SHARED ACTION

Building momentum and collaboration in sustainable tuna fisheries management in Indonesia



JUNE 2024

TUNA CONSORTIUM

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COVER PHOTO: ©MDPI

ACRONYMS

APSI	Purse Seine Association of Indonesia
BPPSDMKP	Marine and Fisheries Human Resources Extension and Development Agency
BRIN	National Research and Innovation Agency
CODRS	Crew-Operated Data Recording System
CPIB	Good Fish Processing and Handling (training)
DGCF	Directorate General of Capture Fisheries
ETP	Endangered, Threatened and Protected (species)
FAD	Fish Aggregating Device
FAO	Food and Agriculture Organization
FCMC	Fisheries Co-Management Committee
FIP	Fisheries Improvement Project
FMA	Fisheries Management Area
FTUSA	FairTrade USA
GOI	Government of Indonesia
GT	Gross Tons
HCR	Harvest Control Rule
IAW	Indonesia Archipelagic Waters
ICTBF	International Coastal Tuna Business Forum
IPNLF	International Pole and Line Foundation
ITC	Indonesia Tuna Conference
MDPI	Masyarakat dan Perikanan Indonesia
MMAF	Ministry of Marine Affairs and Fisheries
MSC	Marine Stewardship Council
MSE	Management Strategy Evaluation
NGO	Non-governmental Organisation
NTMP	National Tuna Management Plan
PIT	Measurable Fisheries (policy)
RFMO	Regional Fisheries Management Organization
STELINA	National Fish Traceability and Logistics System
WCPFC	Western and Central Pacific Fisheries Commission
YII	Yayasan IPNLF Indonesia
YKAN	Yayasan Konservasi Alam Nusantara



ABOUT THIS REPORT

The success of multi-stakeholder engagement and a collaborative approach to developing a harvest strategy as a fisheries management tool for tropical tuna fisheries in Indonesia is an inspiring story. This report draws on the experiences of the Indonesia Tuna Consortium (Consortium) over the past two and a half years (Phase Two) and documents their role as a strategic partner supporting the Ministry of Marine Affairs and Fisheries (MMAF) to develop the Harvest Strategy for Tropical Tuna Fisheries in Indonesia Archipelagic Waters (IAW). We refer to this as the Tuna IAW Harvest Strategy throughout.

We start by giving an overview of harvest strategies as a fisheries management tool within the context of Indonesian tuna fisheries. We then take a deep dive into the Consortium's four thematic areas of focus (right).

We hope that the stories captured in this report will serve as a springboard for fisheries managers, government agencies, industry actors, and other fisheries stakeholders to maintain the momentum and work together through the Consortium's third phase and beyond for the successful implementation of the Tuna IAW Harvest Strategy and broader sustainable management practices.

THEMATIC AREAS OF FOCUS

- Harvest strategy development: advancing the governance and policy framework.
- Stakeholder involvement: inclusive co-management and supply chain engagement.
- Community empowerment: enhancing fisher capacity, benefits and resilience.
- Collective action: building an effective Tuna Consortium.



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OVERVIEW

TUNA FISHERIES MANAGEMENT CHALLENGES IN INDONESIA

The Indonesian marine environment is enormous both in size and natural value. Indonesian marine waters total 5.8 million km^2 and boast the highest marine diversity in the world. They also support fertile fishing grounds for extensive small-scale and large-scale fisheries that are well-known for their commercial tuna stocks, primarily skipjack, yellowfin, and bigeye tunas. In fact, Indonesia is the world's largest tuna producer, with tuna comprising over 10 percent of the national capture fishery production in weight and 15–17 percent of global tuna production annually[1]. In 2022, the total tuna catch amounted to an impressive 301,799 tons, translating to a value exceeding US$ 680 million[2].

Tuna fisheries' high biological and socio-economic values necessitate a comprehensive management approach to ensure their sustainability. Over the last decade, the MMAF has made a sustained effort to develop instruments to regulate access to the fishery and limit catch. The government's ability to design and implement adaptive management actions was hampered by a lack of time-series data to inform decisions about the fisheries and the practicalities of the enormous geographical scale of Indonesia's waters and the complex characteristics of this fishery.

Approximately 97 percent of the Indonesian fishing fleet consists of low-technology, small-scale fishers operating boats under ten gross tons (GT)[3] that have historically been largely unregulated. This has posed challenges for data collection particularly from small scale fishers in the remote eastern Indonesia provinces, as have complex supply chains with many stakeholders and agencies, each requiring different data from landing to export to inform management measures. Furthermore, consulting small-scale fisheries stakeholders during the development of an appropriate management strategy, effectively socialising management decisions and enforcing regulations in fishing communities far from administrative centres is time-consuming and resource intensive.

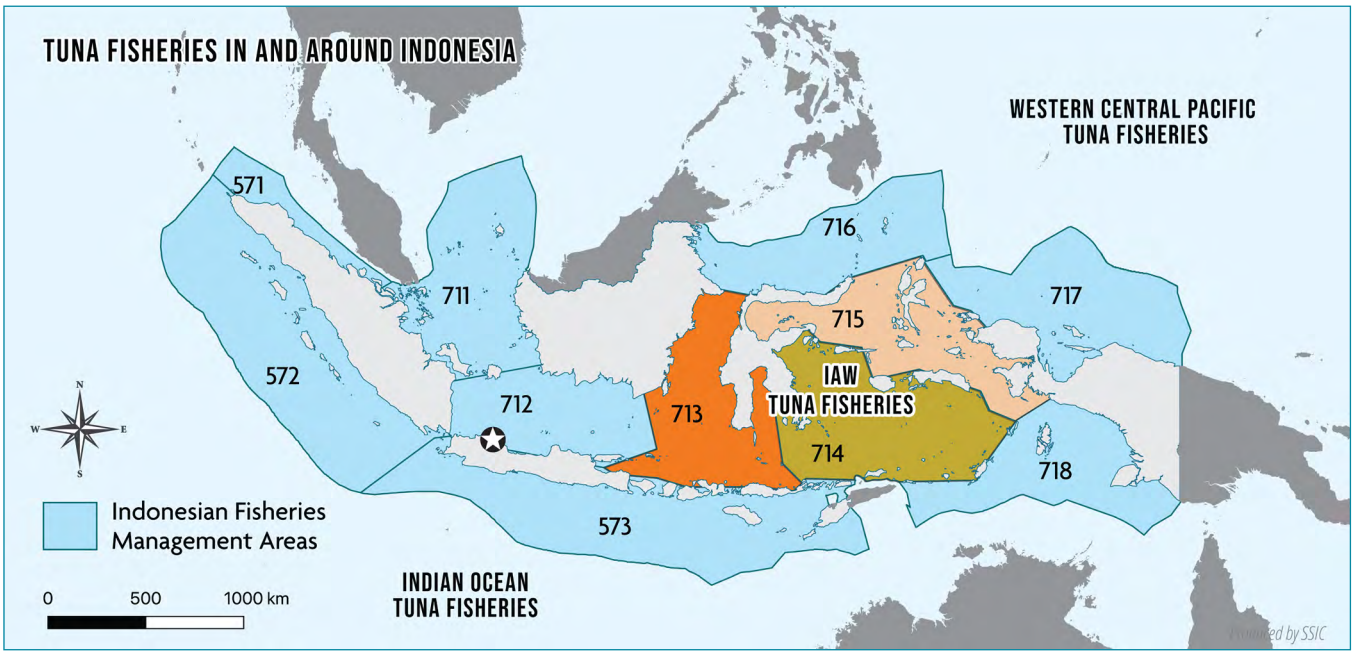


Figure 1. Republic of Indonesia Fisheries Management Areas (FMAs), highlighting the FMAs within Indonesia Archipelagic Waters (IAW) and tuna fisheries.

GEOPOLITICAL CONTEXT OF TUNA FISHERIES IN IAW

Indonesian marine waters are divided into 11 geographical units known as fisheries management areas (FMAs). This division aims to simplify fisheries management by breaking down the complex and diverse needs across the archipelago into more manageable areas. Each FMA has its own management council[4] to develop and implement fisheries management plans that are the basic guidelines for all key stakeholders. However, migratory species such as tuna complicate fisheries management because they often cross FMA and administrative borders, meaning a coordinated cross-region management approach is required. Tunas also cross international marine borders, requiring coordinated management among countries within their range.

