

d. Held After-Action Review meetings within IEG to present preliminary findings to the evaluation manager, relevant task team leaders, and the panel reviewer, among others.