SUSTAINING INDONESIA'S MARINE ENVIRONMENT

Lessons Learned from the USAID Sustainable Ecosystems Advanced Project

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KEMENTERIAN KELAUTAN DAN PERIKANAN

SUSTAINING INDONESIA'S MARINE ENVIRONMENT:

Lessons Learned from the USAID Sustainable Ecosystems Advanced Project

Produced by the USAID Sustainable Ecosystems Advanced (SEA) Project and the Ministry of Marine Affairs and Fisheries (MMAF), Republic of Indonesia

This publication was produced by the USAID Sustainable Ecosystems Advanced (SEA) Project and the Ministry of Marine Affairs and Fisheries (MMAF), Republic of Indonesia.

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Secretariat General
Gedung Mina Bahari I Lt 5
No. 16 – Jakarta Pusat, Indonesia

United States Agency for International Development (USAID)
Jl. Medan Merdeka Selatan no. 3–5
Gambir, RT.11/RW.2, Gambir
Kota Jakarta Pusat,
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Jakarta 10110, Indonesia

Citation: Ministry of Marine Affairs and Fisheries (MMAF), Republic of Indonesia and USAID Sustainable Ecosystems Advanced (SEA) Project (2021) Sustaining Indonesia's Marine Environment: Lessons Learned from the USAID Sustainable Ecosystems Advanced Project. Jakarta, pp. 135.

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Infographics, layout and design: Laura Kola[1]

Copyeditor: Asuncion Sia

1. Sustainable Solutions International Consulting (SSIC)
2. Blue Green Advisors (BGA)
3. USAID SEA Project

Printer: Grafindo

ISBN:

Chief of Party: Alan White, PhD

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USAID Contracting Officer's Representative: Celly Catharina, MSc

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Disclaimer: This publication is made possible by the generous support of the American People through the United States Agency for International Development (USAID) with the close collaboration of the Government of Indonesia. The contents of this report are the sole responsibility of USAID SEA Project and do not necessarily reflect the views of USAID or the United States Government.

USAID Project Number: AID-497-C-16-00008

Front cover photo: Marine protected area socialization with villagers in Buano Island, Maluku Province, 2018. Coral Triangle Center

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ACRONYMS AND ABBREVIATIONS

Bappenas	National Development Planning Agency (*Badan Perencanaan Pembangunan Nasional*)
BCC	behavior change communication
BPKP	proof of vessel registration (*Bukti Pencatatan Kapal Perikanan*)
BRPL	Marine Research Agency (*Badan Riset Perikanan Laut*)
Covid-19	Coronavirus Disease 2019
CPUE	catch per unit effort
CTC	Coral Triangle Center
DF	destructive fishing
DGCF	Directorate General of Capture Fisheries
DKP	Marine and Fisheries Agency (*Dinas Kelautan dan Perikanan*)
EAFM	ecosystem approach to fisheries management
EEZ	exclusive economic zone
EKKP-3-K	MPA management effectiveness assessment system (*Evaluasi Efektivitas Pengelolaan Kawasan Konservasi Perairan, Pesisir dan Pulau-Pulau Kecil*)
ETP	endangered, threatened and protected (species)
FAO	The United Nations Food and Agriculture Organization
FMA	Fisheries Management Area
FMP	fishery management plan
GOI	Government of Indonesia
GT	gross tonnage
ha	hectares
ILMMA	Indonesia Locally Managed Marine Area Foundation
IUU	Illegal, unreported, and unregulated (fishing)
KepMen-KP	marine and fisheries minister (MMAF) decree (*Keputusan Menteri Kelautan dan Perikanan*)
km	kilometers
Komnas Kajiskan	National Commission on Fisheries Resources Assessment (*Komisi Nasional Pengkajian Sumber Daya Ikan*)
KSOP	Harbormaster Office and Port Authority (*Kantor Kesyahbandaran dan Otoritas Pelabuhan*)
LIPI	Indonesian Institute of Sciences (*Lembaga Ilmu Pengetahuan Indonesia*)
LMMA	locally managed marine area
MDPI	Yayasan Masyarakat dan Perikanan Indonesia
MMAF	Ministry of Marine Affairs and Fisheries
MoHA	Ministry of Home Affairs
MPA	marine protected area
MSP	marine spatial planning
MSY	maximum sustainable yield
NGO	non-governmental organization
nm	nautical miles
no.	number
NOAA	U.S. National Oceanic and Atmospheric Administration
OLE	Office of Law Enforcement
NSPK	norms, standards, procedures, and criteria (*norma, standar, prosedur dan kriteria*)

P3D	operating procedure for transfer of personnel, funding, facilities and infrastructure, and documents (*pedoman pelaksanaan pengalihan personel, pendanaan, sarana dan prasarana, serta dokumen*)
PerDa	local regulation (*Peraturan Daerah*)
PerGub	governor regulation (*Peraturan Gubernur)*
PerMen	marine and fisheries minister (MMAF) regulation (*Peraturan Menteri Kelautan dan Perikanan)*
PMI	performance management indicator
Pokja	working group (kelompok kerja)
Pokmaswas	community surveillance group (*kelompok masyarakat pengawas*)
PPP	public-private partnerships
PSDI	Directorate of Fish Resource Management (*Directorat Pengelolaan Sumber Daya Ikan*)
PSDKP	Directorate General of Marine and Fisheries Resources Surveillance (*Pengawasan Sumberdaya Kelautan dan Perikanan*)
PSM	port state measures
PSMA	Port State Measures Agreement
PSPL	Implementing Unit for Coastal and Marine Management (*Loka Pengelolaan Sumberdaya Pesisir dan Laut*)
PTSP	One-Stop Integrated Service (*Pelayanan Terpadu Satu Pintu)*
Pusriskan	Center for Fisheries Research (*Pusat Resit Perikanan*)
RCFI	Reef Check Foundation Indonesia
RPJMD	Regional Medium-Term Development Plan (*Rencana Pembangunan Jangka Menegah Daerah*)
RZWP-3-K	provincial marine spatial plan (*Rencana Zonasi Wilayah Pesisir dan Pulau-Pulau Kecil*)
SEA	Sustainable Ecosystems Advanced (Project)
Siswasmas	community-based surveillance system (*sistem pengawasan berbasis masyarakat*)
SKKNI	National Competency Standards (*Standar Kompetensi Kerja Nasional Indonesia*)
SOP	standard operating procedures
SPAG	spawning aggregation
TAC	total allowable catch
TNC	The Nature Conservancy
TOT	training of trainers
TURF	territorial user rights for fisheries
UKIP	Christian University of Papua (*Universitas Kristen Papua*)
UNEP-WCMC	United Nations Environment Program and World Conservation Monitoring Centre
UNIPA	University of Papua (*Universitas Negeri Papua*)
UPTD	regional technical implementing unit (*unit pelaksana teknis daerah*)
USAID	United States Agency for International Development
USAID SEA	USAID Sustainable Ecosystems Advanced (SEA)
WCS	Wildlife Conservation Society
WWF	World Wide Fund for Nature

ACKNOWLEDGMENTS

MINISTRY OF MARINE AFFAIRS AND FISHERIES
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Bapak TB Haeru, Bapak Hendra Yusran Siry, and Bapak Agus Dermawan. **Directorate of Marine Conservation and Biodiversity**: Bapak Andi Rusandi, Bapak Firdaus Agung , Bapak Amehr Hakim, Bapak Sarminto Hadi, Ibu Pingkan Katharina Roeroe, Bapak Agus Widayanto, Bapak Sukendi Darmasyah, Ibu Anita Setianingsih, Bapak Ahmad Sofiulloh, Ibu Ana Rojayati, Bapak Dedy Eka Syaputra, Ibu Theresia Susanti, Bapak Yusuf Arief Afandy, Ibu Angela Belladova Arundina, Ibu Rusdatus Sholihah, Bapak Teguh Satria Gunawan, Bapak Yoga Hadi Dewanto, Bapak Ihsan Ramli, Bapak Suwardi, Bapak M Subhan Wattiheluw, Ibu Yudit Tia Lestari, Ibu Ririn Widiastutik and Bapak M Saefudin. **Directorate of Marine Spatial Planning**: Bapak Suharyanto, Bapak Krishna Samudera, Bapak Muhandis Sidqi, Bapak Moch. Yusuf Eko Buditomo, Bapak Muhammad Ardan Affandi, Bapak Yanelis Prasenja, Ibu Yovita Anindita, Ibu Nuriftri Syadiah, and Bapak Tedy Priadi.
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Marine and Fisheries Research and Human Resources Development Agency: Bapak Sjarif Widjaja.
Center for Marine and Fisheries Training and Extension: Ibu Aprilia Pergiwati, Bapak Andi Hartoto, Ibu Lusia Dwi Hartiningsih, and Bapak Agus Syah Pahlevi.
Center for Fisheries Research: Ibu Yayan Hikmayani , Bapak Wudianto, Bapak Duto Nugroho, Wijopriono, Ibu Lilis Sadiyah, Bapak Fayakun Satria, Bapak Erfin Nurdin, Ibu Tri Wahyu B, Ibu Tri Ernawati, Bapak Mahiswara, Bapak Ahmad Zamroni, Bapak Duranta D. Kembaren, and Bapak Anthony Sisco Panggabean.

Provincial Marine and Fisheries Offices
North Maluku: Bapak Abdullah Assegaf, and Bapak Syahrudin Turuy. **Maluku**: Bapak Abdul Haris, Bapak Erawan Asikin, Bapak Ahmad Umarella, Ibu Fitriah Khouw, and Ibu Fatmah S. Rumagia. **West Papua**: Bapak Jacobis Ayomi, Bapak Enos S. Menai , Bapak Syafri Tuharea, and Bapak Zulkifli Henan.
Technical Implementation Units (Implementing Unit for Coastal and Marine Management Sorong and Ambon Work Unit): Bapak Santoso Budi Widiarto, Bapak Hendrik Sombo, Bapak Reza Pahlevi, Bapak Prehadi, Ibu Wiwit Handayani, and Sdr. Rahal Marsha Bala'zam.

EAFM Learning Centers: University of Papua, Christian University of Papua, Muhammadiyah University, Sorong, Marine and Fisheries Polytechnic, Sorong, Khairun University, and IPB University.

Working Groups: Serutbar MPA, Kataloka Customary Country (*Petuanan Adat Kataloka*), South Sorong MPA, Bintuni Bay Traditional Community Based Fisheries Management, South Sorong MPA Zoning and Management Plan, and West Papua Province Provincial Marine Spatial Plan.

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Coral Triangle Center Team: Rili Djohani, Hesti Widodo, Leilani Gallardo, Agustin Capriati, Evi Nurul Ihsan, Purwanto, Kasman, Yoga Putra, Alfi Syukron, Nyoman Suardana, Silvianita Timotius, La Ode Junaidin, Marthen Welly, Kitty Courier, I Nengah Winiarta, Dewa Ayu Treanika, Herriwati, and Erniatun Hartini.
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Masyarakat dan Perikanan Indonesia Team: Yasmine Simbolon, Karen Villeda, Saut Tampubolon, Karel Yerusa, Stephani Mangunsong, Wildan, Bachori, Deirdre Duggan, Nilam Ratna, and Widi Artanti.
Rare Indonesia Team: Taufik Alimi, Stuart Campbell, Hari Kushardanto, Raymond Jakub, Katherine Tjandra, Arwandrija Rukma, Handoko Susanto, Galuh Sekar Arum, Gayus Raunsai, Frits Geral, and Nursyam Dwi Vrandi
Reef Check Indonesia Team: Derta Prabuning, Naneng Setiasih, Jaya Ratha, Veronika Niken, Syamsuliarto, and Angel Siagian.
The Nature Conservancy Team: Alison Green, Yusuf Fajaryanto, Glaudy Perdanaharja, Hilda Lionata, Muhammad Imran Amin, Yadranka Farita, Fachry Ramadyan, Dzimar Akbarur Rokhim, and Lukman Hakim.
Christian University of Papua Sorong Team: Stephanus V. Mandagi, Roger R. Tabalessy, Gaspar Manu, Melisa Masengi, Mega Renouw, Sophian Andi, and Indah Renouw.
University of Papua Team: Paul Boli, Fanny F.C. Simatauw, Indra Luhulima, Dedi Parenden, Simon Leatemia, and Selvi Tebay.
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World Wildlife Fund for Nature Indonesia Team: Lukas Adiyakso, Candhika Yusuf, Muhammad Maskur Tamanyira, Navisa Nurbandika, Amrullah Rosadi, Kanyadibya Prasetyo, Siti Yasmina Enita, Miko Budi Raharjo, Tutus Wijanarko, Daniel Efendi Leatemia, Adib Mustofa, Abdul Maskur Marasabessy, Sasi, Umi Kalsum Madaul, Helena Dorce Latupeirissa, Delia, Dirga Daniel, Irwanto, Ehdra Beta Masran, Deti Triani, Inayah, Mansur, Vinsensius Aman, Lambertus Apelabi, Robert W. Petipelehu, Kartika Muchtar, and Imam Musthofa.

Consultants supporting the USAID SEA Project 2016–2021: Abdul Halim, Reza Syaiful Hamdani, Muhammad Badrudin, Ahmad Suryahaminata Taufik, Anselmus Laurensius Kaba, Kahan, Wirdawati, Bambang Wicaksono Triantoro, Alia Marsha, Donald Bason, Dyah Rahmatika Dwi Darmawan, Stephanus V. Mandagi, Paulus Boli, Nathan Gregory, Stacey Kilarski, Catherine Courtney, Paul Van Nimwegen, Eleanor Carter, Debra Grogan, Asuncion Sia, Stuart Green, Daniella Ceccarelli, and Angela Cruz.

In memoriam:
Bapak Aditya Surono (MDPI), Bapak Buyung Radjiloen (North Maluku), Bapak Dr. Aryo Hanggono (MMAF), Bapak Adi Wicaksono (MMAF), Ibu Dianitta Krey (West Papua), and Bapak Kusnadi (WCS).

FOREWORD

Indonesia comprises some of the world's most diverse tropical marine ecosystems, which provide critically important food and livelihoods for coastal communities. In the coming years, without effective management the vital marine biodiversity and ecosystem integrity of the region is at risk, and associated fisheries face a loss of productivity potential, and possible fisheries collapse. The Ministry of Marine Affairs and Fisheries (MMAF) has been engaging various parties to work together in managing oceans and coastal areas in a sustainable way. One of them is the U.S. Government, through the United States Agency for International Development (USAID).

Our collaboration to protect marine biodiversity and support the fishing and marine ecotourism industry through sustainable fisheries production, provides protection to small-scale fishers in the coastal area, and potentially provides opportunities for the tourism industry that will benefit local economies and communities. At present the government's policies and efforts in the marine sector focus on integrated and sustainable marine resource management, as well as strengthening the management of marine protected areas. In the long-term, these policies and efforts will bring economic prosperity to current and future generations and protect Indonesia's unique marine biodiversity.

In October – November 2020, MMAF and USAID jointly held a virtual symposium series to share, discuss and learn from the valuable lessons generated during the implementation of the USAID Sustainable Ecosystems Advanced (USAID SEA) Project (2016-2021) in its efforts to build sustainable fisheries; to improve marine conservation through new and improved marine protected areas and networks; to test innovative ways to improve coastal law enforcement and build capacity in fisheries and marine conservation agencies, locally and nationally. Three main results of these virtual sessions were: (1) consensus on the most valuable lessons learned to be shared in a "SEA Lessons Learned" publication; (2) key lessons and ideas valuable for improvements in fisheries management and marine conservation strategies for the Indonesian government and donor-assisted projects; and (3) access to the volume of products generated through the USAID SEA Project and the results of the symposium presentations and discussions.

The most valuable lessons learned from the implementation of the USAID SEA Project are captured here in the "SEA Lessons Learned" book. This book introduces the marine realm of Indonesia and the issues of its protection and management and explains how the USAID SEA Project worked to achieve its program objectives. The priority lessons learned, and various practical experiences gained throughout the project are expressed in a series of case studies. The cases cover the strategies used to further an ecosystem approach to fisheries management (EAFM) and to support biodiversity conservation through effective marine protected areas (MPAs) and an enabled marine spatial planning (MSP) process, together with an enhanced law enforcement and policy support system. The final chapter provides an overview of all 'Lessons Learned' and suggested paths forward for Indonesian marine and fisheries resource management.

This book is intended as a reference for successful implementation of coastal and marine resources management, including all aspects of fisheries, and the engagement of many stakeholders and government sectors. Thus, this book will also benefit policymakers, donors, academe, project partners and others working in the marine realm.

On behalf of Government of Indonesia, the Ministry of Marine Affairs and Fisheries, would like to express our gratitude and appreciation for our long-standing partnership with U.S. Government in implementing sustainable fisheries management and marine conservation in Indonesia. This successful collaboration gives significant contributions to achieve the Government of Indonesia's current vision for the sustainable development of the maritime sector.

Ishartini

Head of Planning Bureau, Ministry of Marine Affairs and Fisheries, Republic of Indonesia

As the global center of marine biodiversity, Indonesia has the second largest capture fisheries and the sixth largest Exclusive Economic Zone in the world. These unparalleled resources, which provide livelihoods, food security, medicine, climate regulation, and mitigate natural disasters, require our active management and responsible stewardship to safeguard these benefits into perpetuity.

For the past 20 years, the United States Government, through the United States Agency for International Development (USAID), has collaborated with the Government of Indonesia to build a foundation for marine and coastal management. Together, we have advanced Indonesia's capacity to institute a system of marine protected areas (MPA) that will conserve 30 million hectares of Indonesia's rich marine biodiversity by 2030.

Through its Sustainable Ecosystem Advanced (SEA) project, USAID assists Indonesia's Ministry of Marine Affairs and Fisheries (MMAF) to enhance fish production, food security, and sustainable livelihoods in the provinces of Maluku, North Maluku and West Papua. Our joint efforts established 14 MPAs covering approximately 1.6 million hectares, improved fish stock data and management of target fisheries, implemented marine spatial plans and integrated sustainable marine and coastal management in three provinces. Together, by empowering local champions and establishing community-based surveillance groups, we also strengthened coastal communities' participation and leadership to manage their own marine resources. These results are expected to reduce illegal, unregulated, and unreported fishing and in turn maintain fish production at a sustainable level while protecting livelihoods.

Our shared successes have enhanced the Government of Indonesia's self-reliance to manage Indonesia's fisheries sustainably and to protect rich and diverse marine environments for generations to come. As we near the close of USAID SEA, we have an opportunity to reflect on lessons learned and consider how we can continue to strengthen fisheries management and conserve marine biodiversity in the future.

To communicate USAID SEA's strategies and lessons to a wide audience, the Ministry of Marine Affairs and Fisheries and USAID co-hosted a virtual symposium to solicit feedback on USAID's work in sustainable fisheries. Documenting feedback and best practices to replicate USAID SEA successes, this book underscores the following key insights:

- Participatory and evidence-based harvest strategies are critical to addressing widespread overfishing in Indonesian fisheries.
- Successful MPA implementation requires building the capacity of the local governments and stakeholders.
- Improved fisheries and MPA law enforcement will require stronger coordination across national and local governments, including customary groups.

These pieces are just parts of a larger puzzle of how to sustainably manage marine resources. I am proud that USAID can contribute our expertise, and it is my hope that this book will inspire even more ideas that can help ensure the health and productivity of our oceans for many years to come.

Ryan Washburn

Mission Director, USAID/Indonesia

PREFACE

The USAID Sustainable Ecosystems Advanced (SEA) Project commenced in 2016 and, working together with the Ministry of Marine Affairs and Fisheries and multiple government and non-government partners, generated a wealth of experience and lessons about what is required to sustain Indonesia's marine resource inheritance. This book highlights the USAID SEA Project outputs, challenges, and many lessons and opportunities to move forward in improving the governance of Indonesia's marine resources. It conveys the perspectives of USAID SEA Project staff together with primary partners in the collaborating government agencies as well as the many implementing partners.

Uniquely, the USAID SEA Project offers a microcosm of marine resource management in Indonesia with all of its complexities and challenges. The composite message expressed through all the different voices represented is one of progress and an evolving and improving understanding of what is needed to maintain the vast wealth of Indonesian marine ecosystems. The importance of this book lies in its relevance to the critical value of Indonesia's marine wealth for the food security, incomes and general well-being of millions of its citizens.

This book provides an introduction to the marine realm of Indonesia and the issues of its protection and management, and explains how the USAID SEA Project worked to achieve its program objectives. The priority lessons learned and various practical experiences gained throughout the Project are expressed through a series of case studies. The cases cover the strategies used to further an ecosystem approach to fisheries management and to support biodiversity conservation through effective marine protected areas and an integrated marine spatial planning process, together with an enhanced law enforcement and policy support system. The final chapter provides an overview of all 'Lessons Learned' and suggests paths forward for Indonesian marine and fisheries resource management.

Many of the insights and lessons learned presented in this book are also derived from a virtual symposium series held in October and November 2020. The symposium facilitated sharing, discussion, and learning around the USAID SEA Project's experience in building sustainable fisheries, promoting marine conservation, improving coastal law enforcement, and developing relevant capacity across the fisheries and marine conservation agencies at both national and local levels in Indonesia. The eight virtual sessions with more than 20 online hours accumulated more than 1,500 live stream views and answered over 100 live chat questions. It culminated in a 'lessons learned' session that provided much input to this book.

The intended audience for this work is broad because of the reality that successful management of coastal and marine resources, including all aspects of fisheries, is a multidisciplinary process that must engage many stakeholders and government sectors. Thus, those who are from national ministries dealing with coastal and marine issues, as well as the National Development Planning Agency (*Badan Perencanaan Pembangunan Nasional - Bappenas*), policymakers, donors, academe, Project partners and others working in the marine realm will all benefit from this book. It is noted that donors supporting the Indonesian government will also benefit from these lessons learned to refine the focus of their investments in capacity building.

This book does not need to be read from cover to cover. Multiple case studies stand on their own and a culminating section of lessons serves as an executive summary of learnings from the Project. But, to truly grasp what is needed to secure Indonesian marine resources for the future, it is strongly suggested that the entire book be reviewed and hopefully enjoyed!

Alan White

Chief of Party, USAID SEA Project

The USAID SEA Project Team

Activities under the USAID SEA Project were led by the USAID SEA Core Team as the umbrella organization and supported by a consortium of partners implementing activities at the national, regional, and local levels.

2016–2021
WWF implemented multi-level interventions, including: coordinating activities in West Papua; undertaking fisheries assessments; advancing the design and implementation of an ecosystem approach to fisheries management (EAFM) through Fishery Improvement Projects (FIPs) and wider incentivization mechanisms; supporting the effective management of MPAs; advancing sustainable marine tourism across sites; and enhancing skills and capacity at a range of levels.Sites: North Maluku (Ternate, Tidore, Weda); Maluku (Sawai, Koon, Buano Islands); West Papua (South Sorong, Sorong, Bintuni)

2017–2021
Focusing on the development and utilization of a tailored economic rate of return (ERR) methodology as a tool to model use-patterns and economic considerations in target areas, Marine Change's work aimed to optimize investment decisions surrounding both fisheries and sustainable tourism.
Sites: North Maluku (Morotai, Mare, Widi); Maluku (Sawai, Lease)

2017–2020
Focusing on large pelagic (tuna) fisheries, work involved: promoting incentives through Fair Trade and associated schemes for the adoption of EAFM practices; supporting research, design, and management for sustainable fisheries; establishing fora and building skills.
Sites: North Maluku (Kayoa, Bisa [Obi/Bacan], Sula); Maluku (Sawai, Parigi, Bula)

2017–2019
Supported the design, development, establishment, and co-management of new MPAs in target areas.
Sites: West Papua (Fakfak)

2016–2021
Focusing on North Maluku, WCS's work included: coordinating activities with the North Maluku government agencies; undertaking fisheries research and supporting intervention design and implementation for EAFM; addressing destructive fishing practices and the illegal wildlife trade; supporting the establishment and effective management of MPAs; promoting law enforcement and enhanced capacity at the provincial level.
Sites: North Maluku (Morotai, Ternate, Tidore, Mare, Guraici, Weda, Widi)

2017–2020
Work focused on establishing a network of locally-managed marine areas; building skills to enhance community governance; advancing tenurial rights and livelihood initiatives to promote sustainable fisheries management. Sites: Maluku (West Seram, Central Maluku)

2017–2019
Provided direct social and economic benefits to local communities through the development or enhancement of community businesses, including nature-based tourism.
Sites: North Maluku (Morotai, Mare)

2017–2019
Focused on anchovy fisheries, UKIP supported research, fishery intervention design, and sustainable fisheries management in target areas.
Sites: West Papua (Misool, Kabui)

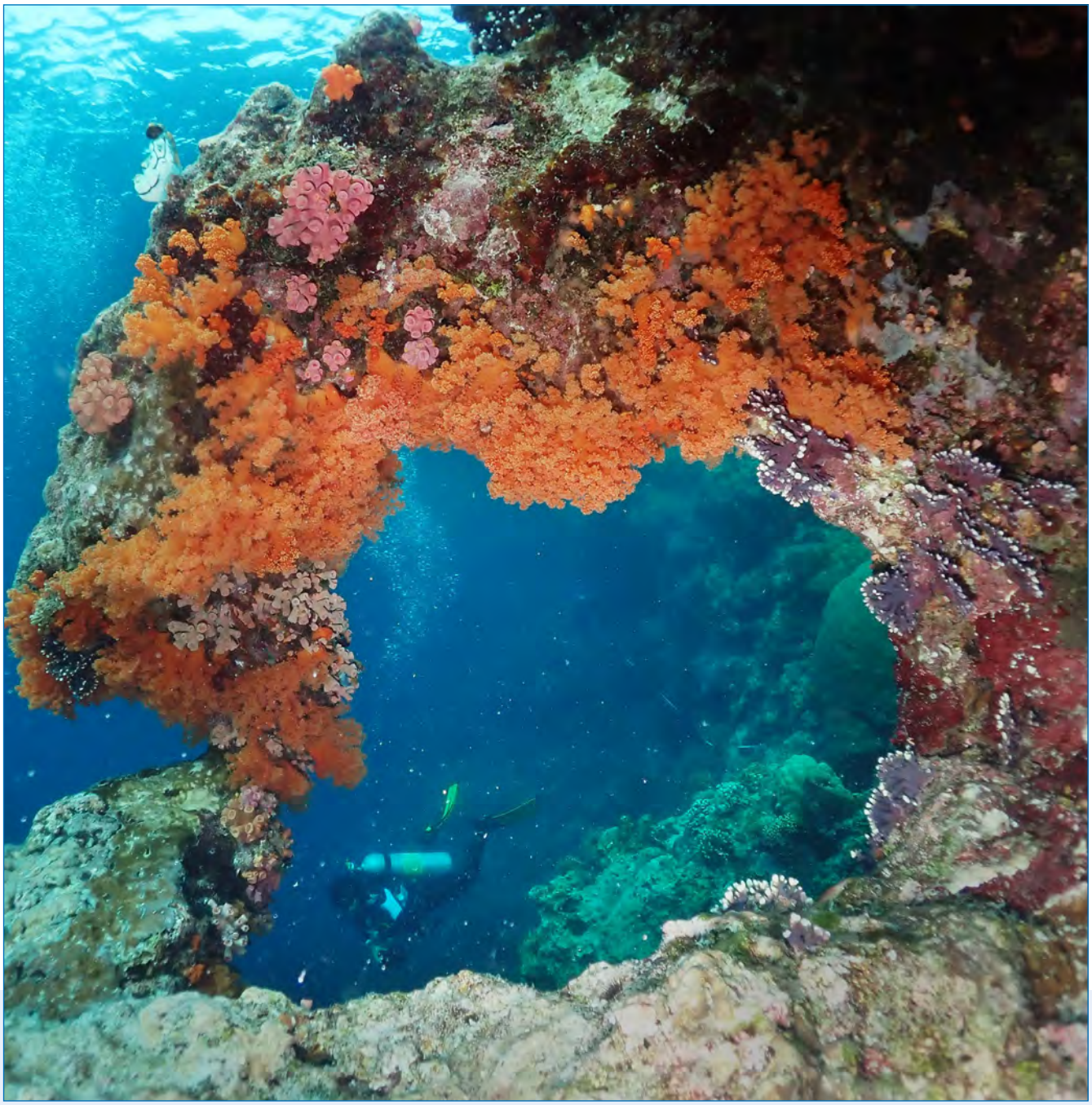
2017–2019
Promoted improved governance of flying fish resources in target areas, including research and community engagement to improve sustainability of the fishery, and enhance fisher income and welfare.
Site: West Papua (Fakfak)

2016–2021
Advancing capacity building to support the effective design, establishment and management of MPAs, CTC's work included: multi-level training and skills-building; promoting the engagement of local communities and the empowerment of MPA champions; supporting the effective design of MPA sites; promoting species management. Sites: North Maluku (Sula); Maluku (Buano, Lease, Ay-Rhun)

2017–2020
Work focused on reforming fisheries management through the establishment of territorial user rights for fisheries (TURFs) to incentivize behavior change in target communities in order to enhance fisheries productivity and advance sustainable livelihoods.
Sites: West Papua (Mayalibit Bay, Dampier Strait)

2017–2019
Supported the creation of incentives for tuna fishers (pole-and-line and hand line) to promote sustainable fishing practices, advance skills, and progress towards MSC certification across Fisheries Management Area (FMA) 715. Sites: Fishing ports in Maluku, North Maluku, & West Papua

2017–2019
Supported the development of MPA networks for each province and across FMA 715, and building capacity in the technical aspects of MPA design as fishery management tools.
Sites: FMA & province-wide.



Underwater in Morotai Island, North Maluku, where three new MPAs have been designated by MMAF in efforts to conserve critical coral reef habitats and associated species of conservation concern. Photo: USAID SEA/Alex Westover

SUSTAINING INDONESIA'S MARINE ENVIRONMENT:

Lessons Learned from the USAID Sustainable Ecosystems Advanced Project

Introduction

Indonesia is host to the highest marine and coastal biodiversity in the world, with an estimated 108,000 kilometers (km) of coastline (including approximately 16 percent of the world's coral reefs) and more than 2,000 species of reef fish. It is also home to six of the seven known marine turtle species, and a wide variety of megafauna (whales, dolphins, sharks, manta rays, sunfish and dugong). Diverse marine life in Indonesia's seas also includes microfauna, such as nudibranchs, seahorses, mollusks, echinoderms, sponges, and a myriad of other lifeforms, some of which may remain as yet undiscovered and unknown to science (Burke *et al.,* 2012; Huffard *et al.,* 2012; UNEP-WCMC, 2008). This diversity makes Indonesia a marine wildlife haven, rich in natural heritage.

As the second-largest producer of marine fishery commodities globally, Indonesia has seen a steady increase in national fishery production since 1950. While globally, fishery growth rates began to slow down to less than one percent per year by the early 2000s, Indonesia's growth rate has continued to accelerate. Between 2003 and 2014, production increased by more than 30 percent (FAO, 2016). Data from 2011 reveals that in this year alone, Indonesia harvested 5.4 million of tons of fish and marine products from the oceans for domestic sales and export (FAO, 2011).

Due to this escalating production, Indonesia's fisheries are considered highly vulnerable to overfishing and potential collapse. Sustainable fisheries management and the effective management of marine and coastal habitats are therefore essential to ensure the future viability of marine production and to protect Indonesia's environmental heritage for future generations.

Given the vastness of the Indonesian archipelago (covering a total area of more than 190 million hectares (ha), with more than 17,000 islands), and recognizing the importance of the marine environment to livelihoods, food security and the economy, the Government of Indonesia (GOI) subdivided the nation into 11 more manageable areas in the mid-2000s, known as Fisheries Management Areas (FMAs). By 2016, studies across these 11 FMAs revealed that numerous fisheries had already reached a level classified as 'overexploited', where catch rates were considered no longer sustainable, with other fisheries considered 'fully exploited' (MMAF, 2016), shown in Figure 1.

On March 21, 2016, USAID/Indonesia launched the USAID SEA project. This five-year initiative aimed to support the GOI to improve fisheries and marine resource governance and conserve biological diversity, with a focus on **FMA 715**, where three out of the four fishery categories were classified as overexploited by 2016.

About FMA 715: Its Importance, Potential and Threats

Stretching from North Sulawesi to West Papua, FMA 715 covers a total area of 474,091 km^2 and boasts a spectacular underwater world (Figure 2). The region's vivid reefscape and abundant marine fauna and flora support the livelihoods of tens of thousands of people.

The area is host to three converging seas—the Maluku, Halmahera, and Seram Seas—with ocean depths ranging from shallow coastal waters to cavernous ocean trenches more than 2,500 meters deep. FMA 715 includes coastal waters under the jurisdiction of six different provinces, and covers a region that is also one of Indonesia's poorest, with coastal populations throughout the FMA highly dependent on marine resources for subsistence, food security, and income. Primary livelihoods for many coastal inhabitants are related to fisheries, whether they work as fishers, traders, processors, or buyers, or are tradespeople in shipping, transportation, boat repairs, or gear sales.

Overall, the FMA is estimated to have a fishery productivity potential of 631,703 tons per year (MMAF, 2016). Studies undertaken from 2005 to 2014 showed that fishing fleets in the FMA became increasingly motorized, indicative of fishers acquiring improved vessels, traveling greater distances, capable of loading greater catch quantities, and thus contributing to increased fishing pressure and overexploitation through this period (MMAF, 2016) (Figure 3).

The same studies revealed that destructive fishing (DF) practices were prevalent across the FMA, including blast fishing, poison fishing, seine netting, and the physical removal of corals. Illegal, unreported, and unregulated (IUU) fishing and wildlife crimes were also commonly occurring throughout the FMA, with the unlawful catch of endangered, threatened and protected (ETP) species being further exacerbated by these same species often becoming victims of bycatch or injury from shipping and fishing practices (MMAF, 2016). Other threats identified

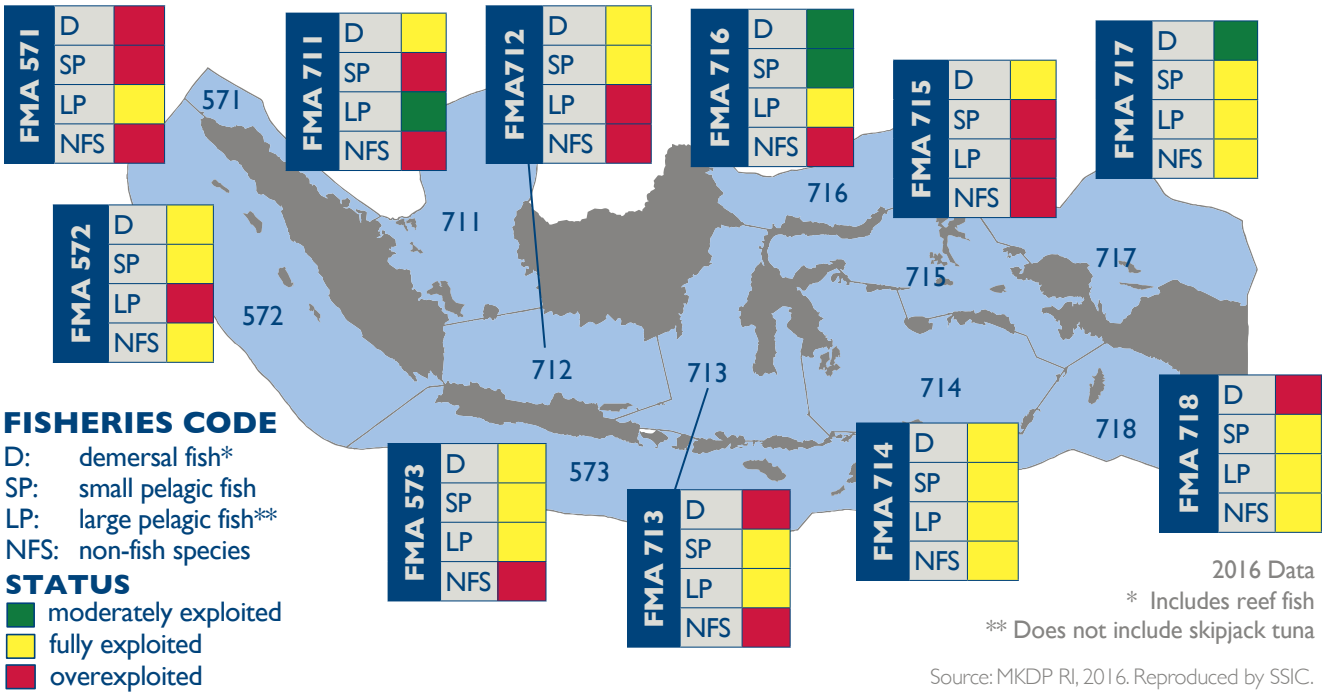


Figure 1. Classification of the level of exploitation of fisheries across the 11 FMAs in Indonesia.

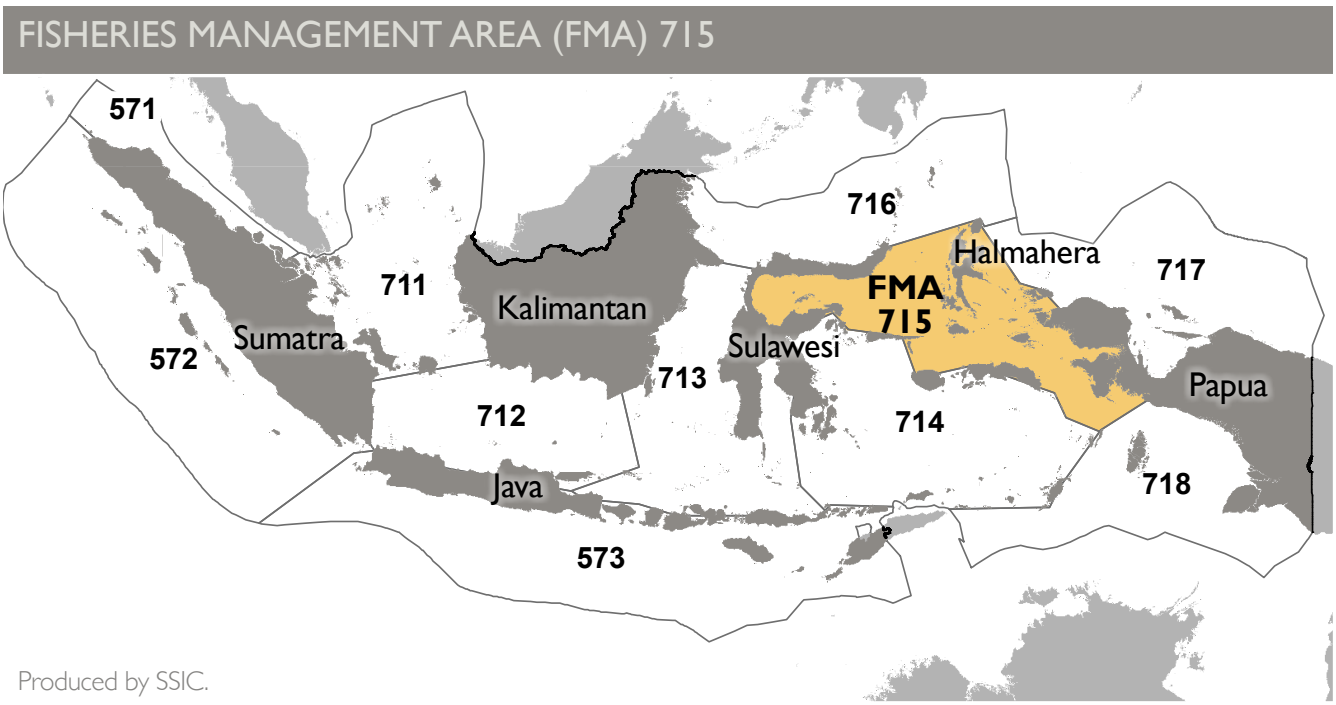
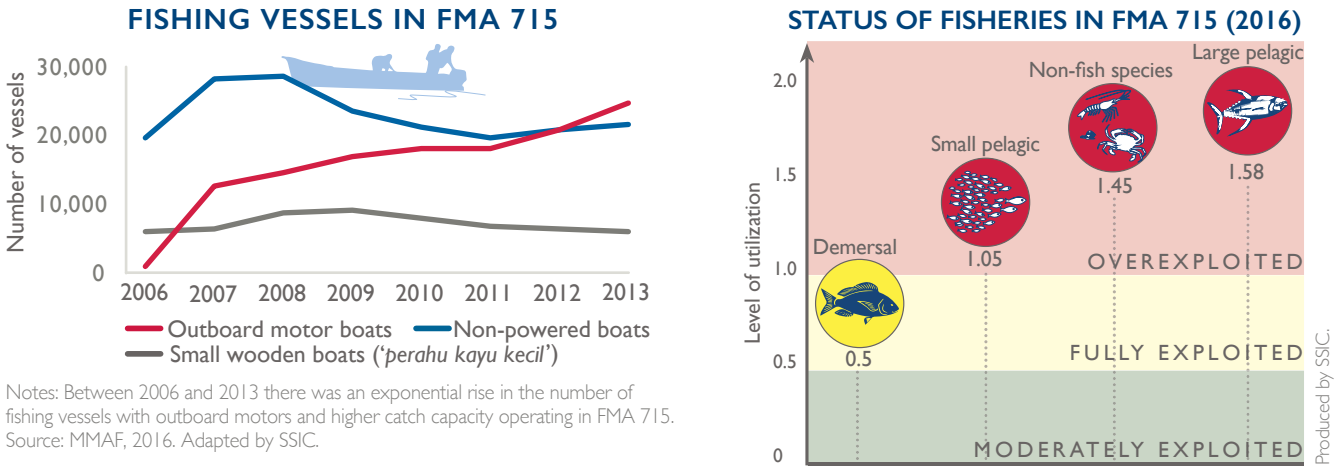


Figure 2. FMA 715.



Notes: Between 2006 and 2013 there was an exponential rise in the number of fishing vessels with outboard motors and higher catch capacity operating in FMA 715. Source: MMAF, 2016. Adapted by SSIC.

Figure 3. Left – changes in vessel type over time in FMA 715; Right – status of fisheries in FMA 715 (2016).

in FMA 715 included: habitat extraction and conversion (particularly corals and mangroves, harvested for trade or converted for development); marine pollution (both from land-based runoff and high incidences of shipping waste being dumped at sea, including plastics); and emerging coastal development (including a growing coastal tourism industry and associated infrastructure).

Therefore, it was recognized that without effective management in the coming years, the vital marine biodiversity and ecosystem integrity of the region was at risk, and associated fisheries faced a loss of productivity potential, and possibly collapse.

Marine Governance in FMA 715

Most FMAs in Indonesia cover areas that encompass several provinces. FMA 715 is spread across six provinces (Figure 4), and these provinces are expected to work together through a Fisheries Management Council to achieve sustainable management of the FMA. The council includes representatives from a range of central government agencies, and may include representatives from academic institutions and partner organizations as relevant to the area.

Provinces are also anticipated to support fisheries management at a sub-FMA level (from provincial level to district and local levels), a jurisdictional expectation that is relatively new for provinces. Prior to 2014, the governance of marine waters fell under the jurisdiction of districts (up to 4 nautical miles [nm] from the shoreline) and provinces were only responsible for waters beyond this area (4-12 nm). Since the enactment of Law no. 23/2014 on Local Government, however, all jurisdiction transitioned to provinces (0-12 nm).