Regional Fisheries Management Organizations (RFMOs) serve as the peak regional bodies for fisheries management on the high seas. As an active member of three RFMOs[5], Indonesia is committed to governing and managing its tuna fisheries in line with each RFMO's conservation and sustainable management measures, and ensuring tuna stocks are conserved across their migratory routes. Indonesia's National Tuna Management Plan (NTMP)[6] guides regional authorities across Indonesia in regulating tuna fisheries within their authority and adopting conservation and management measures for sustainable tuna stocks and trade. The NTMP also requires the creation and execution of a harvest strategy framework for managing tuna fisheries in the Indonesia Archipelagic Waters (IAW). The IAW straddles FMAs 713, 714, and 715 (Figure 1) and contributes over half of the total tuna production from Indonesian waters that fall under the jurisdiction of the relevant RFMO, the Western and Central Pacific Fisheries Commission (WCPFC)[7]. Thus, the Tuna IAW Harvest Strategy must be consistent with international[8], national and sub-national sustainable management objectives for tuna fisheries.

WHAT IS A HARVEST STRATEGY?

Harvest strategies are increasingly popular as a fisheries management tool globally and are recognised as a best practice for evidence-based fisheries decision-making. Unlike traditional, top-down fisheries management, comprehensive harvest strategies are developed through a consultative process involving key stakeholders from the regulatory authorities, scientists, industry, and conservation sector. This collaborative development process increases stakeholder buy-in to fisheries control and negates subjective interpretation of harvest strategies by different stakeholders.

A harvest strategy is a holistic fisheries management approach that outlines fishery resource monitoring, assessment, and management by setting harvest limits for fished species and implementing management measures to achieve specific management goals. Where managers have the technical capacity and economic resources, suitable harvest strategies

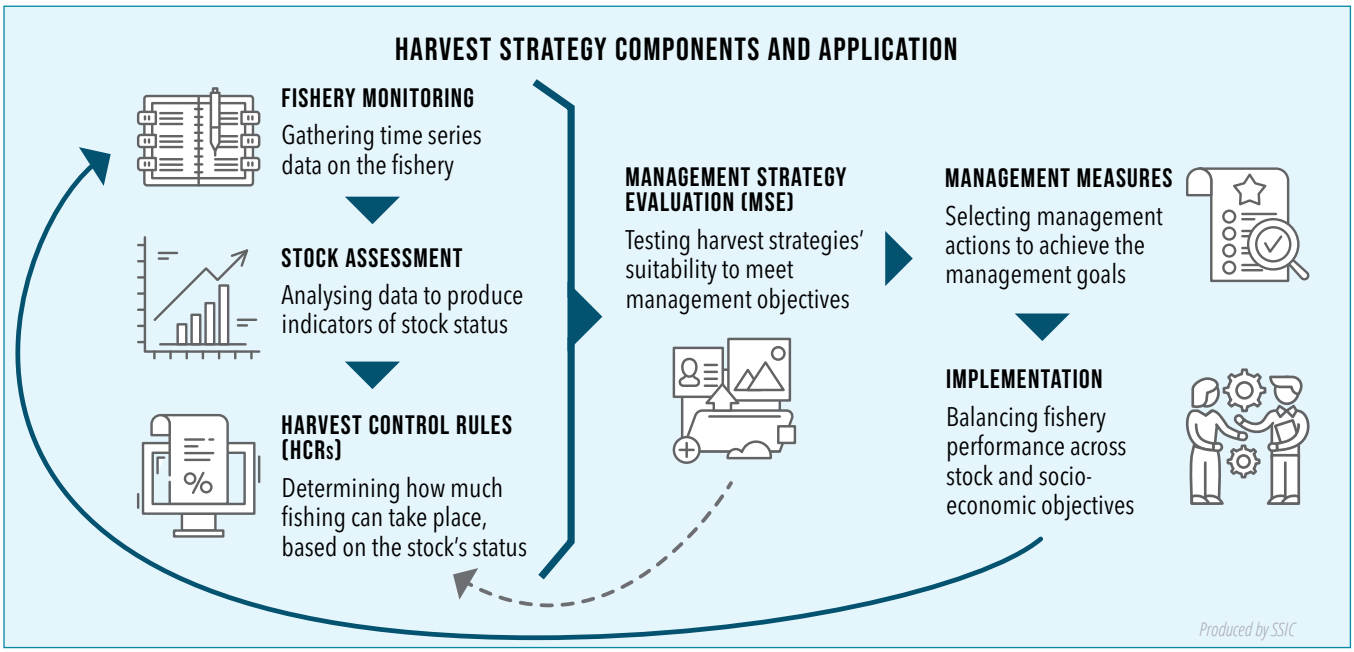


Figure 2. The components of a harvest strategy and how they are applied in managing a fishery.

may be modelled through the 'Management Strategy Evaluation' (MSE) method. MSE evaluates a potential strategy's suitability by testing its performance under different conditions and its robustness in the face of ecological and social fluctuations before its implementation or in response to monitoring data and real-world conditions.

Harvest strategies are adjusted according to the status of the fishery. Data monitoring specific resources are gathered and utilised to evaluate the fishery's performance compared to the pre-established management objectives and reference points[9], which trigger modifications to the management measures intended to achieve the strategy's objectives. The mechanism that defines the response to the fishery's status is called a Harvest Control Rule (HCR). This adaptive system protects fish stocks by avoiding or correcting overfishing, which benefits the marine environment's overall health and socio-economic outcomes for fishers and industry stakeholders. Harvest strategies also represent an opportunity to increase or maintain market access for tuna products, as sustainable seafood certification programs increasingly stipulate that fisheries must have harvest strategies.

Clearly, developing a comprehensive harvest strategy requires a sound understanding of a fishery's conditions (status) and defined management goals for the fishery. In practice, assessing the status of a fishery as a basis for formulating management measures requires considerable research based on fisheries data collected over the long term. Yet for many data- and capacity-limited fisheries in coastal developing countries, such as Indonesia, building enough knowledge about a fishery—or having the necessary resources to build the required knowledge—to develop a comprehensive harvest strategy is a daunting task along the path to improved fisheries management.

> **"A fisheries harvest strategy is a comprehensive framework that sets out the management actions necessary for a fishery to achieve predefined biological, ecological and socio-economic goals.**
>
> — MMAF, 2023



THE INDONESIA TUNA CONSORTIUM

The Indonesia Tuna Consortium (Consortium) was established in 2019 to support the Ministry of Marine Affairs and Fisheries (MMAF) in formalising the Tuna IAW Harvest Strategy. It is dedicated to ensuring healthy, sustainable tuna fisheries and supporting fishing communities across Indonesia. The Consortium works to support a coordinated approach to sustainable tuna fisheries management, aligning key stakeholders across government, industry, and NGO sectors, facilitating dialogue and initiating processes to support collaborative engagement in harvest strategy development and implementation, particularly with fisher associations and other small-scale fisheries stakeholders. The current Consortium comprises five Indonesia-based members, some with key supporting roles to the government, over two phases of work from 2019 to 2024, and a coordinator that started in Phase Two.

TUNA CONSORTIUM



Masyarakat dan Perikanan Indonesia (MDPI) is a non-governmental organisation dedicated to advancing responsible and sustainable fisheries for the benefit of coastal communities and marine ecosystems. With a focus on fishery improvements and community development, MDPI supports strengthening coastal communities and engages in extensive fisheries management initiatives to foster long-term results. MDPI's engagement with and data collection from small-scale tuna fishers provides a valuable overview of conditions on the ground, contributing significantly to the Consortium and the MMAF's development and implementation of harvest strategies. mdpi.or.id

Yayasan Konservasi Alam Nusantara (YKAN), the main implementing partner of the Nature Conservancy (TNC) in Indonesia, is dedicated to promoting sustainable fisheries and marine conservation. YKAN works to catalyse equitable fisheries reform towards sustainability through science, technology, community involvement, and awareness. YKAN is transforming tuna fishery practices in Indonesia by monitoring fish stocks, tracking fishing vessels, developing species identification technology, and preparing for the implementation of the tuna harvest strategy in Indonesia Archipelagic Waters. As a science-based conservation organisation, YKAN adds valuable technical fisheries science expertise to the Consortium and supports the MMAF in building its knowledge and developing appropriate management measures to achieve the Tuna IAW Harvest Strategy goals. ykan.or.id

Yayasan IPNLF Indonesia (YII) is an Indonesian foundation connected with the global International Pole and Line Foundation (IPNLF), dedicated to promoting sustainable pole-and-line and handline tuna fisheries in Indonesia. YII works with multiple stakeholders in Indonesia to scale up best practices, ensure compliance with catch reporting, monitor fisheries, secure market access, and emphasise social responsibility. YII supports adopting traceability tools and increases quality to facilitate market access for small-scale tuna fishers. iplnf.org

Marine Change works to develop strategies and mobilise investments that lead to the regeneration of ecosystems, supply chain efficiencies, and resilient and financially sustainable communities and businesses. Marine Change works on the business challenges associated with fisheries improvement projects (FIPs), Marine Stewardship Council (MSC) and FairTrade certification, and the economic impacts of harvest control rules. During Phase Two, Marine Change supported the inclusion of the purse seine sector as an essential stakeholder in the push for improved fisheries management. marinechange.com

FairTrade USA (FTUSA) is North America's leading certifier of fair-trade products. FTUSA's Fair Trade Certified™ seal on a product signifies that it was made according to rigorous standards that promote sustainable livelihoods, safe working conditions, protection of the environment, and strong, transparent supply chains. In the Consortium, FTUSA engages with buyers, certificate holders, and fishers to promote sustainable and responsible tuna products from Indonesia, strengthen cooperatives, and raise community awareness about sustainable fishery practices. fairtradecertified.org

Resonance is a trusted provider that leads changemakers in the public and private sectors to solve urgent and complex sustainability challenges strategically. Resonance strengthens value chains and generates market opportunities to drive adaptation, resilience, and equity in a climate-impacted world. By engaging with the private sector, Resonance has been a key leader in developing sustainability strategies and natural resource management approaches for fisheries, forestry, land use, and water management. Through its experience in partnership facilitation and implementation, Resonance works to catalyse entrepreneurship, investment, and innovation to help clients overcome business and development challenges. Resonance is the lead secretariat for the Indonesia Tuna Consortium in the second phase of work from 2022 to 2024. resonanceglobal.com

TUNA CONSORTIUM SUPPORT TO THE

ENGAGED STAKEHOLDERS

6,300
FISHERS & FISHERY PROFESSIONALS

73
COMPANIES, SUPPLIERS AND PROCESSORS

6
TERTIARY EDUCATION INSTITUTIONS

53
FISHING VILLAGES

HARVEST STRATEGY DEVELOPMENT

CRITICAL DATA COLLECTION AND ANALYSIS FROM FISHING GROUNDS IN IAW

- 324,036 TUNA IMAGES
- 214 LANDING LOCATIONS SURVEYED
- 12 OBSERVERS DEPLOYED ACROSS 133 VESSELS

TUNA IAW HARVEST STRATEGY

SUPPORTED DOCUMENT FINALISATION, LAUNCH, & PREPARING FOR IMPLEMENTATION

DEFINED 12 SOCIO-ECONOMIC INDICATORS

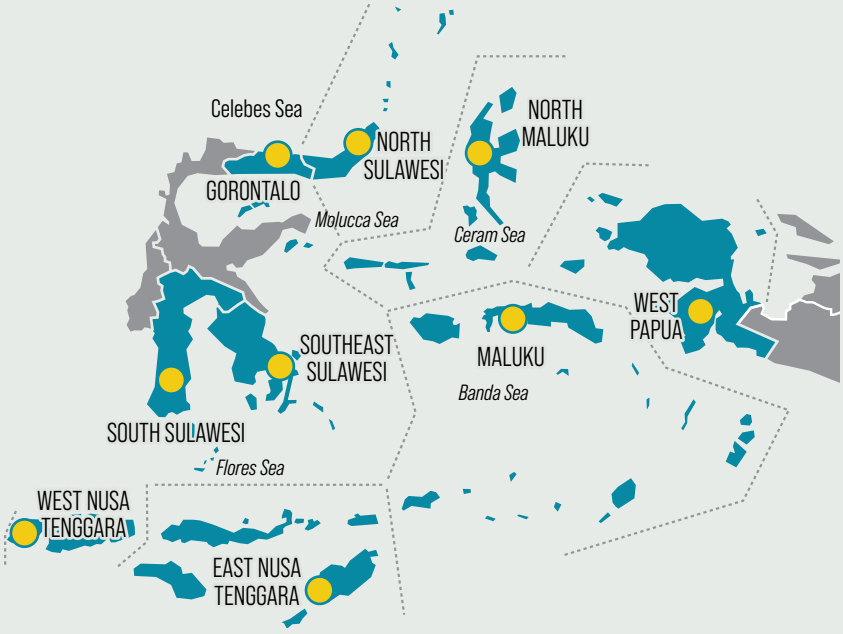
STAKEHOLDER INVOLVEMENT

IMPROVED FISH TRACEABILITY PROGRESSED CERTIFICATION

FACILITATED 39 FISHERY CO-MANAGEMENT COMMITTEE MEETINGS & 3 REGIONAL MEETINGS

PURSE SEINE FISHERY SECTOR REPRESENTATION

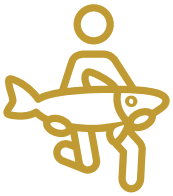
PILOTED MMAF'S E-LOGBOOK WITH 54 SMALL-SCALE FISHERS



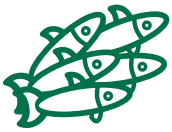
TUNA IAW HARVEST STRATEGY

DEVELOPMENT PROCESS MILESTONES

REFINED HARVEST CONTROL RULES (HCR)



DEVELOPED PRECAUTIONARY CATCH REDUCTION PLAN



AGREED 3 PRIORITY MANAGEMENT MEASURES



TUNA IAW HARVEST STRATEGY LAUNCHED



COMMUNITY EMPOWERMENT





250 FISHER HOUSEHOLDS WITH IMPROVED FINANCIAL LITERACY



105 FISHER CHAMPIONS
TRAINED AS CATALYSTS FOR POSITIVE CHANGE
54 % WOMEN

729 VESSELS REGISTERED



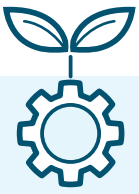


539 FISHERS CERTIFIED IN FISH HANDLING & FISH QUALITY

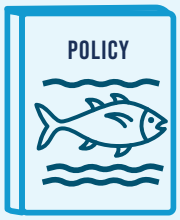


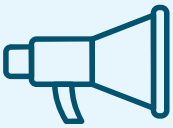
FIRST TWO FADs SUCCESSFULLY REGISTERED IN INDONESIA

COLLECTIVE ACTION



ADVANCED SUSTAINABLE TUNA FISHERIES POLICIES & PROGRAMS





ADVOCATED FOR FISHERS' VOICES IN DECISION-MAKING

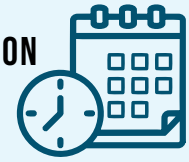


5 CONSORTIUM MEMBERS IN INDONESIA



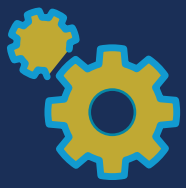
COLLABORATED CLOSELY WITH MMAF & GOVERNMENT IN 9 PROVINCES OF IAW

CRITICAL COORDINATION OF STAKEHOLDERS



THEME 1. HARVEST STRATEGY DEVELOPMENT: ADVANCING THE GOVERNANCE AND POLICY FRAMEWORK

HIGHLIGHTS:



- Assisted in finalising technical documents for the Harvest Strategy for Tropical Tunas in Indonesia Archipelagic Waters (IAW) for FMAs 713, 714 and 715, with a precautionary catch reduction of 10 percent over three years and priority management measures to ensure the sustainability of IAW tuna fisheries.
- Strengthened the evidence base for sustainable tuna fisheries management in IAW through targeted research and multi-stakeholder consultation.
- Facilitated input into harvest strategy implementation with experts from government, NGOs, and academics, resulting in action plans for implementing management actions.

ADVANCING THE TUNA IAW HARVEST STRATEGY

Developing an evidence-based and scientifically tested harvest strategy for tuna fisheries in IAW was successful due to the Ministry of Marine Affairs and Fisheries' (MMAF) commitment to building knowledge and capacity, as well as a collaborative approach to making decisions on critical elements of fisheries management and practice.

In **2014**, the MMAF began developing the Tuna IAW Harvest Strategy. Over the next four years, they collaborated with various stakeholders through consultations, technical workshops, and training sessions covering stock assessment, harvest strategy concepts, and monitoring and evaluation. Primary stakeholders included government agencies, businesses, national and international technical experts, and NGOs. The MMAF also initiated a collaborative review of the available time-series data for tuna, selecting appropriate data sets, and adjusting parameters for use in the Tuna IAW Harvest Strategy. This review informed improving data collection throughout the Tuna IAW Harvest Strategy's development and implementation.