This change in governance has had far-sweeping impacts on marine and coastal management in Indonesia, with provincial governments facing new and unfamiliar challenges and weighty responsibilities for nearshore management, for which they previously had little experience. The MMAF has provided provinces with a range of norms, standards, procedures, and criteria documents (*norma, standar, prosedur dan kriteria*—NSPK) detailing the mechanisms to implement good governance at the provincial level, and various financing, infrastructure, and documentation previously governed by districts have been transitioned to provinces. Nonetheless, provincial governments are challenged to manage very large areas, across multiple islands, from relatively small, understaffed and centralized provincial offices.

Therefore, provinces have increasingly looked to develop partnerships and arrangements with district- and village-level governments to work collaboratively on sustainable management, particularly in relation to site-based management activities and oversight critical for effective fisheries management and marine resource conservation in general.

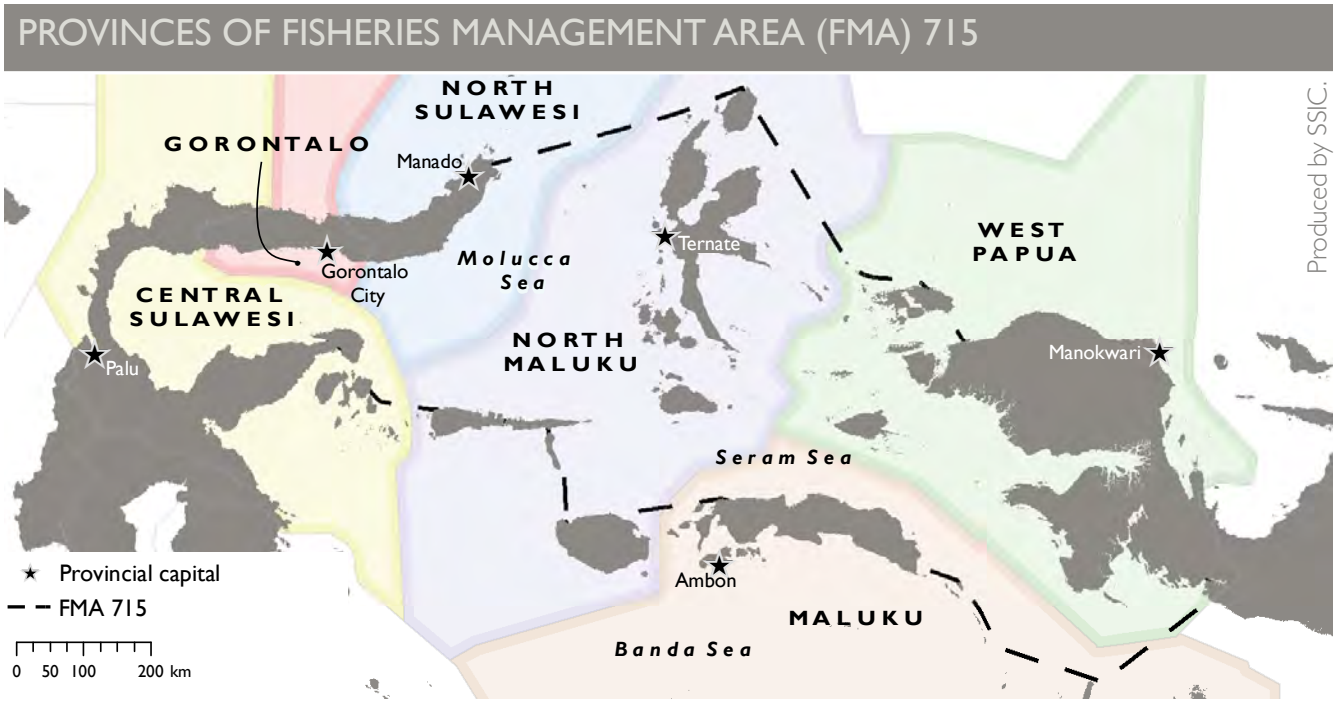
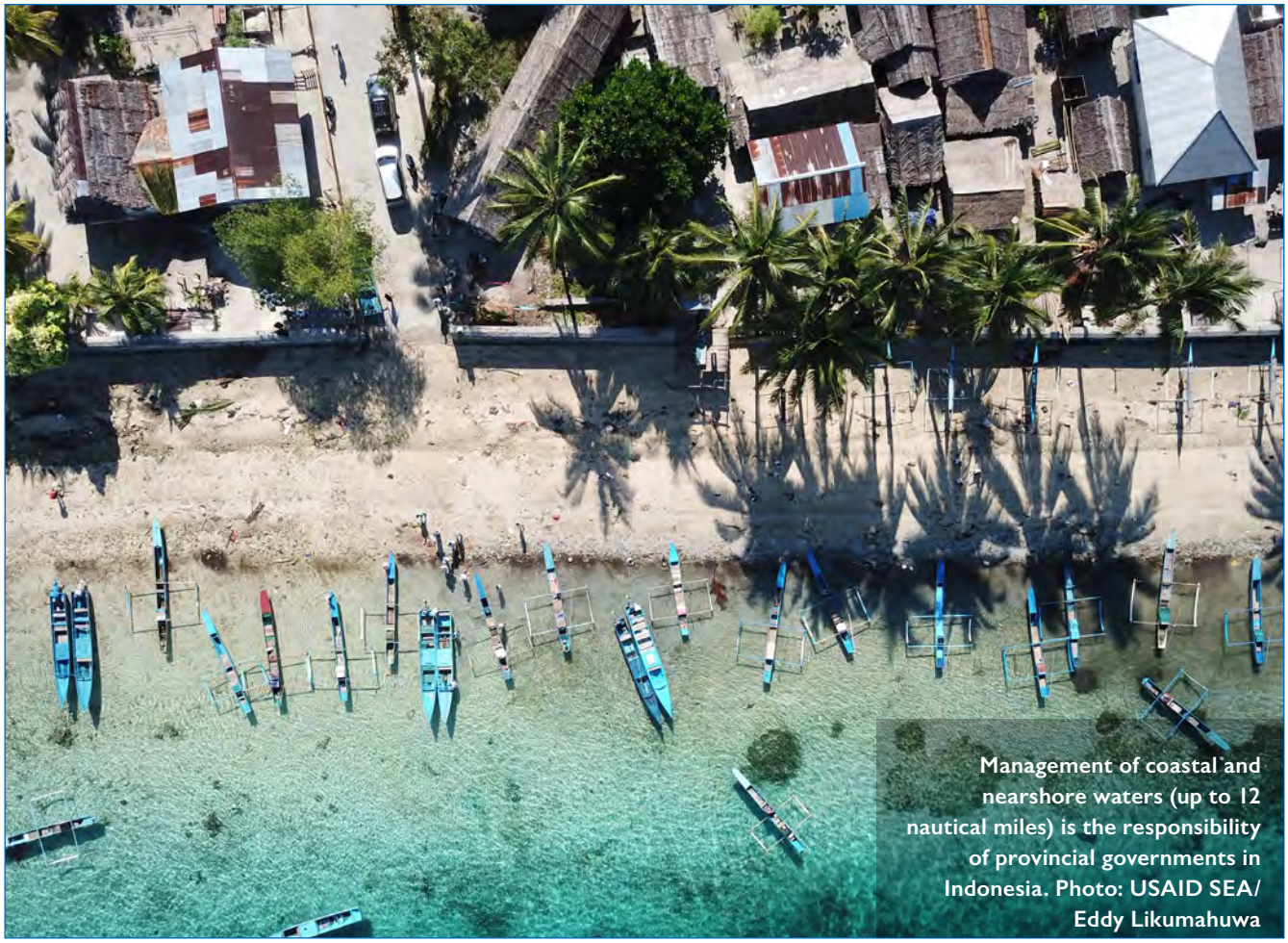


Figure 4. The provinces of FMA 715.



Management of coastal and nearshore waters (up to 12 nautical miles) is the responsibility of provincial governments in Indonesia. Photo: USAID SEA/ Eddy Likumahuwa

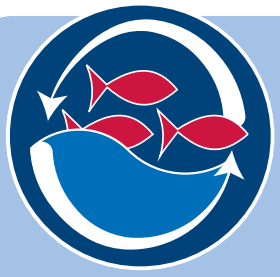
Addressing the Threats in FMA 715: The USAID SEA Project

The overarching aims of the USAID SEA Project were to:

(1) support enhanced conservation and the sustainable use of marine resources in FMA 715 by reforming fisheries management and promoting MPAs to improve fisheries productivity, food security, and sustainable livelihoods; and

(2) support the strengthening of the leadership role and capacity of the MMAF and local governments to promote conservation and sustainable fishing.

The Project was implemented through four pillars of work, referred to as 'technical approaches', as shown below.



Implementing an ecosystem approach to fisheries management (EAFM) to manage fisheries sustainably, within predetermined limitations based on stock assessments, using tailored management plans or 'harvest strategies' that stipulate the harvest rules of the fishery within ecologically meaningful boundaries.

Establishing and effectively managing marine protected areas (MPAs) that are formally endorsed and delineated, with zoning and management plans designed to protect and conserve marine biodiversity (including ETP species), protect vital fish nursery grounds to replenish fishery stocks, and conserve marine and coastal heritage, both individually and through ecologically connected networks of MPAs.

Supporting marine spatial planning (MSP) for sustainable management in order to ensure marine waters under provincial jurisdiction have appropriately designated areas for utilization that support the sustainable management of these waters and the prosperity of the people dependent upon them.

Promoting law enforcement at a range of scales, to ensure the various rules and regulations promulgated to secure a sustainable future are supported and complied with by all relevant resource users.

While efforts under these technical approaches were focused towards FMA 715, work was required at a range of levels to ensure advances involved all key stakeholders and could be effectively institutionalized, legally endorsed and supported, and vertically integrated.

TABLE 1. LEVELS OF SUPPORT PROVIDED BY USAID SEA PROJECT (NATIONAL TO SITE)

NATIONAL	FMA 715	PROVINCIAL	DISTRICT/SITE
Skill building, establishing and updating legislative and regulatory reforms and processes to institutionalize sustainable marine and coastal management frameworks.	Strategically planning, designing, and implementing FMA-wide initiatives for marine biodiversity conservation and sustainable fisheries through improved FMA governance.	Supporting governance systems and cross-sectoral skill building to enable improved management of marine and coastal resources under provincial jurisdiction.	Engaging, involving, supporting, and building the skills of district governments and communities to actively support and implement sustainable practices for marine and coastal management.

To further target efforts within FMA 715, three of the six provinces were prioritized for Project activities: **North Maluku, Maluku,** and **West Papua**. These provinces were selected because of their valuable but increasingly overexploited fisheries, their high marine biodiversity (host to the world's most diverse reef habitat and highest marine endemism) and their critical importance for marine megafauna (host to feeding and breeding grounds for sea turtles and dugongs, and vital migratory corridors for cetaceans). The selection of these provinces also recognized that approximately 38 percent of the population in the region is coastal and heavily reliant on marine resources for livelihoods, while also experiencing some of the highest poverty levels in Indonesia.

Sources: BPS, 2011; BPS Provinsi Maluku, 2015; BPS Provinsi Maluku, 2017; BPS Provinsi Maluku Utara, 2016; BPS Provinsi Papua Barat, 2015; BPS Provinsi Papua Barat, 2017; Ross, 2005. *BPS, 2011 (accessed Aug. 2016). **Ross, 2005. Infographic produced by SSIC.

Figure 5. An overview of the three target provinces of the USAID SEA Project in FMA 715.

THE THREE FOCUS PROVINCES OF THE USAID SEA PROJECT

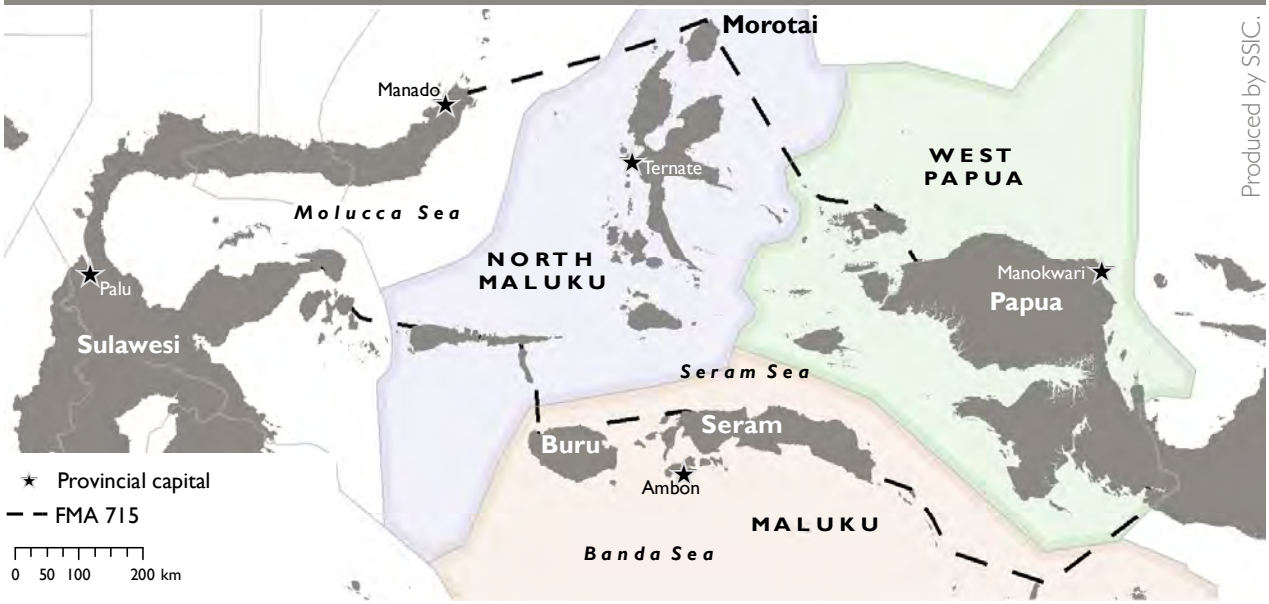


Figure 6. The three priority provinces of the USAID SEA Project.

In order to effectively implement its four technical approaches—EAFM, MPAs, MSP and Law Enforcement—the USAID SEA Project also implemented support activities (referred to as 'strategic approaches') to ensure that enabling conditions were in place to achieve success.

Creating demand through awareness raising and advocacy to increase awareness, appreciation and support for USAID SEA Project activities, involve and engage local champions as 'change agents,' and promote changes in behavior towards a sustainable future.

Increasing incentives for marine stewardship to promote change and link improvements in sustainable management practices with enhanced livelihoods, greater empowerment, and increased access to opportunities.

Advancing marine and fisheries policies and regulations to ensure the legal and regulatory frameworks endorse and support change for a sustainable future.

Institutionalizing capacity building to ensure systems are in place to increase the skills, competencies and capacities needed to sustainably manage marine and coastal resources at all levels into the future.

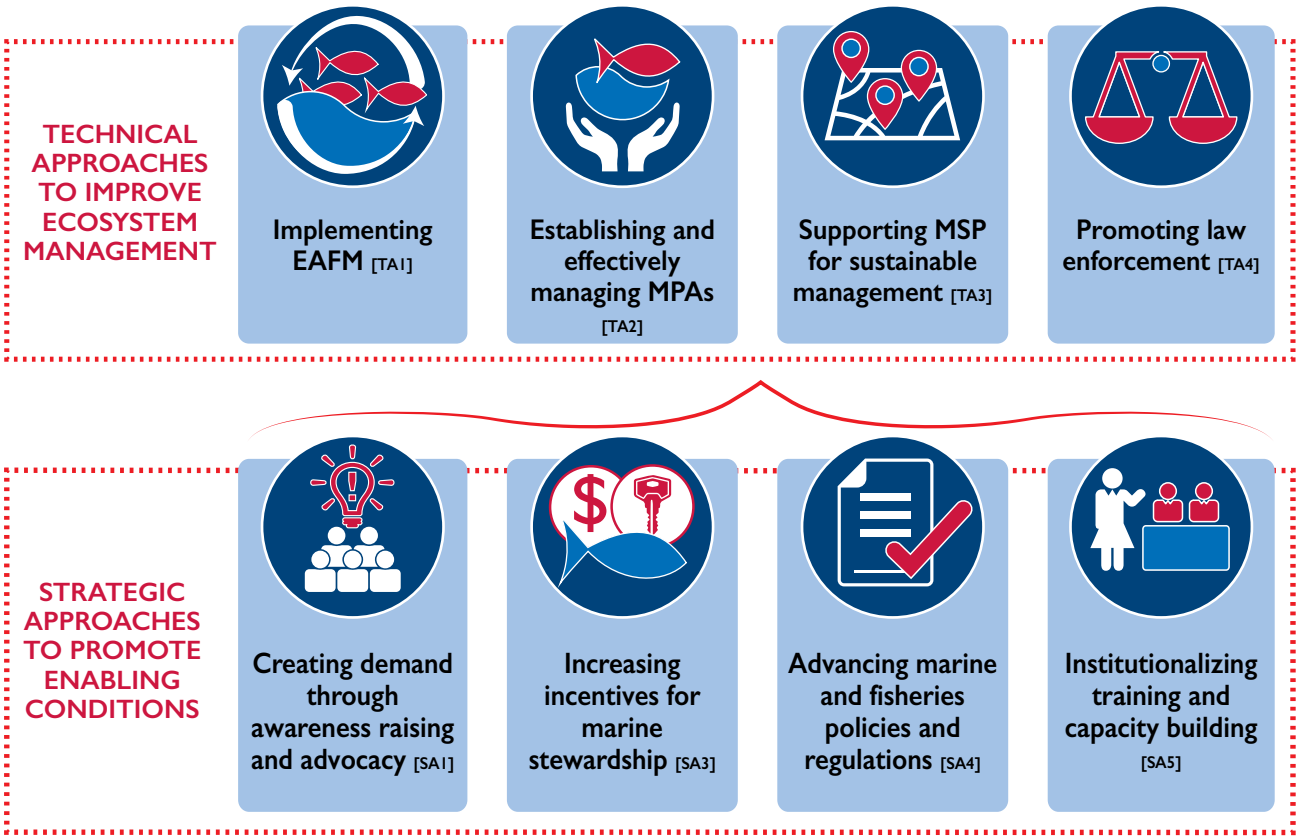


Figure 7. The USAID SEA Project workstreams.

Indicators of Success

Broadly, the USAID SEA Project aimed to achieve the following high-level outcomes over five years.

- At least six million hectares in the target FMA or sub-FMA under improved fisheries management as a result of United States Government assistance, measured through the MMAF's EAFM and MPA Effectiveness Index scores (or other approved national or international standards), disaggregated by national, provincial, and district jurisdictions, and by whether the managed area is within or outside MPAs

- At least six policies, laws, regulations, and/or operational protocols in support of marine conservation and sustainable fisheries management created, strengthened, promulgated, and/or enforced at all levels

- Key drivers and highest-rated pressures to marine biodiversity on a declining trend in the target areas

More specifically, a total of 15 performance management indicators were identified at the onset of the Project, with a further four benchmark indicators developed during the life of the Project, to effectively assess the success of each of the workstreams.

The following chapters (1–8) explores each of these workstreams and the achievements, challenges and lessons learned through the life of the Project.

Each chapter includes case studies on the experiences over the Project's five-year term, to help marine initiatives across Indonesia to benefit from the USAID SEA Project's experiences.

The final sections of this document review the overarching lessons from the Project as a whole, and charts the path forward for others in the marine and coastal conservation community to build on its successes, address the challenges the Project encountered, and benefit from the insights and recommendations shared. Through this, it is hoped that the foundation built by the USAID SEA Project will continue to transform marine and coastal management in Indonesia for a sustainable and prosperous future.

CHAPTER 01: Implementing an ecosystem approach to fisheries management

CHAPTER 02: Establishing and effectively managing marine protected areas

CHAPTER 03: Supporting marine spatial planning for sustainable management

CHAPTER 04: Promoting law enforcement

CHAPTER 05: Creating demand through awareness raising and advocacy

CHAPTER 06: Increasing incentives for marine stewardship

CHAPTER 07: Advancing marine and fisheries policies and regulations

CHAPTER 08: Institutionalizing capacity building

CHAPTER 09: Project management

CHAPTER 10: Lessons learned and charting the path forward

Handline fishers in North Maluku.
Photo: USAID SEA/Indah Rufiati

Sustainable fisheries management conducted by USAID SEA in Haria Village, Maluku, in 2019 helps to protect small-scale fishers' livelihoods and fisheries productivity. Photo: USAID SEA/Adhi Fitri Dinastiar

01

Implementing an ecosystem approach to fisheries management

Fishery products are borne out of complex ecosystems influenced and driven by multifaceted social, economic, and governance issues. Historically, fishery management systems focused on managing fisheries in isolation, which proved ineffective at managing these complexities. Since the turn of the century there has been a shift to address this failure in marine and coastal management by adopting EAFM.

> "[EAFM is] … an approach to fisheries management and development that strives to balance diverse societal objectives, by taking into account the knowledge and uncertainties about biotic, abiotic, and human components of ecosystems and their interactions and applying an integrated approach to fisheries within ecologically meaningful boundaries."
>
> THE UNITED NATIONS FOOD AND AGRICULTURE ORGANIZATION (FAO), FISHERIES DEPARTMENT, 2003: 6

EAFM provides a framework for developing fisheries management approaches that are realistic, equitable, and sustainable. Since its inception, EAFM has evolved globally, and in the late 2000s, Indonesia adopted EAFM to guide national and regional fisheries planning.

To support the implementation of EAFM in FMA 715, the USAID SEA Project focused its efforts on three areas of work.

(1) Knowing the status of the key fisheries in the FMA — through stock assessment data collation and analysis at the national and regional levels, particularly for five priority fisheries (Figure 8). Assessments were supported by fish landing site data collected for all fisheries, and a genetics and morphometric study to identify snapper and grouper stock unit distribution.

(2) Strengthening fisheries governance at a range of scales — through advancing national fisheries policies, data management systems, and regulatory support frameworks; supporting the establishment of fisheries working groups and associated fisheries co-management committees at the provincial level; and skill building for fisheries management planning.

(3) Developing harvest strategies — setting out the management actions (harvest control rules) necessary to achieve defined biological and economic objectives, and associated targets and limits of the fisheries.

Work was also undertaken to establish monitoring systems to support the long-term management of fisheries in the region. This included the following.

- Registering small-scale fishing vessels to assess the levels of fishing pressure across the region, and the numbers of active vessels and fishers, in order to guide and inform management interventions and monitor fisheries over time.
- Implementing a logbook for small-scale fishers to capture and document data on fish catches (yields and species) from key fishing grounds to inform monitoring of fish stocks and fishing effort.
- Testing various innovations for tracking vessel movements to better understand the spatial utilization of different fishing grounds and fishers' activities.
- Testing various innovations to support supply chain traceability, including: (1) TraceTales technology (a digital tally-based system to improve the traceability of fishery products within a processing company), and (2) Trafiz (a downloadable cell phone application for tuna tracking and record keeping by middlemen and suppliers).

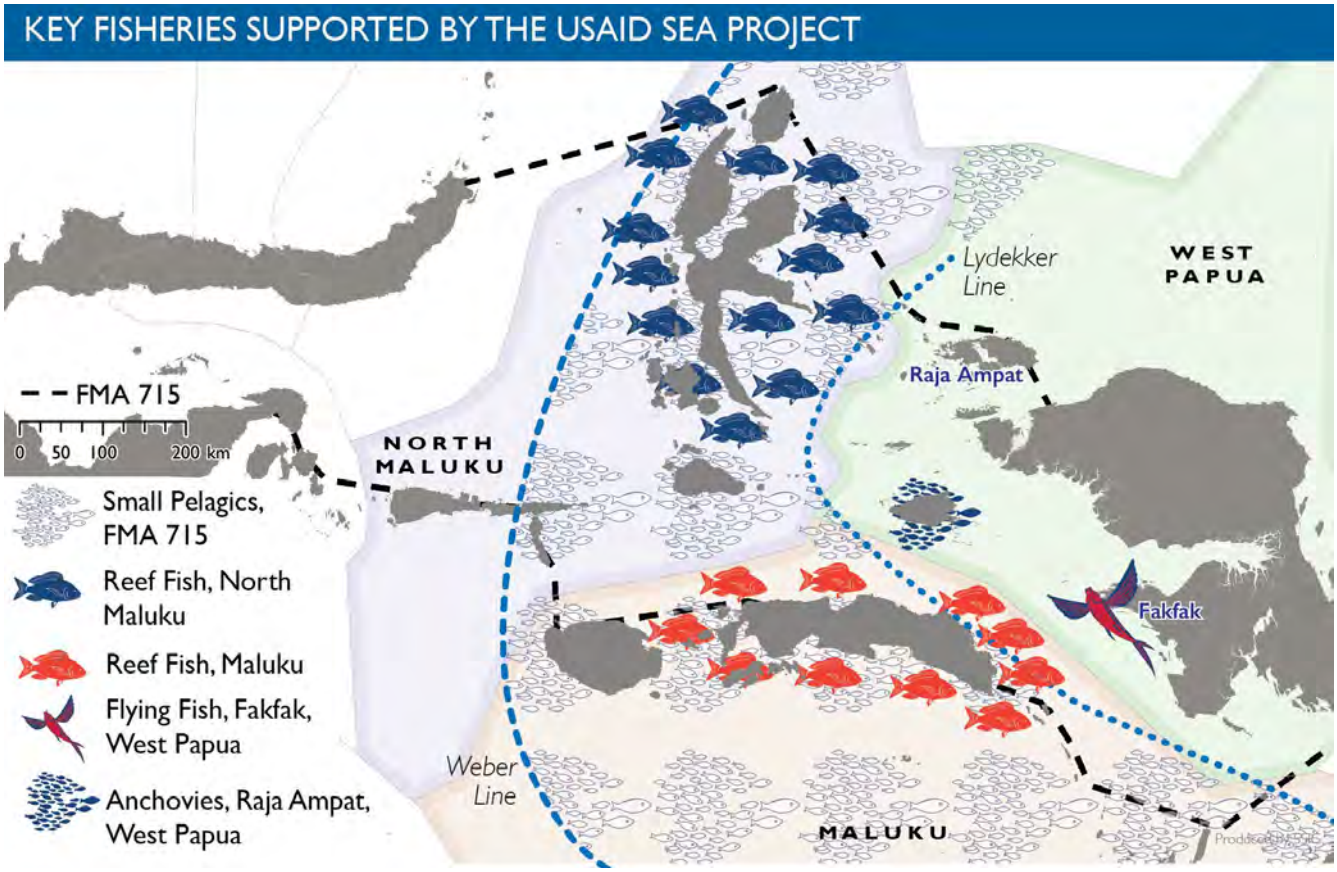


Figure 8. Five target fisheries in FMA 715 supported by the USAID SEA Project.

USAID SEA partner, MDPI, assists yellowfin tuna traders like Kahar Lastor from Morotai, North Maluku, to log details of fish purchased from local fishermen, including fish length, weight, and origin. Photo: USAID SEA/Mohammad Syifa

KEY LESSONS LEARNED FROM EAFM WORK

- Balancing short-term economic needs (livelihoods) with long-term fishery management needs to be slowly and patiently addressed with local officials and stakeholders.
- Field-level experience shows that it is important not to wait for perfect data sets and information before applying management; collecting data simultaneously with experimenting with management is essential, as is adapting management as more information comes to light.
- A standardized regional system for data collection is crucial to allow for scalable analysis.
- Enumerators require adequate training and continued mentoring to ensure robust data collection.
- Stock assessments require a diversity of skills unique to each fishery and location. Training and continued mentoring of assessors in diverse techniques relevant for different stock types and data levels ensure skills continue to build, and managers have confidence in their management interventions.
- Despite the improved capacity of MMAF researchers and partners under the USAID SEA Project, Indonesia's pool of expertise remains insufficient to meet the extensive stock assessment needs across the country's fisheries.
- With the right engagement and incentives, communities can be effectively involved in EAFM monitoring, with potential for improved data collection and coverage, management involvement, and compliance benefits.
- Stock assessment scientists, communities, and managers need to work together and engage in open dialogue throughout the integrated EAFM planning and implementation cycle.
- Systematic data verification systems and processes are vital, as are regular touchpoints to ensure learning, review, and improvements (adaptive management) throughout EAFM planning and implementation.
- In partnership with provincial governments and communities, local universities have an important scientific role to play in supporting data collection, interpretation and management.
- Adequate scientific monitoring enables managers to experiment with targeted interventions, quickly see impacts on the stocks, and adjust accordingly. Limited data approaches to overcome significant data gaps are readily available to allow for management interventions.
- Globally recognized science, technology and management tools are already in use across multiple fisheries in Indonesia, including onboard observer programs, logbooks, e-logbooks, catch per unit effort (CPUE) standards, regional fisheries management units, genetic assessments, vessel trackers, and similar tools. Given the reasonably well-developed data-limited stock assessment and fisheries data analysis systems now in place, the scientifically credible assessment of Indonesia's fisheries' overexploitation needs to be translated into management actions.
- Local customary practices such as *sasi* offer great potential as fisheries solutions.
- Although the Project experienced some successes, the provincial licensing and boat classifications remain to be issues of policy/regulation that require continued attention, simplification, and clarification. A lack of registration for small boats and the complications around licensing inhibit authorities, managers and enforcers from managing the majority of small-scale fisheries.

The next pages provide four case studies that exemplify some of these lessons.

EAFM Case Studies

Building the necessary skills to implement and institutionalize EAFM: the journey from data collection to on-site management

By: Irna Sari, Purwanto and Mardiani SesRini

Fish diversity in Indonesia is exceptional, with over 4,000 species of fish caught and traded. Although this diversity brings a myriad of benefits to the country, it also means that fisheries managers require useful data on each stock's status to underpin any management proposals. The MMAF, universities, and specialized commissions like the National Commission on Fishery Resources Assessment (*Komisi Nasional Pengkajian Sumber Daya Ikan*—Komnas Kajiskan) have well-trained scientists, but their resources are limited and focused on a few priority commercial species. The national agencies are also not currently mandated to support provincial governments who oversee most of the wider fishery species within provincial waters. The USAID SEA Project supported capacity building by working with national-level scientists and provincial governments to bridge this gap.

Most fish stocks in Indonesia are currently fully exploited or overexploited (MMAF decrees no. 47/KepMen-KP/2016; no. 50/KepMen-KP/2017). Overfishing has led to decreased fisheries productivity and resilience. Collaborative fisheries management and enforcement are needed to rebuild stock abundance and restore sustainable productivity. While Indonesia has adopted EAFM, the skills needed to implement EAFM are not uniform across those who manage fisheries at the national or local level.

Developing and implementing fishery management plans (FMPs) is an essential part of EAFM. Preparing FMPs involves:

(1) collecting data

(2) undertaking stock assessments

(3) developing harvest strategies

(4) implementing and institutionalizing these harvest strategies

The USAID SEA Project supported skill building and implementation of the above activities necessary for EAFM with researchers from the National Center for Fisheries Research (*Pusat Riset Perikanan*—Pusriskan) and the MMAF's Marine Research Agency (*Badan Riset Perikanan Laut*—BRPL), academics, and technical staff from the Directorate General of Capture Fisheries (DGCF) at the national level and provincial marine and fisheries agencies (DKPs) at the regional level.

(1) Collecting data

In 2016, existing fish production data were aggregated into larger groupings to describe the stock status at the national level. However, the level of detail was insufficient for individual fish stocks' biological status. The Project worked with Pusriskan and BRPL (the agency responsible for undertaking stock assessments) to address this data gap by designing and implementing a multi-year fish landing collection program. A partnership was initiated between Pusriskan/BRPL and the Project partners (World Wildlife Fund – Indonesia [WWF], Wildlife Conservation Society [WCS], Christian University of Papua [Universitas Kristen Papua—UKIP] and Yayasan Masyarakat dan Perikanan Indonesia [MDPI]) to ensure representation across FMA 715's vast marine area and diverse fish species assemblage.

As the partnership began, it became clear that partners were using various methodologies that were incompatible with each other. To ensure data compatibility, the USAID SEA Project facilitated a working partnership and protocol that governed sampling site selection, methodologies for standardization and data flow, and roles for each party (Figure 9). This standardized regional system of data collection was essential to allow for scalable analysis. All enumerators received training in these standardized systems, and the collaboration strengthened ties between agencies and built the capacities of both NGO and MMAF researchers.

The primary data gathered through this work related to catch per vessel, vessel characteristics, fishing logistics, catch composition and quantity, and fish size composition. Enumerators documented information on monitored species, fishing fleets and ports, and the frequency of monitoring. The partners' field coordinators verified all data before these were submitted to a specially designed database (compatible with BRPL's central I-Fish database). A further review was supported by the USAID SEA Team and BRPL technical staff and researchers. Where possible, information was augmented by secondary data related to catch and effort from the MMAF's yearbook of capture fisheries statistics.

TABLE 2. STOCK ASSESSMENT METHODOLOGIES UTILIZED FOR FISHERIES IN FMA 715

MODEL	TARGET FISHERY	TARGET GEOGRAPHY
Biomass dynamic model	Small pelagic fish	FMA 715
	Flying fish	Fakfak, West Papua
Stock assessments using the non-equilibrium biomass dynamic model were undertaken using the catch-effort and catch-only methods (Prager, 1994). Results enabled estimation of the optimal fish biomass, fishery production, mortality, and effort. For small pelagic fish, catch-effort data from all relevant fish stocks nationwide (all FMAs) were analyzed by the MMAF researchers and USAID SEA Fisheries Team (including the data collection methodology and results). While some FMAs' data were determined as not robust enough for assessment, the small pelagic stock data for FMA 715 were statistically sound and could be used to evaluate the status of fish stock and fishery. A stock assessment using the regular equilibrium biomass dynamic model was implemented by University of Papua (*Universitas Negeri Papua*—UNIPA) lecturers, supported by the U.S. National Oceanic and Atmospheric Administration (NOAA), to assess the status of the flying fish stock and fishery in West Papua.		
Length-based model	Mackerel scad	FMA 715
	Snapper and grouper	North Maluku
	Anchovies	Raja Ampat, West Papua
There are three guiding principles to avoid fishery overexploitation: let fish spawn, let fish grow, and let the 'mega-spawners' live. Indicators for these principles were ascertained using two length-based models: • the length-based Bayesian biomass method — used to estimate the optimum length at first capture (Lc_opt) and the average optimum fishing length (L_opt) for both the mackerel scad stock across FMA 715 and the snapper and grouper stock in North Maluku • the length-based spawning potential ratio method — used to estimate the fishery's optimal reproductive potential (indicated by their spawning potential ratios) for anchovy stocks in Raja Ampat, West Papua		

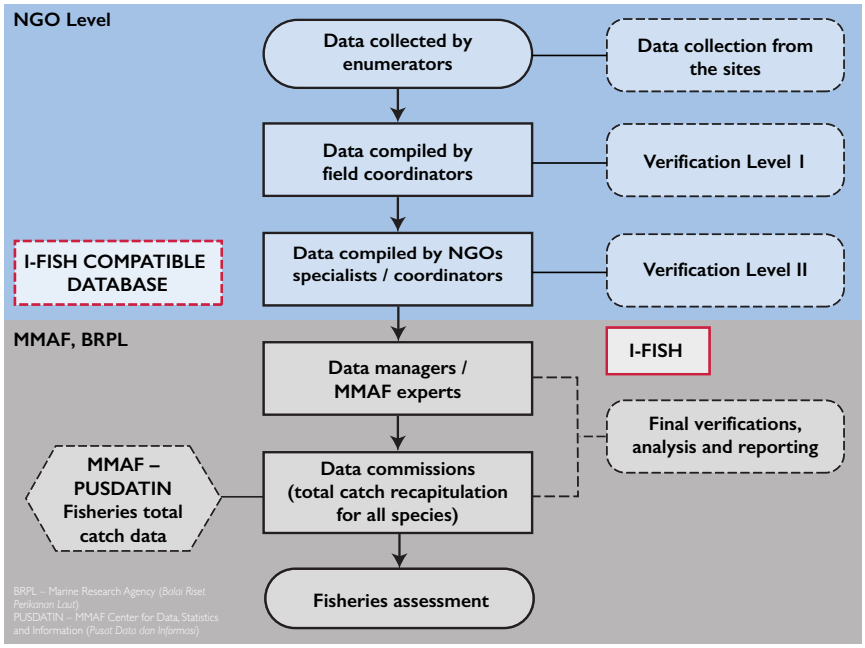


Figure 9. Protocol agreed for data capture and flow between USAID SEA partners and government.

(2) Undertaking stock assessments

Despite standardized data collection systems and protocols, the fisheries data available for analysis was still somewhat limited. Therefore, a three-step process was employed to undertake stock assessments based on the data available.

TABLE 3. THE THREE-STEP PROCESS FOR UNDERTAKING STOCK ASSESSMENTS

STEP	ACTIVITIES
(1) Training on stock assessment methodologies	BRPL researchers and academic counterparts from UKIP and UNIPA were trained in new and improved methodologies for stock assessments: • length-based assessments (i.e., the length-based spawning potential ratio method, and length-based Bayesian biomass method) • the non-equilibrium biomass dynamic model • risk assessment procedures and projections on biomass, fishing mortality, and yields Training included classroom-based learning, hands-on experiential training, and individual mentoring.
(2) Assessing the stock status	Workshops for the analysis, interpretation of results, and write-up of assessments were supported by the USAID SEA Project and led by BRPL researchers and the USAID SEA Fisheries Team. Different analytical models were utilized for distinct fisheries (Table 2).
(3) Reviewing and disseminating stock assessment results	Reviews of the stock assessment results were conducted by the Komnas Kajiskan (in 2018) and senior MMAF researchers and senior scientists from the Indonesian Institute of Sciences (*Lembaga Ilmu Pengetahuan Indonesia*—LIPI) (from 2018 to 2020). Findings were presented in various forums attended by local and national government technical staff and Indonesian and international scientists (including the Asian Fisheries and Aquaculture Forum held by the Asian Fisheries Society in Iloilo, Philippines, 2019). Dissemination of the results was facilitated through the MMAF to NGOs, local universities, fisheries working groups, provincial governments, and other relevant stakeholders.

> "In the past, our research was focused on surplus production models, but from the training we upgraded our models and analytical skills. Previously, each WPP used different formats for fish status reports; now we have a standard for report requirements."
>
> M. NATSIR
> PUSRISKAN Researcher

(3) Developing harvest strategies

At the USAID SEA Project's commencement, harvest strategies were not in place for Indonesian fisheries, despite the guidelines for developing harvest strategies issued in 2017 (MMAF technical instructions [*Petunjuk Teknis*—Juknis] no. 17/2017) and ongoing initiatives targeting several groups of species.

The critical elements of a harvest strategy are: (1) the identification of fishery issues to be addressed; (2) the development of operational objectives; (3) the establishment of target reference points; and (4) the identification of measures and indicators of success. These elements need to address holistically multiple fishery issues, including resource sustainability, socio-economic considerations, and effective governance (FAO, 2003; FAO, 2008).

The USAID SEA Project focused on supporting capacity building and advancing harvest strategy development for target fisheries. The target fisheries were: small pelagic fish in FMA 715, reef fish in North Maluku Province, and several fisheries stock units in West Papua (anchovies in Raja Ampat, flying fish in Fakfak, and mud crabs and prawns in South Sorong).

The USAID SEA Project and the MMAF researchers provided training to regional DKP staff and local university lecturers, covering the concepts and methodologies of EAFM planning as per FAO and the Southeast Asian Fisheries Development Center guidelines. The USAID SEA Fisheries Team also supported the development of draft management plans and harvest strategies, prepared and reviewed by MMAF researchers and DGCF policy staff, and provincial DKP staff, fisheries working groups, and other relevant stakeholders.

Throughout this work it was noted that researchers wanted to have all data in hand before commencing strategy development. While this is understandable, waiting for all data became a challenge. Initiating work earlier in some aspects of the process to develop harvest strategies could have accelerated overall achievements. In particular, building commitment from government and other stakeholders and provisionally identifying fishery issues and operational objectives could have been undertaken concurrently with data and stock analysis. The issues and objectives identified could then be refined based on the analysis findings once all data was available.

A robust process with strong engagement from fishery managers was key to this initiative. Since much of the work was driven by the USAID SEA Project, it was critical to ensure that the fishery officials understood and approved each aspect as it advanced. This understanding was fundamental with provincial and local governments, where a harvest strategy is generally not yet regarded as a compulsory fishery management document. Therefore, building stewardship and ownership of the initiative by local government officials was vital but also challenging.

Contending with local government officials' perception—that sustaining fisheries resources is a lesser priority for government programs than developing local economies and providing employment—was a significant challenge to fostering engagement in harvest strategy development. It was necessary to advocate the importance of sustainable fishery resources to livelihoods and emphasize the socioeconomic benefits that resonated with fisheries managers. This approach successfully attracted the fishery managers' interests, promoting the plans, and encouraging implementation.

Finally, efforts to expand skill building were useful (e.g., providing training to institutions such as Ternate University), but were initiated towards the end of the project term and therefore limited by time. There remains an opportunity to train a cadre of assessors, develop training modules, and engage in curriculum development with fisheries, colleges and universities.

(4) Implementing and institutionalizing the harvest strategy

The support provided by the USAID SEA Project led to the successful completion of harvest strategies, but their implementation relies on provincial governments. Unfortunately, not all of the agencies responsible for implementing harvest strategies are under the provincial DKPs' direct coordination. The One-Stop Integrated Service (*Pelayanan Terpadu Satu Pintu*—PTSP) (fishing licensing) and the port authorities (*Kantor Kesyahbandaran dan Otoritas Pelabuhan*—KSOP) (fisher logbook monitoring) are both outside of the DKPs' authority, meaning collaboration and communication were essential for implementing the harvest strategies.

The provincial governments are also likely to require further technical support and operational guidelines for implementing the strategies' management measures, including clear organizational roles. For example, the PTSP must ensure that the number of fishing permits issued does not exceed the recommended number of vessels in the strategy. Other potential organizational roles include local research agencies assessing management against the identified target reference points and indicators in partnership with local universities. Furthermore, activity plans to implement the harvest strategy should align with current management cycles (Figure 10) to ensure adequate budget allocations for activities and allow for an adaptive management approach. Such activity plans also provide a useful reference tool for the DKPs to track and ensure the fishery's management progress.