By **2018**, the MMAF released an interim Tuna IAW Harvest Strategy. This interim document incorporated stakeholder input and prioritised five management measures for tunas in IAW, narrowed down from an initial fifteen measures at the beginning of the consultation process. Although the interim Tuna IAW Harvest Strategy was an impressive milestone for sustainable tuna fisheries management in the IAW, it was only practical with the necessary harvest control rules (HCR) to support an adaptive management approach. The strategy framework laid out the next steps for completing the Tuna IAW Harvest Strategy, with a focus on testing and refining approaches in FMAs 713, 714, and 715.

A COLLABORATIVE APPROACH TO HARVEST STRATEGY FINALISATION

The Tuna IAW Harvest Strategy was developed through a nine-year consultative process among Indonesian fisheries managers, government agencies, national and international scientists, industry, fishing associations, small-scale fisher communities and non-government organisations (NGOs). The Consortium's experience supporting this process highlights significant advances in achieving the necessary levels of engagement and collaboration that have arguably laid the essential foundations and set the future direction for sustainable and best-practice fisheries management in Indonesia[11].

This collaborative approach to collating and developing knowledge and setting goals for the tuna fisheries increased stakeholder buy-in and ensured transparency in the process, which became a keystone of the MMAF's approach. The Consortium worked tirelessly to support the MMAF in this approach, build an evidence base on fishery sectors and pertinent management issues in IAW, facilitate the refinement of the document and move toward its implementation.

Leading government departments

Ministry of Marine Affairs and Fisheries (MMAF)

- Directorate General of Capture Fisheries (DGCF)
- Directorate General of Strengthening Competitiveness of Marine and Fisheries Products
- Directorate General of Marine and Fisheries Resources Surveillance (PSDI)
- Marine and Fisheries Human Resources Extension and Development Agency (BPPSDMKP)

Technical group members and contributors

- National Research and Innovation Agency (BRIN) and Marine and Fisheries Research Centre (PusRisKan)
- Yayasan Konservasi Alam Nusantara (YKAN)
- Masyarakat dan Perikanan Indonesia (MDPI)
- Yayasan IPNLF Indonesia (YII)
- Fishing Associations
- ACIAR-CSIRO
- Academia

Stakeholder consultations

- USAID Ber-IKAN
- BRIN and PusRisKan
- YKAN
- MDPI
- YII
- Other NGOs
- Fishing Associations
- Industry
- Academia

In **2019**, the MMAF began scenario testing of an operating model (OM), simulating the various aspects of the tuna fisheries system and the harvest strategy, using Management Strategy Evaluation (MSE). In the same year, the MMAF initiated a multistakeholder process to review the National Tuna Management Plan (NTMP). During this period, the Indonesia Tuna Consortium (Consortium) launched to support the MMAF in strengthening data collection and facilitating stakeholder consultations to the Tuna IAW Harvest Strategy development process. The MMAF legalised the revised NTMP in 2021[10], with an emphasis on improving data collection, assessment, and research to support the dual aims of sustainable management of tuna stocks and the economic development of tuna fisheries by supporting business and industry stakeholders to meet market certification requirements.

From **2021–2023**, the MMAF refined the OM, developed a precautionary catch reduction plan, and agreed on three priority management measures at the heart of the Harvest Strategy for Tropical Tunas in Indonesia Archipelagic Waters for FMAs 713, 714 and 715. The Consortium assisted the MMAF by facilitating and coordinating multi-stakeholder meetings to garner input into the development process and contributing technical and capacity-building support to improve resource monitoring as the essential inputs to a measurable and adaptive harvest strategy. On June 08, 2023, the MMAF officially launched the Tuna IAW Harvest Strategy.

The following pages of this report highlight key aspects of the Consortium's contribution during Phase Two of their support to the development process for the Tuna IAW Harvest Strategy during 2021–2023.

TUNA CONSORTIUM KEY SUPPORT TO THE HARVEST STRATEGY DEVELOPMENT PROCESS

The Consortium supported MMAF in strengthening data collection for and facilitating stakeholder contributions to the harvest strategy's development.

Consortium members contributed to stakeholder and technical workshops throughout the process and supported the coordination and facilitation of meetings to finalise the harvest strategy.

2014 INITIATION

MMAF INITIATE A HARVEST STRATEGY FOR TUNA IN INDONESIA ARCHIPELAGIC WATERS

2015-2017 DEVELOPMENT

NATIONAL TUNA MANAGEMENT PLAN 2015

REVIEWED AVAILABLE TUNA FISHERIES DATA
AGREED THE MANAGEMENT OBJECTIVE
AGREED 5 MANAGEMENT MEASURES
DEVELOPED PERFORMANCE INDICATORS

2018 IMPLEMENTATION & REFINEMENT

DEVELOPED ACTION PLAN FOR REFINEMENT AND IMPLEMENTATION

MMAF LAUNCHES INTERIM HARVEST STRATEGY

TUNA CONSORTIUM PHASE ONE

– Facilitation support to MMAF
– Coordinated industry and fishers' input to harvest strategies
– Established tuna Fishery Co-Management Committees
– Provided technical advice to MMAF on selection and implementation of harvest strategies
– Collaborated with industry and fishing association to strengthen data collection
– Supported industry and small scale fishers to obtain eco-certification

(Continued in Phase Two)

2019

BEGAN SCENARIO TESTING OF THE OPERATING MODEL USING MANAGEMENT STRATEGY EVALUATION

2020

INITIATED MULTI-STAKEHOLDER NATIONAL TUNA MANAGEMENT PLAN REVIEW

2021

CONTINUED TESTING OF THE OPERATING MODEL

MMAF LAUNCHES REVISED NATIONAL TUNA MANAGEMENT PLAN 2021

TUNA CONSORTIUM PHASE TWO

– Co-organised and attended international events to promote Indonesian tuna
– Conducted targeted research to inform the harvest strategy
– Developed small-scale fisher capacity for sustainable fisheries management
– Coordinated knowledge development forums with stakeholders from local, regional and national levels
– Contributed to the finalisation of harvest control rules (HCR)
– Coordinated refinement of socio-economic indicators
– Supported MMAF and BRIN for the harvest strategy launch
– Facilitated expert discussion of the implementation of management measures

2022

REFINED OPERATING MODEL
DEVELOPED PRECAUTIONARY CATCH REDUCTION PLAN
AGREED 3 PRIORITY MANAGEMENT MEASURES

2023

MMAF LAUNCHES TUNA INDONESIA ARCHIPELAGIC WATERS HARVEST STRATEGY

TUNA CONSORTIUM PHASE THREE

– Maintaining momentum for implementation

2024

ROLES IN THE HARVEST STRATEGY DEVELOPMENT PROCESS

RESEARCH CENTRE FOR FISHERY, NATIONAL RESEARCH AND INNOVATION AGENCY

- Establish technical working group to advise on process
- Conduct stock assessments and provide guidance on stocks' status
- Ensure appropriate analysis of data
- Support modelling for the reference points and identify potential control rules

DIRECTORATE OF FISH RESOURCES MANAGEMENT - DIRECTORATE GENERAL OF CAPTURE FISHERIES

- Decision-making authority on reference points and control rules
- Coordinate stakeholder participation and consultation
- Establish steering committee
- Report progress on process and seek input from fishery stakeholders

INDONESIA TUNA CONSORTIUM / STRATEGIC PARTNERS

- Support facilitation of consultation and coordinate stakeholder input
- Contribute to data collection and analysis
- Implementation of certification schemes
- Support the socialisation of management actions and decisions

Figure 3. Key government and non-government roles in developing the Tuna IAW Harvest Strategy.