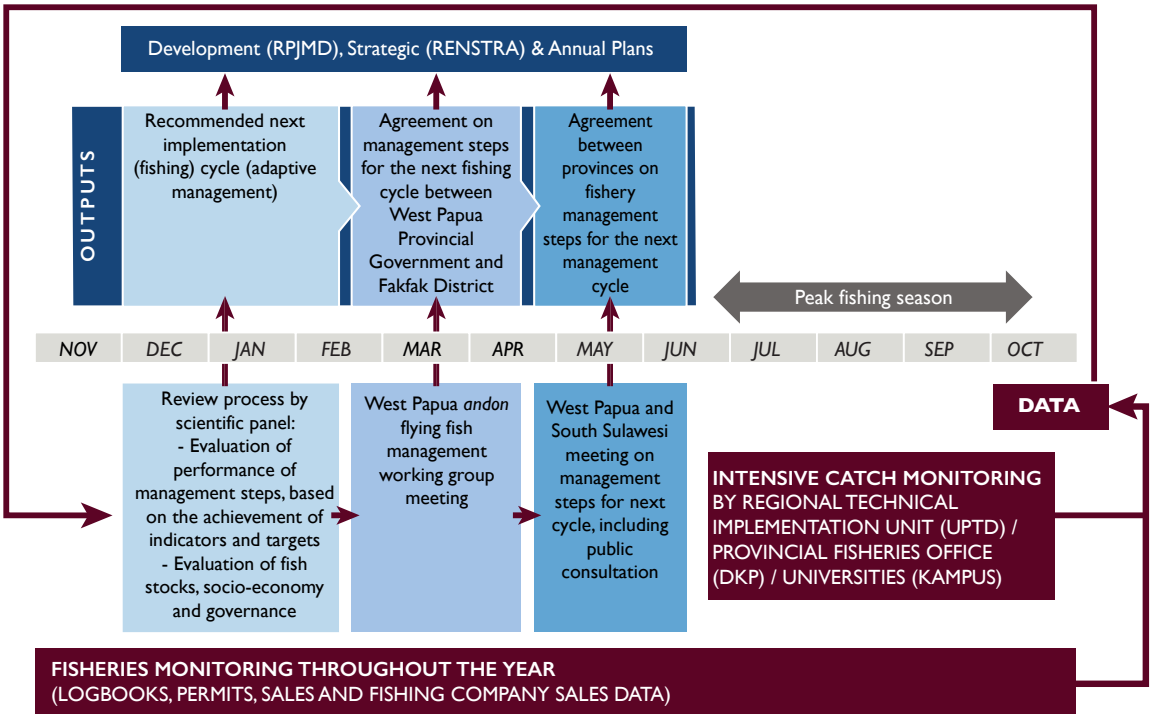


Figure 10. An example of a management cycle for flying fish developed together with the West Papua managers.

In conclusion, developing a harvest strategy is time consuming and requires participation from multiple agencies and stakeholders. Commitment to the strategy's implementation from relevant government agencies is a pivotal factor in determining its success. Practical technical assistance is also necessary at all stages, including strategy design, implementation, and measuring effectiveness. Future projects aiming to improve Indonesian fisheries should capitalize on the USAID SEA Project's momentum by supporting the same geographies and fisheries to achieve successful sustainable management. Supporting these fisheries would provide a fishery management interventions model that regions of the country can learn from, emulate, and replicate to support nationwide sustainable fishery management.

A small-scale fisher in Desa Labuan, Maluku, displaying her fishing vessel registration documents (*Pas kecil* and BPKP) received through support from the USAID SEA Project. Photo: USAID SEA/Siti Yasmina Enita

Accelerating small-scale fishing vessel registration

By: Irna Sari, Irene Sahertian and Muhammad Ichsan

Fisheries management relies on ensuring that the stock remains healthy for reproduction to allow for future fish supplies. Central to maintaining stocks is tracking and ultimately managing/limiting the number and size of boats permitted in a fishery (i.e., managing 'fishing effort'). To do this requires an understanding of the vessels active in a given area, and by law, fishing vessels over 10 gross tonnage (> 10 GT) require licenses and permits to operate (Indonesian Fishery Law no. 31/2004 jo no. 45/2009). Small fishing vessels of less than or equal to 10 GT (≤ 10 GT) do not require licenses but are expected to be registered.

However, small vessel registration is not the 'norm' for fishers, or fisheries officers, at any level of government. Nearly all small-scale fisheries—accounting for around 85 percent of Indonesia's entire fishing sector—are unregistered. This lack of small vessel registration creates a significant challenge for the Indonesian government to monitor fishing pressure, and without a system in place to understand and manage fishing effort, the risk of overfishing is almost inevitable (Halim *et al.*, 2019).

To improve this, the USAID SEA Project supported the Directorate of Vessel Licensing and Fishers of the MMAF DGCF and the provincial DKPs to increase the number of vessels registered and establish an integrated national-provincial small-scale fishing vessel database.

The registration of vessels is complicated by a range of factors, including differing perspectives on the definition of 'small-scale fisheries,' the registration process, and agencies' involvement beyond the MMAF's direct coordination. The breadth of agencies involved, from various ministries and all government levels, required a precise implementation mechanism or synergized plan for vessel registration. The USAID SEA Project worked to facilitate coordination and synergy among government agencies through formal workshops, meetings, and personal engagement to improve the process through four key steps:

Step 1: Gaining national-level commitment

A workshop was held in January 2017 for all departments involved in vessel registration. Participants came from the Directorate of Vessel Licensing and Control, Ministry of Home Affairs (MoHA), Ministry of Transportation, Coordinating Ministry for Maritime Affairs, Cabinet Secretary, and provincial DKPs of the six provinces of FMA 715. The workshop resulted in a memorandum of understanding among parties and a joint action plan that began the work.

Step 2: Identifying a vessel registration implementation mechanism

Discussions held at the regional level in May 2017 resulted in an agreed technical implementation mechanism (summarized in Table 4 and Figure 11). Focal areas of the agreement included identifying partnership and coordination mechanisms for local government agencies, the Project and partners, and defining the costs associated with inventorying and registering fishing vessels. Primary issues were identified, such as the limited capacity of provincial DKPs to inventory and verify a large number of fishing vessels below 10 GT fishing vessels and the limited budget allocation available under KSOP to undertake fishing vessels measurements (as part of the registration process).

TABLE 4. IMPLEMENTATION MECHANISM FOR FISHING VESSEL REGISTRATION ≤ 10 GT

TASK	RESPONSIBLE AGENCY	PARTNERSHIP FOR IMPLEMENTATION
Vessel inventory	DKP (extension services)	Fishing associations/companies; Associations/NGOs support DKP in inventorying and verifying ≤ 10 GT fishing vessels.
Vessel measurement and boat registration certificates (*Pas kecil*)	DKP and KSOP	Associations/NGOs and DKP coordinate with the KSOP to undertake this task collectively.
Proof of Registration (Bukti Pencatatan Kapal Perikanan—BPKP)	DKP or PTSP (depending on province)	Associations/NGOs and DKP facilitate document submission for vessel registration to the PTSP or DKP to obtain BPKP.

Step 3: Registering Vessels

The USAID SEA Project led a proactive 'normalizing' of the vessel registration processes, mobilizing all involved agencies to implement the agreed technical implementation mechanism, including the following activities.

- **Collective vessel registration** — was used to overcome the wide distribution and weak organization of fishers across remote areas with limited government representatives' access. The USAID SEA Project worked to build fishers' awareness of why they should register their vessels and provided technical assistance and facilitation to overcome geographical and institutional obstacles to registration.

- **An expanded role for local fisheries offices (DKPs)** — proved highly effective in mobilizing fishers to register their vessels. Although registration is a fishers' responsibility, the fisheries offices, extension services, and fishing port and transportation officials have a complementary role in encouraging, organizing, and normalizing the practice. Involving them in such work could be scaled up to wider regions as a best-practice approach.

- **Strategic institutionalization** — was promoted by capitalizing on budgetary opportunities. While budget allocations for the vessel registration program are mostly at the provincial level, the opportunity exists to prioritize collective vessel registration within the Village Fund scheme to sustain the registration program. Another strategic institutionalization approach is encouraging the private sector (e.g., fishing and processing companies) to advocate for vessel registration to improve transparency along their supply chains.

Step 4: Promoting sustainability and advocating lessons learned to local governments

This final step built on lessons learned through the vessel registration activities, namely:

- Fishing vessel registration can mainstream when governments appreciate the benefits of and fund registration.
- Fishers need incentives and support to register their vessels, which requires close cooperation between relevant and responsible agencies.
- Support from outside agencies, including donors and NGOs, is crucial to maintain this initiative's momentum and scale up the positive changes achieved to date.

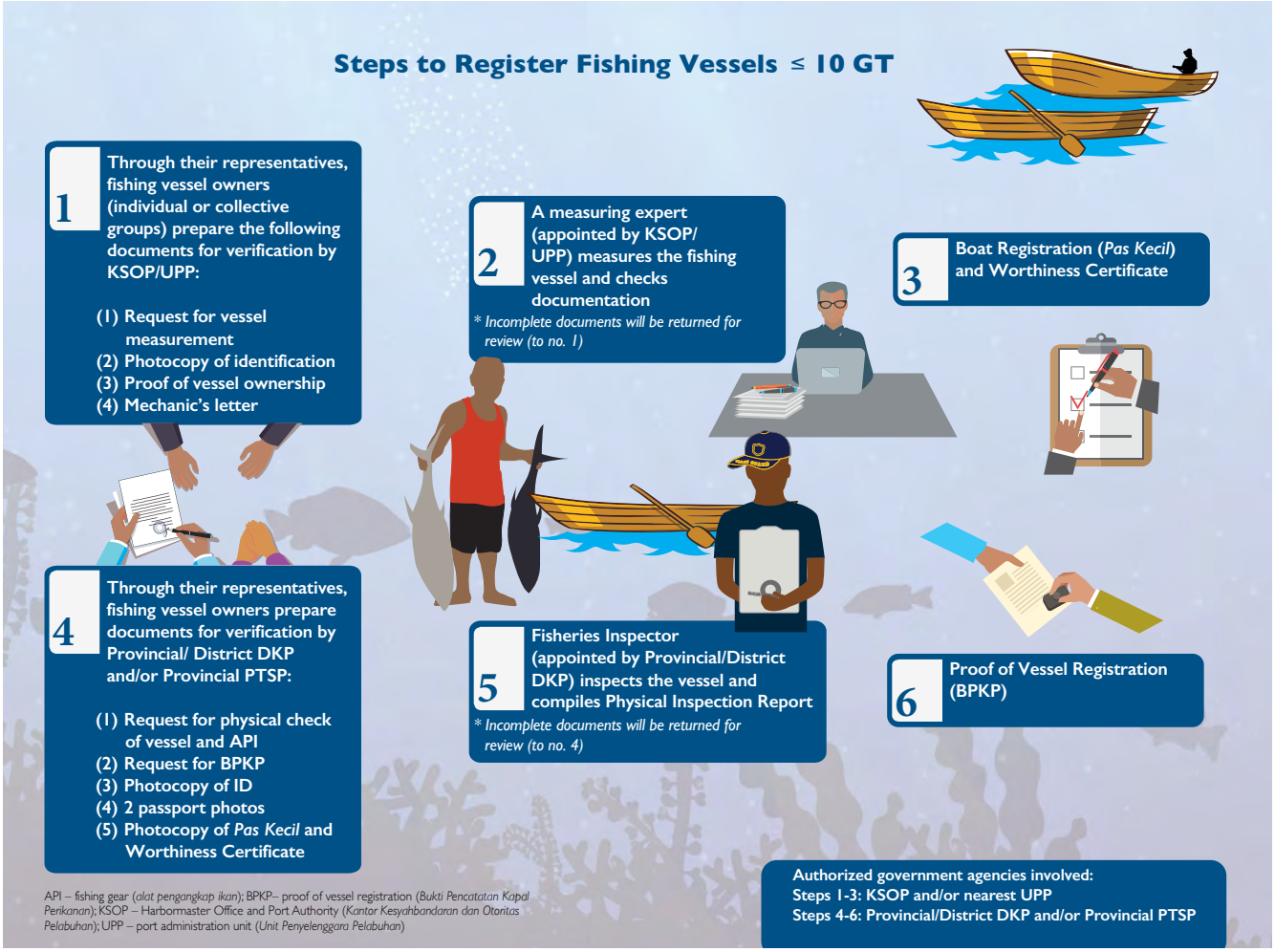


Figure 11. Flowchart of the registration process for small-scale fishing vessels.

Establishing logbooks for small-scale fisheries

By: Irna Sari and Muhammad Ichsan

Effective fishery governance requires establishing a range of systems to monitor and evaluate a fishery's performance and the effectiveness of a management plan or harvest strategy. There are various tools and options available to provide data to catch monitoring systems. The fisher logbook is a tool that both achieves data collection and allows fisheries scientists and fishers to work together to understand the fishery. However, MMAF regulation no. 48/PerMen-KP/2014 only requires logbooks for fishers with vessels equal to and above five GT (≥ 5 GT). Small-scale fishers with boats below 5 GT are not required to submit data on their catch, meaning a significant data gap impedes stock assessment and managers from making appropriate decisions (Halim *et al.*, 2019).

Small-scale fishers dominate the harvest of fishery resources and capture the vast majority of fish within provincial waters. To forge a pathway towards improved catch monitoring, the USAID SEA Project worked alongside the MMAF Directorate of Fish Resource Management (*Pengelolaan Sumber Daya Ikan*—PSDI) and DGCF, as well as provincial DKPs, to identify ways to improve logbook compliance. Utilizing incentivization methods for compliance and establishing an umbrella framework for small-scale fisher logbooks, the initiative involved stakeholders from national to village levels.

Initially, establishing a catch monitoring system was not a priority for most fisheries managers. To build interest and obtain buy-in from the PSDI as the agency responsible for fisher logbooks, the USAID SEA Project and partners advocated the importance and added value of logbooks for small-scale fisheries management. For example, logbooks increase fishers' capabilities to comply with traceability measures that can improve market competitiveness. Collaboration with the Head of the DGCF Sub-directorate of Monitoring and Analysis for Fish Resource Management (together with the PSDI) resulted in a road map and work plan with clear targets, activities, and milestones that helped catalyze small-scale fishers to report their catches. This road map became an essential reference point of the commitment between the USAID SEA Project and the PSDI.

The PSDI initially focused on establishing incentives and identifying improved methods for existing logbook reporting (including an e-logbook system) because of a pressing need to improve logbook compliance by large- and medium-scale fishers. Despite this difference in focus and a broadened scope of the anticipated intervention between the PSDI and USAID SEA Project, the initiative ultimately galvanized the PSDI to develop a small-scale fisher logbook regulation.

The Project and the PSDI recognized that the low literacy of small-scale fishers limits their ability to record their catches from the outset. In developing a logbook suitable for small-scale fishers, it was necessary to accommodate these limited capabilities and other unique concerns and support the provincial- and district-level government institutions to develop a practical design and associated management system.

A more straightforward fisher-friendly logbook format design was piloted after a review of the existing logbooks available (≥ 5 GT). The new design reduced the data collection to the bare minimum needed, which allowed for relevant data while ensuring the collation was not too burdensome for small-scale fishers to use.

The USAID SEA Project and the PSDI explored best-fit mechanisms for logbook implementation. Initially, fishers tested completing logbooks on board their vessels. However, due to literacy and the constraints of writing at sea, it was agreed that fishers would work with family members to fill in the data after fishing. The implementation mechanism also had to consider that small-scale fishers land their catches in locations other than fishing ports (where logbooks are usually submitted). To address this, the USAID SEA Project and the PSDI involved fish traders, companies, heads of villages, NGOs, extension service officers, and others with access to the fishers in providing support in collecting the fishers' logbook data and submitting it to the fisheries office on their behalf.

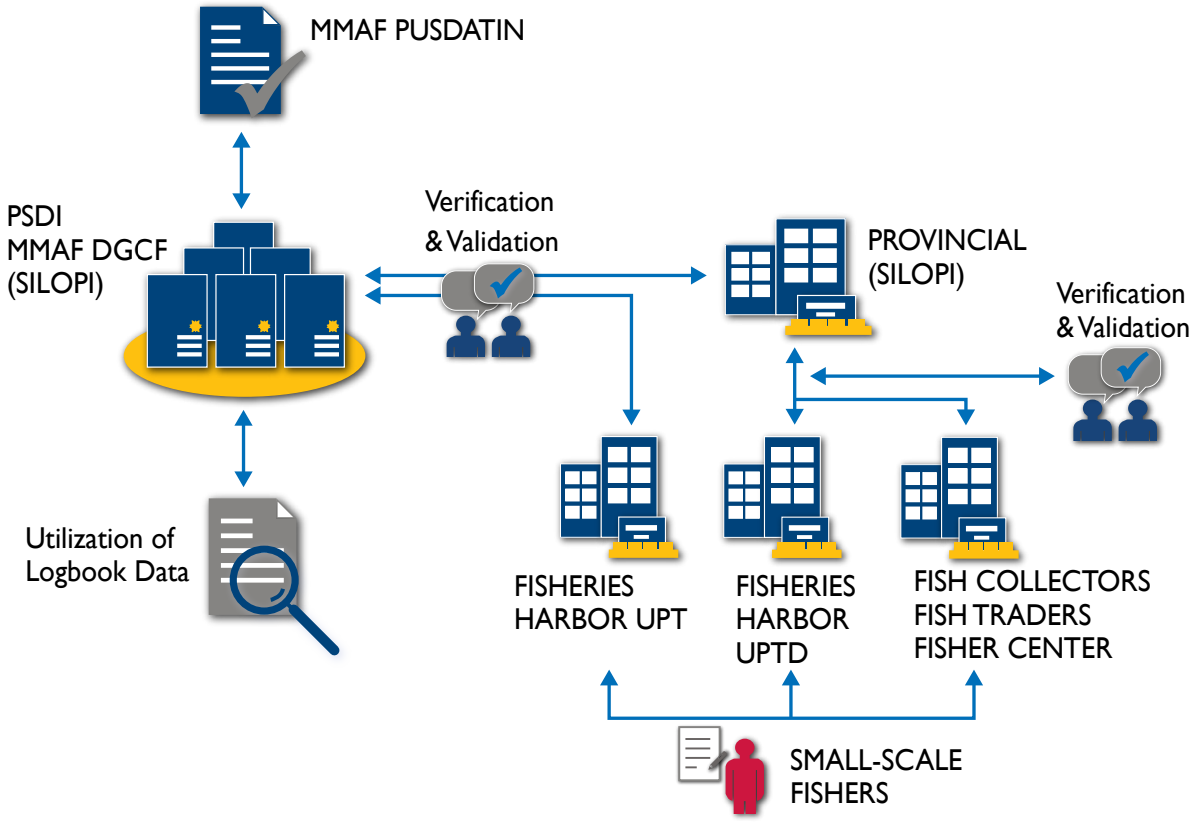
Consultations with relevant directorates of the MMAF, the provincial governments of Maluku, North Maluku, West Papua, and partner NGOs were instrumental in finalizing the logbook's format. Once the fisheries managers agreed to the format, the logbook was piloted at the community level. Leadership from district fisheries offices and extension service officers in piloting the logbook was essential to building stewardship of this initiative and should ensure the initiative sustains.

Critical lessons from establishing a logbook for small-scale fisheries

Despite the complexities, the trials were successful at several sites in Tidore Island, North Maluku, including Dawora Village and neighboring areas. The involvement of fishery extension officers was pivotal to building the fishers' capacities and creating buy-in for the logbooks. Adoption of and compliance with the logbooks correlated with technical assistance and awareness-raising activities, i.e., targeted personal engagement improved compliance. Family members' involvement was also influential, with logbook adoption improved where capacity support was provided to fishers' wives. Further feedback for improvements to the logbook functionality includes the use of photos of the fish.

A draft fisher logbooks regulation, initiated by the USAID SEA Project, was submitted to the DGCF Legal Unit for legalization and accepted by the PSDI in June 2020. This acceptance demonstrates the culmination of the PSDI's strong buy-in, support, and political will for improved monitoring of small-scale fisheries through logbook implementation. While there are no immediate plans for continued roll-out of the logbooks, the PSDI's uptake of this initiative is a significant achievement and an essential milestone to improving small-scale fisheries management.

Overall, the logbook initiative successfully raised awareness of the value in fisher logbooks, in parallel with developing capacity for monitoring small-scale fishers' catches. Future implementation requires further support and advocacy, particularly to provincial-level fisheries managers who oversee the small-scale coastal fisheries.



DGCF– Directorate General of Capture Fisheries
PSDI – Directorate of Fish Resources Management (*Pengelolaan Sumber Daya Ikan*)
PUSDATIN – MMAF Center for Data, Statistics and Information (*Pusat Data dan Informasi*)
SILOPI – Fishing Logbook Information System Application (*Aplikasi Sistem Informasi Logbook Penangkapan Ikan*)
UPT – technical implementing unit (*Unit Pelaksanaan Teknis*)
UPTD – regional technical implementing unit (*Unit Pelaksanaan Teknis Daerah*)

Figure 12. Proposed model for a small-scale fisher logbook management system.

Strengthening Komnas Kajiskan: a fisheries scientific advisory body for robust and adaptive fisheries management

By: Irna Sari

The Komnas Kajiskan was officially established in 2005 through MMAF regulation no. 14/2005. MMAF regulation no. 30/PerMen-KP/2016 jo no. 35/2020 laid out its operation as an independent scientific advisory body under, and responsible to, the MMAF. The mandate of the Komnas is to provide input and/or recommendations to the Minister on fisheries management by collating and reviewing results of fisheries research and assessments from various sources. This includes reviewing the best available scientific evidence for determining estimates for maximum sustainable yield (MSY) and total allowable catch (TAC) for the FMAs across the country.

To perform this mandate, the Komnas has five key tasks:

(1) identifying and tracing data and information for stock assessments;

(2) synchronizing national programs for fish stock assessments;

(3) validating and synthesizing stock assessment results to inform Indonesian fisheries MSY and TAC;

(4) reviewing the implementation of strategic policies that manifest MSY and TAC values; and

(5) evaluating the status of fisheries exploitation in the nation's FMAs.

To support these tasks, the USAID SEA Project and BRPL engaged some of the Komnas members in several scientific review workshops related to the stock assessments supported by the Project. Technical consultations were also held with Komnas members in October 2018 and September 2019 where BRPL researchers presented the approach, methodologies and results of data-limited assessments. Through this collaboration, a range of lessons were learned and recommendations identified for improving Indonesia's fisheries management system.

Firstly, it has become clear that a protocol is needed to ensure a robust scientific review process exists, detailing mechanisms for the reviewers' selection process, and outlining the criteria for an assessment that enables independent reviews to be based on objective scientific judgments. This includes considerations of potential conflicts of interest or overlapping roles, as experience through the USAID SEA Project revealed that some of the researchers involved in the preparation of the stock assessments were also members of the Komnas. Such overlapping roles may hinder the independence and objectivity of reviews, and risk subjective feedback in evaluating the results of stock assessments. To avoid this, the Komnas could take the opportunity of engaging some of the country's leading stock assessment scientists from a cross-section of universities to overcome the redundancy roles of some Komnas members.

Secondly, the protocol needs to outline an appropriate procedure for the Komnas members to follow when reviewing and providing feedback to stock assessments. For the stock assessments supported by the USAID SEA Project, the reviewers only provided immediate in-person feedback during consultations, without any prior review of the reports, and without sufficient time to truly digest and thoroughly assess the information presented. Ensuring a more thorough review process is in place that provides reviewers sufficient time and space to adequately assess information and formulate responses, will enable the Komnas review process to become more thorough and in-depth, and able to provide more scientifically robust feedback and recommendations.

Thirdly, for the Komnas to perform the task of "reviewing the implementation of strategic policies that manifest MSY and TAC values," there needs to be clarity over the breadth of this mandate. During the USAID SEA Project meetings, the inputs provided by the Komnas members related only to stock assessment considerations and data systematics. For example, the Komnas members recommended restructuring data to meet the minimal requirement needed to account for unreported fishing practices, and recommended a standardization of statistical methods for analyzing CPUE. Such recommendations are important and valid to improve the robustness of

the stock assessments, but they remain limited to scientific data considerations. To truly meet the mandate of reviewing the 'implementation of strategic policies,' the scope of Komnas assessments needs to be broadened to evaluate the effectiveness of management measures being implemented and whether current policies and institutional arrangements are sufficiently achieving the objectives of sustainable fisheries.

Such performance evaluations could be undertaken, for example, on the FMP for flying fish (as per MMAF decree no. 69/KepMen-KP/2016) or sardines (as per MMAF decree no. 68/KepMen-KP/2016). Such a broadening of the review process could also extend to the various harvest strategies being developed at FMA and sub-FMA levels for snapper and grouper, tuna, anchovies, flying fish, and blue swimming crabs.

Finally, to further advance the Komnas as a scientific advisory body to the Minister, the Komnas may consider examining fish stock assessments that require differing levels and scales of management and governance. For example, the USAID SEA Project's experience in conducting a genetic study for red snapper and grouper in Maluku helped identify the management unit area for these stocks, and an assessment of small-pelagic stock distribution factored in ocean bathymetric structures to reveal the localized stock scales. Such information can be used to inform and guide policy recommendations for the decentralization of fisheries management for localized stocks, and whether stocks should be managed at provincial, FMA or national levels. Such a process would also help clarify the shared tasks and responsibilities of the national and provincial authorities in managing fisheries. (It is noted that such considerations of appropriate management scales also requires the clarification of the Omnibus Law on Job Creation (Law no. 11/2020) that affects the authority arrangement to develop FMPs against Law no. 23/2014.)

Ultimately, the Komnas Kajiskan will require sufficient budget allocation and associated human and technical resources to function optimally, and to ensure fisheries management is based on robust science for sustainability, to support the millions of households that rely on fisheries resources, today and into the future.

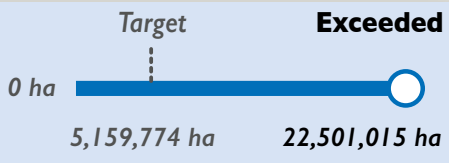
Data gathering for stock assessment; measuring and weighing prawn catch (Penaeidae sp.) in Bintuni Bay, West Papua. Photo: USAID SEA/Inayah

EAFM ACHIEVEMENTS AGAINST INDICATORS

The success of the EAFM workstream under the USAID SEA Project was measured through three indicators. All of the targets for EAFM were achieved, or exceeded expectations.*

EAFM Targets and Results

The number of hectares of biological significance and/or natural resources under improved natural resource management applying EAFM.



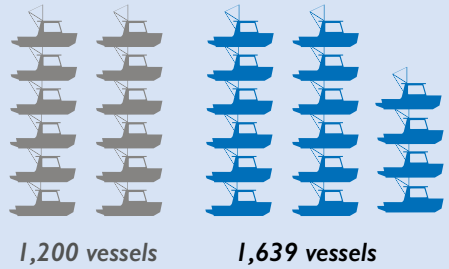
Percent change in CPUE for selected gear and landing sites.

Target: Steady

Achieved

Steady (Av. +14.75% kg/day/vessel)

Number of small- and medium-scale vessels registered or licensed.



* **Number of hectares improved applying EAFM** was calculated based on the 22,501,015 ha coverage for the small pelagic fishery in FMA 715, based on the following: (1) the distribution/migration of small pelagic species in the area between the Weber Line and Lydekker Line (21,786,624 ha), (2) the fishing grounds of anchovies in Raja Ampat, West Papua (75,593 ha), and (3) the fishing grounds of flying fish in Fakfak, West Papua (638,798 ha). Two further fisheries of focus under the USAID SEA Project — the snapper and grouper fisheries of North Maluku and Maluku—also had delineated ecological boundaries (41,600 ha and 33,800 ha respectively), however these areas have not been counted towards the total area for this indicator as they are situated within the existing small pelagic fishery area (already counted). In addition to this, the fisheries supported but not targeted for harvest strategy development included 404,921 ha for the prawn and mud crab fisheries in South Sorong (338,000 ha) and Bintuni (66,921 ha) in West Papua (based on the areas allocated for MPAs/traditional fishing management areas at these sites); and 261,156 ha of multi-species fisheries in Raja Ampat, West Papua (based on the combined areas being managed under territorial user rights for fisheries and associated reserves in Raja Ampat being supported under another workstream of the USAID SEA Project).

Studies to assess **percent change in CPUE** examined changes over time in the number of kilograms (kg) landed per day per vessel, from 2018 (baseline) to end 2019/20 (comparison study) in the following selected fisheries and areas: (1) handline fishers in North Maluku (Tidore Islands, South Halmahera and Morotai Island); (2) purse seine fishers in North Maluku (North Halmahera, Tidore Islands and Central Halmahera); (3) handline fishers in Maluku (East Seram, Central Maluku and West Seram); and (4) folding trap fishers in West Papua (South Sorong and Bintuni Bay). This revealed amalgamated data showing an average overall change of +14.75 percent in CPUE across sites, indicating CPUE has remained 'steady', as any change plus or minus 20 percent is considered stable due to the variability of data and short time duration of the data set assessed.

Number of vessels registered was calculated based on the verified receipt of one or more of the following documents per vessel: (a) a proof of registration document (BPKP), (b) a boat registration certificate (*Pas Kecil*), or (c) a fishing permit (*Surat Izin Penangkapan Ikan*—SIPI).

The local community around South Sorong MPA in West Papua contributing to a zoning and management plan (RPZ) public consultation run by the USAID SEA Project. Photo: USAID SEA/Christopher Rotinsulu

02

Establishing and effectively managing marine protected areas (MPAs)

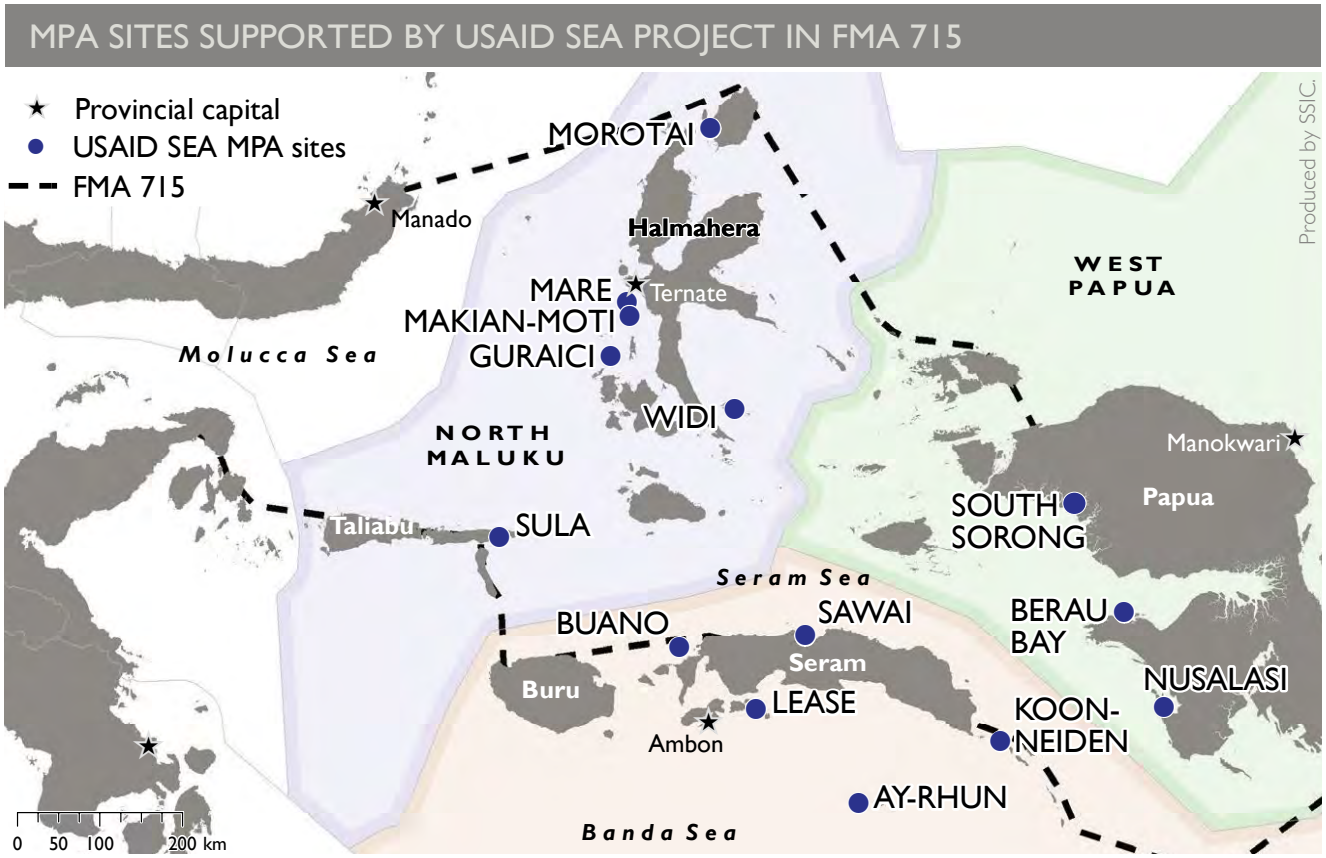


Figure 13. MPA sites supported under the USAID SEA Project.

The USAID SEA Project supported the establishment and development of 14 MPAs across the three target provinces in FMA 715 (Figure 13), and the design of an MPA Network across FMA 715.

USAID SEA Project support for the effective implementation of MPA establishment and development was provided from the national to the site levels.

At the national level, the Project supported a review of key regulatory frameworks that produced recommendations for streamlining and merging the various policies governing MPA establishment and management. Support for MPA Networks included the development of systems for their design and implementation as well as a training manual and training rollout to build the skills of key stakeholders (at the national, FMA, and provincial levels). A central conservation database was established to support tracking and consolidating data concerning the establishment and effective management of MPAs across the country.

At the provincial and site levels, support to the 14 MPAs in the USAID SEA Project portfolio was tailored to their specific needs. All the MPAs were supported to become formally delineated, legally reserved, and recognized in their respective province's marine spatial plan.

Site-based efforts under the MPA workstream were carried out at multiple scales, particularly in the design and development of MPA zoning and management plans (*Rencana Pengelolaan dan Zonasi*—RPZ) at each site. Provincial government agencies, district and local government offices, communities, fishers, and public and private sector entities were engaged across the MPA sites. Preparations for site-based management at each of the MPAs also involved: extensive engagement of local communities, stakeholders, and conservation champions; the establishment of community surveillance and monitoring teams; and skill building with village, district and provincial agencies in order to understand, plan for, and initiate the implementation of effective management at each site.

Combined, the MPAs in the USAID SEA Project portfolio cover 1,630,106 ha, of which 142,189 ha is designated within no-take zones (including 83,561 ha within fully protected core zones).

KEY LESSONS LEARNED FROM MPA WORK

- A clear vision, robust planning, and extensive experience backed by a suite of standardized capacity-building tools, a national effectiveness rating system, and ample successful working models have enabled Indonesia to make great strides towards its goal of 32.5 million ha of MPAs by 2030.
- Of the 23 million hectares of legally declared MPAs in Indonesia, only about 15 percent are meeting their management and conservation objectives, and the percent coverage of no-take zones within MPAs remains well below targets to build resilience in critical habitats and sustain fisheries.
- MPAs are an essential buffer for reducing risks of ecological system failures and strengthening other management interventions while also providing opportunities to build on fisheries management, enhance tourism development, and create other social, economic, and ecological benefits.
- MPA networks fit well with the scale of provincial MPA management planning.
- Communities and district governments in Indonesia have a large role to play in supporting environmental outcomes. Both can be harnessed through creative enabling policies at both the national and provincial levels to support the establishment and management of MPA networks.
- Collaborations around data collection can be effective. Even when data is limited and not standardized, pooling data sets allows for a better understanding of the situation and identifies priority interventions for management.
- Multiple stakeholder engagement and provincial government leadership are vital to the long-term success of MPAs within provincial waters.
- The allocation of adequate human and financial resources for MPA management is essential for long-term success.
- Well-planned MPA networks support resource health and the sharing of lessons on governance, planning, and management across the network.
- Over the short to medium term, effectively managed MPAs do not always lead to improvements in biophysical conditions. Broader fluctuations in ocean health (such as changes in currents, ocean warming, and acidification) highlight that MPAs are a sound local solution but do not address broader issues that need addressing at the national, regional, and even global levels.

The next pages provide three case studies that exemplify some of these lessons.

Data provision for MPA designs in FMA 715

By: Asri Puji Lestari

Designing and developing an MPA relies on the availability of relevant site-based data to inform and guide design, identify management objectives, and establish site-relevant mechanisms for effective management. Marine areas of interest (AOIs) identified and recognized in provincial marine spatial plans (*Rencana Zonasi Wilayah Pesisir dan Pulau-Pulau Kecil*—RZWP-3-K) follow a set process pathway to become effectively managed MPAs. The MPA process includes a series of steps beginning with initiation, then establishment, followed by the development and implementation of management and zoning plans. The MPA design process involves provincial governments, local communities, and other stakeholders in a collaborative approach. Such stakeholders are often represented by an MPA working group (*kelompok kerja*—Pokja).

At the initiation of an MPA, measurable management objectives are defined and design criteria are established which should be rational and achievable. For example, design criteria generally aim to protect 20 percent of each habitat type represented in the MPA. Therefore, the information needed to describe each habitat is a standard requirement. Site-specific data necessary for design includes primary biophysical data and information gathered from community meetings and local experts. Data are compiled, analyzed, evaluated, refined, and ultimately utilized to develop an optimal design for the area.

However, obtaining all the data necessary to support MPA design can be challenging in the short term. Protecting ETP species was a common objective of the MPAs supported by the Project, but there were insufficient data available to describe measurable criteria for their protection. Most site-level data collected by the Project teams pertained to critical ecosystems and habitats (such as coral reefs and associated ecosystems), and while any evidence of local populations of dugong, dolphins, whales, and other threatened and protected species was documented, to obtain such data requires longer-term specialized surveys. Therefore, to ensure the protection of critical species, design criteria based on the protection of primary habitat were assumed to provide some degree of protection for endangered and threatened species.

Despite the identified needs for more comprehensive and species-specific data, MPA designs can proceed with the data available at the initiation stage to meet time and resource constraints for developing the MPA. Collaboration to obtain further data to support improvements to the MPA design and optimize achievement of objectives through adaptive management is anticipated in the future.

Throughout the Project, the implementing NGO partners collected data in the three focus provinces in FMA 715 to support 14 MPAs (Figure 14). The collected data was intended to describe the marine environmental and socio-economic conditions in the target MPAs, identify and analyze the conservation issues, and enable the production of biodiversity maps to support potential zoning decisions.

The data collected under the USAID SEA Project provided thorough baseline information on the coral reef condition, reef fish diversity, and fish biomass of the 14 MPAs (coral ecosystems dominate 13, and a mangrove ecosystem dominates 1). This baseline data is useful in measuring the impacts and effectiveness of MPA management over time.

Standard protocols to determine the sites' biophysical status were followed throughout the data collection process so that the data could be easily accommodated and stored with the MMAF (Ahmadia *et al*., 2013; USAID, 2020). Standard monitoring protocols allow for future assessments, assist in filling in geographic data gaps in LIPI's monitoring system, and contribute data to international research networks compiling information on coral reef status globally to inform international decision-making, such as the Global Coral Reef Monitoring Network (GCRMN).

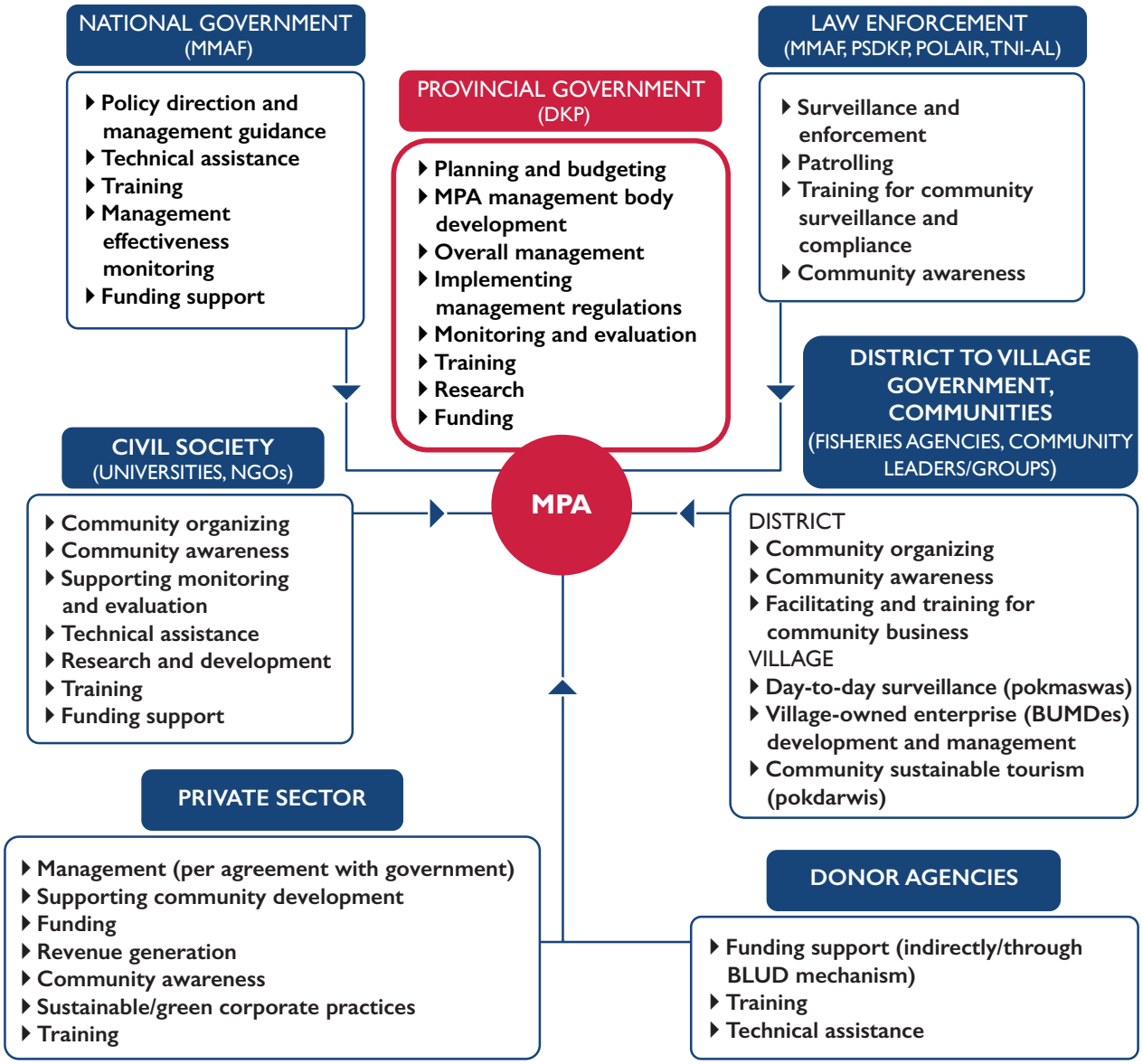
USAID SEA Project partner Marine Change conducting an underwater survey of critical reef habitat in Morotai, North Maluku. Photo: USAID SEA/Alex Westover

		NORTH MALUKU						MALUKU					WEST PAPUA		
MANAGEMENT OBJECTIVES	HABITATS														
	Coral reef	•	•	•	•	•	•	•	•	•	•	•		•	•
	Mangrove	•	•	•	•	•	•		•	•			•	•	•
	Seagrass	•	•	•	•	•	•	•		•	•			•	•
	Turtle nesting beach	•													
	Intertidal estuary												•		
	IMPORTANT BIOTA														
	Shark	•	•	•	•	•		•				•	•		
	Hammerhead shark					•									
	Manta ray	•	•		•									•	•
	Napolean fish			•				•				•			
	Turtle	•		•	•		•	•	•		•	•		•	•
	Giant clam			•											
	Sea bamboo							•							
	Dugong	•	•							•	•	•		•	•
	Dolphin		•			•						•		•	•
	Marine mammal							•	•				•		
	Whale										•				
	Chinese crested tern											•			
	Grouper & snapper fisheries	•		•											
	Pelagic fisheries		•		•	•		•							
	Spawning Aggregations (SPAGs for fisheries						•			•		•		•	•
	Snapper SPAGs for fisheries										•				
	Shrimp & crab fisheries												•		
	MPA	Morotai	Mare	Makian-Moti	Guraici	Widi	Sula	Ay-Rhun	Buano	Lease	Koon-Neiden	Sawai	South Sorong	Berau Bay	Nusalasi
DATA MONITORED	Reef health	•	•	•	•	•	•	•	•	•	•	•		•	•
	Reef fish abundance & biomass	•	•	•	•	•	•	•	•			•		•	•
	Coral recruitment	•			•	•									
	Marine invertebrates	•			•	•									
	Fisheries								•				•		
	SPAGs						•		•	•	•				
	Mangroves	•					•					•	•		
	Seagrass beds	•					•					•			
	Water quality												•		
	Resource use						•		•	•	•	•			
	Fisher perceptions	•			•	•									
	Socioeconomic status		•	•	•	•	•	•	•	•	•	•	•	•	•
	Socioeconomic status: Fishers	•													
	Socioeconomic status: Communities	•													

Figure 14. MPA objectives and data provisions across the USAID SEA Project portfolio.