CONTRIBUTING TO THE REGIONAL MANAGEMENT OF TUNA FISHERIES

The Consortium supports the GOI's membership to the Regional Fisheries Management Organization (RFMO) Western and Central Pacific Fisheries Commission (WCPFC) meetings and forums, enhancing its role in the regional management of tuna fisheries. Key preparatory meetings and outcomes in 2023:

Convening	Consortium Support	Outcome
14th Annual Tuna Fisheries Catch Estimate Review	Collaborated with MMAF, BRIN, and the Pacific Community (SPC) to facilitate the workshop	• Compliance with the RFMO member annual reporting requirements • Recommended to strengthen collaboration between government agencies and continue observers for longline fisheries
Scientific Committee	Supported aggregate catch and effort data and gap analysis workshop	Understanding around generating aggregate catch and effort data for WCPFCs requirements, and logbook and observer data from tuna fisheries
Technical Compliance Committee	• Reviewed the tuna management measures • Engaged on the position paper for RFMO meetings	Recognising the role of government agencies in data verification and validation to meet RFMO reporting requirements
WCPFC20 preparation meetings	• Discussions contributed to harvest straegy development • Collaborated with MMAF and AP2HI to facilitate the meeting	• Review and revision of the Tuna IAW Harvest Strategy document • Recommendations made for the delegation's position paper

TUNA IAW HARVEST STRATEGY LAUNCH

On World Ocean's Day, June 8, 2023, the Indonesian Minister of the MMAF, Sakti Wahyu Trenggono, officially launched the Harvest Strategy of Tropical Tunas in Indonesia Archipelagic Waters for FMA 713, 714 and 715.



STRENGTHENING THE EVIDENCE BASE



Consortium members contributed substantially to advancing research and improving fisheries data collection to inform the Tuna IAW Harvest Strategy's development and finalisation. The data contributions from the Consortium to the MMAF's Technical Harvest Strategy Team for Tropical Tuna in Indonesia Archipelagic Waters (IAW) have been crucial for developing a solid, science-based management strategy. A key outcome of the Consortium's engagement with the MMAF is improved coordination and partnerships among organisations and programs engaging in tuna fisheries data collection. Many NGOs and agencies collect fisheries data in various formats to serve their own monitoring or research purposes. Through technical workshops, the Consortium supported the MMAF to integrate varied datasets from strategic partners—mostly NGOs—into the government's monitoring framework to enable Indonesian scientists to derive stock health more accurately and feed it back into tuna management in archipelagic waters.

BUILDING A BETTER PICTURE OF THE FISHERIES

Through the Tuna IAW Harvest Strategy development process, the MMAF addressed data collection challenges collaboratively, with stakeholders providing data to meet a common goal of improving understanding of the fishery's characteristics and tuna fisheries management. Consortium members contributed critical data and analysis from fishing grounds in the IAW.

Consortium member YKAN conducted a study on fish aggregating devices (FADs) and purse seine fisheries in IAW. This included collecting image-based data from August 2022 to August 2023, which was submitted to the MMAF and BRIN as part of a comprehensive data set of 324,036 identified tuna and related species caught from the FMAs of 713, 714, and 715. These data were drawn from 1,370 boat landings of handline, trolling line, purse seine and pole-and-line. A comprehensive survey of 214 landing locations at 41 sites confirmed that more than 1,700 purse seiners are operating in the region, most of which are vessels under 30 GT. Their findings demonstrate that purse seiners rely heavily on FADs to increase the effectiveness and productivity of their operations. The 20 purse seiners that were monitored did not make any setting on free-swimming schools. In pole-and-liners, the findings shows a very clear difference in median size between fish caught on FADs and without FADs. FAD-associated skipjack and yellowfin tuna were about six to seven centimetres smaller than

fish caught from free-swimming schools. These detailed data are invaluable to fisheries managers and policymakers grappling with the restriction of FADs as a management measure.

Demonstrating the value and application of data-driven decision-making, Consortium member YKAN released the results of an investigation into catch composition and fleet characteristics of tuna fisheries in IAW. Using a length-based assessment of yellowfin and skipjack tunas in IAW based on 2020 data, the report evaluated the outcomes of various length-based harvesting scenarios and presented management options and measures to balance economic and stock conservation priorities.

The investigation entailed a frame survey of tuna fishing vessels in IAW and a catch survey using the image-based Crew-Operated Data Recording System (CODRS), which combines catch data with location tracking. The use of the CODRS illustrated applying a cost-effective and scalable data collection approach in response to the challenges of data collection in the IAW tuna fisheries. Emphasising the importance of sound decision-making and cooperative management, the data and analysis contributed to the comprehensive evaluation of harvest strategies.

Consortium members also contributed data from on-vessel observer programs, characterising tuna fisheries by measuring catch, species and size, gear and vessel type, interaction with FADs and endangered, threatened and protected (ETP) species, and location of catch relative to governance boundaries. To help the MMAF increase observer coverage in IAW, Consortium member YII collaborated with the Indonesian Pole and Line and Handline Association (AP2HI) to deploy 12 observers, who gathered data from 133 pole-and-line vessels and 12 companies.

Maintaining comprehensive data collection and research and integrating it into the MMAF monitoring systems over the long term will be essential to the sustainability and responsiveness of the Tuna IAW Harvest Strategy, as it will enable the document to be modified based on the best scientific evidence available.

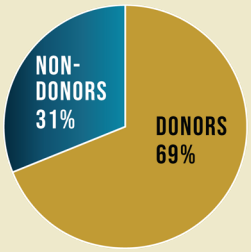
FUNDING LEVERAGED TO SUPPORT THE TUNA IAW HARVEST STRATEGY

Since 2019, the Indonesia Tuna Consortium leveraged over US$ 310,000, including US$ 230,000 from donors and nearly US$ 80,000 from non-philanthropic sources. Around US$ 235,000 of the funds were leveraged by Consortium members MDPI and YII to transition the costs for ongoing routine data collection and supply chain improvement efforts to other sources of funding. Resonance successfully leveraged US$ 75,000.

ROUTINE DATA COLLECTION:

US$ 155,673 Leveraged by MDPI

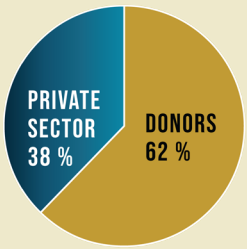




SUPPLY CHAIN IMPROVEMENTS:

US$ 80,620 Leveraged by YII





~ FUNDING IMPACT



Provided data to support tuna fisheries management policies.



Port sampling data were used in the harvest strategy development, and determining the catch composition of handline tuna in the WCPFC area.



Data were used in the annual catch estimates workshop (ITFACE-14).

~ FUNDING SOURCE AND APPLICATION



$50,000 — Preparatory grant by the World Bank Standards and Trade Development Facility for improved handling.



$16,000 — Connected to the UNDP Ocean Innovation Challenge Award for renewable energies in Indonesian small-scale tuna fisheries.

$12,700 — Supported FairTrade USA certification for Indonesian tuna fisheries.

$1,560 — Provided 3 electronic traceability systems.

Figure 4. Funding leveraged by the Tuna Consortium for data collection and supply chain improvements in support of the Tuna IAW Harvest Strategy.

INFORMING FAD POLICY AND REGULATIONS

In Indonesia, regulations to control FAD use have undergone multiple iterations since the mid-1990s. FAD management strategies need to consider the impact of control measures on small-scale fishers, commercial fishers and fish stocks, and the broader marine ecosystem, and ideally should be informed by a detailed understanding of stock status, catch data, and fishing fleet dynamics.

Recognising the need for better FAD management in Indonesia's tuna fisheries, the Consortium supported the MMAF in gathering expert knowledge to advise on improvements. Consortium member YII undertook research that provided a comprehensive overview of the social and ecological aspects of using anchored FADs. This overview considered the costs and benefits to fisheries and fishers and the impact of FADs on fish stock health and catch, tuna life history and migratory patterns.

YII also completed a review of Indonesia's policy framework for FAD management, including a comparison of Indonesia's regulations with the recommended RFMO conservation and management measures that prioritise long-term control of FADs to minimise threats to tunas. From 2021 to 2022, the MMAF released several regulations that involve FAD management, including limiting the number and type of FADs per fishing operator or cooperative based on their scale and area of operation (territorial waters or high seas)[12], banning FADs in FMA 714[13], and fisheries activity standards for fishers with an expired FAD permit[14]. The thorough policy review found that these regulations are generally compliant with WCPFC requirements.

Consortium members MDPI, YII and YKAN collaborated to organise a national FAD forum in Jakarta bringing together government representatives, industry partners, fisher associations, fisher champions and NGOs. The forum shared knowledge on topics such as FAD planning and management, FAD licensing, industry perspectives on FAD registration, the results of YII's policy review and YKAN's dissemination on the use of FADs by purse seine.

At the provincial level, MDPI organised FAD Forums to build an understanding of the new FAD-related regulations, ease their implementation by fisheries managers, and support the future implementation of FAD management measures in the Tuna IAW Harvest Strategy.



FADs CONTEXT IN INDONESIA'S TUNA FISHERIES

FADs are structures installed in the open ocean to mimic naturally occurring organic matter floating on the surface, to which fish are attracted. aFADs are FADs fixed to a concrete anchor or sinker. Tunas congregate beneath FADs to prey on smaller fish attracted to the shelter, and for spawning. FADs are commonly used in tuna fisheries in Indonesia because tuna fishers can spend less time and fuel locating productive fishing grounds. However, a rapid increase in FADs in tuna fishing grounds in the 2000s led to unsustainable fishing practices, including overfishing and conflict between FAD users.



DETERMINING SOCIO-ECONOMIC INDICATORS

Consortium member YII organised four multi-stakeholder workshops focused on refining approaches to develop socio-economic indicators for the Tuna IAW Harvest Strategy. The process involved government representatives, academics, associations, private sector, Consortium members and other NGOS and resulted in twelve key indicators for monitoring the socio-economic conditions of fishers and fisheries in IAW. Stakeholders mapped available data and potential data collectors to enable the measurement of the indicators through a unified data collection framework.

NGOs involved in the workshops committed to collecting the relevant socio-economic data to monitor the impacts of the Tuna IAW Harvest Strategy's implementation and to inform future decision-making for tuna fisheries. Consortium members used the workshops to build collaborative relationships between government and non-government stakeholders to improve data collection and data sharing mechanisms. The workshops had a noticeable repeat attendee participation, indicating successful progress towards a more collaborative and engaged environment.

PRIORITY MANAGEMENT MEASURES AND HARVEST STRATEGY FINALISATION

The technical and consultative processes culminated in the MMAF's finalisation of the Tuna IAW Harvest Strategy in the first half of 2023. Consortium member YKAN and other experts offered technical support to the MMAF and BRIN in the last stages of refining the Tuna IAW Harvest Strategy, through the final technical adjustments and discussions of linkages with the new quota-based measurable fisheries policy[15] (PIT policy), which needed to be considered prior to finalisation. The management measures and controls within the Tuna IAW Harvest Strategy will, once implemented, enable tuna fisheries to operate sustainably and achieve new, or maintain current, sustainable fishery certifications, an increasing prerequisite to access higher-value markets.

Following the document's release, the Consortium's engagement with Indonesian experts continued. Consortium member MDPI collaborated with USAID Ber-IKAN[16] to support the MMAF, NGOs, and academics to develop action plans that will serve as guidelines to address uncertainties in implementing each of the three management measures in the Tuna IAW Harvest Strategy.

The Tuna IAW Harvest Strategy has three core management actions to ensure the sustainability of yellowfin, bigeye and skipjack tunas:

1. **Restrictions on the use of fish aggregating devices (FADs)**
2. **Spatial closure (of important spawning or nursery areas) and temporary closure (during key periods such as spawning)**
3. **Total allowable catch limit (TAC) per fisheries management area (FMA).**

Additional work is needed to get feedback from stakeholders, improve data collection to measure stock status, and perform more comprehensive testing to ensure the robustness of the strategy, practicality of implementation, and consistency with government regulations and WCPFC stock assessments. The GOI is continuing collaborations with scientific experts to finalise tuna biological parameters and to develop an effort- or catch-based operating model. While this work continues over the next three years, **stakeholders agreed to a precautionary catch reduction of approximately ten percent from the 2021 catch level,** phased as reductions of four percent in the first year of implementation and three percent in each of the next two years.



THEME 2. STAKEHOLDER INVOLVEMENT: INCLUSIVE CO-MANAGEMENT AND SUPPLY CHAIN ENGAGEMENT

HIGHLIGHTS:



- Organised Fishery Co-Management Committees (FCMCs) as crucial platforms for subnational consultation on tuna fisheries management with government, industry, fishers, and NGOs.
- Engaged industry to establish the Purse Seine Association of Indonesia (APSI) providing a voice for purse seine fishers in support of improved fisheries management.
- Strengthened small-scale fisher engagement in sustainable tuna fisheries management by promoting catch reporting using the MMAF's electronic logbooks.
- Co-organized the 1st Indonesia Tuna Conference (ITC) and 7th International Coastal Tuna Business Forum (ICTBF) with the government, attended by over 200 national and international delegates.

COORDINATION AND COOPERATION: SUPPORTING FISHERIES CO-MANAGEMENT COMMITTEES

Fisheries Co-Management Committees (FCMCs) exist at both provincial and regional levels. They serve as inclusive platforms for stakeholder communication, fisheries data analysis, and discussion of emerging fisheries management issues.

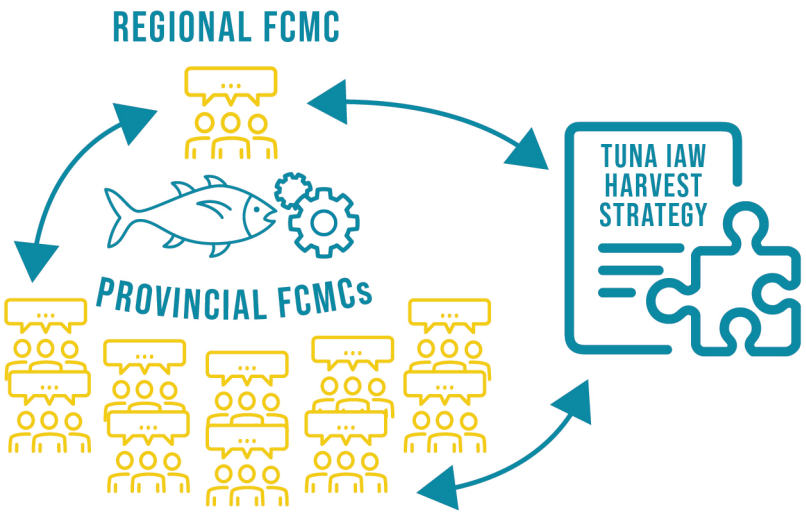
FCMCs are a vital space where government agencies, industry partners, associations, academia, researchers, NGOs, fishers, and mini-plant suppliers come together to share their unique perspectives on sustainable fisheries management. Researchers and NGOs contribute evidence for policy development, fishers provide the context for applying policies on the ground, and the government collects inputs to formulate fisheries policies for sustainable outcomes, including the Tuna IAW Harvest Strategy and National Tuna Management Plan (NTMP).

At the provincial level, FCMCs meet biannually and aim to strengthen stakeholder coordination and build stronger fisheries policy. Representatives from provincial-level FCMCs also participate in annual regional FCMC meetings attended by a broader range of fisheries stakeholders. In this way, the FCMCs provide two-way information, feeding provincial-level information about fisheries management issues to national decision-makers and providing national-level information to provincial-level stakeholders.

Since 2019, Consortium members MDPI and YII have facilitated and organised FCMC meetings, including ensuring fishers' representation in the management forums. Some popular issues discussed in FCMCs during the last two and a half years include: cooperation with other organizations to collect tuna data, socialisation of fish aggregating device (FAD) registration and licensing, vessel registration and migration permits, catch composition analysis and trends per province, current fishery conditions, fuel subsidies for small-scale fishers and socialization of the Tuna IAW Harvest Strategy.

In FCMCs led by MDPI, stakeholders develop work plans and action plans for progressing between meetings, which encourages ongoing cooperation and organization among stakeholders. Key issues for FCMCs within their action plans often revolve around strengthening fisheries, empowering fishing communities, and navigating government

FISHERY CO-MANAGEMENT COMMITTEES



KEY SUPPORT

Facilitated stakeholder contributions to tuna fisheries management across 9 provinces

39 PROVINCIAL FCMC & 3 REGIONAL FCMC MEETINGS



processes for compliant fishers. FCMCs have led to the development of scientific papers, a Memorandum of Understanding (MoU) between an FCMC and the Provincial government, and cooperation among organisations to collect tuna data.

The value of FCMCs as an inclusive space for fisheries stakeholders to exchange information was recognised during a recent investigation by Consortium member MDPI into lessons learned from FCMCs[17]. From this assessment, several strengths were identified, including the role of FCMCs in bridging the distance between stakeholders, increasing the participative capacity of attendees, creating equal negotiation spaces, and providing freedom for open discussions to enable a shared understanding of each other's concerns and provide a genuine opportunity for problem-solving and capacity building to improve tuna fisheries management.