"I think the scale of the project working within one fisheries management area across six provinces strengthening provincial government and local communities in establishing MPAs with national government support is unprecedented in Indonesia with a lot of emphasis on creating the enabling conditions and systems for lasting marine conservation impact."

RILI DJOHANI
Executive Director, Coral Triangle Center



BLUD – Regional Public Service Agency (*Badan Layanan Umum Daerah*)
BUMDes – village-owned enterprises (*Badan Usaha Milik Desa*)
PSDKP -- Directorate General of Marine and Fisheries Resources Surveillance (*Pengawasan Sumberdaya Perikanan*)
Pokdarwis – tourism awareness group (*Kelompok Sadar Wisata*)
Pokmaswas – community surveillance group (*Kelompok Masyarakat Pengawas*)
POLAIR – Water Police (*Polisi Perairan*)
TNI-AL – Indonesian Navy (*Tentara Nasional Indonesia-Angkatan Laut*)

Figure 15. Key stakeholders and their roles in supporting MPA management.

Provincial government leadership in establishing and managing MPAs

By: Rudyanto and Anisa Budiayu

The enactment of Law no. 23/2014 placed control of all coastal and marine waters extending seaward up to 12 nm from the shoreline under provincial jurisdiction. In doing so, this new law created challenges for provincial governments related to establishing and managing MPAs. Before this law, coastal waters up to 4 nm from the shoreline were under district governments' authority. Most MPAs in Indonesia are located within 4 nm of the shoreline, and their management was, therefore, the responsibility of regencies and city governments. At the time of the law's introduction, provincial governments had little involvement in MPAs and lacked the necessary experience, knowledge, and human resources to manage the established MPAs. In addition to taking over existing management duties, provincial governments were also expected to establish new MPAs in their provincial waters, in line with the government's MPA Vision 2030 to expand MPA coverage to 32.5 million ha (from the existing coverage of around 23 million ha).

The Project Team worked intensively with the provincial DKPs to build the capacity of the provinces to meet MPA management challenges. Notably, the partner NGOs provided crucial technical assistance to these agencies to establish new MPAs in their respective provinces. However, the ability and willingness of the agencies to work with the project contractor and NGOs varied. For North Maluku, it was the first time the DKP worked with NGOs in a project context, and building the prerequisite trust and learning and adjusting to work together effectively took time. In contrast, both the West Papua and Maluku DKPs had prior experience working with NGOs and more readily engaged with project planning and activities from the outset. This willingness from all provinces was vital to the successful undertaking of various aspects of MPA establishment and management.

Developing management and zoning plans for the MPAs required the fisheries agencies to create working groups. In all three provinces, the head of the DKP invited representatives from external institutions with relevant expertise to participate in these groups.

> "The SEA Project, with partners WWF and CTC, provided extraordinary assistance and support ... from the initiation of MPAs, to providing back up support."
>
> IBU FATMAH S. RUMAGIA, S.PI, M.SI.
> Head of Marine Sub-Unit, Island Cluster VII of DKP Maluku

Law no. 23/2014 also provides for the head of the provincial DKP to decide on the road map to establish an MPA and the next steps for MPA management (i.e., budget allocation, management unit establishment, and staffing). However, national guidelines for MPA establishment and management are being enhanced under the MPA Vision 2030 to support provincial management. The DKPs need to be familiar with this national guidance (and emerging guidelines) to satisfy national protocols and enable MPA legalization under the MMAF frameworks.

Each of the three provinces supported by the USAID SEA Project took a different approach to establish MPA management units. In West Papua, the new MPA management unit was combined with the existing MPA management unit to overcome the challenges of knowledge transfer and limited human resources. In North Maluku, a governor regulation (PerGub no. 37/2019) established a provincial management unit with some initial staffing and resources. Meanwhile, in Maluku, the DKP head established a DKP branch for each island cluster, with the mandate to manage MPAs within their administrative area. The relative efficiency and effectiveness of these different approaches to forming MPA management units should be tracked over the coming years to determine which approach achieves the best support for the management of MPAs.

The USAID SEA Project, NGO partners, and broader stakeholders (including community representatives from the MPA sites) were involved throughout the design, development, and establishment of MPAs in the three focus provinces. This multi-stakeholder engagement proved essential for progressing MPA development and creating buy-in and support for the MPAs during the establishment process. Over time, the different management constructs' success can be seen in effectiveness and MPA management outcomes. Overall, MPA management success depends significantly on the provinces' allocation of budget and resources and their willingness and ability to collaborate long term with private sector partners, local government offices, and communities.

Developing MPA networks to better conserve biodiversity over large areas

By: Noorafebrianie Minarputri

MPAs are a recognized tool to support fisheries and marine biodiversity conservation and nurture coastal communities' economic and cultural value. A carefully designed and effectively managed MPA network, comprising individual MPAs connected by ecological, socioeconomic, and cultural values, can increase the likelihood of each MPA meeting its objectives. Unfortunately, a lack of scientific data and information about an area can result in suboptimal MPA or MPA network designs.

In 2016, there were 14 designated MPAs in FMA 715, covering a combined area of approximately 1.9 million ha. These MPAs were mostly small in size, established in marine waters previously under district authority (less than 4 nm from shore) or early development stages. However, the highly diverse marine environment of FMA 715 was also intensely utilized for international, national, and local economic purposes, such as shipping lanes, tuna fishing grounds, and the growing marine tourism industry. An MPA network to safeguard the sustainability of FMA 715's biodiversity needed a design to consider the full spectrum of uses of the area. Existing MPAs needed to be enhanced, either by expansion at the site level or through the development of new sites in strategically selected locations, to optimize conservation objectives across the FMA.

This need to improve biodiversity conservation across such a large, multi-use area triggered the USAID SEA Project's support for designing a well-planned MPA network across FMA 715. The MPA network design aimed to support fisheries management, biodiversity protection, and community livelihoods, while also protecting local customs and contributing to Indonesia's goal of establishing a further nearly 10 million ha of MPAs by 2030. The proposed MPA network area included the three provinces of focus under the Project, North Maluku, Maluku, West Papua, and the three other provinces with waters in FMA 715, namely, North Sulawesi, Gorontalo, and Central Sulawesi. These provinces cover a significant portion of Indonesia's marine waters.

In 2018, USAID SEA Project partner The Nature Conservancy (TNC) conducted a series of workshops and meetings in the six provinces to design MPAs and MPA networks for the region. The workshops defined SMART objectives (specific, measurable, action-oriented, relevant, and time-bound) to manage the MPAs and design criteria to meet those objectives. Data were also compiled from national, provincial, and district levels and verified by experts to support the FMA 715 MPA network's draft design.

In the end, 161 data layers from various sources were used for the draft MPA network design. The data layers consisted of biophysical data (e.g., coral reefs, seagrass beds, mangrove forests, currents, seamounts), socioeconomic data (e.g., fishing grounds, wrecks, local traditional customs), threats to the areas (e.g., mining, DF, sea turtle egg poaching), and utilization activities other than for conservation (e.g., ports, mining, energy, underwater cable lines). The gathered data covered both the provincial waters (less than 12 nm from shore) and national waters (beyond the 12 nm boundary). Data from provincial MSP processes were also utilized, including the existing MPA data layers and potential AOIs.

> "One of the most valuable lessons we learned was how to integrate different spatial approaches to marine conservation and management (MPAs, MSPs and fisheries management areas) through MPA network design using the latest science and best practices. Lessons learned will be useful for MPA network design not only in Indonesia, but worldwide."
>
> DR. ALISON GREEN,
> Senior Marine Scientist, TNC Global Team

Throughout the MPA network development process, lessons were learned pertinent to MPAs and the future development of MPA networks.

The FMA 715 MPA network design identified 44 AOIs for MPAs covering a combined area of 5,336,477 ha and recommended sites that should be connected to protect migratory biota (Figure 16). The design also highlighted areas of conflicting use, such as seamounts that were highly recommended for protection because of their unique features but were located in busy shipping lanes or experiencing high fishing intensity. Other areas earmarked for protection were located within or adjacent to military bases or mining areas. The Project quickly learned the importance of considering multiple-use areas at the design phase to harmonize current uses and conservation uses. For many sites, multi-purpose areas were adopted through zoning plans that permitted multiple utilization activities in certain areas. However, rules in multi-use zones need to be respected by relevant stakeholders and enforcement.

Another lesson learned through this MPA network development was the importance of quality data and its availability. Sound data are essential for effective design; if MPA designs are planned using low-quality data, their conservation, biodiversity, and livelihoods objectives may be unachievable. Sources of high-quality data include updated centralized databases, local and expert knowledge, relevant research papers, and ground-truthing activities. Time series data gathering is an essential iterative process used to assess impact and achievements and to update or upgrade the MPAs and MPA network designs through adaptive management.

Ultimately, designing the FMA 715 MPA network was only the first step in the network development process; the more substantial implementation task remains. Implementation required each of the six provinces to establish MPA management units responsible for their respective MPAs. Each unit needs a shared understanding and vision to manage its MPAs as part of the network. They must recognize the advantages of networking in shared budgets and resources, up-to-date knowledge and data, sharing activities and materials, and complementarity in implementation. Achieving a shared vision requires the MMAF to convene an MPA network coordination body at the national level to ensure the MPA network and its governance system is viable.

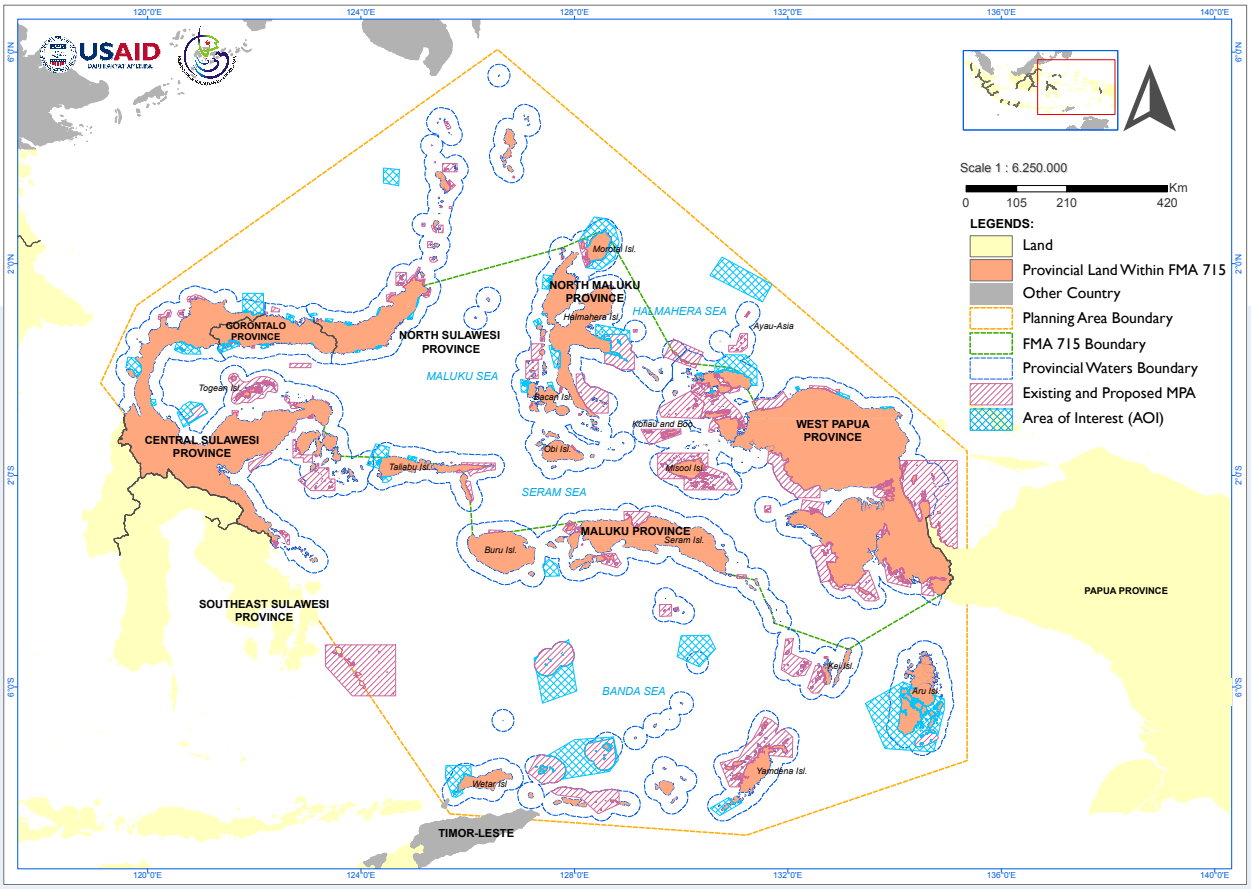
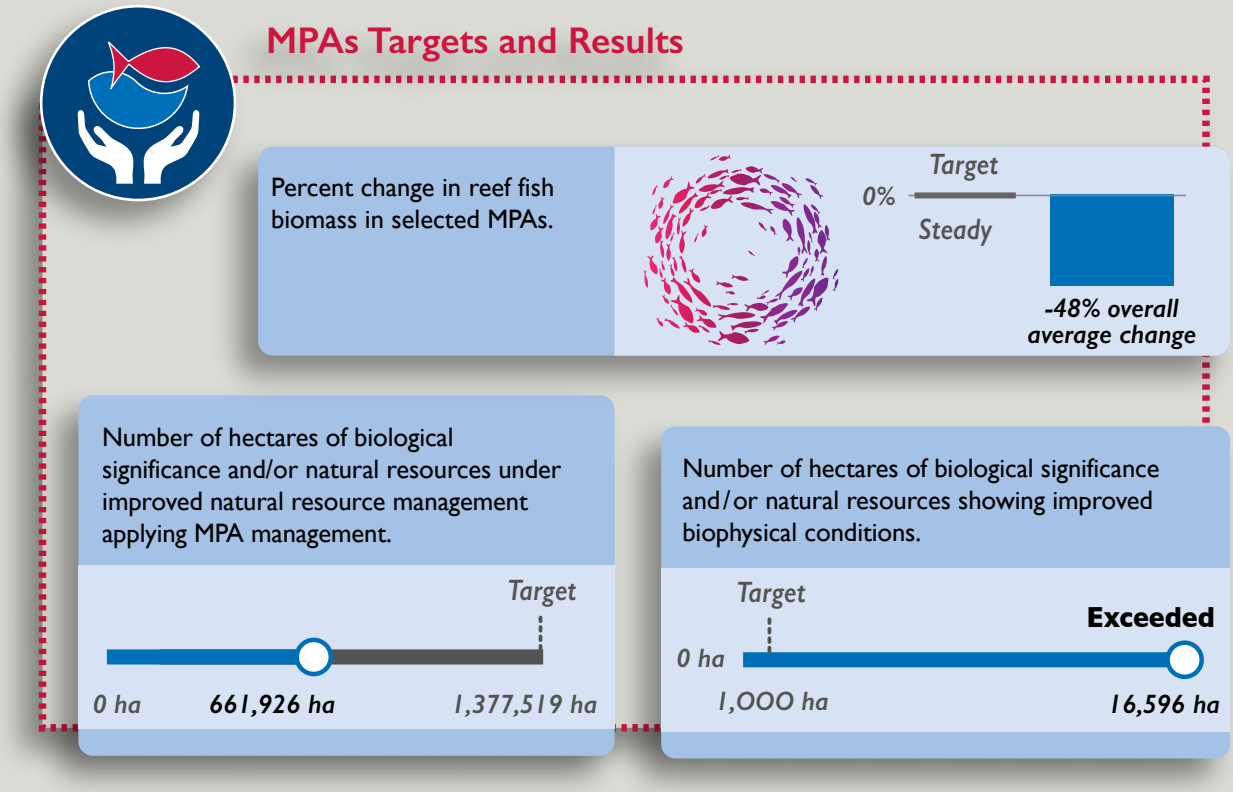


Figure 16. FMA 715 MPA network design.

MPA ACHIEVEMENTS AGAINST INDICATORS

The success of the MPA workstream under the USAID SEA Project was measured through three indicators. The number of hectares showing improved biophysical conditions far exceeded expectations, while the status of reef biomass and the number of hectares achieving the prerequisite 'management effectiveness status' fell below targets due to a range of factors, including the limited time of the Project.*



* The **coral reef fish biomass** was measured in eight select MPAs, comparing baseline studies in 2016/18 with follow up surveys in 2020. Results revealed significant increases in biomass in Mare MPA, stable reef fish biomass in Widi, Guraici, and Lease MPAs, and decreases in biomass in Morotai, Sula, Koon-Neiden, and Sawai MPAs. Surveys were conducted in the no-take zones of these newly established MPAs, where enforcement of zone regulations is only just getting underway. Additionally, the presence of large shoals of fusiliers in some of the baseline surveys (absent from follow up surveys) is anticipated to have potentially skewed results. Nonetheless, the overall aggregate average change was minus 48 percent.

The **number of hectares with improved management** was calculated using the GOI's MPA management effectiveness assessment system (*Evaluasi Efektivitas Pengelolaan Kawasan Konservasi Perairan, Pesisir dan Pulau-Pulau Kecil*—EKKP-3-K). This ranks the status of effective management based on a range of criteria across five levels, from level 1 (MPA initiated) to level 5 (self-sustaining MPA). Under the USAID SEA Project, the aim was for each of the MPAs in the project portfolio to achieve the ranking of level 3, with a score of 90. Of the 14 MPAs in the portfolio, three managed to reach level 3 (90): Widi MPA in North Maluku (315,118 ha), Berau MPA (98,944 ha) and Nusalasi MPA in West Papua (247,864 ha). The spatial areas of these MPAs have been combined to show total hectares under improved management. Of the remaining 11 MPAs, six successfully reached level 2, and five successfully completed all criteria for level 1. It is noted that achieving level 3 ranking in the relatively short time span of the Project was ambitious. In addition to this, the ranking criteria in the EKKP-3-K do not necessarily reflect the level of on-site proactive management at a given site, and in 2020, the GOI underwent a review of the effectiveness assessment, launching a revised system for 2021 and beyond.

The **number of hectares showing improved biophysical conditions** was calculated based on the size (ha) of no-take zones in Project-supported MPAs where reef health remained stable or improved during the life of the Project. Reef health was determined by percent hard coral cover, and of eight MPA sites surveyed, seven showed stable or increased levels of coral cover from T0 (baseline) surveys to T1 surveys.

Participatory MSP mapping in West Papua. Photo: USAID SEA/Ehdra Beta Masran

03

Supporting marine spatial planning for sustainable management

Effectively managing regional coastal and marine resources requires applying an in-depth understanding of resource use practices to designate areas appropriate (or not appropriate) for development activities. Spatial planning is an important governance tool for defining and governing use patterns of both land and sea areas practiced globally.

> MSP is defined in Indonesian law as "[A] guiding plan to determine appropriate spatial utilization of water areas, developed with consistent provisions for spatial structures and patterns, and determining permissible activities, non-permissible activities, and activities permissible only with relevant licenses."
>
> LAWS NO. 27/2007 AND NO. 1/2014

With the introduction of the Coastal and Small Islands Management Law (no. 27/2007 jo no. 1/2014), Indonesian provinces were mandated to produce marine spatial plans (or RZWP-3-K), for their respective waters. In 2015, the President of Indonesia further endorsed the development of marine spatial plans with the launch of the government initiative "National Movement for Saving Natural Resources." All provincial governments are obliged to finalize their plans and enact them through a local regulation *(Peraturan Daerah*—PerDa) as a mechanism to manage their marine areas.

The development of spatial plans requires collating and analyzing a considerable amount of physical and thematic data. These data are then spatially represented and overlaid onto 18 different maps. Provincial governments and associated stakeholders (including representatives relevant to the province from district governments, academic institutions, NGOs, fisher groups, etc.) use these maps to assess potential areas of resource-use and -user conflict, identify appropriate jurisdictions, and make trade-off decisions regarding acceptable (and unacceptable) activities at sites in their region.

The USAID SEA Project supported the development of marine spatial plans in the three target provinces of FMA 715 throughout the MSP process; from initiation (including team establishment and funding support), through data collection and analysis (participatory mapping, field surveys, spatial analysis, map production, and consultation), to drafting of the MSP technical reports and local regulations, reviewing these documents through public hearings, and finalizing and supporting the legal adoption of the plans. Preliminary implementation of the plans was supported with activities such as socialization of the plans, issuance of governor implementation decrees, conducting strategic environmental assessments, establishing monitoring and evaluation systems, advancing technical staff capacity, and developing associated permit and licensing systems for utilization areas.

In each province, MSP work adapted to cultural and social contexts, with consequential high levels of community representation and recognition of traditional tenure arrangements (in Maluku and West Papua) and cross-sectoral government representation and team implementation (in all three provinces).

At the national level, MSP activities included skill building for spatial planning, design, and implementation of a geoportal (SEANODE) to collate and track marine spatial plans nationally and contribute to monitoring support systems, to name a few.

KEY LESSONS LEARNED FROM MSP WORK

- MSP is essential for an archipelago like Indonesia, where the sea covers about 75 percent of the total geographical area. With over 20 government institutions having some form of oversight of the ocean, MSP allows for clarity of zones and harmonization of policies and development plans, reducing overlapping jurisdictions in coastal areas.
- MSP provides an opportunity for provincial leaders, policymakers, government departments, and other stakeholders to work together. The planning process lays out a series of steps that take stock of each province's unique situation, organizational priorities, and integration under one umbrella master plan for the medium to long term.
- MSP enables spatial allocation, reduces conflicts, and maximizes the local resources' use while minimizing the adverse effects of open access. MSP allows government and other stakeholders to plan for the future, and is all the more vital in areas with fast-growing populations with resource use conflicts arising from development for tourism, shipping, and non-renewable (e.g., sand mining) and renewable (e.g., fisheries) extractive industries.
- The Project learned lessons from working in partnership with the provincial governments; these include the benefits of integrating customary practices, engagement with local leaders (and allowing time to build those relationships), and engaging local civil society and community-based organizations in the planning process. Localized issues such as DF can also be addressed through MSP when appropriate.
- Once a plan is in place, fisheries and integrated coastal management are much easier to implement, building on the clarified roles and jurisdictions and aligning different sectoral plans under one umbrella.
- The marine spatial plan is only the beginning; once adopted, it needs monitoring and enforcement to ensure its implementation at the ground level, and a regular review process.
- Strong provincial leadership and support from political, government, civil society organizations, and community leaders can lead to effective MSP that guides and integrates sustainable development.
- A legally adopted and enforced marine spatial plan creates an enabling environment that allows other management interventions (MPAs, fisheries, etc.) to succeed.

The next pages provide two case studies that exemplify some of these lessons.

MSP Case Studies

Marine spatial planning: lessons learned from North Maluku, Maluku and West Papua

By: Wen Wen

MSP aims to reduce conflict in the use of marine resources. It can be used as a marine management mechanism to integrate fisheries, MPAs and other marine uses, and determine the allocation of marine resources.

Under the MSP pillar, the USAID SEA Project supported the MMAF and the local governments of North Maluku, Maluku, and West Papua provinces to undertake marine and coastal spatial planning using an integrated zoning approach. This approach aimed to enhance and improve conservation, promote the sustainable use of marine resources, enhance fishery productivity, provide food security, and support sustainable livelihoods in marine areas under provincial jurisdiction.

At the national level, the focus of MSP work was to help the government develop, implement, monitor, and evaluate the MSP process. The USAID SEA Team also supported developing an online MSP information system portal (geoportal) called SEANODE to improve transparency in the permitting and licensing procedures for provincial waters. SEANODE was designed to store and make accessible information related to provincial zoning for conservation and fisheries areas, strategic areas, sea lanes, general use zones, and local marine tenure zones. Including local marine tenures in the geoportal ensures these areas are recognized by local and national government and safeguards their use for local communities' sustainable livelihoods activities.

At the provincial level, the USAID SEA Project supported the MSP process to secure more than 8 million ha of MPAs across the target provinces. Scientific and transparent technical support utilized technological tools and a collaborative planning method to engage local stakeholders, including community representatives. Approximately 268,152 ha of coral reefs, 7,190 ha of mangrove forests, and 27,355 ha of seagrass beds were allocated for protection. Furthermore, protection strategies for migratory and charismatic marine species were integrated into zoning plans. The resultant marine spatial plans allocated more than 60 percent of marine and coastal areas for capture fisheries and sustainable tourism development activities within provincial waters, and recognized approximately 150,000 ha of local marine tenure areas to enable indigenous communities (*masyarakat hukum adat*) to manage their resources for local benefits.

The MSP process overcame the three provinces' data-poor status and their limited government budgets for planning through a participatory mapping approach. This mapping method proved an efficient tool to collect and collate data and was essential to the success of the MSP process. Participatory mapping also highlighted the importance of having resources to undertake such work; it is anticipated that resourcing will be paramount for future-envisaged 3D mapping approaches to MSP. Intensive communication and active participation from key stakeholders expedited designing the zoning plan, as did trust-building activities.

The USAID SEA Project facilitating a Training of Trainers on SEANODE in Jakarta, attended by MMAF MSP Directorate staff. Photo: USAID SEA/Ndaru Prasetiyo

As MSP in Indonesia is principally a top-down approach, guidance from the national government was a critical factor in accelerating the plans' final production through close cooperation with the provincial governments and local stakeholders.

An integrated approach from planning through to implementation, with support frameworks throughout, is the ideal MSP approach. At the same time, ensuring provinces allocate resources to implement the plans after they are approved is essential.

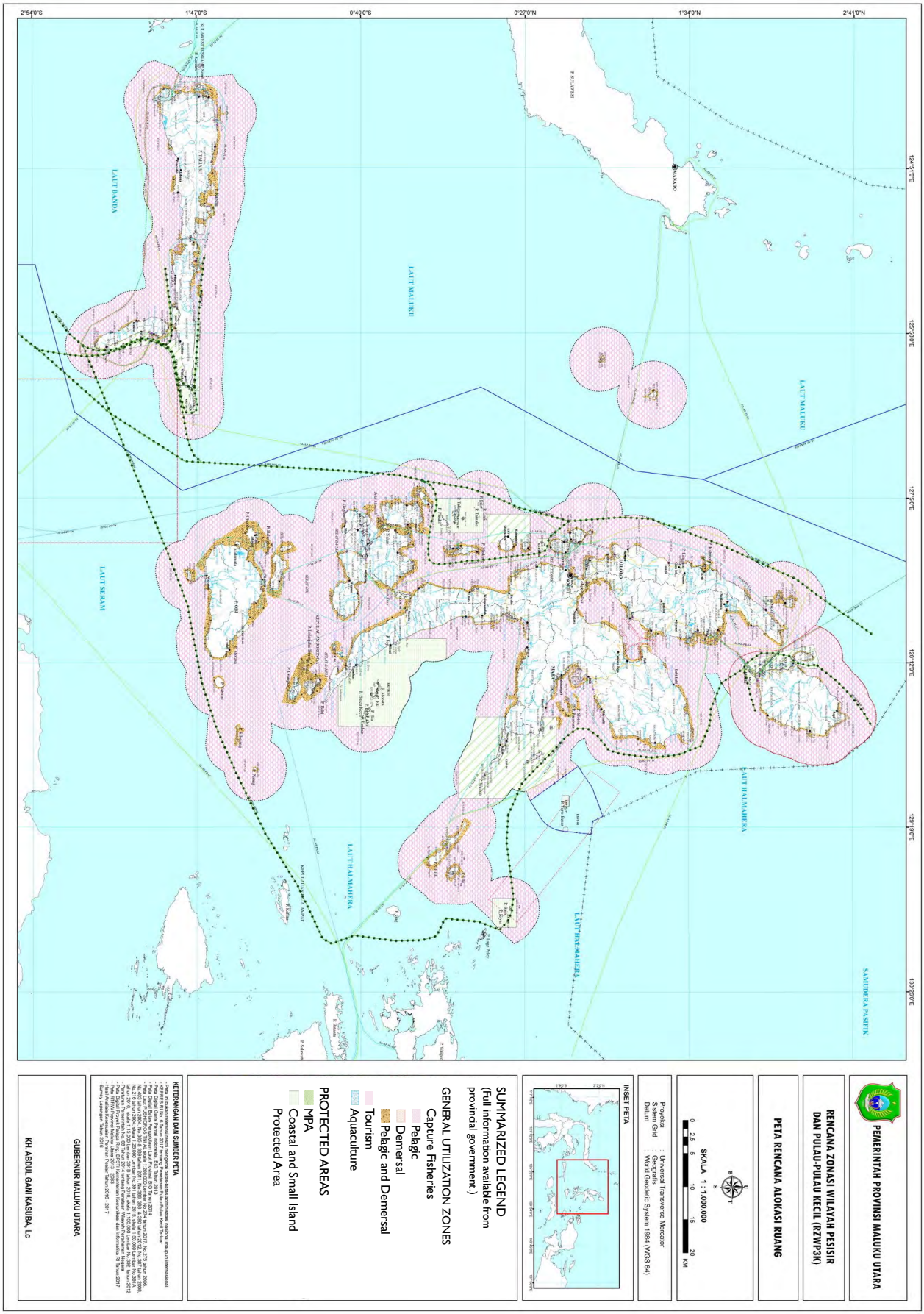


Figure 17. The final MSP map of North Maluku Province.

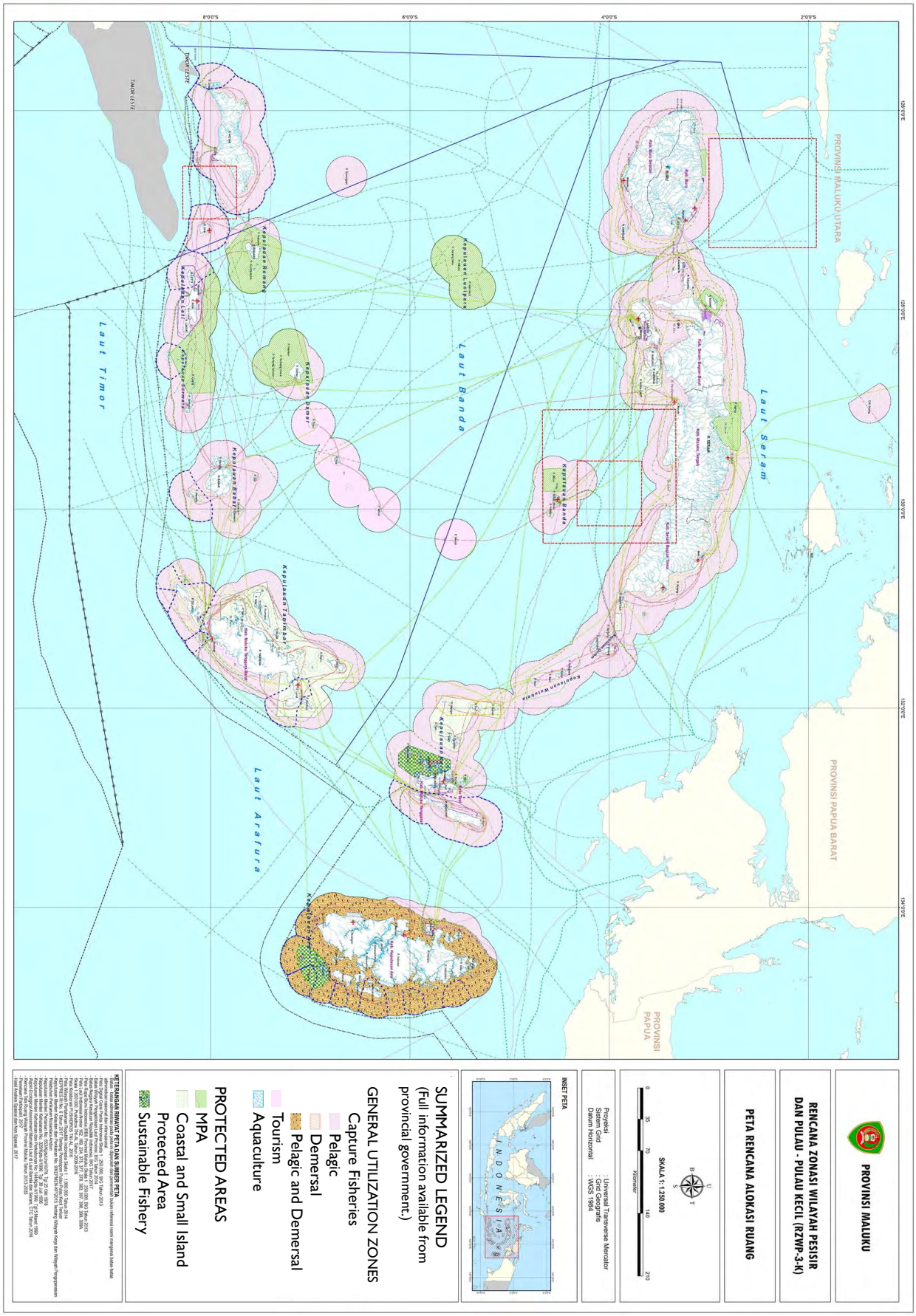


Figure 18. The final MSP map of Maluku Province.

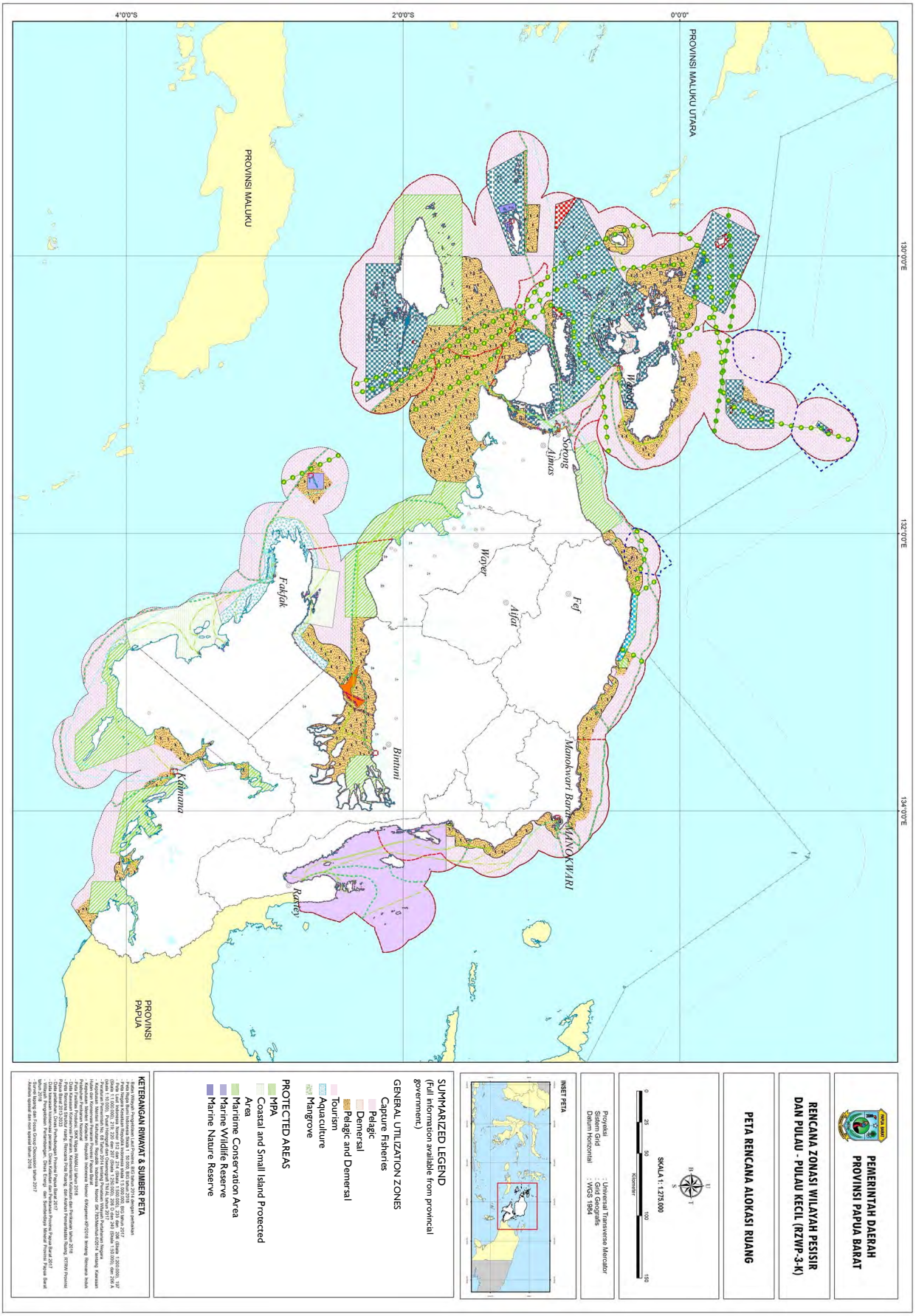


Figure I9. The final MSP map of West Papua Province.

Integrating customary coastal rights into provincial law for the West Papua Marine Spatial Plan

By: Christovel Rotinsulu and Wen Wen

In West Papua Province, around 67 distinct ethnic tribes are residing in coastal areas. Local customs (*adat*) that have been practiced by these tribes for centuries are respected under the 1945 Constitution of the Republic of Indonesia to maintain cultural values under modern governance systems (Basic Law no. 1945 as amended by Law no. 2002, articles 18B, 281). The Coastal and Small Islands Management Law (no. 27/2007, amendment no. 1/2014) includes the rights of customary communities (*masyarakat adat*) to exercise authority over the management of their natural resources (including marine resources) within customary *adat* areas.

The provincial government of West Papua used participatory processes to design their marine spatial plan and ensure governance of coastal, marine, and small islands resources across West Papua (following MMAF regulation no. 23/PerMen-KP/2016 for technical guidance). The provincial government recognized the ethnic tribes' dependence on their marine and coastal resources for livelihoods and subsistence and their rights to utilize their resources without permits.

The MSP process began with establishing a West Papua provincial task force, formalized by a governor decree (*Surat Keputusan Gubernor*—SK Gub), consisting of officials from provincial governmental agencies, NGOs, academia, and related ministries at the national level. The task force led the process of integrating areas with exclusive customary rights into the marine spatial plan through a series of steps:

(1) Identifying issues and conflicts over customary area delineations through a local participatory mapping process

(2) Linking indigenous knowledge, modern science, and policy

(3) Integrating knowledge systems through negotiations with local indigenous groups.

(4) Agreeing on decisions about spatial allocations and associated attributes of customary rights (For example, the negotiation process came to fruition when customary representatives agreed that the recognition of their area should be consistent with the existing law and that the owner of customary rights should endorse any investment program.)

(5) Translating the rights and obligations of customary communities into narrative policy (This representation in the legal narrative was an essential step, resulting in 16 different allocations to benefit customary communities recognized during the MSP process.)

(6) Legalizing the process in the provincial house of representatives, where the recognition of customary rights in the provincial MSP regulation gained strong support from parliament members and ultimately resulted in legal recognition of community areas under customary management (PerDa no. 13/2019).

> "The community — through *adat* leaders, women, tribal leaders, and village heads — hopes that this project will help us to improve living standards in the future. Because marine resources are a necessity for us, our children and our grandchildren; we need to understand how to protect the coastal environment."
>
> IMEKKO COMMUNITY *ADAT* DECLARATION 2018

The resultant marine spatial plan gave local coastal Papuans exclusive rights to utilize their customary areas up to 12 nm from the coastline without permits, except areas where management initiatives exist under other government regulations. Local customary communities were given the authority to endorse any commercial activities proposed by private enterprises within their customary areas, with community permission required before proposals can be submitted to the provincial authority.

This case study highlights the possibility of recognizing customary rights and community custodianship in provincial planning under existing legal frameworks. The process requires strong engagement with customary leaders and time to build relationships. Marine spatial planners need to factor in the time required to undertake this work effectively and recognize the importance of showing respect to communities at each stage of the process to avoid and resolve conflicts and promote buy-in, support, and future compliance with the proposed plan.

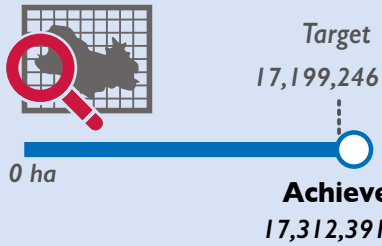
Ceremony to celebrate an *adat* declaration for conservation of the Imekko area through *sasi* in South Sorong, West Papua, in August 2018. Photo: USAID SEA/Ugi Sugiarto

MSP ACHIEVEMENTS AGAINST INDICATORS

The success of the MSP workstream under the USAID SEA Project was measured by one indicator relating to the overall number of hectares of MSP in each province. The USAID SEA Project effectively achieved (and slightly surpassed) its target.*

MSP Target and Result

The number of hectares of biological significance and/or natural resources under improved natural resource management applying MSP.



* This metric was based on the overall area of provincial waters designated through marine spatial planning, as follows:

North Maluku MSP = 7,942,405 ha

Maluku MSP = 2,093,933 ha

West Papua MSP = 7,276,052 ha

TOTAL combined = 17,312,391 ha

Community-based Surveillance Group (Pokmawas) Leawana Squad, on patrol in Koon Marine Protected Area (MPA), East Seram, Maluku. Photo: USAID SEA/Farhan Ramadhani

04

Promoting law enforcement

> "The meaning of marine and fisheries law enforcement held by MMAF is broader than reward and penal punishment. It also includes a compliance aspect, namely efforts to improve awareness of regulations and normalizing the sustainable management of marine and fisheries resources."
>
> IR. M. EKO RUDIANTO, M.BUS.IT.
> Director of Surveillance for Maritime Resources Management

The impact and success of marine and coastal management systems (such as EAFM, MPAs, and MSP) rely upon resource users and broader society complying with the incumbent restrictions and regulations. Marine and coastal law enforcement in Indonesia is hampered by a lack of resources and capacity, complex policy, and numerous agencies with intersecting responsibilities and multiple roles to play. The different Indonesian cultures also complicate enforcement as confrontation is typically frowned upon, especially within communities. Law enforcement agencies generally consider fisheries and environmental violations as a lower priority than other legal offenses.

There are generally two approaches to law enforcement:

(1) hard enforcement of existing laws, including arrests, citations, penalties, etc. (applied mostly to priority cases such as dynamite fishing or other similarly destructive illegal fishing activities)

(2) soft, or 'low key', enforcement (applied in most situations to promote prevention and compliance through education, use of incentives, community outreach, etc.)

The USAID SEA Project worked at a range of scales across both of these approaches.

Nationally, efforts focused on supporting the adoption and rollout of the Port State Measures Agreement (PSMA), a binding international agreement to target, deter, and eliminate IUU fishing by preventing IUU vessels from using ports for landing their catches (ratified by Indonesia in 2016). Frameworks were also designed to promote, empower, and train volunteers through community surveillance groups (*kelompok masyarakat pengawas*—pokmaswas) and community-based surveillance systems (*sistem pengawasan berbasis masyarakat*—siswasmas).

At the provincial level, the USAID SEA Project supported communities to establish 38 new pokmaswas and strengthen pokmaswas capacity throughout the three priority provinces. Tailored support for groups included leveraging operational material and funding and providing training to community members in surveillance monitoring, evidence gathering, and reporting. Partnerships were developed across sites among these community groups and local police, law enforcement officers, and district and provincial judiciary to improve cooperation. Community-based surveillance activities have led to the successful reporting of infractions and arrests at several sites.

Due to the threat posed by destructive fishing to fisheries, biodiversity conservation, and sustainable livelihoods, the USAID SEA Project also developed provincial action plans to alleviate destructive fishing practices. Lessons learned from these provincial plans were shared at the national level to guide and inform other provinces across the nation to address this pervasive threat to Indonesia's marine and coastal environment.

KEY LESSONS LEARNED FROM LAW ENFORCEMENT WORK

- Effective law enforcement is a critical piece of achieving good fisheries and MPA governance. The USAID SEA Project made remarkable strides in strengthening law enforcement in its focus provinces in FMA 715 through synergy building between all relevant actors. But there remain both a need and opportunity to use the Project's lessons learned to enhance the policy and enabling environment for marine and coastal law enforcement, not only in FMA 715 but across Indonesia.
- Marine and coastal law enforcement in Indonesia is hampered by a lack of resources and capacity, complex policy frameworks, numerous agencies having intersecting responsibilities, and the enforcement agencies' generally low-priority recognition of the urgency of combating fisheries crimes.
- In the development of new policies or local regulations that impact resource use, stakeholder ownership and compliance can be fostered through engagement between policymakers and their constituents, and early community involvement in policy discussions. Policies and regulations that incorporate local contexts and take into account fishing communities' need for viable livelihood alternatives are likely to get local buy-in, and are pragmatic and more self-enforceable.
- Trust, engagement, and local leadership from the community, local and provincial government, and civil society organizations are key to success in policy and law implementation. When tied to MPAs and fisheries management interventions, community engagement through local institutions and the establishment of groups like pokmaswas can be instrumental in ensuring enforcement and compliance.
- The effectiveness of Indonesia's localized enforcement systems relies on district and community involvement, which requires delegating authority from the provincial government to district fisheries agencies, integrating the siswasmas into village governance, and ensuring all parties have access to resources for long-term enforcement through regular allocations.
- Enforcement work requires interventions across the law enforcement continuum and through to working with judiciary and national policy makers. To have any meaningful impact, the effort to address illegal fishing must be a collaborative and integrated undertaking across multiple agencies at all levels of government, and between government and all those working in or dependent on the marine sector.

The next pages provide two case studies that exemplify some of these lessons.

Law Enforcement Case Studies

Alleviating destructive fishing at the provincial level

By: Christiana Yuni Kusmiati

Destructive fishing (DF) is recognized as a considerable threat to fisheries resource management in the FMA 715 Fisheries Management Plan, which guided the technical assistance provided to the MMAF by the USAID SEA Project. An initial assessment of DF in FMA 715—carried out by the USAID SEA Project with partner provinces Maluku, North Maluku, and West Papua and the MMAF Directorate General of Marine and Fisheries Resources Surveillance (*Direkturat Jenderal Pengawasan Sumberdaya Kelautan dan Perikanan*—PSDKP)—identified 120 areas prone to DF practices across the region. Given the risk that these illegal practices pose to ecosystem health, fish resources, and fishing communities' welfare, alleviating DF practices was a priority for the Project from 2018 to 2020.

As responsibilities for DF awareness-raising, surveillance, interdiction, investigation, prosecution, and fining are divided among different parties, achieving effective results can be challenging. The USAID SEA Project aimed to achieve three targets that recognized the mutual interest of relevant parties across the provincial and community levels and considered their programs and targets for reducing DF practices (Figure 20):

(1) strengthen synergies among agencies that play an essential role in tackling DF at the provincial level;

(2) provide a guiding tool for all parties to implement DF alleviation efforts systematically, comprehensively, and in an integrated and complementary way; and

(3) build voluntary compliance through raising awareness of the law and the significant impact of DF practices on community livelihoods and fisheries.

These three targets were translated into programmatic interventions to strengthen policy (strategies and collaborative work plans), coordination and communication, detection and monitoring capacity, and data systems.

Using this programmatic design, the USAID SEA Project developed a five-step series of activities in each province.

(1) Undertaking DF assessments at the provincial level (involving the USAID SEA Team, together with members of the Fisheries Crime Handling Coordination Forum [DKP, Water Police, the navy, prosecutors, the judiciary, and PSDKP] in partnership with pokmaswas, local NGOs, and universities). Strengthening coordination between law enforcement agencies and pokmaswas through meetings, training, and the WhatsApp Group platform to increase DF detection systems' effectiveness. Through this facilitation, pokmaswas were able to connect with law enforcement agencies and alleviate DF.

(2) Training 38 pokmaswas and over 300 SEA Champions (change agents) on the detection of fish caught by DF methods, practices, and impacts, and law provisions concerning DF and DF reporting. Part of this work engaged groups of women to recognize fish caught by DF to avoid purchasing them for

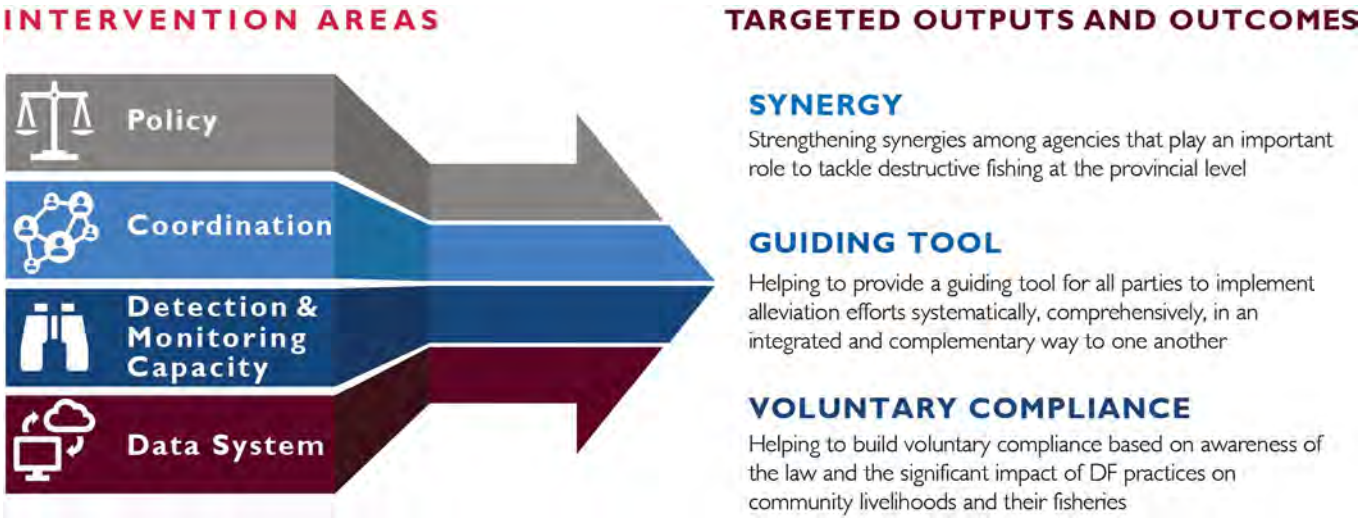


Figure 20. Programmatic design to assist the alleviation of destructive fishing at the provincial level.

household consumption and socializing DF issues to the broader community.

(3) Strengthening community-based monitoring and encouraging efforts to initiate a system for recording and handling DF incidents at the village level by empowering pokmaswas and village officials.

(4) Working at the provincial level to ensure DF alleviation efforts continued as a policy priority, supported by available programs, human resources, and budget allocations. This step involved assisting provincial stakeholders to ensure that DF handling became an indicator in key provincial policies in regional and governor regulations.

As a result of these activities, efforts to tackle DF advanced through several vital achievements.

- DF alleviation was adopted as a key performance indicator in North Maluku's 2020–2024 Regional Medium-Term Development Plan (*Rencana Pembangunan Jangka Menegah Daerah*—RPJMD), which ensures the ongoing availability of programs and budgets and measuring the success of these efforts.
- Governor regulations on 'Provincial Action Plan[s] to Alleviate Destructive Fishing' were initiated in all three provinces.
- A DF Handling Task Force was formed in Maluku Province.
- The revitalized Fisheries Crime Coordination Forum has progressed in North Maluku and West Papua, with a priority focus to alleviate DF.
- The district fisheries agencies, whose involvement in DF alleviation was removed under Law no. 23/2014, were actively involved in alleviating DF.
- Mechanisms to record data on DF incidents at the village level were initiated with pokmaswas' and village officials' support.
- The successful collaboration between pokmaswas and law enforcement officers in the Kayoa area, South Halmahera, North Maluku resulted in the determination of DF penalties for perpetrators.

> "Indonesia's waters cover a vast area, and with limited human resources and facilities to monitor them, it is imperative that we strengthen the resilience of on-the-ground surveillance efforts through siswasmas and pokmaswas. We depend on the community to safeguard our marine environment."
>
> IR. SUHARTA, M.SI.
> Director of Vessel Operation Monitoring, PSDKP

These achievements were attained in part through government and the USAID SEA Project's mutual interest in tackling DF, meaning support for project interventions progressed smoothly. Nationally, DF alleviation became a policy priority and performance indicator for the MMAF and the Water Police, and keen interest was generated at the local level for community involvement in implementation. In addition to this, facilitating a strategic planning approach for integrating DF handling efforts within each institution on a site-by-site basis generated optimism at the provincial level that alleviating DF was a realistic implementation goal. Integrating DF alleviation efforts at the village level and developing alternative livelihood programs for fishers, including former DF actors, was also a critical element of the work. Greater success was seen when the Ministry of Village Empowerment and the Village Community Empowerment Program at the provincial and district/city levels were involved from the outset.

These lessons highlight the importance of integration among various government agencies and government levels to alleviate DF. The involvement of village institutions to foster creative enterprise development and facilitate DF actors is crucial. Fishing communities need viable livelihood alternatives to DF practices that can otherwise be their primary source of income. It is hoped that these lessons can guide parties in combating DF in Indonesia in the future.

Poison fishing is damaging to coral and the marine environment.
Photo: CTI PEW/T Reed

Rebuilding Indonesia's community-based surveillance system

By: Christiana Yuni Kusmiati

In 2014, marine and fisheries resources surveillance in Indonesia underwent a drastic change with the introduction of the Law on Local Government (no. 23/2014), which transferred the responsibility for surveillance functions in coastal waters (up to 12 nm from shore) to provincial governments. This new responsibility created challenges for provincial DKPs, as the increased workload was not supported by commensurate increases in financial resources, personnel, or the infrastructure to perform these functions properly.

While there are regulatory frameworks that ban illegal and DF practices nationwide, there are insufficient resources at all levels of authority to carry out the scale of surveillance and enforcement necessary to mitigate these activities. Unsurprisingly, various threats to marine and fisheries resources have emerged in provincial waters, and the suboptimal performance of surveillance functions has caused considerable concern for the MMAF and provincial DKPs.

In addressing surveillance challenges, the USAID SEA Project targeted both the underperforming systems and the underutilized role of on-site communities with a common interest in improving surveillance outcomes. The Project strived to support systems-based interventions with the MMAF and provincial governments and rebuild the community-based surveillance system (siswasmas). Efforts were designed to provide an effective mechanism for on-site communities to monitor marine and fisheries areas supporting and interconnected with government law enforcement systems. This focus on community-based surveillance is derived from knowing that communities' presence throughout provincial waters is far greater than that achievable by formal law enforcement fleets.

Work to amend the MMAF decree on siswasmas (no. Kep. 58/Men/2001) provided a more straightforward regulatory framework for key stakeholders to operate effectively under the revised jurisdictional authorities. The Project engaged all key stakeholders related to the siswasmas (including representatives who carry out surveillance functions within customary-law frameworks) to conduct an objective review of surveillance practices in the field and identify opportunities at the policy and technical levels to address and integrate into the amended regulation.

For the review's purposes, the siswasmas and its functions were considered one component of the more extensive marine and fisheries law enforcement process and mission. There was consensus among parties that the reinventing of the siswasmas should focus on ensuring that all resource users consciously comply with legal norms in the management and use of marine and fisheries resources, with a view to a reduction in violations over time. Parties also agreed that the community-based surveillance system should protect resources to benefit local livelihoods in coastal communities.

Through the above lens, the review determined the intention of the siswasmas, the required inputs, roles of involved parties, and anticipated participation levels for individuals and groups, including women and youth, and appropriate monitoring and evaluation mechanisms for the system's implementation. The review found three fundamental paradigm changes needed to reinvent the siswasmas.

(1) The siswasmas is not only the domain of the MMAF and provincial DKPs. Other agencies and institutions with a significant role in supporting siswasmas include the Ministry of Village Empowerment and the Community Empowerment Program at the provincial and district levels. At the community level, district fisheries agencies support the facilitation and guidance of siswasmas activities, making them an essential partner for provincial DKPs. Their involvement encompasses improving the capacity and strengthening of the siswasmas, socializing compliance expectations, monitoring pokmaswas activities, and responding to violation reports.

(2) Law no. 23/2014 provides at least two options for provincial governments to engage districts in surveillance functions: (a) delegate authority for surveillance-related functions, programs, and budgetary resources, or (b) develop cooperative agreements with district government's specific targets. These two options enable provincial governments to focus on broader surveillance affairs. In contrast, district governments can support efforts via socialization and training, and through the provision of alternative livelihoods to minimize marine resources pressure and motivate communities to reduce illegal

activities. The first option is generally more appealing as it ensures sufficient human and budgetary resources in the field to strengthen the siswasmas' implementation.

(3) The siswasmas are more implementable and scalable if integrated into the village (or at least subdistrict) governance. This is especially important in the context of provisioning local resources to develop the siswasmas, measure the routine activities and impacts of pokmaswas, and enable economic support for community and village development.

Throughout this work, the USAID SEA Project aimed to ensure that policy recommendations were optimally workable, practical, and realistic. The establishment of 38 new and improved pokmaswas provided a platform for testing the amended siswasmas mechanisms. Training modules were developed to enable pokmaswas to implement agreed siswasmas practices effectively. Training of Trainers (TOT) resulted in a cadre of skilled national and provincial educators to further roll out this capacity-building support.

Despite these achievements, work to rebuild the siswasmas was not without challenges. Meaningful involvement of the full range of stakeholders relevant to the siswasmas—particularly the Ministry of Village Empowerment and the Village Empowerment Program at the provincial and district levels—required significant time investment. Furthermore, concerns were raised that using Village Funds to support pokmaswas would erode volunteerism and lead to the groups' commercialization. However, while newly introduced funding streams still require testing in the field, the belief that a sustainable system requires ongoing resources has been a driving force for parties to pursue this approach. The enactment of a law on village governance (no. 06/2014) has given villages greater security in financing management practices, including protecting local marine and fisheries resources, and this presents a strategic opportunity for the MMAF and provincial DKPs.

The effectiveness of the USAID SEA Project's approach in revitalizing the siswasmas was recognized and appreciated by the MMAF, provincial DKPs, and community groups. In a satisfactory outcome, the updated siswasmas regulation is in the final stages of enactment (at the time of writing), with policy recommendations developed by the Project officially accepted in full by the MMAF through the PSDKP. Ideally, this approach can be adopted across Indonesian coastal villages in the future.

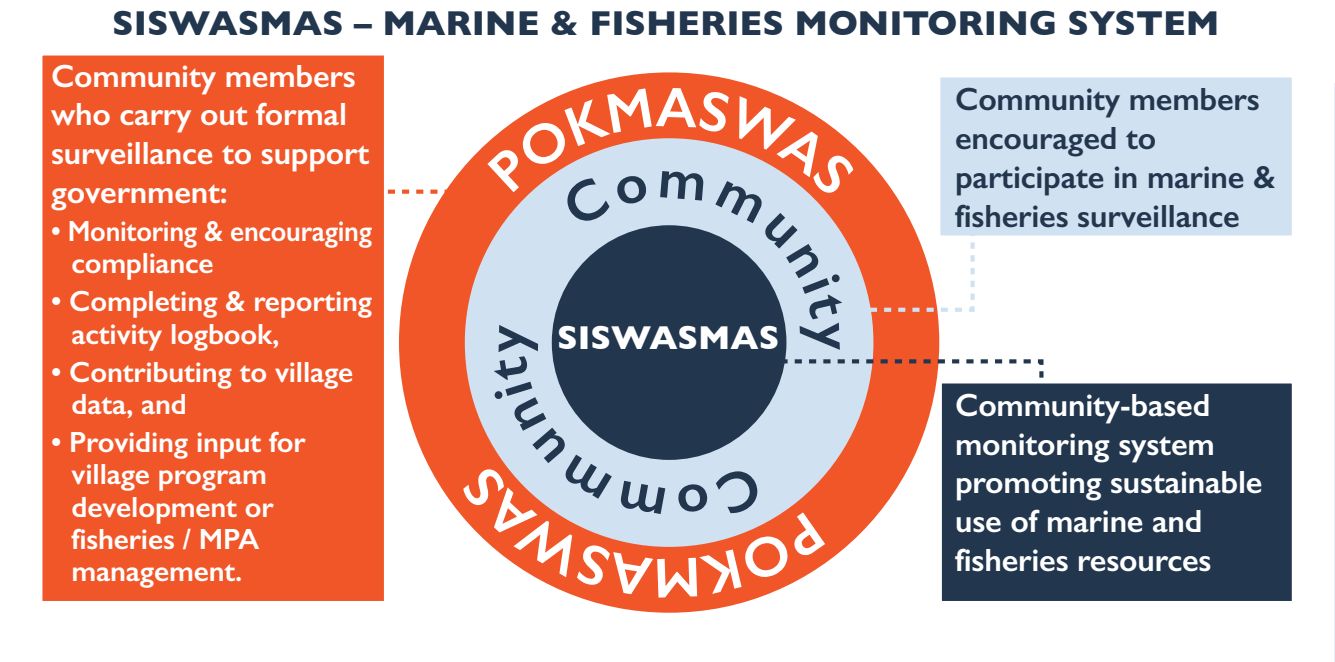
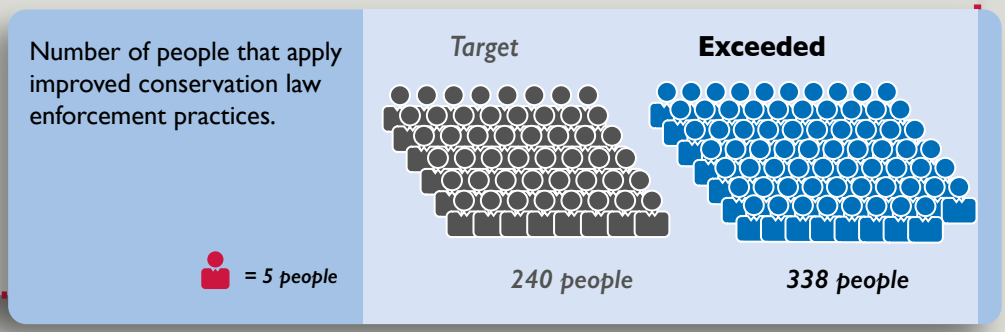


Figure 21. A revitalized model for siswasmas.

LAW ENFORCEMENT ACHIEVEMENTS AGAINST INDICATORS

The success of this workstream under the USAID SEA Project was measured by one indicator relating to the number people showing improved conservation law enforcement practices as a result of the Project. The USAID SEA Project achieved (and surpassed) its target.*

LAW ENFORCEMENT Target and Result



* The **number of people applying improved law enforcement** was calculated based on: (a) pokmaswas members who had proactively participated in patrols and themselves completed the logbook and reporting process (326 people) and (b) port inspectors alumni of the USAID SEA – NOAA training program who went on to prove themselves as initiating inspections and socializing the port state measures requirements to stakeholders (12 people).

USAID SEA Champions performing during the Driving Action for MPA Conservation training in Sorong, West Papua, in October 2019. Photo: USAID SEA/Mochammad Topandi

05

Creating demand through awareness raising and advocacy

Achieving sustainable marine and coastal management requires some level of behavior change amongst resource users; whether that change relates to no longer using destructive fishing gear, or complying with limited zone access in MPAs, it relies on people adapting their behavior accordingly.

Changing behaviors is a slow, transformative process. Therefore, the USAID SEA Project embedded Behavior Change Communication (BCC) techniques across interventions to support accountable and measurable change for sustainability, based on Prochaska's model (Prochaska *et al.*, 1992), as shown in Figure 22.

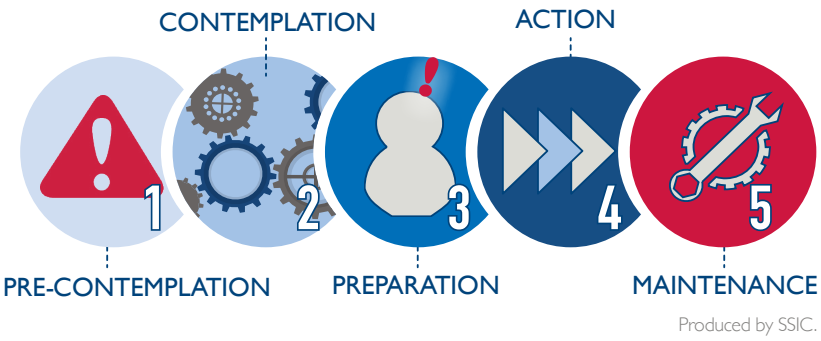


Figure 22. The five stages of behavior change under Prochaska's model.

The BCC work was implemented through two key 'tasks':

Task 1. Changing behaviors to increase demand for conservation and management

Increasing demand for conservation and management required the USAID SEA Project to conduct a range of behavior change activities at their project sites. However, the understanding of BCC techniques and experience in their application varied among partners. Accordingly, the USAID SEA Team developed a capacity-building approach for partners, conducting BCC training and rotating support clinics. The USAID SEA Team also selected four 'model sites' for learning purposes, at which the full BCC cycle (Figure 23) was applied, namely:

- an MPA site—Buano Islands in West Seram, Maluku (with the Coral Triangle Center [CTC] as implementing partner);
- a sustainable fisheries site—Dampier and Mayalibit in West Papua (Rare);
- an ecotourism site—Maregam in North Maluku (Reef Check Foundation Indonesia—RCFI); and
- a community-based surveillance site—Konda and Kokoda in South Sorong, West Papua (WWF).

Coastal communities were targeted across these learning sites, particularly those members of society directly affected by project interventions; and activities at these sites achieved foundational awareness-raising for behavior change on a wide range of topics related to improving marine and coastal management.

In keeping with Prochaska's model, the Project reached at least 50 percent of the target communities total population (supporting the 'contemplation' stage), secured a significant commitment to addressing the issues identified at each site (preparation), and catalyzed community actions, including the development of pokmaswas and other fora for change (action).

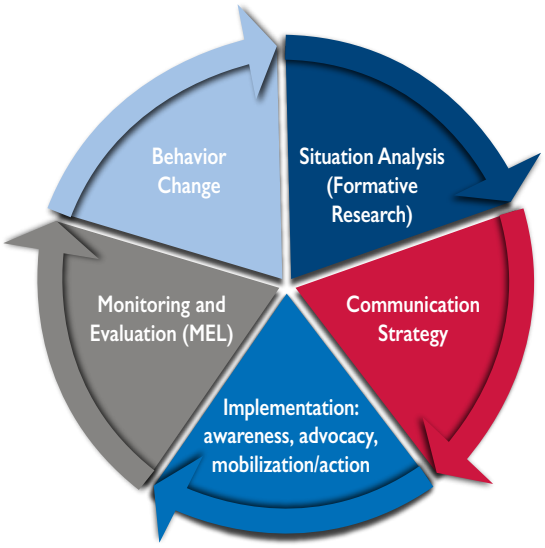


Figure 23. The full behavior change cycle.

Task 2. Building coalitions and champions for change

Champions are influencers and peers within target societies that can galvanize change. The USAID SEA Project developed a 'SEA Champion' program to promote positive change in marine management and fishery practices across Project sites by identifying influential figures from various backgrounds and engaging them as SEA Champions. This coalition of voluntary champions enabled the USAID SEA Project partners to extend their activities into communities and increase their influence for change (Figure 24).

The SEA Champion program was very successful, with a total of 324 SEA Champions engaged across the three focus provinces and an increase in the representation of women as champions, from 2 to 16 percent over the project term.

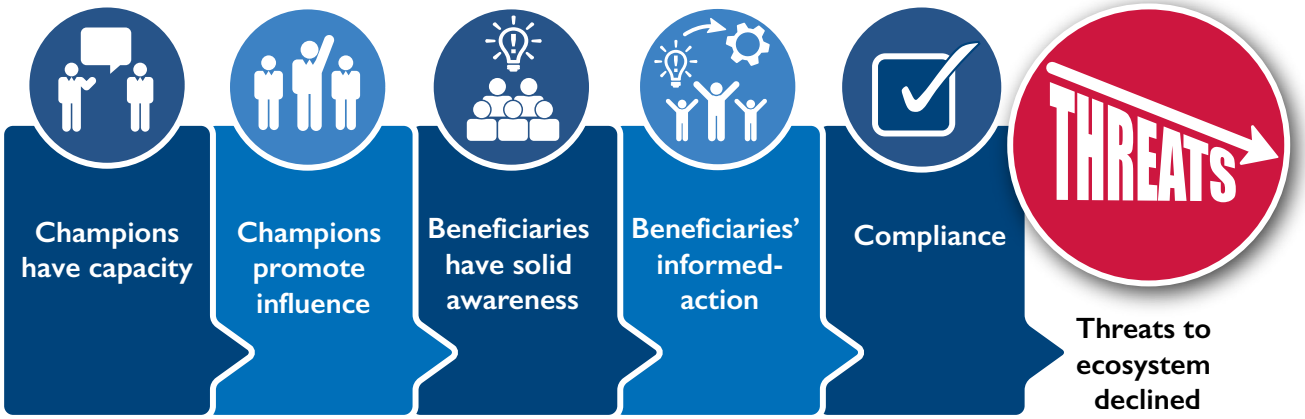


Figure 24. Task 2 Theory of Change of the SEA Champion program.

With support from USAID SEA partner ILLMA, SEA Champion, Florence Tanikwele, educates children about the importance of protecting juvenile fish and how to measure their catch in Nikulukan Village on Seram Island, Maluku. Photo: USAID SEA/Sandra Tjan

KEY LESSONS LEARNED FROM BEHAVIOR CHANGE WORK

- Behavior change takes time, is complicated, and needs to be tied with management interventions while ensuring that incentives for sustaining positive behavior (e.g., increased fish catch, more revenues from tourism) are seen and felt quickly by the community.
- Catalyzing behavior change at scale requires interventions to engage fishers, resource users, their families and the broader community.
- The presence of local champions and community leaders (change agents) from the beginning ensures that behavior change occurs and sustains.
- Training content for champions and communities is optimal when tailored to the local context.
- Opportunities to engage and work with community-led institutions (e.g., siswasmas) can greatly support compliance and enforcement.
- Successful BCC relies heavily on the four intertwined components of: (1) facilitators with social skills that stay or come from local stakeholders, (2) integration within program design, while (3) utilizing peers to accelerate influence of the new behaviors, and (4) promoting wider influence through outreach and by example through influential peers to sustain momentum.
- Behavior change interventions and BCC techniques can accelerate stakeholder engagement and improve the management effectiveness of fisheries and MPA interventions.
- With experienced behavior change specialists, BCC can be adaptable to both the community level and high political levels.
- Building on the initial experiences gained from BCC use in the Project, the approach is increasingly utilized for higher-level change, leading to exciting reforms like promoting regulatory and policy change.

The next pages provide two case studies that exemplify some of these lessons.

Behavior Change Case Studies

Sea Champions: drivers of change

By: Ely Andrianita and Ansel Kaba Kahan

Behavior change programs are most successful where community members are engaged to champion daily interventions and exert influence to advance a campaign for change. To employ this behavior change approach, the USAID SEA Project developed the SEA Champion Program, launched with Project partner CTC in November 2017.

Under the program, the USAID SEA Team and partners identified key individuals from coastal communities to take on voluntary awareness-raising and advocacy roles across project sites in each of the three focus provinces. These SEA Champions, who represented a broad cross-section of society and gender, trained as drivers of change for marine conservation in their communities. Champions included people in influential public roles such as teachers, nurses, village government officials, youths, local leaders (including women), public health officers or fishery extension officers, and those with a commitment for change, from wives to fishers, collectors, and boat captains.

Initially, site-based Project staff (such as live-in community facilitators and fishery enumerators) found that a lack of confidence among local fishers made it challenging to engage them in the SEA Champion Program. In response, the USAID SEA Team delivered coaching clinics with all counterpart staff, leading to partners organizing training for their field staff to enhance their social skills and understanding of mechanisms to utilize local traditions for behavior change. With this assistance, the field staff were then able to successfully scout potential champions.

A complementary training program was designed to build SEA Champions' capacity as agents of change and remove their self-confidence barriers. Recognizing the diversity of participants, the USAID SEA Team created a supportive learning space that allowed everyone to feel welcomed and equal. A 'school' setting was developed for the training sessions, with 'teachers' and a 'principal' (USAID SEA provincial coordinators and technical leads), 'class-mates' (peer champions), and partner field facilitators acting as peer mentors. A code of conduct for champions was delivered to guide participants' attitudes.

> "We learned how to work with village champions, which was extremely effective and important for our work [and]..will be very helpful to our work in the future."
>
> CLIFF MARLESSY
> Country Director, ILLMA

The SEA Champion training proved successful, with 284 champions completing five modules tailored to build participants' essential marine conservation knowledge and increase their capacity as agents of change:

(1) MPA 101

(2) sustainable fisheries practices

(3) ETP species

(4) pokmaswas (community surveillance)

(5) communication techniques, with a focus on public speaking and social media use

Following the completion of the training, SEA Champions were empowered to implement practical actions in their villages. Successful actions resulted in a considerable increase in community awareness around issues relevant to the protection of ETP species; the impacts of DF and overfishing; the hazards of sea littering and mechanisms to deal with waste; systems for community surveillance and incident reporting; marine conservation and MPA zoning; participation in vessel registration; and early exposure to fisher logbooks to document fishery activities.

Several social marketing initiatives were initiated to ensure ownership of local stakeholders. 'SEA Champion' was translated by consensus of program participants to '*Pejuang Laut'*—literally, 'Sea Warrior'—meaning those who guard their marine and fishery resources. SEA Champion t-shirts, pins, hats, and bandannas were produced and popularized to increase the recognition of champions in the community and boost their confidence and sense of camaraderie. Catchy slogans, mottos, and a jingle were created to promote the SEA Champion message through various media, with slogans like "*sustainable sea, abundant fish*" and "*healthy sea, strong fishers, prosperous community*" proving especially trendy.

Some highlights from this initiative included the following.

- Fifteen champions who were particularly committed and conducted behavior change actions consistently and bravely were acknowledged as 'Champions of Champions' (see Figure 25).
- A WhatsApp Group was created to overcome communication difficulties among SEA Champions across project sites and served as a forum for sharing information and providing updates. The USAID SEA Team used this platform to continue capacity building with champions through story writing and telling, poetry, and song composition that conveyed the message of marine conservation. Where possible, local culture was used to improve engagement and awareness.
- The implementing partners engaged government agencies at the site and provincial levels, including MMAF district branches, the Sorong Implementing Unit for Coastal and Marine Management (*Loka Pengelolaan Sumberdaya Pesisir dan Laut*—PSPL), and provincial DKPs. Government stakeholders adopted the behavior change approach and have indicated a willingness to host champions beyond the USAID SEA Project's life and to institutionalize the champion approach through a proposed 'SEA Champion Network.'

The SEA Champion Program also achieved a series of equality wins by equipping partners with gender awareness, engaging resident facilitators, and maneuvering around local patriarchal structures. An effective communication channel was established at a peer level to ensure equal opportunity for all champions to express views and exchange and debate ideas.

Training content was adapted to suit the various skills, backgrounds, and literacy and education levels of participants. Before commencing their SEA Champion training, many participants confessed to not feeling confident about speaking in front of their community, let alone in the broader public sphere. Therefore, the USAID SEA Team focused on building the champions' capacity to implement achievable, practical actions rather than delivering an intensive knowledge-centered program. 'Speaking competence' in public forums is essential in eastern Indonesia, and the adapted training has enabled SEA Champions, with their newfound confidence, to become opinion leaders.

SEA Champions are excellent examples of local leaders who are able to influence others through peer-to-peer interactions. Through them, the SEA Champion Program has shown that ordinary community members can achieve extraordinary influence and be effective advocates for conservation not only in their communities but in the broader Indonesian context. The GOI can build on the program's success by utilizing the SEA Champions' collective knowledge and expertise to advance a culture of marine conservation and sustainable use throughout the country.

Figure 25. SEA Champions of Champions.

Behavior change communication model: tourism in Maregam

By: Ely Andrianita

Building stewardship of the marine and coastal environment through behavior change was an essential element of the success and sustainability of interventions implemented under the USAID SEA Project. Using model learning sites, the Project assessed the effectiveness of the behavior change approach in increasing demand for conservation and management among resource users. At Maregam Village in Mare, North Maluku, the USAID SEA Team and partner RCFI promoted sustainable marine tourism to provide alternative and additional livelihoods for communities dependent on the marine and coastal environment. A full BCC cycle was implemented during the intervention, including situational analysis, communications strategy design and implementation, and monitoring of behavior change success.

The situational analysis took place in 2018 using quantitative and qualitative methods and focus group discussions. The assessment studied the community's understanding of local tourism potential and the sustainability of positive behavior. Results indicated an understanding of Maregam's tourism potential across all respondents (n=33) and a positive attitude towards maintaining this potential into the future. Multiplier pressure points to impact behavior change, such as influential figures, media-use preferences to build communication channels, and gender balance, were analyzed.

However, the research also identified that the common practice of dumping domestic garbage in the sea significantly detracted from Maregam's ecotourism profile. Therefore, the USAID SEA Team and RCFI agreed that the BCC strategy should focus on this behavior. Women were targeted because they are usually responsible for household waste disposal and constituted 70 percent of survey respondents in 2018.

Two barriers to achieving behavior change in local waste management were identified:

(1) a lack of supporting infrastructure (public garbage cans and a designated disposal area); and

(2) low awareness of waste management issues.

Maregam and Galo Galo Communities

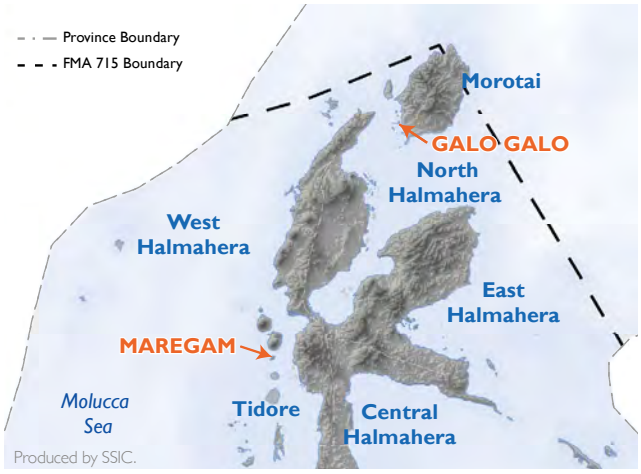


Figure 26. Maregam and Galo Galo villages.

RCFI prioritized capacity building and awareness raising on local waste management to set a benchmark for good local hygiene practice for tourism. RCFI deployed two live-in facilitators to work on building awareness within the community and ran an intensive communications and marketing campaign, producing a series of communication materials, social media postings, and an interactive radio program.

Follow-up survey results in 2019 showed that awareness-raising activities on local waste management were effective. Responses to the BCC survey from 53 individuals (including the original survey cohort) demonstrated:

- the knowledge of tourism potential in Maregam was maintained;
- the entire sampled community was active in beach cleanups (building on the initial near-unanimous agreement on the need for neighborhood cleanliness);
- household waste disposal practices had shifted towards landfill (burying waste rather than dumping waste in the sea) following increased concern about marine litter.

RCFI expanded BCC activities to another tourism project site in Galo Galo, Morotai, North Maluku, with similarly encouraging results. Between 2018 and 2019, the sense of shared responsibility for caring for public infrastructure and facilities (e.g., trash cans, public toilets, etc.) increased from 73 to 100 percent among survey respondents. There was also an increase in the number of Galo Galo respondents who were involved in beach cleanups. These shifts in attitude and practice can be attributed to the RCFI campaign and advocacy activities.

Across the Maregam and Galo Galo sites, RCFI triggered behavior change in 106 people, in four key areas:

(1) improved commitment to the provision and maintenance of public facilities

(2) reduced dumping of garbage in the sea

(3) increased involvement in beach cleanups

(4) improved perceptions of the higher standard of public facilities as a result of the RCFI campaign

Two keys aspects led to the success of RCFI's BCC approach in Maregam.

- Employing live-in facilitators who developed a strong bond with the local community was vital to the campaign success, and was praised by the Village Head who welcomed the RCFI intervention in the village and was receptive to their inputs.

- RCFI's intensive social marketing and communications significantly increased the number of people exposed to USAID SEA Project messaging and demonstrated successful influence over perceived knowledge in the early stages of the BCC campaign.

The greatest challenge in this BCC model was the short time frame of implementation. RCFI successfully effected behavior change, but the intervention would have had broader influence if it was implemented over a longer period of time. Expanding the program could influence change at the administrative levels, e.g., fund a village garbage disposal site, involve neighboring communities, or link to the regional waste bank in Ternate.

Placing behavior change at the core of a project ensures it is focused on the beneficiaries affected by interventions, giving a high likelihood of changing behaviors sustainably. For sustainable marine tourism projects, a BCC approach provides an opportunity to build eco-awareness and maintain eco-friendly attitudes and behavior to support conservation aims. In the case of Maregam and Galo Galo, RCFI made an outstanding contribution with their commitment to implement the BCC model and demonstrate successful behavior change resulting from Project activities.

Figure 27. RCFI supported Maregam and Galo Galo communities to establish tourism codes of conduct and produce educational materials for tour operators in the region to to promote sustainable nature-based tourism.

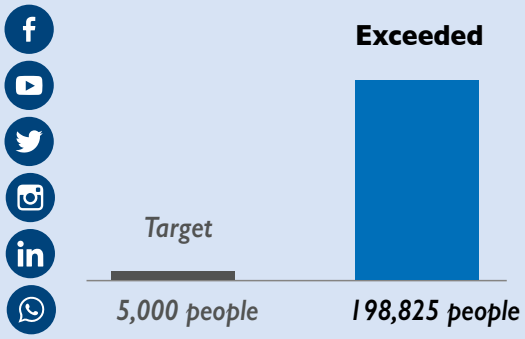
BEHAVIOR CHANGE ACHIEVEMENTS AGAINST INDICATORS

The success of the behavior change workstream was measured through one indicator with four benchmarks. Nearly all of the targets for behavior change were achieved or went beyond expectation.*

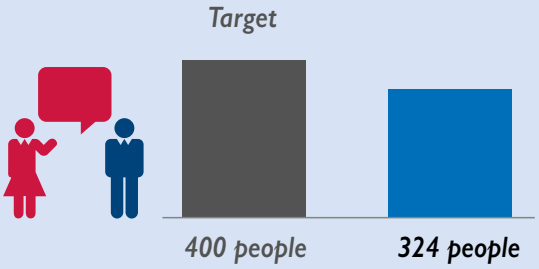
BEHAVIOR CHANGE Targets and Results

Number of people demonstrating behaviors that contribute to biodiversity conservation.

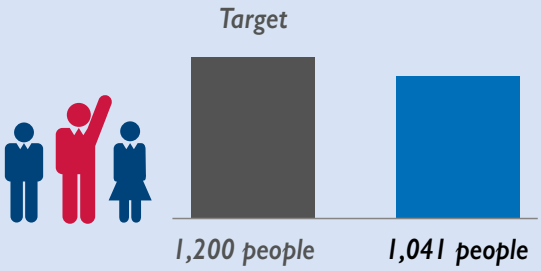
Number of people exposed to USAID SEA Project messages through communication and media outreach.



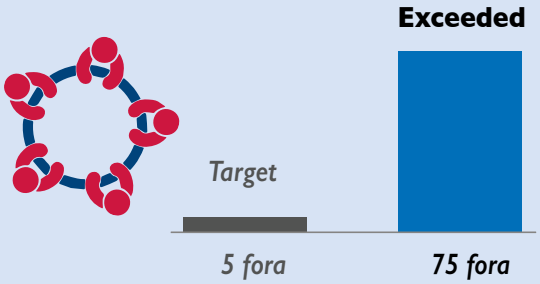
Number of champions that have the capacity to deliver USAID SEA Project messages.



Number of people influenced by champions.



Number of fora established and functional.



SEA Champion, Nus Siahay, sharing his success story about helping nearly 200 fishers obtain their vessel licenses during the USAID SEA Project Close Out Ceremony in Ambon, Maluku. Photo: USAID SEA/Mochammad Topandi

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* The **number of people demonstrating behavior change** was calculated by combining the number of champions with the number of people influenced by champions, and adding the results of a separate behavior change survey (conducted in North Maluku) showing progress of people through the behavior change stages (pre-contemplation, contemplation, preparation, action, maintenance).

The **number of people exposed to the USAID SEA Project's messages** was calculated based on a range of factors. People addressed or given materials directly were counted individually, and the proportion of communities reached by awareness-raising materials was estimated based on the positioning and location of those materials. For collaterals disseminated through various media (online, radio etc.), exposure measures were based on average readership/listeners/viewers of the media channel. All data was reported with associated evidence to support calculations.

Champions were recruited from across the three provinces: North Maluku 79 (13 percent women); Maluku 130 (23 percent women); and West Papua 115 (10 percent women).

The **number of people influenced by champions** was calculated based on a range of evidentiary documentation and testimonials gathered through the life of the Project, including the number of individuals signing agreements or proactively joining action-oriented endeavors as a result of the influence of champions.