BOOSTING COLLABORATION ON SUSTAINABLE TUNA FISHERIES MANAGEMENT

At Regional FCMCs, representatives from provincial-level FCMCs meet with people from central government, regional government, academia, fisheries associations, and industry to discuss current hot topics in sustainable tuna fisheries management in Indonesia.

During the Tuna IAW Harvest Strategy's development, regional FCMCs provided important opportunities to discuss the document's progress and milestones. Following the Tuna IAW Harvest Strategy's finalisation, discussions have evolved to consider its implementation and the interplay of tuna fisheries policies on the strategy's management measures.

At the Fifth Regional FCMC in July 2023, organised by Consortium member MDPI, topics included the implementation of the strategy and FAD regulation, and fisher licensing and compliance. More recently, in May 2024, the Ministry of Marine Affairs and Fisheries (MMAF) used the Sixth Regional FCMC meeting as an opportunity to present its recently released measurable fisheries policy (PIT policy) to regional stakeholders. The PIT policy requires a quota or allocation for Indonesian fish resources, including tuna, to be set for each Fisheries Management Area (FMA). Fishers in attendance took the opportunity to discuss the policy's practical application, and it was concluded that socialising the provisions and mechanisms of quota-based fishing will be essential to support its implementation.





SOUTHEAST SULAWESI FCMC EXPLORES THE IMPACT OF FISHERIES POLICIES

In late 2022, the YII-led provincial Southeast Sulawesi FCMC had a broad agenda to discuss the development of the fisheries policies regarding vessel licenses and fish aggregating devices (FADs) in FMA 714, and to review the progress of the Indonesia Southeast Sulawesi Yellowfin Tuna and Skipjack Tuna Purse Seine Fisheries Improvement Program (FIP)[18]. Priority discussion topics included harvest strategies, vessel license management, catch data collection, and the role of the FCMC. External stakeholders presented on implementing social policies within FIPs to protect the rights of fisheries workers.

An innovative 'PIT Game' simulated the challenges and opportunities associated with different fisheries policies and controls. Scenarios explored in the game included traditional one-by-one fisheries, unregulated fisheries using non-selective fishing gears, and three different zone- or quota-based policy applications to illustrate the impacts of fishing practices and policy decisions. The game provided participants with a better understanding of the intent behind zone- and quota-based policies and highlighted the significance of catch reporting, regulatory measures, and stakeholder collaboration in achieving sustainable fisheries management.



PURSE SEINE SECTOR ENGAGEMENT



Purse seine fishing operations are one of the most important sectors of the Indonesian fishing industry, accounting for the largest catch share across all gear types. The sector is diverse, ranging from larger vessels that fish all over Indonesia's territorial waters to small boats operating close to shore. Most purse seine vessels operating in Indonesia archipelagic waters (IAW) are medium-sized, around 20–30 GT capacity[19]. Larger vessels (> 60 GT) with onboard freezers or collector services may be at sea for up to three months with a crew of 30. Purse-seine fishing in open water is generally considered an efficient form of fishing, however, when purse seiners target fish congregating around FADs it can result in higher levels of juvenile fish and bycatch.

In 2021, the Consortium recognised that the purse seine sector is underrepresented as a stakeholder advocating for improved fisheries management compared to other fishery sectors in Indonesia. In 2023, Consortium member Marine Change supported the establishment of the Purse Seine Association of Indonesia (APSI) to provide a voice for purse seine fishers. APSI develops relationships between purse seine fisheries stakeholders, the Indonesian government, and NGOs and supports sustainable fishing policies. APSI promotes sector-wide transparency, collaborative resource management, and compliance with national, regional, and international regulations and fisheries best practices.

PURSE SEINE TUNA FISHERY IMPROVEMENT PROJECT

One of APSI's primary achievements to date has been establishing a fishery improvement project (FIP) for the tuna purse seine fishery in FMAs 715 and 716. The FIP measures progress towards the fishery's sustainability and aims to achieve Marine Stewardship Council (MSC) certification by 2028. A pre-assessment in September 2023 highlighted the need for the fishery to improve data collection, record interactions with endangered, threatened and protected (ETP) species, and register FADs.

The association provides the purse seine industry with a seat at the table in government-run Tuna IAW Harvest Strategy meetings and consultations with the MMAF. Twelve companies have joined APSI since its establishment, which is a fantastic outcome for the industry and an indication of the potential for industry acceptance of the Tuna IAW Harvest Strategy management measures.



PROMOTING SUSTAINABLE TUNA FISHERIES MANAGEMENT

Co-hosting the 7th International Coastal Tuna Business Forum (ICTBF) with the MMAF in Bali in May 2023 was an opportunity for the Tuna Consortium to promote the fishing industry's role and involvement in sustainable tuna fisheries management. Concurrently, the Consortium organised the Indonesia Tuna Conference (ITC), opened by the Minister for the MMAF who emphasised the value of tuna fisheries to the Indonesian economy. The Minister also used this platform to promote the forthcoming Tuna IAW Harvest Strategy launch.

The ICTBF held panel sessions on renewable energy, technology in small-scale tuna fisheries, transparency and traceability, and market incentives for tuna fisheries. All Consortium members and more than 200 attendees participated in the forum. A key outcome of the ICTBF was the signing of the Bali Declaration by the Director of Fisheries Resource Management and the IPNLF Chair, committing the parties to take four actions for a sustainable future for one-by-one tuna fisheries[20]:

1. Safeguard the health and well-being of all workers throughout supply chains
2. Elevate the market recognition of one-by-one tuna fisheries
3. Support investments in innovations and modern climate-friendly technology
4. Follow global best practices in tuna handling and processing.

The Declaration is a strong statement of support from the Government of Indonesia, industry, and NGOs for collaborating with small-scale fishers to support sustainable tuna industries. The Declaration's signing caused a buzz online, with the story of government backing for sustainable one-by-one tuna fisheries sparking over 50 news articles and social media posts.

INDONESIAN SUSTAINABLE TUNA FISHERIES ON THE GLOBAL STAGE

As the twin processes of technical development and consultation for the Tuna IAW Harvest Strategy advanced within Indonesia, the Consortium connected with international tuna industry stakeholders to promote the Indonesian sustainable tuna fisheries globally.

Immediately before the ITC in 2023 and concurrent to the Regional FCMC held in Bali, the Consortium organised 'Tuna Talks,' bringing together fisheries scientists and practitioners to share knowledge and research. All Consortium members were active in the talks, sharing research and approaches to encourage the Tuna IAW Harvest Strategy development and sustainable, equitable tuna fisheries management. Attended by academia from the 18 provinces of IAW and its FMAs, the Tuna Talks built momentum for implementing the Tuna IAW Harvest Strategy and prompted discussion on how scientists and practitioners can better manage tuna fisheries. The Tuna Talks are available as an online resource for fisheries managers and stakeholders.

The Consortium expanded its efforts on the international front by assisting the MMAF at the Indonesia pavilion during the Boston Seafood Expo North America in March 2023. Here, they showcased sustainable Indonesian tuna fisheries products alongside 14 Indonesian companies and the Indonesian Pole and Line and Handline Association (AP2HI). Other international opportunities promoting the achievements of the Indonesian tuna fisheries were the World Fisheries Congress, March 2024, and the InfoFish Tuna Conference in Bangkok, May 2024.

PROMOTING AND IMPROVING E-LOGBOOK USE WITH SMALL-SCALE FISHERS



Cell phones and data packages incentivise eLogbook uptake



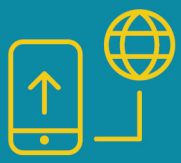
Training for fishers in eLogbook app



70 % of new users sustained from 2022–2023

KEY SUPPORT

Piloted the eLogbook with 54 small-scale fishers and reviewed eLogbook data from 26 tuna vessels



OVER 500 TRIPS LOGGED

STRENGTHENING SMALL-SCALE FISHER ENGAGEMENT IN DATA COLLECTION

Monitoring and gathering data from Indonesia's small-scale fishers' fleet (boats < 5 GT) is challenging due to the remote locations of fishing communities and poor communication and data collection infrastructure. The MMAF's electronic logbook (eLogbook) application[21] is a practical solution for small-scale fishers to self-document the location of fishing grounds, catch yields, levels of fisher effort, and vessel usage. However, its implementation and uptake are challenged by fishers' limited capacity and a lack of incentive for its use.