The **75 fora** included: 38 pokmaswas, 16 fishers' associations, 2 fisheries committees, 10 technical working groups, 5 community tourism groups, 2 traditional (*adat*) groups and 2 SKKNI capacity-building groups.

Declaration ceremony for the Mayalibit Bay Customary Fisheries Area in West Papua, a form of territorial user rights for fisheries supported by the USAID SEA Project and partner Rare. Photo: USAID SEA/Rare Team

06

Increasing incentives for marine stewardship

Offering incentives for change can encourage marine and coastal resource users to adopt new practices, change behaviors, or comply with new regulations. The USAID SEA Project focused on three main pathways to incentivize change.

Pathway 1: Developing markets for sustainable fisheries through certification programs

Sustainable fisheries are a growing market, and certification programs for sustainable fisheries can benefit fishers in the form of improved prices for their yields and secure trading opportunities. In return, fishers are expected to comply with various environmental and social standards in their work. The USAID SEA Project established Fair Trade certification schemes in its North Maluku and Maluku project sites with 16 fishers' associations, and developed two Fishery Improvement Projects for future Marine Stewardship Council certification in West Papua.

Pathway 2: Promoting and developing sustainable marine tourism and alternative livelihood opportunities

A range of activities were undertaken across Project sites in support of this pathway:

- Carrying capacity assessments were conducted for marine tourism in MPAs to ensure visitor numbers can be appropriately managed and limited to avoid detrimental impacts on the environment (Morotai, Sawai, and Koon-Neiden).
- Public-private partnerships (PPP) were established to engage tourism enterprises and operators in marine and coastal management activities and support their operations to become sustainable (with hoteliers in Sawai and Widi, dive operators in Morotai, Lease, and Ambon, and the Indonesia Liveaboard Association).
- Communities were supported to establish sustainable tourism enterprises (and community tourism groups) to optimize income-generating opportunities linked with preserving the natural environment (in Mare, Morotai, and Lease).
- Business prospect analyses were undertaken using an economic rate of return model to identify optimal opportunities for intertwining local revenue generation with sustainable marine and coastal management (Morotai, North Maluku).
- Alternative local livelihoods were supported through nature tourism, soap production, and fishery offcuts product development (in Morotai, Mare, and Raja Ampat).
- A range of support resources were provided, including 'A Practical Handbook' for implementing sustainable tourism in and around MPAs, and a collation of case studies on private sector contributions to MPA management in Indonesia.

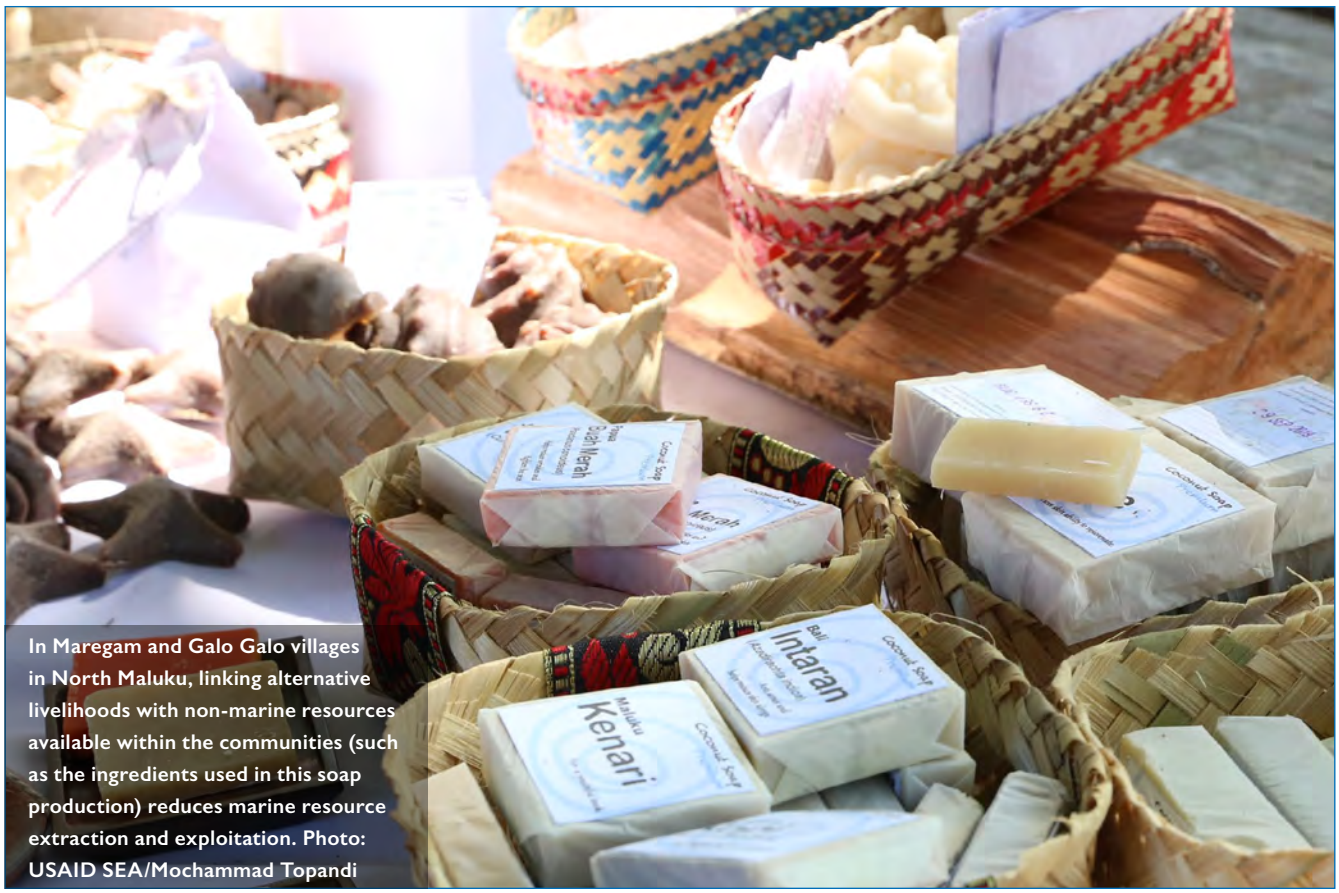
Pathway 3: Promoting preferential, managed, and secure access to marine resources

Work under this pathway was implemented through three mechanisms:

(1) Establishment of 24 locally managed marine areas (LMMAs) in Central Maluku and West Seram (Maluku), covering a combined area of more than 98,000 ha and securing preferential access to fishing grounds for communities with a combined population of 19,398 people

(2) Declaration of 36 customary fisheries areas in Mayalibit Bay and Dampier Strait (Raja Ampat, West Papua) as a form of territorial user rights for fisheries (TURFs), with a combined area of 261,156 ha providing secure tenure for 7,993 people from the region

(3) Preliminary design and development of a traditional community-based fisheries management area in Bintuni Bay (West Papua) securing 66,921 ha of waters for five communities from three subdistricts in the region



In Maregam and Galo Galo villages in North Maluku, linking alternative livelihoods with non-marine resources available within the communities (such as the ingredients used in this soap production) reduces marine resource extraction and exploitation. Photo: USAID SEA/Mochammad Topandi

Fishing boats in Bintuni Bay. Photo: USAID SEA/Inayah

KEY LESSONS LEARNED FROM INCENTIVES WORK

- Traditional marine management approaches tend to focus on disincentives (e.g., arrests, seizures, prosecutions, penalties, and fines); these remain necessary for severe crimes but tend not to work for fisheries and environmental infractions that require wide spread compliance.
- Strategic use of positive economic incentives (e.g., tourism, Fair Trade premiums) can support local uptake of MPA and fishery management measures.
- Incentives were most successful when affected resource users were consulted well before management measures were introduced.
- Market challenges can affect income-related incentives, and mechanisms need to be established for mitigating such challenges in programmatic design.
- Engagement and collaboration should be pursued with government agencies whose functions are external to, but can support, fisheries and environmental health through cross-sectoral incentives and solutions (e.g., access to livelihood resources, jobs, and income from tourism).
- Recognition of positive actors, enforcers, and local champions is a significant positive incentive that helps create a network of supportive actors.
- Local cultural and stakeholder context is para-mount, as is being flexible with incentive interventions.
- PPPs can be a useful tool at the right time and in the right place; it is not a universal tool that works in every situation.
- Tourism development is a sound approach that works well with resource management, but it requires the considerable engagement of stakeholders, and it is vulnerable to externalities that cannot be mitigated at the local level (such as Covid-19).
- Choice of who leads the different stakeholders' engagement is vital; establishing trust and rapport with the communities first before embarking on interventions is very important. Implementing incentive mechanisms requires a reasonably long planning and engagement process to ensure the right fit interventions are trusted by local adopters.

The next pages provide three case studies that exemplify some of these lessons.

Marine Stewardship Incentives Case Studies

Creating incentives for sustainable fisheries management through market demand

By: Karen Villeda, Nilam Ratna and Tiene Gunawan

In business, demand drives supply. Unfortunately, the current level of demand for marine products is driving declining fish stocks (from overfishing, destructive fishing, IUU fishing, and a lack of enforcement), as well as poor handling practices that lead to low pricing. Creating market demand that drives sustainable fishery practices and provides tangible economic benefits for local fishing communities is one of the critical pathways to incentivizing marine stewardship and improved fisheries management.

In 2013, MDPI, a local NGO, began working with small-scale handline tuna fishers in Ambon and Buru (Maluku) to encourage Fair Trade capture fisheries standards (from the United States). Adopting these standards aimed to strengthen market access, reduce price volatility, and increase fishers' bargaining power. The Fair Trade standards also enable more significant equity in value chains and ensure the export benefits are spread among producers. MDPI's work was, therefore, a natural match for the USAID SEA Project's objective of increasing incentives for marine stewardship.

With support from the USAID SEA Project, MDPI expanded their work across Maluku (North Seram) and North Maluku (Bisa, Ternate, North Halmahera, and Sula) and linked with trade partners Anova, PT Harta Samudra, and PT Blue Ocean Grace International to increase the number of locations supplying Fair Trade fish. These locations were targeted for their importance in the yellowfin tuna (*Thunnus albacares*) fishery. For many coastal communities in the region, tuna fishing is one of the few economic opportunities available and a significant income source. By introducing the Fair Trade standards, fishers were allowed to incorporate the core elements of Fair Trade into their fishing practices while receiving support to commercialize their product further.

To avail of Fair Trade, fishers were required to form at least one democratic fishers' association (or belong to an established legal cooperative). Association members coordinate their responsibilities for resource management, vessel safety, and trade relationships with buyers. Every kilogram of product sold on Fair Trade terms attracts a Fair Trade Premium, paid (over and above trading price) by the local processor. This premium is paid directly into an account managed by a Fair Trade Committee, comprised of elected individuals from the relevant fishers' associations in the region, and is to be spent following a plan collaboratively developed by the fishers. At least 30 percent of the premium funds are earmarked for environmental projects contributing to the fishery and marine ecosystem's sustainability.

Fishers participating in the program must be willing to adhere to the Fair Trade standards and receive training on implementing these sustainability requirements, including ensuring products' traceability for transparency compliance. MDPI provided support for establishing the associations and committees, planning for premium fund usage, and implementing the required catch management systems and financial plans.

Overall, MDPI's Fair Trade program's expansion to new sites under the USAID SEA Project was successful, connecting over 400 fishers and establishing 16 Fair Trade associations. Fishers were empowered and provided with access to premium funds directed towards local community and fisher priorities. The fishers also benefited from a platform to regularly share and exchange information, assess community needs, and communicate with their contemporaries. Consequently, fishers were better engaged in the broader community and political issues, such as education and women's involvement in the decision-making process.

Figure 28 provides an overview of the benefits of Fair Trade standards and premium fund initiatives for fishers.

> "At the Fair Trade training we were introduced to practical tips on how to maintain fish quality. As our fish quality is better, the price is higher. In the past tuna was sold 49,000 IDR/kg. Now we could get 55,000 IDR/kg."
>
> SARNO LAJIWA
> Tuna fisher, Madapolo village, South Halmahera, North Maluku

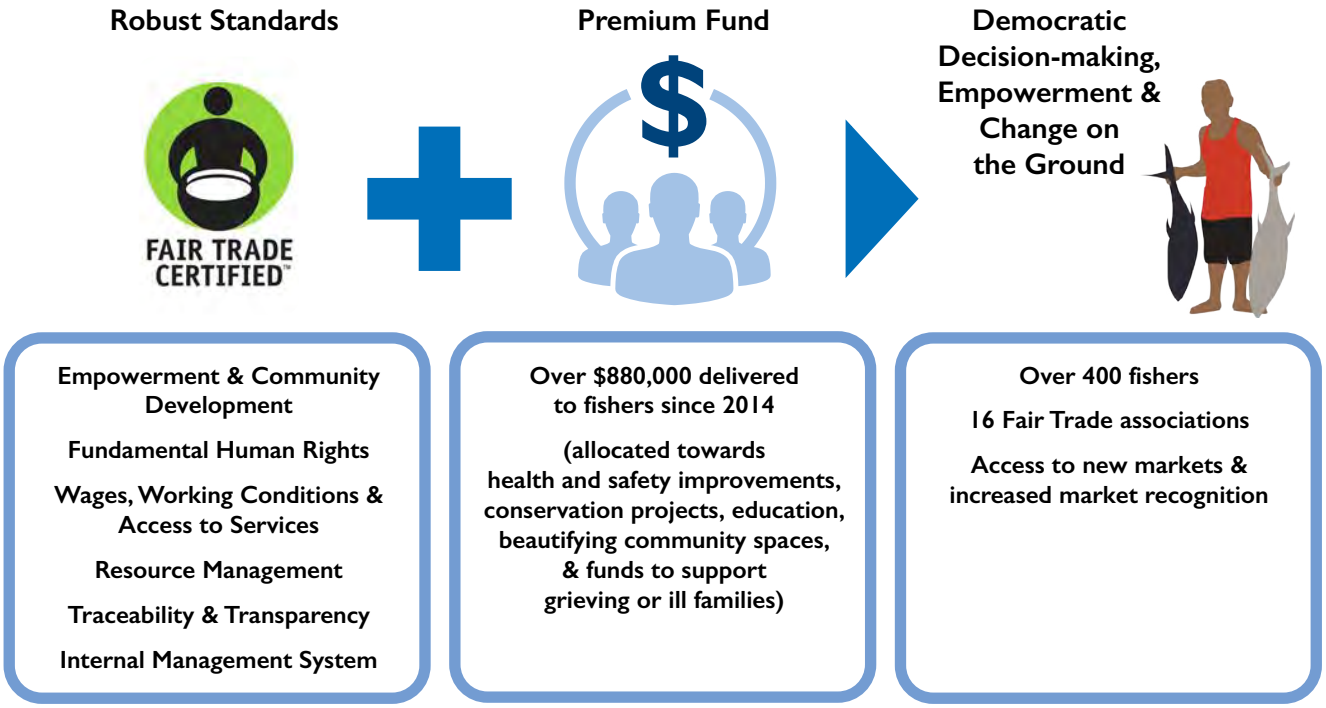


Figure 28. An overview of Fair Trade standards and premium fund promoting sustainable fisheries.

Critical lessons learned through the work to incentivize sustainable fisheries management include the following.

- **The importance of contextualized knowledge.** The success of expanding this Fair Trade initiative within the Project's time limitations was, in part, due to MDPI's strong existing relationships in and deep contextualized understanding of the region. In addition to experience in implementing Fair Trade initiatives, MDPI was familiar with the sites selected for expansion and had relationships with local fishers and an understanding of their supply chain. MDPI embedded its staff within the beneficiary communities, emphasizing building strong relationships with the fishers and their families. Implementation of the Fair Trade standards required extensive on-the-ground expertise and a network of trained community organizers capable to translate theory into practices that could be replicated across multiple islands and communities.

- **The importance of local champions.** MDPI supported select fishers to become SEA Champions for marine sustainability and fisheries management within their communities. Selected champions were motivated individuals interested in linking sustainability with general improvement and development in their communities. These champions facilitated the transfer of knowledge from fishers to the broader community and strengthened understanding of the stepwise approach to implementing Fair Trade activities. Champions were essential to the Fair Trade expansion and provided a promising opportunity for the continuation of efforts to improve sustainability and fisheries management.

- **The challenge of uncontrollable market forces.** The longevity and sustainability of the Fair Trade model are directly linked to continued market demand for socially responsible seafood. In mid-2019, the initiative faced significant challenges due to a decline in demand in the U.S., which was (and remains) the sole market for the Maluku and North Maluku Fair Trade-certified yellowfin tuna products. This decline in demand was caused by several factors, including the recent association of the Fair Trade brand with seafood (consumers are more familiar with other Fair Trade products); the increased availability of yellowfin tuna from other sources in 2019; and the uncompetitive consumer price of certified versus non-certified tuna. It led industry partner Anova (and its counterparts) to reduce their purchase of Fair Trade tuna. This challenge shows that Fair Trade certification is a valuable tool for sustainability where market demand holds, but that it cannot be solely relied upon to drive sustainability. Fair Trade initiatives need to be complemented by broader support efforts to offset the risk of market volatility.

TraceTales uses QR codes to collect and manage supply chain data including Fair Trade fisher sources. Piloted by USAID SEA Project and partner MDPI, it has been adopted by several processors in Maluku and North Maluku. Photo: USAID SEA/Mohammad Syifa

Small-scale public-private partnerships to strengthen sustainable tourism as a revenue stream for managing MPAs

By: Deborah Aragao and Tiene Gunawan

Following establishment, MPAs require extensive funding and resources to cover operational costs, such as staffing for patrols and monitoring, and the provision of assets (e.g., boats), to enable these activities. Often, governments are unable to fulfill these funding or resource requirements for MPAs. Therefore, MPAs need alternative revenue streams and opportunities to complement government support.

MPAs are attractive tourist destinations because of their biological importance and natural underwater beauty. This tourism appeal presents opportunities for site-based private sector support and offers a potential long-term revenue stream. Public sector agencies working on MPA establishment and implementation, local entrepreneurs, and others can support the initiation of tourism services. Therefore, PPPs centered on tourism services are essential to catalyzing support for MPA operations and management activities.

PPPs can involve stakeholders from the national and local levels structured towards specific objectives. The USAID SEA Project tested a variety of PPP strategies in three locations. At each location, localized strategies were developed considering the nascent nature of tourism and particular objectives supporting a broader sustainable tourism strategy.

These partnerships were intended to install and maintain critical sustainable tourism infrastructure and create direct income streams for local communities to build respect for the recently established MPA zones by attaching a monetary value to conservation. The success of these strategies varied and was influenced by several factors: time, local idiosyncrasies, and the level of 'readiness' for tourism within the MPAs.

TABLE 7. PILOT PPP STRATEGIES IMPLEMENTED THROUGH THE USAID SEA PROJECT

LOCATION			PPP – PARTNERS	PPP – AIM
NORTH MALUKU	**Morotai**	Within the MPA, 'Rao Island-Tanjung Dehegila Marine Conservation Area and surrounding waters' *(Kawasan Konservasi Perairan Pulau Rao-Tanjung Dehegila dan Perairan Sekitarnya)*	Local dive centers, the local MPA management unit, and the District DKP office.	To maintain mooring buoys within Morotai MPA.
MALUKU	**Widi**	Within the MPA, 'Widi Islands Marine Conservation Area' *(Kawasan Konservasi di Perairan Kepulauan Widi)*	A foreign-invested entrepreneurial business (PT. Leadership Islands Indonesia), local communities, and the District DKP office.	To establish patrolling and surveillance monitoring within the Widi MPA.
	Nusa Laut	Part of the MPA, 'Lease Islands Marine Conservation Area' *(Kawasan Konservasi di Perairan Kepulauan Lease)*	Seven villages and the Indonesia Liveaboard Association	To offer local village tours and establish mooring buoys within the Lease MPA in Nusa Laut.

- **Time.** The Project's limited duration was one of the biggest challenges in developing PPPs primarily because MPAs were a new concept in most Project locations. Successful legal establishment of MPAs requires significant time and energy to familiarize the government, local communities, and entrepreneurs with basic MPA concepts and gain their trust and buy-in. Efforts to assess the viability of PPPs began early in the Project. However, the initiative had little traction until important stakeholders' trust, buy-in, and cooperation were established.

- **Local dynamics.** Each of the three locations where the USAID SEA Project established PPPs had local idiosyncrasies that directly impacted the involved parties' speed and engagement. In Morotai, a new local regent with ambitious economic development goals limited the resources devoted to strategies that did not demonstrate potentially large economic gains in the short term. In Nusa Laut, a history of non-collaboration among different villages hindered developing an island-wide strategy that would benefit multiple villages. In Widi, the nature of the entrepreneur made negotiations with external parties strenuous. These localized conditions required the initial PPP strategies to be adapted and, in some cases, reduced the PPPs' potential scope.

- **Tourism readiness.** Similar to much of Eastern Indonesia, tourism services and infrastructure were poorly developed in the three testing locations. As budding tourism destinations—with recently declared MPAs— these locations also lacked entrepreneurs or tourism services poised for partnerships and required further product development to foster PPPs.

In the USAID SEA Project's three testing locations, the nature of the PPP matched a minimum requirement to instigate some tangible, sustainable tourism activities. Small but crucial investments for mooring buoys to prevent coral damage from anchors can promote communities' trust and buy-in, and open up opportunities for community tourism enterprises, such as local land tours. Designed effectively, such actions can leverage additional (and potentially larger) investments in sustainable tourism in an MPA, and open the opportunity of an entrance fee for visitors to generate revenue that contributes to MPA operations.

This potential value of sustainable tourism to provide a proportion of revenue support for MPAs is dependent on careful consideration of local arrangements with public and private sectors. PPPs must be calibrated to the site's conditions and enabling environment. Preconditions to successful PPPs at MPAs in eastern Indonesia include a compatible local stakeholder culture and a community's ability to work effectively with external entities and to accept some level of change. PPPs can be a vital element of a carefully executed and cohesive sustainable tourism strategy and offer the possibility to reap substantial economic support for MPAs.

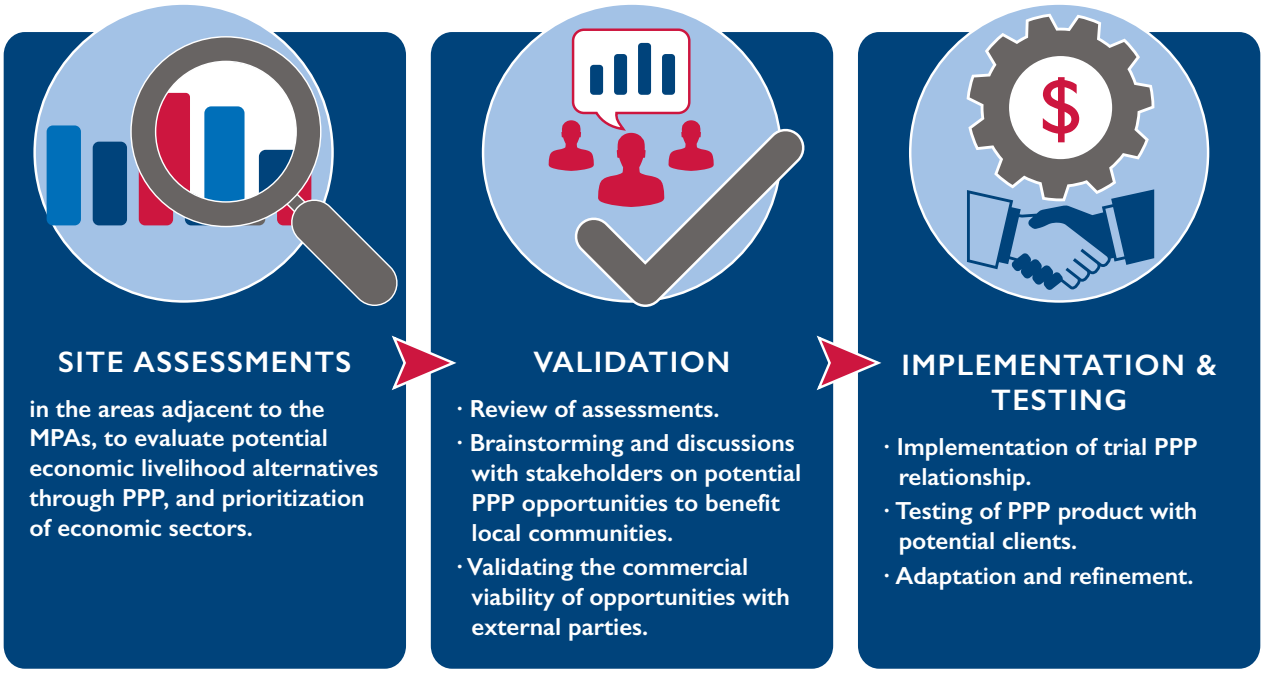


Figure 29. The processes followed in developing public-private partnerships.

The Hatunuru community was among the first villages in West Seram, Maluku, to establish a no-take zone in their traditional marine waters through *sasi* declaration. Photo: USAID SEA/Sandra Tjan

Facilitating community involvement in marine resource management: locally managed marine areas

By: Tiene Gunawan and Sandra Tjan

Around the world, conservation and fisheries management approaches promoted at the global or national levels often have little impact at the local level due to a lack of involvement by local communities in decision-making processes. This constitutes a significant failing of marine and fisheries resource management, as local communities have repeatedly been proven to be the best stewards of their natural resources because of their proximity and direct relationship with the natural environment.

Providing local communities with privileged resource access and rights over local resource use can be an effective incentive for them to proactively manage their resources. In marine and coastal environments, this incentive is intertwined with the inherent value of local marine resources for people's food security and livelihoods, and the importance of preserving the ecosystem services for sustainable utilization.

In eastern Indonesia, some of the world's most biologically diverse marine ecosystems are utilized for fishing by hundreds of thousands of local people as a primary source of subsistence and livelihoods. Fortunately, the coral reefs, other marine habitats, and fisheries in this area are relatively healthy (compared to many other areas in Southeast Asia and the Pacific). Local communities in Indonesia have customary and traditional systems and practices for managing natural resources that can be useful management tools—such as *sasi*, based on community agreement.

> "Working with SEA we were able to expand community-based fisheries conservation to a new area of Indonesia and also gain capacity and knowledge on how to work effectively with village champions and how to manage monitoring data. This expansion and the lessons learned have and will continue to benefit marine conservation and fisheries management in Indonesia for years to come."
>
> CLIFF MARLESSY
> Country Director, ILMMA

LMMAs use this agreement-based approach to engage community members and provide them access to manage their resources for improved fisheries and biodiversity conservation. With the creation of networks of LMMAs, local communities work cooperatively to manage and preserve natural resources by developing and implementing regulations and activities to mitigate threats in their area.

The Indonesia Locally Managed Marine Area (ILMMA) Foundation implemented this community-based approach through USAID SEA Project support in West Seram and Central Maluku Districts, Maluku. ILMMA helped the communities identify and agree on marine areas under their traditional tenure to set aside for protection and conservation. Such customary agreements are highly respected and adhered to by the communities but exist outside Indonesia's formal regulatory systems (making them vulnerable to be usurped if formally challenged). To address this problem, ILMMA facilitated communities to develop formal village regulations reflecting the customary agreements, for recognition and endorsement by the subdistrict governments.

Over the Project's term, ILMMA reached out to 50 communities to promote awareness and encourage engagement in marine governance. Twenty-four communities successfully established LMMAs, including mapping their marine sites, preparing village regulations, and seeking their regulations' endorsement. More than 98,000 ha (combined) of nearshore marine habitat and fisheries areas were designated for community management, providing privileged access to more than 19,000 community members and setting aside nearly 1,800 ha (combined) of no-take zones within these sites.

The establishment and formal recognition of community agreements required a series of process steps that were time-consuming and challenging. However, this approach yielded considerable success in changing local communities' attitudes towards managing their marine areas and securing protection for critical marine and coastal habitats.

Some key factors were required for this approach to be sustainable and to ensure community ownership of the program:

- **The readiness of the local communities to develop agreements.** Some coastal communities perceived that they had no decision-making power or control over the use of their marine resources. Increasing the awareness and capacity of community members and local government to be directly involved in the planning and agreement process was critical to the initiative's success. Once the management activities start to show results, the approach empowers a greater sense of ownership and sustainability efforts.

- **The readiness of local governments to support and regulate local management.** When local and subdistrict governments are ready, supportive, and active in formalizing local marine management, more opportunities are created for community participation in the process, e.g., the activities and processes can be included in village planning and budgeting. Furthermore, when village planning bodies recognize the importance of supporting and financing conservation work, the LMMA approach can be internalized and become sustainable beyond the end of the Project.

- **Facilitation presence on the ground.** The on-ground presence and capacity of facilitators to support the communities to identify their areas and management objectives and draft the agreements and regulations is essential to this approach. Spending time with communities builds trust and helps the facilitator gain a more thorough understanding of the communities' culture, customs, and nuances to tailor the intervention appropriately. Gaining community members' trust also requires the program facilitators to participate in tasks and activities outside of the Project's scope, such as local ceremonies, daily chores, and listening to communities' concerns that do not specifically relate to marine and coastal conservation. Capable facilitators with strong leadership skills, knowledge about marine resources and fisheries, and community organizing experience ensure that the communities trust them to guide the process and apply best-practice approaches and up-to-date information. Implementing parallel activities in response to communities' needs, such as providing training, livelihood diversification activities, etc., has also been shown to promote buy-in and support long-term engagement and program sustainability.

- **Using peer influence to encourage program uptake.** Understanding local culture and capitalizing on the good-natured competitiveness among villages helped promote wider adoption of the LMMA approach. Villages where program implementation was smooth and yielded good results positively influenced their neighboring villages. Sharing success stories among villagers was a useful tool, as villagers were generally more comfortable talking and asking their neighboring villagers (rather than Project staff).

Coral reefs in the waters around Buano Island, West Seram, Maluku. Photo: USAID SEA/Marthen Welly

INCENTIVES ACHIEVEMENTS AGAINST INDICATORS

The success of the incentives workstream was measured through two indicators, both of which far exceeded their targets.*

INCENTIVES Targets and Results

Number of people with increased economic benefits derived from sustainable natural resource management and conservation.

Target
450 people

Exceeded
1,116 people

0

Number of people with more secure tenure or managed access.

Target
6,000 people

Exceeded
28,189 people

0

* **Increased economic benefits** were assessed through three lenses: (1) the number of villages where USAID SEA Project interventions enabled improved economic benefits, (2) the number of households considered to be engaged in economic activities as a result of project assistance, and (3) the number of households (and individuals) that have increased their key assets as a result of project assistance. Assessments targeted a sample 20 % of target populations and involved extensive household analysis questionnaires and surveys to determine results.

More secure tenure was calculated based on the populations benefiting from: (1) the establishment of LMMAs in Maluku (19,398 people), (2) the privileged marine access conferred through the establishment of TURFs in Raja Ampat, West Papua (7,888 people), and (3) the establishment of traditional closure areas (*sasi*) in Fakfak, West Papua (903 people).

PSM Inspector Training to conduct robust and effective inspections to prevent the entry of IUU fishing vessels and fisheries products into Indonesian territory. Photo: USAID SEA Team

07

Advancing marine and fisheries policies and regulations

Indonesia has a complex legal and regulatory fisheries framework that spans, vertically and horizontally, from the national level, through the FMAs and the provinces, the districts, and subdistricts, to the villages and communities. At the national level, the MMAF oversees the majority of fisheries-related activities. However, many other national government agencies with different perspectives, values, and mandates are also involved, including the Ministry of National Development Planning, Ministry of Transport, Ministry of Environment and Forestry, Ministry of Finance, and Coordinating Ministry for Maritime Affairs. There is an overlapping and unclear division of roles between the province and over 20 agencies tasked with overseeing and managing marine resources. The opportunity for communities, NGOs, and industry to support and engage in the planning, development, implementation, and management feedback remains unclear.

Under this workstream, efforts focused on supporting the development, consolidation, and production of a range of statutes to progress towards a robust legal and regulatory framework for sustainable marine and coastal management. Supported statutes ranged from national-level policy documents, strategic plans and associated regulations, to provincial governor decrees and associated statutes, village and district regulations, and formally endorsed customary agreements. A total of 58 statutes were supported through the USAID SEA Project, categorized by the four key Project pillars (EAFM, MPAs, MSP, and Law Enforcement) and marine and fisheries governance.

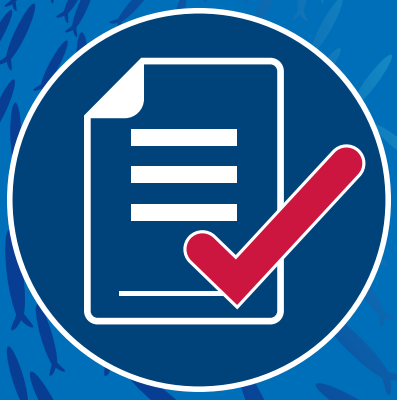
The USAID SEA Project supported eight MMAF decrees for MPA declarations, including Guraici Islands in Kayoa Subdistrict, South Halmahera (pictured). Photo: USAID SEA/Yoga Putra

TABLE 6: STATUTES SUPPORTED BY THE USAID SEA PROJECT (BY KEY WORKSTREAMS)	
EAFM	
23	Customary village regulations on land, coastal, and marine natural resource management in target communities throughout West Seram and Central Maluku in Maluku province
2	Governor statutes endorsing FMPs (for snapper and grouper in North Maluku, and flying fish in West Papua)
1	Joint village regulation ratifying agreements for land, coastal, and marine natural resource management in Kobisonta and Kobisadar communities in Central Maluku
1	Mayoral Regulation on the Management of Marine Resources Based on Local Wisdom in Community Customary Law in the Raja Ampat District of West Papua (no. 42/2019)
1	Local regulations on fisheries resource management in North Salawati and Central Salawati, Raja Ampat, West Papua
1	Logbook policy for small-scale fishers
1	Functional definition of small-scale fisheries in Indonesia
MPA	
8	MMAF decrees for MPA declarations (Morotai, Mare, Guraici, Widi, Makian-Moti, and Sula in North Maluku; Koon-Neiden in Maluku; Berau Bay and Nusalasi in West Papua)
1	MMAF regulation (no. 31/PerMen-KP/2020) on MPA Management, amending a 2010 MMAF regulation (PerMen no. 30/2010)
1	Technical Guidelines for MMAF regulation no. 13/PerMen-KP/2014 on MPA Networks
MSP	
3	Provincial regulations on marine spatial plans (RZWP-3-K) for North Maluku, Maluku, and West Papua
3	Accompanying governor regulations for implementing the plans in North Maluku, Maluku, and West Papua
LAW ENFORCEMENT	
3	Governor regulations on combating destructive fishing in North Maluku, Maluku, and West Papua
2	Ministerial regulations: (a) on community participation in surveillance of marine and fisheries resources, and (b) on the implementation of the PSMA guidelines
1	Ministerial decree designating PSM ports (no.52/KepMen-KP/2020)
1	Marine and fisheries compliance strategy and management framework for national and provincial levels
1	Standard operating procedures (SOPs) for the technical implementation of the PSMA for the Indonesia PSM Secretariat
MARINE AND FISHERIES GOVERNANCE	
3	Sets of Regional Medium-Term Development Plans (RPJMD) and provincial fisheries offices strategic plans for North Maluku (2019–2024), Maluku (2019–2024), and West Papua (revision only, 2017–2022)
1	Support framework for Village Funds to ensure local fisheries management and MPAs in coastal villages, with lessons learned from the USAID SEA Project areas

KEY LESSONS LEARNED FROM LAW AND POLICY WORK

- Strong provincial governor and support staff leadership can override the fragmented roles and responsibilities across different agencies and departments and bring a wealth of resources and expertise to fisheries and ocean governance.
- The importance of developing mutual understanding among the many actors of their individual and collective roles in policy implementation cannot be underestimated.
- The FMA Councils' role remains broad and unclear and may lead to further complication of a highly fragmented system. Implementation should be considered carefully to ensure that the benefits outweigh the added complexity.
- Law no. 23/2014 has considerably reduced the district government's authority over fisheries. However, district governments, and village governments, still have a significant fishery and coastal management role. Cooperative agreements and the development of plans (such as a village master plan) can effectively engage site-based participation in marine and coastal management
- There are gaps and overlaps in the current policies. Simultaneously, flexibility in their application by provincial governments and local stakeholders is encouraged to ensure progress in implementation and enforcement.
- National policy to support international commitments (e.g., the PSMA) should follow Indonesian law and institutional arrangements, and should be as realistic as possible, relevant to the Indonesian context, and with consideration for follow-up actions to anticipate risks.

The next pages provide two case studies that exemplify some of these lessons.



Law and Policy Case Studies

Contextualizing an international agreement into national policy: PSMA

By: Christiana Yuni Kusmiati

The commencement of the USAID SEA Project in 2016 coincided with the issuance of Presidential Regulation no. 43/2016 regarding the GOI's ratification of the PSMA to tackle IUU fishing. This agreement reduces IUU vessels' incentives to operate, and blocks fisheries products derived from IUU fishing from reaching national and international markets. The ratification of this agreement confirmed the government's commitment to protecting Indonesian waters from IUU vessels that threaten both fisheries health and domestic fisheries businesses.

This commitment presented a considerable challenge for the ministries responsible for introducing PSM practices and their ongoing application. Implementation required readying the necessary policies and human resources to carry out strict, robust surveillance and professional port services, and adequate infrastructure to support PSM practices. Thus, the MMAF requested the USAID SEA Project and the NOAA-Office of Law Enforcement (OLE) to provide technical assistance. To meet the government's most pressing needs, and considering the strengths and limitations of the Project and NOAA-OLE, this technical assistance was directed at strengthening personnel policies and building capacity.

> "IUU fishing remains a persistent challenge, and a global collective effort is required to effectively overcome it. Indonesia has made tremendous efforts in combating IUU fishing. The U.S. Government's partnership with the Government of Indonesia is designed to accelerate the implementation of Port State Measures Agreement (PSMA) and block the flow of IUU-caught fish into national and international markets."
>
> MATTHEW BURTON
> USAID Environment Office Director

Illegal vessels apprehended in Indonesian waters. Photo: MMAF (PSDKP)

(1) Strengthening policies

PSM management in Indonesia differs from other countries (including the U.S.). It involves multiple ministries and institutions at the national level, primarily the MMAF, Coordinating Ministry for Maritime Affairs, Ministry of Transportation, Customs, and Ministry of Foreign Affairs. Consequently, the USAID SEA Project and NOAA-OLE adapted their technical assistance to ensure that the policies formulated would follow: (1) the provisions of Indonesian law and (2) Indonesia's institutional arrangements.

Rather than provide direct recommendations to the MMAF and other relevant ministries, the USAID SEA Project and NOAA-OLE demonstrated the general global principles for the technical implementation of the PSMA. They developed a PSMA training for policymakers to build a common understanding of the substance of the PSM policy to be produced for Indonesia. The ministries applied this knowledge to formulate derivative policies of the PSMA suitable to the Indonesian context, ensuring consistency with national law. Two policies were successfully drafted and endorsed: MMAF regulation no. 39/PerMen-KP/2019 on the PSMA's implementation, and MMAF decree no. 52/KepMen-KP/2020 on PSM-designated ports in Indonesia. The third policy setting out the SOPs for the implementation of the PSMA remains in draft form awaiting approval.

Facilitating the development of policies deriving from the ratification of an international agreement requires a high level of prudence and is complicated by domestic field implementation realities. The policy development process required a significant investment of time and patience, especially given the number of national agencies involved who do not work collaboratively regularly. However, these agencies demonstrated the desire—and ability—to adapt to the requirements of an international agreement in the interest of combating the threat of IUU fishing in Indonesian waters.

(2) Building capacity

The USAID SEA Project and NOAA-OLE provided a series of concurrent trainings for fisheries surveillance officers and port officers to build capacity for PSM implementation. The training focused on conducting robust and effective inspections to prevent the entry of IUU fishing vessels and fisheries products into Indonesian territory. In total, the USAID SEA Project and NOAA-OLE assisted the MMAF to:

- develop seven competency-based PSM implementation training modules for fisheries surveillance officers
- conduct TOT for eight MMAF PSM implementation trainers of fisheries surveillance officers
- prepare 109 fisheries supervisors and port officers with the necessary knowledge and skills to implement PSM (to be stationed at the PSM Secretariat in Jakarta and all PSM-designated ports

There were several benefits to the cross-institutional and collaborative developmental approach to policy support and capacity building activities.

- All parties agreed on the policy content to be carried out or adjusted by each institution for consistent and effective implementation of the PSMA. Policymakers gained substantial technical insight from trained fisheries surveillance officers and port officers, improving their understanding of the details and dynamics of PSMA technical implementation in the field.
- Policies were formulated to be as realistic as possible, relevant to the Indonesian context, and with consideration for follow-up actions to anticipate risks.
- Policy outputs reflected the mutual understanding among the various institutions of their roles in PSMA. For instance, MMAF regulation no. 39/PerMen-KP/2019 emphasizes the MMAF's role in implementing the PSMA and its relationship with other ministries and institutions, while MMAF decree no. 52/KepMen-KP/2020 designates three Indonesian fishing ports (under the MMAF) as PSM ports and has established a PSM port under the Ministry of Transportation domain.

A summary of the PSMA support work's successful outputs and positive changes over the Project's life is shown in Figure 30.

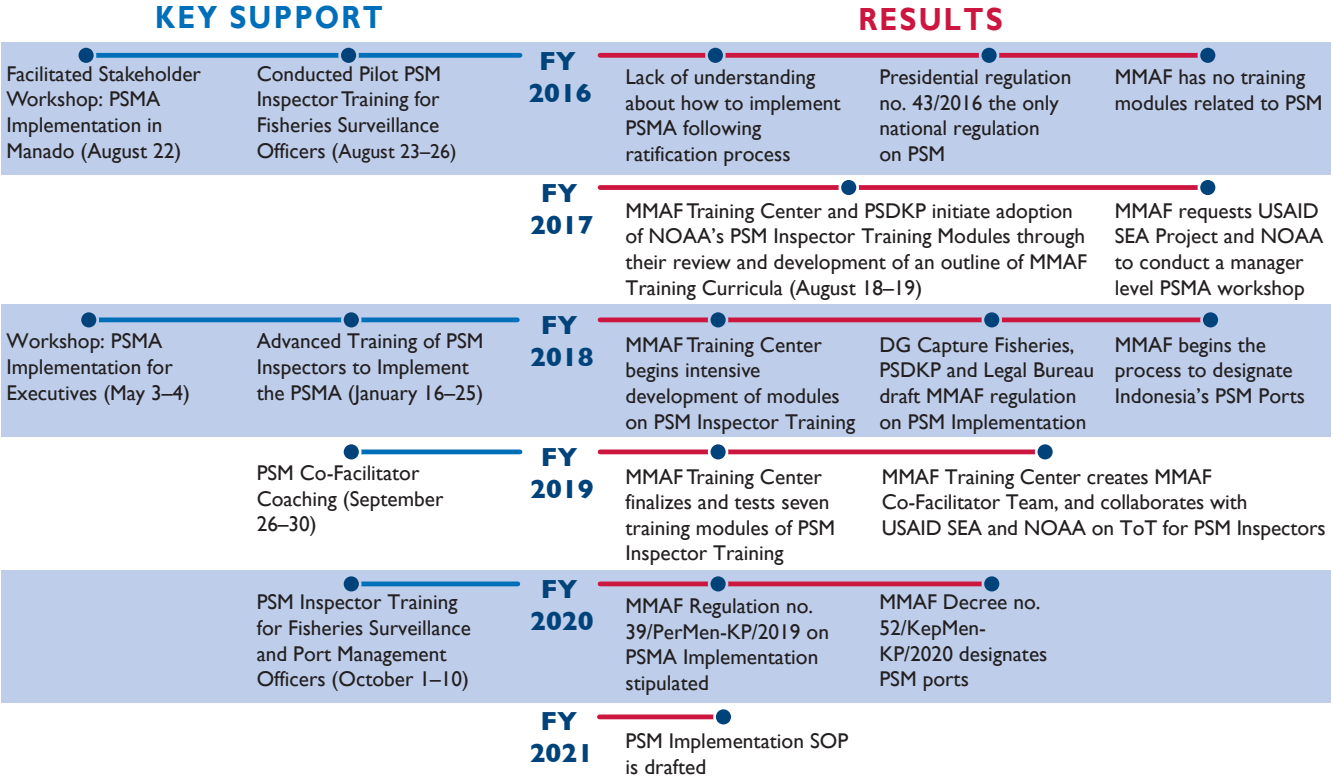


Figure 30. USAID SEA Project and NOAA-OLE support for PSMA.

Actualizing marine and fisheries resource management in the decentralization system

By: Christiana Yuni Kusmiati

The major change to the management of inshore waters brought about by the introduction of Law no. 23/2014 reduced and disrupted the capacity of local government to manage marine and fisheries resources effectively. At the inception of the USAID SEA Project in 2016, this disruption was generally reflected in the three focus provinces of North Maluku, Maluku and West Papua, by:

- the inadequacy of the provincial institutions necessary to carry out the management function of marine and fisheries resources at the local level, both in the form of regional technical implementing units *(unit pelaksana teknis daerah*—UPTDs) or marine and fisheries branches (*Cabang Dinas*)
- insufficient capacity of management unit personnel, in terms of both quantity and quality;
- insufficient budgets to finance field management activities; and
- decreased collaboration between the provincial and district/city governments due to the psychological impact of Law no. 23/2014

At the same time, the implementation of Law no. 23/2014 significantly increased demands on the MMAF and the Ministry of Home Affairs (MoHA) to ensure that provincial and district/city governments were provided with appropriate guiding policies (NSPK), to manage marine and fisheries resources. The law stipulated that the NSPK should be completed within two years, but both ministries struggled to meet that deadline.

In response, the USAID SEA Project attempted to: (1) help the MMAF progress the preparation of the NSPK, and (2) support the provincial DKPs to increase their governance capacity incrementally. Work under these initiatives aimed to:

- increase mutual understanding among central, provincial, and district/city governments regarding gaps in policy and governance capacity that needed to be addressed to actualize marine and fisheries resource management in the field
- secure commitments to take priority actions
- strengthen the spirit of collaboration among parties, all of which have important roles in ensuring effective marine and fisheries governance
- ensure tangible community and village government participation in marine and coastal management

USAID SEA Support to the MMAF and provincial DKPs

From 2017 to 2020, USAID SEA Project efforts to assist the MMAF and provincial DKPs included the following.

(1) Facilitating dialogue between the MMAF implementing units and provincial DKPs to identify, map and develop priority NSPKs to effectuate on-ground marine and fisheries resource management

(2) Facilitating dialogue between the MMAF, MoHA, and the provincial DKPs to accelerate the transfer of personnel, financing, infrastructure, and strategic documents (*pedoman pelaksanaan pengalihan personel, pendanaan, sarana dan prasarana, serta dokumen*—P3D) from the district/city governments to the provincial governments (P3D are used to estimate and set adequate targets for institutional capacity, funding, and personnel.)

(3) Facilitating learning forums with the MMAF and provincial DKPs to strengthen their understanding of the need to establish functional MPA management bodies (e.g., Raja Ampat MPA management body) in terms of human resources, facilities, infrastructure, and critical activities to outline in the funding profile (The USAID SEA Project worked with NOAA to share best practice approaches in MPA management from the U.S. and other Indonesia regions.)

Marine and fisheries practitioners attending an Expert Verification Workshop in Jakarta, August 2019, for the FMA 715 MPA Network design proposal. Photo: USAID SEA/ Melva Artitonang

(4) Involvement of the district/city fisheries agencies in provincial work programs to improve marine and fishery resource management (For example, local fisheries agencies were encouraged to better align their fisher empowerment programs with provincial programs and activities to manage marine and fisheries resources at the local level. This work was undertaken to increase the collaborative spirit between the district/city fisheries agencies and the provincial DKPs.)

(5) Improving community and local stakeholder ownership of, and knowledge, volunteerism, and independence in the sustainable management of marine and fisheries resources, through education and training activities for the community, SEA Champions, and pokmaswas; and the facilitation and development of customary and village regulations (at 24 sites in Seram, Maluku and 36 sites in Raja Ampat, West Papua)

This support work resulted in:

- increased efforts from provincial DKPs to secure programs and budgets to develop a functioning MPA management body in their respective RPJMDs (amended RPJMD in West Papua)

- acceleration of the P3D transfer (which initially faced resistance) for managing marine conservation areas, and monitoring and managing capture fisheries resources (especially in North Maluku)

- support from the MoHA in the facilitation of the RPJMD for each province and ratifying the annual funding in the regional state budgets (*Anggaran dan Pendapatan Belanja Daerah*—APBD)

- increased support from local and village governments to implement customary law and village rules governing responsible fishing practices, marine zoning socialization, and the pokmaswas' surveillance activities, with support from Village Fund budgets and financing

Promoting the engagement of all levels of government to achieve impacts

Boosting the provincial governments' capacity for marine and fisheries resource management requires flexibility in approach, especially in areas characterized by many islands or that have challenging geographical conditions (where priority areas for management are far from the provincial capital). In this context, the USAID SEA Project considers the following changes or policy breakthroughs essential for consideration by the government at all levels.

(1) Involvement of district/city fisheries agencies in managing marine and fisheries resources as per article 20, Law no. 23/2014, which provides for provincial governments to delegate management through the co-administration mechanism—In this co-administration scheme, the provincial governments can delegate tasks outside district/city authority and provide a sufficient budget for the district/city fisheries agencies to carry out the delegated tasks. This scheme's strength is that the provincial government can utilize the local knowledge and capacity of district/city fisheries agencies to implement marine and fisheries resource management programs more effectively and efficiently.

(2) Using regional cooperation mechanisms as an opportunity to improve marine resource management effectiveness between the provincial governments and district/city governments, as per Government Regulation no. 28/2018 on regional cooperation—While the regional cooperation scheme does not provide for delegation of authority, regional marine resource management could be improved by integrating management plan guidelines agreed by the provincial and district governments.

(3) Cooperation between the provincial governments and private organizations or NGOs for tasks that the provincial government struggles to implement or those that could be implemented more effectively and efficiently by third parties

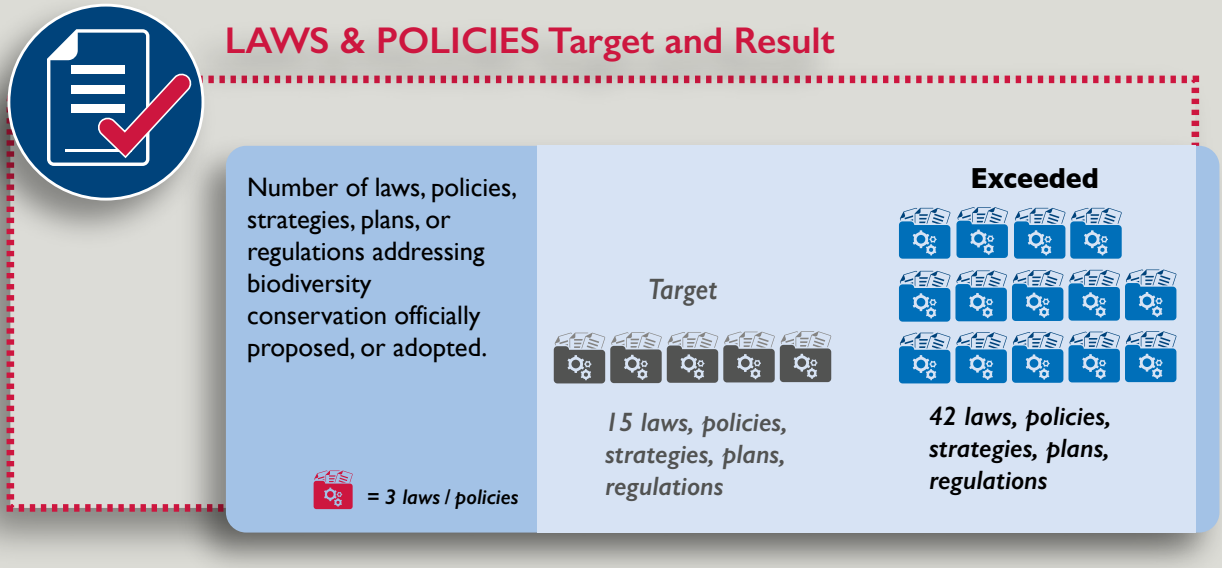
(4) Involvement of village administrations in the management of marine and fisheries resources enabling actual management actions to occur systemically and sustainably at the local level—The MMAF and the Ministry of Village Empowerment may develop a master plan for coastal village development that balances economic development and sustainable marine and fisheries management. Such a master plan would guide village governments to implement management actions and support effective management of marine and fisheries resources.

In summary, ensuring the sustainable management of marine and coastal resources along the extensive coastlines of Indonesia calls for involving the local (village, district, and city) governments and communities with a direct stake in these resources' longevity.

South Sorong Regent receives donated materials and gears from MMAF to support Pokmaswas Kokoda. Photo: USAID SEA/Chris Rotinsulu

LEGAL, REGULATORY AND PLANNING ACHIEVEMENTS AGAINST INDICATORS

The success of the Laws and Policies workstream was measured through one indicator, which far exceeded the target.*



* Achieving this target required the statutes to be endorsed or accepted (i.e., reaching stage 2 of the authorization process, with stage 1 being 'initiated' and stage 3 being 'implemented'). Of the 58 statutes supported by the USAID SEA Project, 42 reached at least stage 2 during the Project's term and were counted towards achieving this indicator. The remaining 16 statutes achieved stage 1.

USAID SEA and partner WCS conducted MPA 101 Training for key stakeholders in Ternate, North Maluku, in March 2020. The training aimed to improve stakeholder understanding of the functions and management of MPAs, and help prepare stakeholders to implement zoning schemes. Photo: USAID SEA/Ping Machmud

08

Institutionalizing capacity building

This final cross-cutting workstream on institutionalizing capacity building was essential to successfully implement all of the activities under the USAID SEA Project and establish a foundation for continued progress towards sustainable marine and coastal management. Under this workstream, efforts focused on improving skills and enhancing capacities and competencies across a wide range of sectors, agencies, organizations, and individuals to generate the necessary cadre of proficient personnel and stakeholders to manage Indonesia's maritime heritage sustainably.

This workstream operated through four fundamental modus operandi:

(1) **Developing training materials, curricula, and educational resources**—including a training course for pokmaswas (from Stage 1, initiated, through to stage 3, advanced) and a seven-module training course for port inspectors.

(2) **Conduct training**—for 3,042 stakeholders from various sectors, including government personnel from national to district-level agencies, community members, fishers, and broader marine resource users. Training courses were generally held over two full days (or longer), with women representing 25 percent of trainees.

(3) **Training trainers**—to provide instructor and coaching capacity beyond the Project's term. Key personnel in the MMAF's training institutions and representatives from different sectors were trained as trainers for the future. This was particularly relevant for both the PSMA and pokmaswas training courses.

(4) **Institutionalizing systems for the future rollout of training and capacity building**—to ensure developed courses were approved and adopted by the MMAF and related training institutions. This included the PSMA training receiving endorsement as a specific work competency (*Standar Kompetensi Kerja Khusus*—SK3), and two training programs developed by USAID SEA Project implementing partner CTC receiving endorsement as meeting national competency standards (*Standar Kompetensi Kerja Nasional Indonesia*—SKKNI), an MPA outreach program and a marine tourism management training package (Ministry of Manpower decrees no. 96/2018 and no. 55/2018 respectively).

Logbook training for small-scale fishers to improve catch data recording, West Papua. Photo: Rare Team

KEY LESSONS LEARNED FROM TRAINING AND CAPACITY BUILDING WORK

- There remains an opportunity for universities and academic institutions to sit on the scientific panels of all 11 FMAs to enrich scientific processes and analysis for stock assessment and its management.
- Putting in place mechanisms to promote donor investments across diverse implementers is essential (including international, national, and community-based organizations). Coordinating these investments is also vital — while recent years have seen improvements in coordination, gaps remain to ensure priority themes and geographies have technical support.
- Frequent changes in government staff rotations means there will be an ongoing need for capacity building for key roles in marine and coastal management.
- Opportunities exist to institutionalize capacity building into project design objectives and strategies to ensure adoption for long-term use. This includes training cadres of future trainers to ensure continuity, institutionalizing capacity development programs and processes within the government's priorities, and formally adopting capacity building plans.
- The value of promoting stakeholder ownership for the capacity development process cannot be understated.
- Collaborative multi-agency/multi-disciplinary/multi-sectoral working arrangements always tend to have the most significant long-term impact.
- The use of the USAID SEA Project's capacity building framework for all proposed capacity-building interventions proved very influential across the vast range of training and capacity-building activities.
- Ensuring that training programs always have a gender lens is very important.
- Government-to-government peer support and training (e.g., NOAA-MMAF) can be very effective, as seen with the PSMA training.
- The Project tested and supported several technological innovations, some more successful than others and generally only providing support in cases where stakeholders were willing to resolve the specific problem being addressed.

The next pages provide three case studies that exemplify some of these lessons.

Training and Capacity Building Case Studies

The USAID SEA Project capacity-building intervention framework

By: Nour Muhamad

Since the beginning of the USAID SEA Project, training and capacity building has been at the core of several workstreams through developing skills, enhancing knowledge and understanding, and improving the delivery, uptake, and adoption of interventions. Delivering training support is, however, often a fleeting activity. Fixed-term projects such as the USAID SEA Project often develop and deliver training, but such support ends with the project's cycle without careful planning. For this reason, the institutionalization of capacity-building skills within the MMAF and key long-term partners/stakeholders was a priority for the Project and considered vital for sustainable skill-building into the future.

Under the USAID SEA Project, several training initiatives were purposefully designed and developed to optimize institutionalization and adoption for long-term use. Development of these programs followed a capacity-building intervention framework as shown in Figure 31, developed in collaboration with the MMAF and partners to identify needs, co-design tools, materials and modules, and identify and capacitate trainers from the MMAF and partners for sustainable delivery (through TOT support).

This approach successfully led to training initiatives being adopted for further rollout beyond the USAID SEA Project's term and for scaling nationally. Such an approach exemplifies the importance of incorporating considerations of institutionalization from the outset of capacity-building initiatives and the impact such an approach can have on facilitating long-term skills-building nationwide.

MMAF staff receive instructor training from the USAID SEA Project on the SEANODE geoportal, to ensure skills-building can continue beyond the Project term. Photo: USAID SEA/ Ndaru Prasetiyo

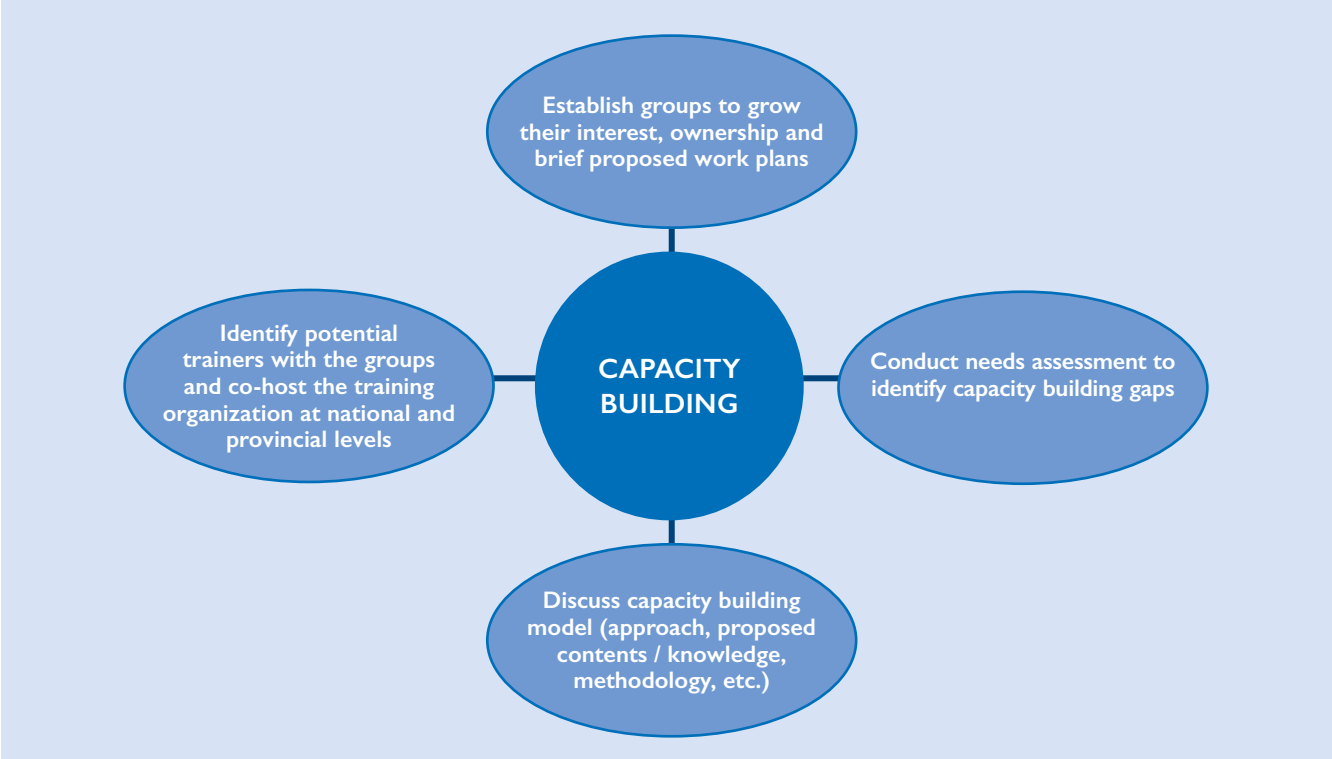


Figure 31. SEA's capacity building intervention framework.

Providing the necessary skills for Port Inspectors to combat IUU fishing

By: Nour Muhamad

In 2016, with the ratification of the PSMA, the MMAF committed to combating IUU fishing. This agreement outlines a range of requirements and mechanisms to ensure that vessels are inspected appropriately and assessed to ensure they meet the landing standards on entering ports.

Considerable capacity building was required for port inspectors to undertake the necessary inspections on the ground, analyze the data, and report the findings appropriately. To help build this capacity, the USAID SEA Project supported developing a PSM Inspectors Training Manual comprising seven modules (see Figure 32), designed to complement the MMAF's existing SOPs for vessel inspections.

In addition to 109 inspectors receiving training, the USAID SEA Project and partner NOAA-OLE provided extensive training and mentoring to future trainers to ensure these modules can continue to be rolled out for ports across the country beyond the Project's term. Overall, eight trainers are now equipped to continue to deliver these modules. Providing this support was not without challenge, however. Training security forces personnel and officers who have the right to bear arms (such as police, army, and fisheries surveillance officers) requires a lengthy Leahy Law verification process (which prohibits the U.S. from assisting foreign security force units). Compliance with this process entailed extensive documentation from participants, and some officers declined training due to the personal and sensitive nature of some of the data required.

Overall, however, the program was a great success, mainly due to the extensive TOT and the consideration of institutionalization factors from the start of the program to ensure the capacity building could continue beyond the Project's term.

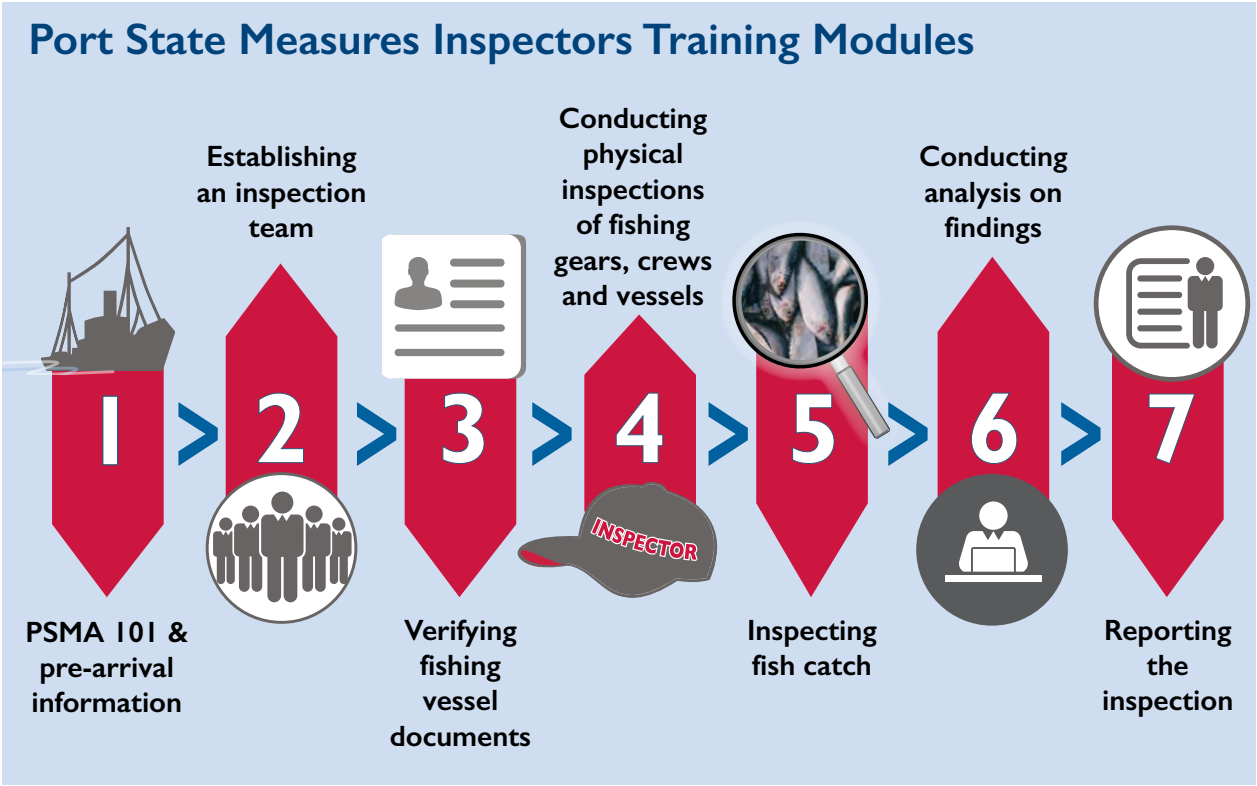


Figure 32. PSM inspectors training modules.

"In Bitung, we were never exposed to inspection procedures for foreign' vessels. The training is very useful for us to be familiarized to PSMA standards. We learned how to conduct thorough onboard inspections and ethical standards. The instructor also gave us some online resources that could be our reference when seeking vessels' data. This is very helpful when we do the screening of pre-boarding documents. From those online platforms, we could get information about the vessels identity and their history. It will help us determine if the vessel is engaged to IUU fishing activity or not."

EMY RIMADHANI
Fisheries Surveillance Officer. Bitung Port

Mr. Yogi Effendi Darmawan, here participating in PSM Inspectors Training in 2018, has already applied the stages and practices of PSM inspections to prevent IUU fishing products entering Benoa port in Bali. Photo: USAID SEA /David Hermanjaya

Empowering and equipping community members with the skills necessary to manage and monitor their resources

By: Nour Muhamad

From the start of the USAID SEA Project, the MMAF and partners (provincial DKPs, WWF, WCS, and CTC) collaborated on developing training modules and manuals for pokmaswas. Pokmaswas operate at the front line of coastal and fisheries management and provide vital surveillance services by monitoring marine areas, reporting observations, and collecting evidence for law enforcement officers to deal with perpetrators of marine crimes or violators of marine regulations.

The training was presented in three progressive modules, appropriate to the communities' expertise and skills, and local needs, and designed for participatory adult learning. It covered local customary laws, monitoring tools and applications (such as the pokmaswas daily logbook), and communication systems to track and report violations in real-time (e.g., SMS Gateway and WhatsApp) (Table 8). It also provided a platform for community members to share information and exchange experiences.

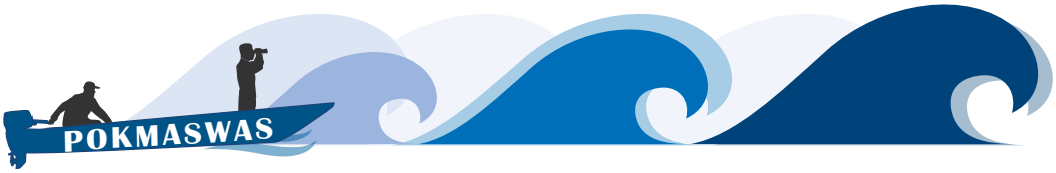
TABLE 8. POKMASWAS TRAINING MODULES

	STAGE 1 INITIAL	STAGE 2 INTERMEDIATE	STAGE 3 ADVANCED
Knowledge Focus	(1) Pokmaswas' role, function, and main assignment (2) Marine ecosystem (3) Threats and potential (4) Resource management (5) Reporting management (6) Pokmaswas organizational development (internal)	(1) Communication ethics (2) Safety principles (3) Management of sensitive issues (4) Management plan for fisheries and MPAs (5) Surveillance network and protection for pokmaswas (6) Basic rules on the criminal code related to marine and fisheries violations (7) Pokmaswas organizational development (internal and external)	(1) Village planning (2) Regional action plan for alleviating destructive fishing (3) Self-reliance and contribution of pokmaswas to villages (4) Entrepreneurship (5) Pokmaswas network development (external)
Skills Built	(1) Monitoring (2) Reporting (3) Technology usage (4) Pokmaswas logbook (5) Reporting management (6) Pokmaswas organizational development (Internal)	(1) Effective communication (2) Evidence management (3) Monitoring skills (4) Information and data management (recording) (5) Pokmaswas organizational development (assessment for improvement)	(1) Advanced communication skills (bargaining, promotion, negotiation, diplomacy) (2) Entrepreneurship (3) Statute and by-laws development
Format	3 modules 24 hours (minimum 3 days) of training	6 modules 24 hours (minimum 3 days) of training	4 modules 18 hours (minimum 2.5 days) of training

Training in one or more of these modules was provided to 534 pokmaswas members (Figure 33). This number is remarkable given the difficulty of getting fishers to attend activities that would take them away from work for more than two days, to say nothing of the challenge of conducting training in remote areas. The training was often delivered with limited infrastructure (no electricity, internet, etc.) or under other unpredictable conditions.

Ensuring equitable gender representation was also challenging. Women were often underrepresented for several reasons, such as competing societal and cultural gender roles and competing time demands from gendered expectations such as domestic work, childcare, or difficulty obtaining permission from their spouse to participate. In 2020, restrictions on movement due to the Covid-19 pandemic hampered the implementation of the field training. As a workaround, the USAID SEA Project and partner WCS turned to delivering training remotely through the use of Internet-based technology (WhatsApp), which proved highly successful, accessible, and efficient in reaching target groups.

STAGE 1 (Initial) – Completed



LOCATION		POKMASWAS	
NORTH MALUKU	Morotai MPA	Bangkit Sehat	10
	Widi MPA	Widi Star	15
		Giman Widi	15
	Sula MPA	Pagama Indah	14
		Pasir Putih	13
		Tanjung Deko	10
		Fat Bot	10
MALUKU	Koon-Neiden MPA	Tanjung Keter	10
		Pasukan	17
		Leawana	
	Buano MPA	Hena Berkarya	10
		Hena Puan	11
	Lease MPA	Uku Ha'a	10
		Rupranya	10
		Duurztede	12
	Ay-Rhun MPA	Lawere	15
		Naelaka	15
WEST PAPUA	Bintuni Bay	Awego	10
		Warai	10
		Tahiti	12
		Babo	12

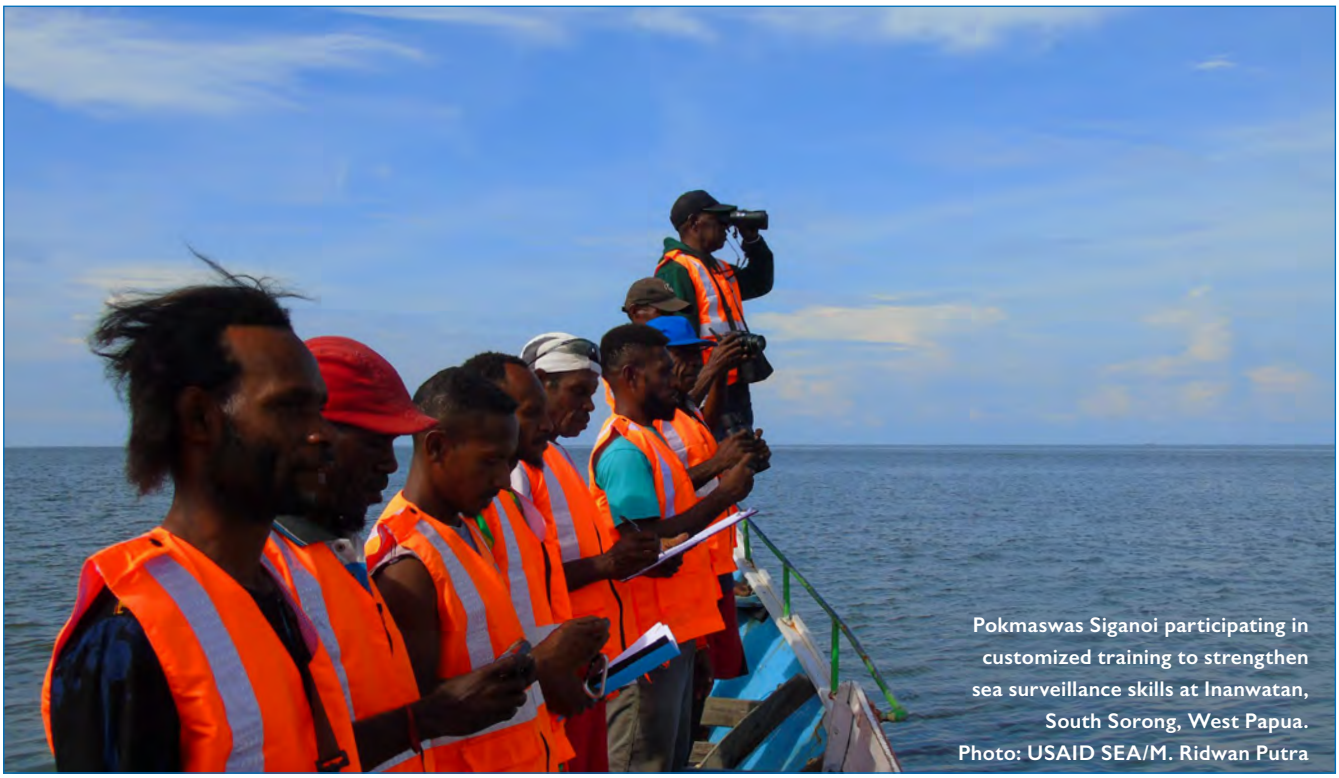
Produced by SSIC.

STAGE 2 (Intermediate) and STAGE 3 (Advanced) – Completed

LOCATION		POKMASWAS	
NORTH MALUKU	Guraici MPA	Ene Lo Ene	15
		Kie Ruru	15
	Morotai MPA	Loumadoro	10
		Batu Kopi	10
		Horomoi	10
	Mare MPA	Ahu Malinga	10
		Jiko Se Doe	10
	Makian-Moti MPA	Sebelei	15
		Tafamutu	15
MALUKU	Sawai MPA	Pantura	26
		Toha Putih	14
WEST PAPUA	Nusalasi MPA	Nusa Matan*	18
	South Sorong MPA	Metemani	15
		Udang	23
		Knasaimos	20
		Siganoi	20
		Kenaburi	23
		Mangewang	24

= Number of members
* = Stages 2 and 3 training received, but not funded by USAID SEA Project

Figure 33. Pokmaswas trained through the USAID SEA Project term, from initial to advanced stage training.



Pokmaswas Siganoi participating in customized training to strengthen sea surveillance skills at Inanwatan, South Sorong, West Papua. Photo: USAID SEA/M. Ridwan Putra

To ensure the capacity building is sustained beyond the Project's life and will be available to pokmaswas nationwide, a concerted TOT program was undertaken, and the modules were successfully adopted under the MMAF Training Center for future rollout.

The success of this initiative was based on three key factors:

(1) Throughout the design and development of the training modules, there was strong ownership from the MMAF. The MMAF Training Center and other related directorates showed a clear commitment to lead the process, organize training events, and fully engage in producing the manuals and materials.

(2) The working arrangements were collaborative and cooperative between all parties, including the MMAF, provincial DKPs, and USAID SEA Project partners.

(3) Capacity building plans effectively formalized the program, using a comprehensive design and institutional models that were extensively discussed by the relevant parties, including around the content of the training manual and modules.

Innovations supported by the USAID SEA Project

Under this workstream, skills were also enhanced at both the national and regional levels through the development, testing, and implementation of a range of innovations.

Innovations may be products, processes, tools, approaches, service delivery models, or other interventions that have the potential to achieve significant (not incremental) improvements in development outcomes versus existing alternatives.

In simplified terms, innovations can be broken down into two broad categories: processes and tools. Under the USAID SEA Project, 12 innovations were tested and/or implemented.

INNOVATIVE PROCESSES	TRIAL REGION
Procedures for the Participatory Design and Establishment of TURFS/Managed Access Areas — were developed through the work of Rare in Raja Ampat, and ILMMA in Seram Island, as a first-of-its-kind in Indonesia.	Maluku and West Papua
The Participatory Planning Process Utilized for RZWP-3-K Development — has provided a model that many wider provinces in Indonesia have expressed interest in replicating.	North Maluku, Maluku and West Papua
Incorporating Robust Institutional Management Frameworks into Policy — with several unparalleled advances across strategic and technical approaches implemented under the USAID SEA Project for incorporating robust institutional management frameworks into policy.	National
INNOVATIVE TOOLS	**TRIAL REGION**
GPS vessel tracking systems to identify fishing grounds (e.g., Spot Trace and Pelagic Data Systems) — can be attached to any vessel and use satellite technology to track the vessel's movements, supporting management planning and monitoring.	North Maluku and Maluku
Handheld devices for fisheries data collection — utilizing technology to record and upload field fisheries data in real-time. Include: I-Fish, OURFISH, WWF-ID resource monitoring, MDPI – supplier App, iDAPAR and FISH-AP2HI (all compatible with MMAFs I-Fish database).	North Maluku, Maluku, and West Papua
MPA Alert System based on Visible Infrared Imagining Radiometer Suite (VIIRS) data — for detecting boat activity in a defined area (such as an MPA core zone) at night, offering a means (beyond existing technology capabilities) to capture the movement of vessels.	West Papua
SEANODE Marine Spatial Planning Geoportal Database — an online geoportal using a LINUX operating system, equipped to house all provincial spatial data, MSP thematic data, and all the marine spatial utilization guidance documents that have been formally endorsed by legislation.	National
Offline SIMKADA – Process and app for fishing licenses — system and storage application to integrate vessel registration data from remote areas into a central database.	National
Non-equilibrium biomass dynamics modeling for stock assessments — statistical analysis tool to support: (a) the effective testing of available data (pre-analysis, to assess levels of robustness), and (b) the utilization of approved data (analysis) to determine stock status assessments.	National
TraceTales application for tuna tracking for suppliers — digital tally-based, aims to replace a paper-based recording system to improve the traceability of products within a processing company.	North Maluku and Maluku
Trafiz application for tuna tracking through processors — an app that can be downloaded onto cell phones and used as an alternative to paper-based record keeping by middlemen and suppliers.	North Maluku and Maluku
Ocean Eye cellphone app — a conservation app that puts a value on key species in an area, and enables that value to be realized through tourism payments to communities, creating a powerful incentive to protect these animals instead of monetizing them by fishing or hunting.	North Maluku

La Nafsahu Indrus, a SEA Champion and leader of Pokmaswas Tanjung Deko, promoting the inclusion of important ocean habitats for cetacean species in MPA zoning plans at a Cetacean Training Workshop run by USAID SEA Project and partner CTC in Ambon, Maluku, September 2019. Photo: USAID SEA/Kasman

TRAINING AND CAPACITY BUILDING ACHIEVEMENTS AGAINST INDICATORS

The success of the training and capacity building workstream was measured through two indicators, both of which met, or exceeded, their targets.*

TRAINING and CAPACITY BUILDING Targets and Results

Number of people trained in sustainable natural resources management and/or biodiversity conservation.

Number of innovations supported.

Target: 12 innovations

Achieved

* **Number of people trained** was measured as those attending USAID SEA Project-supported or -delivered training courses more than two full days in length (pre Covid-19), or through serial online courses (during Covid-19).

Number of innovations is as shown in the inset box on the previous page.

Small-scale fisher vessels arriving for measurement and vessel registration (*Pas Kecil* and BPKP) in Haria and Nolloth Villages, Saparua Island, Maluku. Photo: USAID SEA/Eddy Likumahuwa

09

Project management

The USAID SEA Project was designed to bridge the gap between marine biodiversity conservation and fisheries management in a manner that would enhance the sustainability of marine resources while providing benefits to people. In Indonesia, as in many countries, the fisheries sector has historically been treated as a source of revenue and employment with little concern for its long-term sustainability. In contrast, marine biodiversity conservation has been viewed as a stand-alone effort with little relation to fisheries management, or fish stock status or production. In response, the Project employed an integrated strategy for improving the governance and management of fisheries and marine resources, conserving biodiversity, and enhancing sustainable livelihoods. These goals necessitated a project entity that cut across levels of government and a variety of disciplines to accomplish its objectives set by the donor, USAID, and the GOI.

The USAID SEA Project applied a multifaceted approach through its Core Technical Team that spearheaded the four 'pillars' of fisheries management: EAFM, MPA development, MSP facilitation and support for law enforcement. These four pillars were supported by cross-cutting workstreams and expertise for building incentives for improved marine conservation and fisheries management, education and communication, behavior change, training, and policy development. Thirteen subcontractor NGOs were engaged to support the Project's workstreams and achieve the 15 monitoring, evaluation and learning indicators.

The USAID SEA Project Core Team included 45 employees, and the total personnel employed under contractors and consultants was more than 250 persons—a large group of people to manage. The mechanisms used to build a cohesive team to accomplish the project objectives required having clear scopes of work for all employees and subcontractors, and maintaining a rigorous reporting system so that all entities reported on their progress at least every three months (for quarterly and annual reports). Reporting requirements also included thematic, monthly work planning meetings guided by technical leads under the primary workstreams.

The Project strived to link strategies for marine biodiversity conservation with fisheries management so that opportunities for integration contributed to marine conservation, sustainable fisheries and income.

Several project management lessons were key to accomplishing the Project's goals:

Leverage USAID and implementing partner relationships and financial support with the government to accomplish more together. Work to identify the most appropriate ways to integrate project objectives so that the larger, holistic objectives can be achieved, and select indicators suitable to achieving integrated outcomes in consultation with implementing partners. Linking with other donor and government support to augment the USAID SEA Project objectives—such as local government investments, other donors working in parallel with the Project, and private sector investments—led to surpassing the target for leveraged funds (Figure 34).

Periodically review integration efforts to examine whether and how larger objectives are being achieved. Regularly review the theory of change and annual work plans through planning cycles to analyze how different interventions intersect, overlap, or do not support each other, and how integration across interventions can amplify outcomes for fisheries and marine biodiversity conservation. Employ an adaptive management approach to ensure that integration efforts are on track and adapt to the geographic and political context, without sacrificing the main objectives and integration goals.

Engage multiple partners and counterparts to achieve cross-sectoral approaches. Involve partners in planning and implementation processes to ensure integrated approaches are understood and that interaction with all important stakeholders is accomplished. Indicator setting to measure project progress was done with partners to ensure a common understanding of what needed to be accomplished to achieve goals and objectives.

Be realistic about the time required for planning and implementation. Set realistic timelines for implementation that recognize the additional time needed to plan cross-sector activities and allow time for baseline monitoring. Measuring some valuable biodiversity and fisheries indicators, such as biophysical change and CPUE, can take seven to eight years to demonstrate changes; plan for this time and adapt as necessary.

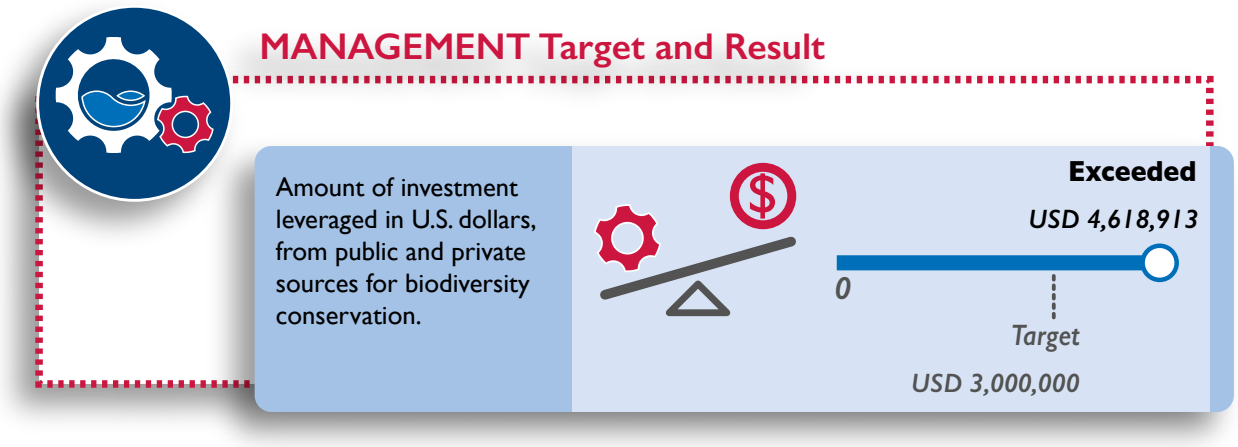


Figure 34. Project management achievements under the USAID SEA Project.

A few of the obstacles encountered by the management team in pursuit of the desired results are:

A large project with multiple objectives requires a range of human resource talent both in its core staff and among implementing partners. At the outset, the Project needed to take time to recruit and train its staff and its subcontracted partners, some of whom did not have all the required expertise for the technical work or reporting on results in a manner that accurately measured the project indicators. The time and effort to bring all staff and partners up to a common level of understanding is easily underestimated. This time cannot be rushed and highlights a common mistake of some donors to fast track 'early' results that lead to poor outcomes.

Comparable outcomes can be difficult to achieve among many partners. The USAID SEA Project subcontracted non-government partners that were responsible for much of the village field work, and for conducting baseline surveys to monitor change for biophysical and socioeconomic indicators. Relegating these surveys to multiple partners with differing levels of expertise produced results that were not uniform and sometimes difficult to analyze as a common data set. An important lesson is that the Project needed to do extensive training and testing for all the staff (on the core team and subcontractors) to ensure that common methods were used. Or, it needed to only employ one entity to undertake all the survey work across all the sites. There are pros and cons to these options to be considered; the USAID SEA Project attempted to standardize across its partners with varying degrees of success.

Working across a vast geographic area may diminish the results. The USAID SEA Project worked across a large geographic area incorporating three provinces in eastern Indonesia. The benefit of this was that the potential influence of the Project covers large marine areas. The downside was that a project with finite resources and personnel cannot work directly in too many field sites. This limited the Project's impact and hands-on management in the field. For example, the area of 14 MPAs targeted—about 1.6 million ha—was too vast to create active and effective field management in all of the sites during the five-year project life.

In summary, the USAID SEA Project taught us that project management is a very dynamic process, requiring multiple systems that work well together to track progress in a timely manner and provide feedback to adaptive management. A project of this size and scope needs strong leaders who are technically knowledgeable and good communicators, and who work well with the team. The large team required constant interaction and the strength of the USAID SEA Team is that the technical leads could operate independently on their workstream and guide those under their purview while also sharing the results with the larger team. Finally, to truly achieve the integration of fisheries management and biodiversity conservation, the team needed to be flexible in thinking and planning so that integration could occur.

Promoting small-scale vessel registration to support sustainable fisheries management in Haria Village, Maluku.
Photo: USAID SEA/Mochammad Topandi

10

Lessons learned and charting the path forward

The following insights summarize some of the overarching lessons learned from the USAID SEA Project that aim to chart Indonesia's path towards a future of sustainable fisheries and to protect marine biodiversity. The lessons expressed here are drawn from the case studies in earlier chapters and the broader discussion in the USAID SEA virtual symposium and insights of the USAID SEA technical staff.

TAKING A FLEXIBLE, CROSS-CUTTING INTEGRATED APPROACH

Indonesia's fisheries governance system is probably the most complicated in the world. It involves multiple interfaces and layers of administrative, legal, regulatory, and procedural complexity, with overlapping, fragmented, and sometimes conflicting roles and jurisdictions. Indonesian fisheries governance also cuts across multi-faceted industrial, and artisanal fisheries spread out over a wide geographical area. As noted in section 9 on project management, previous GOI fisheries policies allowed fishing at unsustainable levels and did not recognize marine biodiversity conservation's relevance to fisheries management. Consequently, as the number of fishers increased, catch rates began to decline, with some lost species. Research indicates that Indonesian fisheries are headed towards sustained losses without significant improvements to conservation and management. As of 2017, half of Indonesia's wild capture fisheries were overexploited, and 7 of the 11 FMAs showed no opportunities for expansion of production (MMAF decree no. 50/KepMen-KP/2017 shown in Figure 1 on page 3, Introduction).

In this context, USAID/Indonesia conceived the USAID SEA Project as an integrated strategy for improving fisheries and marine resource governance and management. An adaptive management approach was employed to ensure that integration efforts were tracked and adapted to the geographic and political context without sacrificing the Project's main objectives and goals. Community needs were integrated to support biodiversity objectives, and incentives were created (e.g., through alternative livelihood programs) to encourage local resource stewardship and community support for marine conservation. This integration led to improved fisheries management practices, strengthened marine tenure systems, secured access to traditional groups' resources, boosted women's participation in management processes, enhanced resilience, and improved fisheries value chains without increasing fishing capacity. These gains contributed to improving marine conservation and food security, critical long-term goals for self-reliant, sustainable development.

To achieve sustainable outcomes and promote policy coherence across Indonesia's fisheries governance system, the MMAF was engaged to advance collaboration within and between national agencies and provincial governments, achieving closer cooperation vertically and horizontally around fisheries and marine conservation.

This integration experience offers the following guide that can be applied to a variety of program contexts.

(1) Conduct regular group reviews to ensure smooth implementation and achieve target indicators, focusing on integration efforts and broader objectives.

(2) Regularly review the theory of change to analyze how different interventions intersect, overlap, support or do not support each other, and how integration across interventions can amplify outcomes for project objectives and goals.

(3) Build implementation structures that are adaptive and flexible—rather than predictive and rigid—to enable learning and adjustments to navigate the dynamic decision-making environments.

(4) Tap into the NGOs' unique ability to experiment with different management approaches by adopting a project design that facilitates their experiences to be science-driven, well documented, and scalable.

(5) Be realistic about the time required for integrated design and implementation and set timelines that recognize the additional time needed to plan co-funded activities.

(6) Allow time for baseline monitoring and adapt as necessary: Some biodiversity indicators, such as the number of hectares showing improved biophysical conditions, can require up to a decade to observe measurable results.

(7) Allow time for all parties to engage: Patient, sustained, and long-term work is needed to integrate stakeholder cooperation for sustainable fisheries across Indonesia's multi-layered governance system.

Local government, community members and wider stakeholders were involved in district-level public consultations in Sula Islands, North Maluku, which garnered support for the Sula Islands MPA zoning plan. Photo: USAID SEA/Asril Djunaidi

CREATING LOCAL-CONTEXT-DRIVEN SOLUTIONS

The early recognition within the USAID SEA Project was that there was a need to provide opportunities and an enabling environment for locally-led initiatives to thrive. This was particularly true for traditional sustainable marine resource use (e.g., *sasi* and *adat*) among communities at the site level. Providing these opportunities allowed the Project to build on what was already in place while engaging multiple partners and counterparts in policy development, planning, and implementation to achieve cross-sectoral integration to support the project objectives. As a result, space was created for traditional resource use and management practices within the formal legal and governance structure, providing some level of certainty around government support for community-led initiatives. This approach brought to the fore useful considerations for the GOI and other projects:

(1) Solutions that build on and embrace local customs and context are simpler to initiate and sustain. Where religious, social, and cultural traditions like *sasi* and *adat* already serve the purpose of management, they provide a beachhead to discuss effective conservation and fisheries problems.

(2) Relevant stakeholders need to develop tools for measuring impacts to ensure that partners understand how integration helps achieve goals and objectives.

(3) Working with local partners enables local capacity and resources to sustain project activities well beyond the project timeframe; e.g., the smaller, community-based organizations and local universities are vital to promoting local ownership and continuity of project implementation.

Small-scale vessels being measured in South Halmahera, North Maluku, as part of the vessel registration process. Registration of the small vessel fishing fleet will contribute to better management of nearshore waters. Photo: USAID SEA/MDPI Team

STRENGTHENING THE POLICY AND LEGAL ENVIRONMENT FOR SUSTAINABLE FISHERIES

The integration facilitated by the Project between the MMAF, local governments, communities, and local institutions created a shared understanding of the institutional and social changes needed to bring about sustainable fisheries, which led to some success in policy and legal outcomes. Opportunities to further develop the policy and legal environment to support sustainable fisheries should continue to be pursued, particularly to enable fisheries bodies, local authorities, and other stakeholders to effectively address fisheries issues as they arise.

(1) Continue to engage in policy advocacy. Meaningful policy reform requires time, continuity, and perseverance because, often, policy outcomes do not turn out as envisioned. This was exemplified recently by the Omnibus Law on Job Creation (Law no. 11/2020), which while purportedly "a step forward for market labor flexibility" (Rookmaaker, 2020), has raised concern for its implications on the natural environment (Jong, 2020), among several sectors (Wijaya, 2020).

(2) Utilize the Law on Local Government (Law no. 23/2014) as a framework for further capacitating the provincial government to engage with district and village governments in information, surveillance, and other cooperative agreements. With this law's grant of authority to the provincial government over nearshore coastal and marine areas, the province could play a strategic role in convening, planning, and achieving effective horizontal and vertical coordination in fisheries and conservation management. This role requires provincial governments to exercise appropriate political will and leadership levels and have the long-term perspective needed for successful co-management in fisheries. It is also crucial for the provinces to facilitate policy dialogue at the district and village levels and encourage local governments to partner with the province and actively engage in fisheries and marine conservation.

(3) There remain jurisdictional and functional overlaps that the Project encountered. A mechanism to bring together the MMAF, Ministry of Finance, MoHA, Ministry of Transport, Ministry of National Development Planning, and Coordinating Ministry for Maritime Affairs could be very advantageous to the sector. Such a body could streamline coordinated fisheries support to local governments and avoid mixed messages and fragmented interventions that are noticeable.

(4) Support the registration (and ultimately licensing) of the small vessel fishing fleet (< 10 GT) to help mitigate IUU fishing and enable more effective management of nearshore waters.

USING NEW TECHNOLOGIES AND TOOLS

By exploring emerging technologies and tools for sustainable fisheries management, the USAID SEA Project developed new ways to strengthen project outcomes while also generating lessons of relevance to the GOI and future projects.

(1) Fair Trade and other market-based instruments can support marine stewardship, but they are not a panacea. They take time, resources, and, more importantly, market support. Instead of relying entirely on weak, externally driven markets to effect and support change, management should seek a balance between intrinsic and extrinsic community drivers.

(2) New technologies and apps can be enablers of agility in complex systems (such as supply chain traceability technologies TraceTales and Trafiz, or catch monitoring systems I-Fish and OurData). However, the apps are only as useful as the system that uses and maintains them. Rigorous testing and validation are required before they can be broadly applied in a real-world setting. A variety of similar apps are available to users (such as vessel tracking units or systems for collating fisheries data). Their compatibility with centralized government systems and processes, and with one another, is paramount to optimizing their real-world value.

(3) Innovation and experimentation are vital in generating new thinking. However, to be practical, innovations need to be framed within a systematic process for tracking what is successful or unsuccessful. Sharing the pilot testing results and the lessons learned to assess the innovation's viability in the long term or at scale will ensure their broader scale adoption.

WORKING AT THE APPROPRIATE SCALE

Indonesia uses 'region-led national (fisheries) management' based on the FMAs as the 'jurisdictional unit of intervention.' This approach divides the country into 11 management units and has been successfully used by *Komnas Kajiskan* as a framework for its stock assessment program. FMAs help support the management of the migratory stocks (i.e., tuna and large pelagic fishes) and the mobile licensed fishing fleet (> 30 GT). FMAs also offer a structure for communicating policy and science and contributing to resource users' overall engagement.

However, the USAID SEA Project experience suggests that the FMAs have not yet been operationalized. The Project's focus on three provinces in FMA 715 ensured high-quality on-ground results and clear impact at fisheries management's operational level. The FMA 715 focus also

Fisheries officers in North Maluku were trained in the identification of reef, small and large pelagic fish, and sustainable fisheries principles using an educational flipchart developed by USAID SEA. Photo: USAID SEA/M. Ichsan

provides valuable insights into institutional arrangements for fisheries management and what could work best moving forward.

(1) Return on USAID SEA Project investment at the linked provincial-district-village levels is seen to be substantially higher than at other levels of investment. Project gains were most significant at the provincial level, where the provincial, district, and village governments' partnerships worked together with the various stakeholders to effect management regimes that fit well.

(2) Provinces have trained staff, resources, and an unequivocal mandate over most small-scale fisheries that rely on species with localized nearshore life cycles and that most need to be managed.

(3) Given the province's relative strength as a management unit, it may be prudent to prioritize fisheries management improvement at the provincial level before seeking opportunities at the FMA level.

FOSTERING A COMMUNITY OF PRACTICE FOR THE OCEAN SECTOR

A key takeaway from this work is that a wealth of information, knowledge, and learnings exist within the sector, mostly held informally by NGOs, academics, industry, community groups, and the provincial and district governments that regularly collect data and conduct site-level interventions. This information can help fill data gaps and increase the breadth and variety of data available to stock assessment scientists and managers, and potentially translate into considerable prospects for improving the whole sector.

As well as enriching the data, engaging the broader sector in the ocean community of practice can bring in new perspectives, tools, and points of view that allow for critical wide-lens, interdisciplinary, and diverse thinking that works well in high complexity situations.

> "It was a great pleasure working with MMAF and the SEA project team and partners on this project. Together we have achieved a lot to help Indonesia protect their extraordinary marine diversity and resources."
>
> DR. ALISON GREEN
> Senior Marine Scientist, The Nature Conservancy Global Team

INVESTING IN SCIENCE-DRIVEN DECISION MAKING

The USAID SEA Project provided significant technical assistance supporting the MMAF's stock assessment program, which is at the core of the ministry's mandate to oversee Indonesia's fisheries management systems. The Project facilitated data collection through its partners, assisted in data analysis for stock assessment, organized stock assessment workshops, and helped in the design of science-based harvest strategies for targeted fisheries, namely, small pelagic fish in FMA 715, reef fish in North Maluku and Maluku, and anchovies and flying fish in West Papua. The experience highlighted the following points:

(1) Small-scale fishers account for more than 85 percent of Indonesia's fishing fleet and are estimated to yield more than half of Indonesia's total harvest from the ocean (CEA, 2018). Without their inclusion in fishery assessments and management interventions, any efforts at sustainable EAFM will—at best—be ineffective.

(2) Adopting a methodological framework for identifying and implementing management interventions in advance is far more optimal than waiting until a stock collapses or stakeholders are impacted, and emotions are high.

(3) Logical planning and analysis based on scientifically based monitoring should drive the decision making: Sound decision making and prioritization for fisheries management require an understanding of fish stock status.

(4) Without accurate and timely stock assessments to determine catch limits and reference points, managers cannot ascertain if stocks are experiencing overfishing, leading to weak management strategies based on nothing but uninformed guesswork and risking stock depletion and loss of fisheries benefits.

(5) The collapse of fisheries and the livelihoods that depend on them is something that all parties concerned want to avoid: The use of longer-term management, such as harvest strategies, can help mitigate both collapsing fisheries and the need for reactive management and political interventions.

(6) Harvest strategies are a big step forward in establishing long-term sustainability plans. They should be developed with strong engagement from a wide array of stakeholders because they entail effort reduction and control that are often not politically popular and require stakeholder agreement and education.

(7) Harvest strategies need to achieve more than monitoring the stock. They should include precise information on what management interventions should be taken when the stock falls below a certain level and who is responsible for decision making.

(8) MPAs and MPA networks remain the cornerstone of marine resource management in Indonesia, being both the most successful conservation tool and large enough to have significant impacts. Indonesia has the experience, clearly documented MPA planning and establishment guidelines, capacity building programs (MPA 101), national targets (32.5 million hectares by 2030), and even an MPA rating system to ensure continued success.

(9) MPAs provide a robust governance framework within which fisheries management can be conducted and should be at the heart of fisheries reform.

CHANGING BEHAVIORS FOR A SUSTAINABLE FISHERIES FUTURE

Indonesia appears to be at a crossroads for management, with the pressures of a growing population, a mobile and well-financed small-scale fleet, new gear, and technologies driving overfishing. If the current business-as-usual scenario continues, fisheries production will likely follow its neighbors' downward trend. A lack of management has led to overfishing, reducing production by over 40 percent in both the Philippines and Vietnam. That said, Indonesian complexity and diversity could be its greatest strength, providing an opportunity to create an enabling environment that allows the provincial, district, and village governments to develop creative context- and situation-based solutions to fisheries management.

However, building leadership and changing behaviors to reduce fishing effort and stop illegal and DF activities takes longer than the donor's five year timeframe. It requires working strategically with all sectors at the individual, institutional, network, sectoral, and system levels. The central government needs to decide whether it can continue to attempt to manage centrally with its limited resources and reach. There remains an opportunity to shift to a more service-driven approach that creates the right enabling environment and supports capacity building for local governments to manage the thousands of fisheries under their jurisdiction. Supporting the on-ground institutions mandated to implement fisheries, and using the best possible data, science, and fisheries management tools, could ensure that Indonesia's seas are sustainably fished in the coming decades. The knock-on impacts of successful management can secure the fishing sector's future, boost exports, ensure food security, and protect jobs. Additionally, the integration of livelihoods, tourism, and other positive incentives can help towards successful and long-term management.

"I and my fellow villagers in Jefman Timur Village perceive the benefits of establishing KPA (Customary Fisheries Management). Now, ***bagan*** (raft lifting nets) cannot operate in our waters, if bagan fishers operate here, people from my village will drive them away. We can also witness that fish recovers; we can see trevally fish swim around our waters, hook-and-line fishers claim that their catch improves. Because of this evidence, we are motivated to make customary rules becoming village regulations, so the rules will be more imposing, workable and be recognized by the village government."

MS. SAMSIAH
Secretary to the Village Government and fish trap owner,
Jefman Timur Village, Raja Ampat District

Members of Pokmaswas Lembaga Adat Wanu Atalo'a, 'Leawana Squad', patroling and socializing the zones of Koon MPA in Maluku. The pokmaswas was established by the customary authority of Kataloka Village to protect the MPA and ensure community activities align with customary expectations. Photo: USAID SEA/Farhan Ramadhani

REFERENCES CITED

Ahmadia G.N, Wilson J.R. & Green A.L. (2013). Coral Reef Monitoring Protocol for Assessing Marine Protected Areas in the Coral Triangle. Coral Triangle Support Partnership.

Burke, L., Reytar, K., Spalding, M., and Perry, A. (2012). Reefs at Risk Revisited in The Coral Triangle. Washington DC: World Research Institute.

CEA [California Environmental Associates]. (2018). Trends in Marine Resources and Fisheries Management in Indonesia: A 2018 Review. Prepared with the support of the David and Lucile Packard Foundation.

FAO [Food and Agriculture Organization of the United Nations]. (2003). FAO Technical Guidelines for Responsible Fisheries. Rome. ISBN 92-5-104897-5.

FAO (2008). FAO Fisheries Technical Guidelines for Responsible Fisheries. Rome.

FAO (2011). 'Fishery and aquaculture country profiles: The Republic of Indonesia'. [online] FAO. Available at: http://fao.org/fishery/facp/IDN/en [Accessed 10 Dec 2020].

FAO (2016). The State of World Fisheries and Aquaculture 2016: Contributing to food security and nutrition for all. Rome: FAO.

Halim, A., Wiryawan, B., Loneragan, N.R., Hordyk, A., Sonditaa, M.F.A., White, A.T., Koeshendrajana, S., Ruchimat, T., Pomeroy, R.S., Yuni, C. (2019). Developing a functional definition of small-scale fisheries in support of marine capture fisheries management in Indonesia. Marine Policy 100: 238–248. Available on-line at: http://doi.org/10.1016/j.marpol.2018.11.044.

Huffard C.L., Wilson, J., Hitipeuw, C., Rotinsulu, C., Mangubhai, S., Erdmann, M.V., Adnyana, W., Barber, P., Manuputty, J., Mondong, M., Purba, G., Rhodes, K., and Toha, H. (2012). Ecosystem-Based Management in the Bird's Head Seascape Indonesia. Papua, Indonesia: Conservation International, The Nature Conservancy, and WWF–Indonesia. Available at: http://conservationgateway.org/Documents/EBM%20%20English%20310512_11june2012_LOW%20RES.pdf [Accessed 30 Nov. 2017].

Jong, H.N. (2020). "Indonesia's omnibus law a 'major problem' for environmental protection." Mongabay. Available at: http://news.mongabay.com/2020/11/indonesia-omnibus-law-global-investor-letter/ [Accessed Nov. 2020].

MMAF [Ministry of Marine Affairs and Fisheries]. (2016). Keputusan Menteri Kelautan dan Perikanan Republik Indonesia Nomor 82/KepMen KP/2016 Tentang Rencana Pengelolaan Perikanan Wilayah Pengelolaan Perikanan Negara Republik Indonesia 715. Jakarta: KKP.

Prager, M. H. (1994). A suite of extensions to a nonequilibrium surplus–production model. Fishery Bulletin 92: 374–389. Prager, M. H. 2016. User's Guide for ASPIC Suite, version 7: A Stock–Production Model Incorporating Covariates and auxiliary programs. Prager Consulting Portland, Oregon, USA. www.mhprager.com. Froese, R., Demirel, N., Coro, G., Kleisner, K.M., and Winker, H. 2016a. Estimating fisheries reference points from catch and resilience. Fish and Fisheries, 18, 506–526.

Prochaska, J.O., DiClemente, C.C. and J.C. Norcross (1992). In search of how people change. Applications to addictive behaviors. American Psychologist, 47(9), pp. 1102–1114.

Rookmaaker, T. (2020). "Omnibus law boosts Indonesian Growth Prospects." The Jakarta Post. Available at: http://thejakartapost.com/academia/2020/10/19/omnibus-law-boosts-indonesian-growth-prospects.html [Accessed 19 Oct. 2020].

UNEP–WCMC [United Nations Environment Program and World Conservation Monitoring Centre] (2008). Establishing National and Regional Networks of MPAs: A Review of Progress with Lessons Learned. Kenya: UNEP and WCMC.

USAID. (2020). SEA Project reef health monitoring protocol. USAID Sustainable Ecosystems Advanced Project. Jakarta.

Wijaya, C. (2020). "Thousands protest against 'omnibus law' on jobs." BBC News. Available at: http://bbc.com/news/world-asia-54460090 [Accessed 8 Oct. 2020].

Annex One: SEA Knowledge Products and Selected References

The publications listed in this Annex are organized by technical categories of USAID SEA Project work. Full citations and a link for access are provided where possible. The USAID SEA Project has produced many internal technical, training and activity reports that are not listed here but can be accessed through the website: www.sea-indonesia.org.

Overview publications (marine status and project context)

The State of the Sea: Indonesia (3 Volumes) (English and Indonesian)

Volume One: An Overview of Marine Resource Management for Small-Scale Fisheries and Critical Marine Habitats in Indonesia

Citation: Ministry of Marine Affairs and Fisheries (MMAF), Republic of Indonesia and USAID Sustainable Ecosystems Advanced (SEA) Project (2018). State of the Sea: Indonesia, Volume One: An Overview of Marine Resource Management for Small-Scale Fisheries and Critical Marine Habitats in Indonesia. Jakarta, 156p.
URL English: http://sea-indonesia.org/wp-content/uploads/2017/07/SOTS-Volume-1.pdf
URL Indonesian: http://sea-indonesia.org/wp-content/uploads/2017/07/SOTS-Bahasa-V1.pdf

Volume Two: Introducing the Heart of the Eastern Indonesia Seas: Status and USAID SEA Project Support

Citation: Ministry of Marine Affairs and Fisheries (MMAF), Republic of Indonesia and USAID Sustainable Ecosystems Advanced (SEA) Project (2018). State of the Sea: Indonesia, Volume Two: Introducing the Heart of the Eastern Indonesia Seas: Status and USAID SEA Project Support. Jakarta, 114p.
URL English: http://sea-indonesia.org/wp-content/uploads/2017/07/SOTS-Volume-2.pdf
URL Indonesian: http://sea-indonesia.org/wp-content/uploads/2017/07/SOTS-Bahasa-V2.pdf

Volume Three: A Journey Through Eastern Indonesia: USAID SEA Project – Sites and

Citation: Ministry of Marine Affairs and Fisheries (MMAF), Republic of Indonesia and USAID Sustainable Ecosystems Advanced (SEA) Project (2018). State of the Sea: Indonesia, Volume Three: A Journey Through Eastern Indonesia: USAID SEA Project – Sites and Activities. Jakarta, 206p.
URL English: http://sea-indonesia.org/wp-content/uploads/2017/07/SOTS-Volume-3.pdf
URL Indonesian: http://sea-indonesia.org/wp-content/uploads/2017/07/SOTS-Bahasa-V3.pdf

Talking SEA Newsletters (English and Indonesian)

Issue No. 1: ***Kaleidoscope*** (December 2017)
Editors: Alan White, Eleanor Carter, Tiene Gunawan
URL English: http://indonesiasea.wpengine.com/wp-content/uploads/2017/07/Talking-SEA-Kaleidoscope-2017-ENGLISH.pdf
URL Indonesian: https://sea-indonesia.org/wp-content/uploads/2017/07/Talking-SEA-Kaleidoskop-2017-Bahasa.pdf

Issue No. 2: ***Taking Indonesia's Fisheries Management to the Next Level: Towards Sustainable Fisheries*** (August 2018)
Editors: Alan T. White, Masayu Y. Vinanda, Ely Andrianita, Tiene Gunawan.
URL English: http://sea-indonesia.org/wp-content/uploads/2017/07/Newsletter-2-FA-FINAL.pdf
URL Indonesian: http://sea-indonesia.org/wp-content/uploads/2017/07/Newsletter-2-FA-BAHASA-FINAL.pdf

Issue No. 3: ***Protecting Indonesia's Marine Ecosystems for Future Generations: Towards Effectively Managed Marine Areas*** (January 2019)
Editors: Alan White, Eleanor Carter, Stacey Tighe, Ely Andrianita, and Tiene Gunawan
URL English: http://sea-indonesia.org/wp-content/uploads/2017/07/USAID-SEA-Newsletter-Talking-Sea-issue-No.3-English-28FEB19.pdf
URL Indonesian: http://sea-indonesia.org/wp-content/uploads/2017/07/USAID-SEA-Newsletter-Talking-Sea-Issue-No.3-Bahasa-28FEB19.pdf

Issue No. 4: ***Making Biodiversity Matter: Creating Incentives for Conservation*** (July 2019)
Editors: Alan White, Eleanor Carter, Ely Andrianita, and Tiene Gunawan
URL English: http://sea-indonesia.org/wp-content/uploads/2017/07/USAID-SEA-Talking-Sea-Newsletter-Issue-4_LowRes_English.pdf
URL Indonesian: http://sea-indonesia.org/wp-content/uploads/2017/07/USAID-SEA-Talking-Sea-Newsletter-Issue-4-1.pdf

Issue No. 5: ***Safeguarding Our Seas: Compliance with the Law in the Marine and Coastal*** (January 2020)
Editors: Alan White, Eleanor Carter, Laura Kola, Christiana Yuni Kusmiati and Tiene Gunawan
URL English: http://sea-indonesia.org/wp-content/uploads/2017/07/USAID-SEA-Talking-Sea-Newsletter-Issue-4_LowRes_English.pdf
URL Indonesian: http://sea-indonesia.org/wp-content/uploads/2017/07/TS-Issue-5_LAYOUT_B.Indo_Lores_10.03.pdf

Issue No. 6: ***USAID SEA Project, Impacts and Experiences: Sustainably Managing Marine and Coastal Resources in Indonesia*** (February 2021), in press.
Editors: Alan White, Eleanor Carter, Laura Kola and Tiene Gunawan

Fisheries publications

Anchovy Fisheries Management Plan for South Misool Area of Raja Ampat (Indonesian)
Citation: Mandagi, S., Sari, I., Maasengi, M., Tabalessy, R. and C. Rotinsulu (2020). *Rencana Pengelolaan Perikanan Ikan Puri di Misool Selatan Area IV Kawasan Konservasi Perairan Kepulauan Raja Ampat*, USAID Sustainable Ecosystems Advanced Project dan Dinas Kelautan dan Perikanan Provinsi Papua Barat. 33p.
URL: http://sea-indonesia.org/wp-content/uploads/2017/07/Rencana-Pengelolaan-Perikanan-Ikan-Puri-KKP-R4.pdf

Sustainable Fisheries Extension Material. Flipchart (Indonesian)
Editors: USAID SEA Project Team, 2020
URL: http://sea-indonesia.org/wp-content/uploads/2017/07/USAID-SEA-Materi-Penyuluh-Perikanan.pdf

Status of Red Snapper and Grouper Stocks and Fisheries in sea waters around Halmahera Island, North Maluku Province, and the Alternative Management Strategy (Indonesian)
Citation: Purwanto, Mardiani, S.R., Ernawati, T., Kembaren, D.D., Tirtadanu, Nurdin, E., Zamroni, A., Budiarti, T.W., Fauzi, M., Prihatiningsih, Muchlis, N., Taufik, M., Panggabean, A.S., Yulianto, I. and S. Agustina (2020). *Status Sumber Daya Ikan dan Perikanan Kakap Merah dan Kerapu di perairan laut sekitar Pulau Halmahera Provinsi Maluku Utara, serta Alternatif Strategi Pengelolaannya*. MMAF - Research Institute for Marine Fisheries and USAID Sustainable Ecosystems Advanced Project. Jakarta, Indonesia. 57p.
URL: https://pdf.usaid.gov/pdf_docs/PA00X8RN.pdf

Status of Small Pelagic Fish Stock and Fishery in Fisheries Management Area 715 and the Alternative Management Strategy (Indonesian)
Citation: Purwanto and S.R. Mardiani (2021). *Status Sumber Daya Ikan dan Perikanan Pelagis Kecil di WPP 715 serta Alternatif Strategi Pengelolaannya*. USAID Sustainable Ecosystems Advanced Project. Jakarta, Indonesia. 52p.
URL: https://pdf.usaid.gov/pdf_docs/PA00X8RP.pdf

Status of Reef Fish Stock and Fishery in sea waters around Seram Island, Maluku Province, and the Alternative Management Strategy (Indonesian) - in progress
Citation: Purwanto and S.R. Mardiani (2021). *Status Sumber Daya Ikan dan Perikanan Karang di perairan laut sekitar Pulau Seram Provinsi Maluku, serta Alternatif Strategi Pengelolaannya*. USAID Sustainable Ecosystems Advanced Project. Jakarta, Indonesia, in press.
Link will be available at: https://sea-indonesia.org/

A Genetic and Morphometric Study on Red-Snapper and Grouper in Fisheries Management Area 715 (English)
Citation: Zamroni, A., Kembaren, D.D., Ernawati, T., Purwanto and S.R. Mardiani (2021). *A Genetic and Morphometric Study on Red Snapper and Grouper in Fisheries Management Area 715. A Case Study on Malabar Blood Snapper (*Lutjanus malabaricus*) and Leopard Coral Grouper (*Plectropomus leopardus*)*. Prepared by MMAF - Research Institute for Marine Fisheries and USAID Sustainable Ecosystems Advanced Project. Jakarta, Indonesia. 57p.
URL: https://pdf.usaid.gov/pdf_docs/1e7ae381548e4b35880840f8ea545f65.pdf

Frame Survey. A framework designed for Fisheries Management Area 715 (English)
Citation: Badrudin, M., Purwanto, Wudianto, Nugroho, D., Satria, F., Mahiswara, Nurdin, E., Widodo, A., Sadiyah, L., Priatna, A., Budiarti, T.W., and S.R. Mardiani (2021). *Frame Survey. A framework designed for Fisheries Management Area 715*. Prepared by MMAF - Research Institute for Marine Fisheries and USAID Sustainable Ecosystems Advanced Project. Jakarta, Indonesia. 31p.
URL: https://pdf.usaid.gov/pdf_docs/6bfc2f8871a84e9b931760d46e33d3bf.pdf

Management of Flying Fish Resources in the Waters of West Papua Province (Indonesian)

Citation: Boli, P., Sari, I., Tebay, S., Simatauw, F., Parenden, D., Luhulima, I., Ananta, A. and C. Rotinsulu (2020). *Pengelolaan Sumber Daya Ikan Terbang di Wilayah Perairan Provinsi Papua Barat*. USAID Sustainable Ecosystems Advanced Project dan Dinas Kelautan dan Perikanan Provinsi Papua Barat. 65p.

URL: https://pdf.usaid.gov/pdf_docs/eea61d0d21e749ff8cf454a029a1f22b.pdf

Monitoring Small-Scale Fisheries Catches in Indonesia Through a Fishing Logbook System: Challenges and Alternatives (English)

Citation: Sari, I., Ichsan, M., White, A., Raup, S.A. and S.H. Wisudo (in development, submitted 2021). For Marine Policy.

Stock and Exploitation Risk of Small Pelagic Fish in Fisheries Management Area 715 of Indonesia (English)

Citation: Purwanto, Franklin, E., Mardiani, S.R. and A. White (in development, prepared 2021).

Marine protected area publications

A Guide, Framework and Example: Designing Marine Protected Areas and Marine Protected Area Networks to Benefit People and Nature in Indonesia (English and Indonesian)

Citation: Green, A.L., Fajariyanto, Y., Lionata, H., Ramadyan, F., Tighe, S., White, A., Gunawan, T., Rudyanto and N. Minarputi (2020). *A Guide, Framework and Example: Designing Marine Protected Areas and Marine Protected Area Networks to Benefit People and Nature in Indonesia.* Report prepared by The Nature Conservancy (TNC) for the USAID Sustainable Ecosystems Advanced Project, 90p.

URL English: https://sea-indonesia.org/wp-content/uploads/2017/07/AGuide-Framework-and-Example-in-Designing-MPA.pdf

URL Indonesian: https://sea-indonesia.org/wp-content/uploads/2017/07/Panduan-Kerangka-Kerja-dan-Contoh-untuk-Merancang-KKP.pdf

Policy Brief: Designing Marine Protected Areas (MPAs) and MPA Networks to Benefit People and Nature in Indonesia (English and Bahasa Indonesia)

Editors: White, A (USAID SEA Project), Rudyanto (USAID SEA Project), Fajariyanto, Y (TNC), Green, A (TNC), 2020

URL English: http://sea-indonesia.org/wp-content/uploads/2017/07/Policy-brief-Designing-MPAs-and-MPA-Networks-USAID-SEA.pdf

URL Indonesian: http://sea-indonesia.org/wp-content/uploads/2017/07/Policy-brief-Indonesian_compressed.pdf

Biophysical Criteria: Designing Marine Protected Areas and Marine Protected Area Networks to Benefit People and Nature in Indonesia (English)

Editors: Green, A (TNC), Fajariyanto, Y (TNC), White, A (USAID SEA Project), 2020

URL English: http://sea-indonesia.org/wp-content/uploads/2017/07/USAID-SEA-Biophysical-Criteria.pdf

Biophysical Report: Status of coral reefs and reef fish in 13 marine protected areas in Maluku, North Maluku and West Papua Provinces (English)

Citation: Ceccarelli, D. M., Lestari, A. P., Rudyanto, R. and A. White (2021) *Status of coral reefs and reef fish in 13 marine protected areas in Maluku, North Maluku and West Papua Provinces.* USAID Sustainable Ecosystems Advanced (SEA) Project and the Government of Indonesia (GoI), Jakarta, Indonesia, 225 p.

Link will be available at: https://sea-indonesia.org/

Province Factsheets: Designing an MPA Network in FMA 715 and 6 Associated Provinces (Indonesian)

Editors: White, A and Rudyanto (USAID SEA Project), 2019

URLs: Gorontalo Factsheet URL: http://sea-indonesia.org/wp-content/uploads/2017/07/Factsheet-MPA-GORONTALO_USAID-SEA.pdf

Maluku Factsheet URL: http://sea-indonesia.org/wp-content/uploads/2017/07/Factsheet-MPA-MALUKU_USAID-SEA.pdf

North Maluku Factsheet URL: http://sea-indonesia.org/wp-content/uploads/2017/07/Factsheet-MPA-MALUKU-UTARA_USAID-SEA.pdf

West Papua Factsheet URL: http://sea-indonesia.org/wp-content/uploads/2017/07/Factsheet-MPA-PAPUA-BARAT_USAID-SEA.pdf

Central Sulawesi Factsheet URL: http://sea-indonesia.org/wp-content/uploads/2017/07/Factsheet-MPA-SULTENG_USAID-SEA.pdf

North Sulawesi Factsheet URL: http://sea-indonesia.org/wp-content/uploads/2017/07/Factsheet-MPA-SULUT_USAID-SEA.pdf

Marine spatial planning publications

National Marine Spatial Planning Implementation Symposium for Indonesia (English)

Citation: Wen, W., Johnson, G., Prasetyo, N., Haskell, B., Belinda. J., Lassiter, McGee, G., Snow, P. and M.S. Brancato (2019). *National Marine Spatial Planning Implementation Symposium for Indonesia*. USAID SEA Project, Jakarta. 46p.
URL English: https://pdf.usaid.gov/pdf_docs/PA00WQGV.pdf

Best Practices and Lessons Learned in the Process of Developing Zoning for Marine Spatial Planning (RZWP-3-K) in Maluku Province (Indonesian)

Citation: Prasetiyo, N., Wen, W., Anwar, A.H., Asikin, E., Manuel, E., Sopaheluwakan, J., Talahatu, C.E., Ishak, A., Rumagia, F.S., Sagfan, A., Mainassy, J.E., Nanlohy, A.M. and F. Khouw (2021). *Best Practices dan Lessons Learned Proses Penyusunan Rencana Zonasi dan Wilayah Pesisir dan Pulau-Pulau Kecil (RZWP-3-K) di Provinsi Maluku*. USAID SEA Project, Jakarta. 44p.
Link will be available at: https://sea-indonesia.org/

Allen Coral Atlas for Coral Reef Management in Indonesia: A Brief Review (English)

Editors: Wen, W. and A. White (USAID SEA Project), 2020
URL English: http://sea-indonesia.org/wp-content/uploads/2017/07/Allen-Coral-Atlas-for-Coral-Reef-Management-in-Indonesia-A-Brief-Review.pdf

Law enforcement and policy publications

Developing a functional definition of small-scale fisheries in support of marine capture fisheries management in Indonesia (English)

Citation: Halim, A., Wiryawan, B., Loneragan, N.R., Hordyk, A., Sonditaa, M.F.A., White, A.T., Koeshendrajana, S., Ruchimat, T., Pomeroy, R.S. and C. Yuni (2019). Developing a functional definition of small-scale fisheries in support of marine capture fisheries management in Indonesia. *Marine Policy* 100: 238–248.
URL: https://doi.org/10.1016/j.marpol.2018.11.044.

Formulate a definition of small-scale fisheries to support capture fisheries management in Indonesia (Indonesian)

Citation: Halim, A., Wiryawan, B., Loneragan, N.R., Hordyk, A., Sonditaa, M.F.A., White, A.T., Koeshendrajana, S., Ruchimat, T., Pomeroy, R.S. and C. Yuni (2020). Merumuskan definisi perikanan skala-kecil untuk mendukung pengelolaan perikanan tangkap di Indonesia. *Journal of Fisheries and Marine Research* 4(2): 239-262.
URL: http://jfmr.ub.ac.id

Handbook for Community Surveillance Groups (Indonesian)

Citation: Hartini, E., Ihsan, E.N., Capriati, A. and C. Yuni (2020). *Sistem Pengawasan Berbasis Masyarakat dan Peran Kelompok Masyarakat Pengawas dalam Pengelolaan dan Pemanfaatan Sumber Daya Kelautan dan Perikanan yang Berkelanjutan*. MMAF and USAID SEA Project, 40p.
URL Indonesian: http://www.sea-indonesia.org/wp-content/uploads/2017/07/USAID-SEA-BUKU-SAKU-POKMASWAS-1.pdf

Book I: Technical Guidelines to Develop MPA Networks and Establish Management Framework in Indonesia (Indonesian)

Authors: Rusandi., A., Agung, F., Ramli, I., Halim, A., White, A.T., Yuni, C., Tighe, S., Rudyanto and M. Febrianie.
Citation: Direktorat Konservasi dan Keanekaragaman Hayati Laut (Dit. KKHL) (2021). *Petunjuk Teknis Proses Pembentukan dan Perangkat Pengelolaan Kerjasama Jejaring Kawasan Konservasi Perairan di Indonesia.* Direktorat Jenderal Pengelolaan Ruang Laut, Kementerian Kelautan dan Perikanan, Jakarta, 56p.
Link will be available at: https://sea-indonesia.org/

Book 2: Technical Guidelines to Evaluate the Impact of MPA Networks in Indonesia (Indonesian)

Authors: Rusandi., A., Agung, F., Ramli, I., Halim, A., White, A.T., Yuni, C., Tighe, S., Rudyanto and M. Febrianie.
Citation: Direktorat Konservasi dan Keanekaragaman Hayati Laut (Dit. KKHL) (2021). *Petunjuk Teknis Proses Pembentukan dan Perangkat Pengelolaan Kerjasama Jejaring Kawasan Konservasi Perairan di Indonesia.* Direktorat Jenderal Pengelolaan Ruang Laut, Kementerian Kelautan dan Perikanan, Jakarta, 52p.
Link will be available at: https://sea-indonesia.org/

Behavior change publications

Stories of Change from Eastern Indonesia (English and Indonesian)

Citation: Kahan K., Ansel and E. Andrianita (2021). *Stories of Change from Eastern Indonesian*. USAID Sustainable Ecosystems Advanced Project, Jakarta, in press.

Link will be available at: https://sea-indonesia.org/

Incentives and marine conservation guidance publications

Private Sector Contribution to Marine Protected Areas in Indonesia (English)

Editor: R. Hodges (Marine Change, USAID SEA Project Partner), 2020

Link: http://sea-indonesia.org/wp-content/uploads/2017/07/USAID-SEA_TR_Private-Sector-Contribution-to-MPAs-MC-Mar2020.pdf

Infographics on Carrying Capacity on Morotai Dive Sites (English and Indonesian)

Editors: Marine Change (USAID SEA Project Partner) and USAID SEA Project Team, 2020

URL English: http://sea-indonesia.org/wp-content/uploads/2017/07/USAID-SEA-Carrying-Capacity-Infographics-on-Morotais-Dive-Sites.pdf

URL Indonesian: http://sea-indonesia.org/wp-content/uploads/2017/07/USAID-SEA-Infografis-Daya-Dukung-Wisata-Selam-Morotai.pdf

Sustainable Tourism Around Marine Protected Areas (English and Indonesian)

Citation: Aragão, D. L., Paulus, I. G. N., Nuraini, Kosasih, V.C., White, A., Gunawan,T., Rudyanto, and N. Minarputri (2020). *Sustainable Tourism Around Marine Protected Areas. A Practical Handbook for Implementation in Indonesia*. Jakarta, Indonesia. Publication prepared by Marine Change for the USAID Sustainable Ecosystems Advanced Project. 134p.

URL English: http://sea-indonesia.org/wp-content/uploads/2017/07/USAID-SEA-SUSTAINABLE-TOURISM-HANDBOOK-ENG-FINAL.pdf

URL Indonesian: http://sea-indonesia.org/wp-content/uploads/2017/07/USAID-SEA-SUSTAINABLE-TOURISM-HANDBOOK-ID-FINAL.pdf

Morotai Mooring Buoys Program Within Pulau Rao–Tanjung Dehegila Marine Protected Area in Morotai, North Maluku, Indonesia: Findings, Lessons and Next Steps (English)

Editor: D. Aragao (Marine Change, USAID SEA Project Partner), 2020

Link: https://pdf.usaid.gov/pdf_docs/PA00X8RM.pdf

Socialization of MSC Pre-assessment Result and Discussion on The Fisheries Improvement Project Action Plan for Shrimp Fisheries, Sorong Selatan, West Papua (English)

Editor: B.T. Hardianto (WWF Indonesia, USAID SEA Project Partner), 2020

Link: https://pdf.usaid.gov/pdf_docs/PA00X8RK.pdf

Produced by
the USAID Sustainable Ecosystems
Advanced Project and
the Ministry of Marine Affairs and Fisheries,
Republic of Indonesia.