In 2023, Consortium members MDPI and FairTrade USA (FTUSA) provide incentives to IAW fishing communities to activate and trial the latest eLogbook application. To help fishers understand why recording data is important, eLogbook use was promoted both as a mechanism for fishers to contribute to improved fisheries management and a way to increase traceability and transparency of their fishing operations and, therefore, access sustainable seafood markets. FTUSA and MDPI collaborated to conduct audit workshops with Fair Trade fishers in Fairtrade Committees to develop best practices for premium spending against eLogbook and data recording.

Lessons from previous logbook trials have raised concerns about the accuracy of data logged by fishers. To explore this issue, Consortium member YKAN conducted a comparative analysis of the accuracy of eLogbook reporting practices using catch data from January to June 2022. Of the 46 identified tuna CODRS vessels in the Fishing Logbook Information System (SILOPI), 20 vessels never filled out the e-Logbook, while 26 vessels filled it out inconsistently. This resulted in 156 trips available for the comparison study. The analysis results justified concern around data accuracy, with fishers underreporting their total catch to varying degrees for nearly three-quarters of the logged trips. Species identification by fishers from over half of the tuna vessels aligned closely with eLogbook records. These results are useful for the government and implementing partners to consider when rolling out eLogbook use with fisher communities and provide insight into the level of confidence fisheries managers can have in data from the application.

> **"Without data from stakeholders, there is no Harvest Strategy. The Harvest Strategy will not succeed without collaboration.**
>
> — Dr. Fayakun Satria, Head of PusRisKan







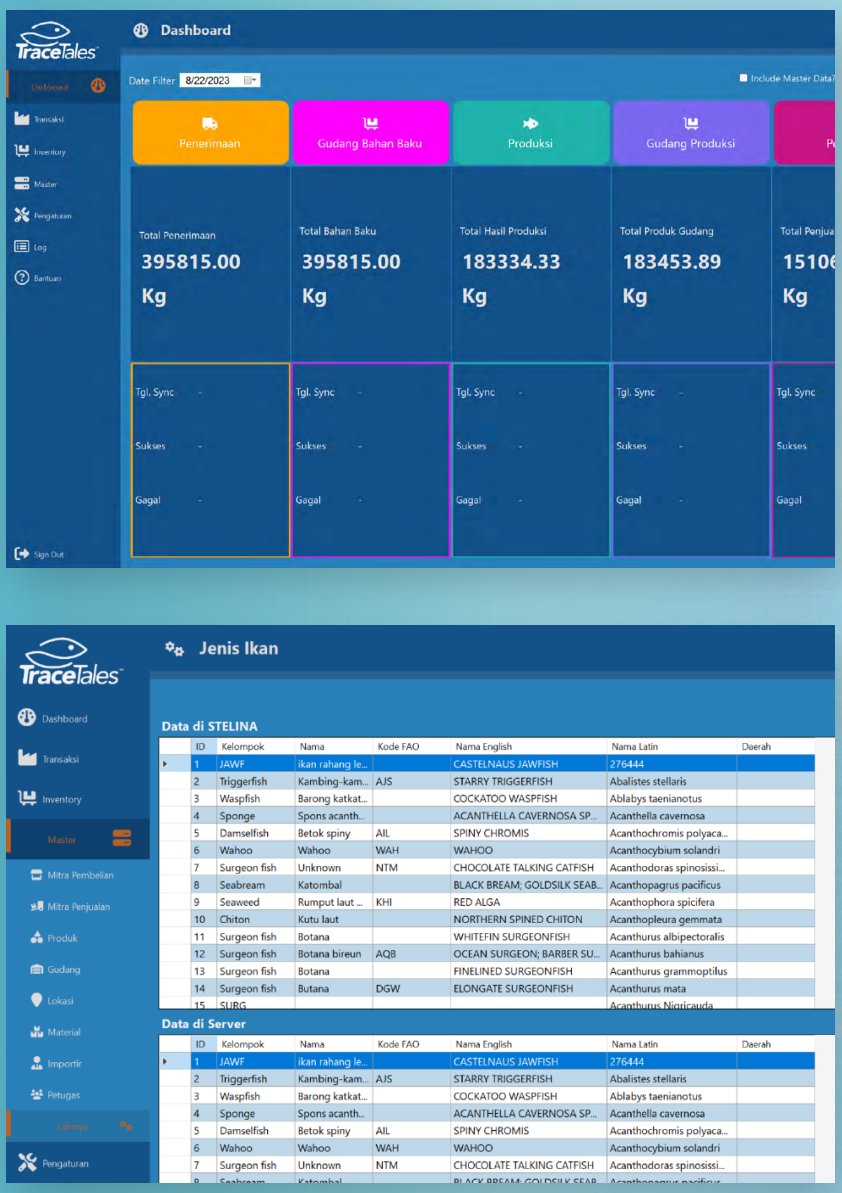
CULTIVATING INNOVATIONS IN TUNA FISHERIES MANAGEMENT

Establishing traceability is increasingly required by buyers in key markets and becoming essential to achieving sustainable seafood certifications. Electronic catch and documentation traceability (eCDT) technologies and systems are innovations designed to overcome barriers to traceability in marine capture fisheries. Developing eCDT systems requires input from a diverse range of stakeholders, including government agencies, fishery associations, suppliers, processors, academics, and IT experts and developers. To facilitate these connections, the Consortium established an eCDT First Mover Forum for eCDT developers, industry, government, and NGOs to build collaboration, share the latest innovations, and support the adoption of eCDT in Indonesia's tuna fisheries and supply chains.

Consortium member YII also investigated various eCDT technologies to identify systems that will provide tangible benefits to fishers and fishing companies of different scales. The investigation found that the success of eCDT systems relies on a clear benefit to fishers, policy framework support, and a committed partnership among stakeholders for the development and implementation of the technology.

The MMAF has developed its traceability system, STELINA[22], but more interoperability with private sector eCDT systems is needed to improve its usefulness in meeting certification and buyer traceability needs. Ultimately, the information system will assist fishery businesses in improving fishery product traceability, fulfilling importing market requirements and increasing the competitiveness of Indonesian tuna on the international market. By recording data from catch, storage, processing, and distribution to the market, STELINA will help combat illegal, unreported and unregulated (IUU) fishing. Data generated by STELINA will also inform ministry reporting systems, with the potential to offer insights into details such as catch volumes and seasonality of key species. The Consortium members have advised the MMAF on ways to increase STELINA's operability and use the data generated by the system to inform the development of better policies.

In an exciting development in increasing STELINA's operability, Consortium member MDPI successfully trialled the integration of their TraceTales traceability system with STELINA in two fish processing companies. TraceTales allows the processors to electronically track their inventory as it moves through processing—from receiving, to filleting, packaging, freezing and shipping. The TraceTales integration application aims to improve data filing for traceability in STELINA and improve its uptake by the industry by facilitating easier access to submit fisheries data.



ID	Kelompok	Nama	Kode FAO	Nama English	Nama Latin	Daerah
1	JAWF	ikan rahang le...		CASTELNAUS JAWFISH	276444	
2	Triggerfish	Kambing-kam...	AJS	STARRY TRIGGERFISH	Abalistes stellaris	
3	Waspfish	Barong katkat...		COCKATOO WASPFISH	Ablabys taenianotus	
4	Sponge	Spons acanth...		ACANTHELLA CAVERNOSA SP...	Acanthella cavernosa	
5	Damselfish	Betok spiny	AIL	SPINY CHROMIS	Acanthochromis polyaca...	
6	Wahoo	Wahoo	WAH	WAHOO	Acanthocybium solandri	
7	Surgeon fish	Unknown	NTM	CHOCOLATE TALKING CATFISH	Acanthodoras spinosissi...	
8	Seabream	Katombal		BLACK BREAM; GOLDSILK SEAB...	Acanthopagrus pacificus	
9	Seaweed	Rumput laut ...	KHI	RED ALGA	Acanthophora spicifera	
10	Chiton	Kutu laut		NORTHERN SPINED CHITON	Acanthopleura gemmata	
11	Surgeon fish	Botana		WHITEFIN SURGEONFISH	Acanthurus albipectoralis	
12	Surgeon fish	Botana bireun	AQB	OCEAN SURGEON; BARBER SU...	Acanthurus bahianus	
13	Surgeon fish	Botana		FINELINED SURGEONFISH	Acanthurus grammoptilus	
14	Surgeon fish	Butana	DGW	ELONGATE SURGEONFISH	Acanthurus mata	
15	SURG				Acanthurus Nigricauda	

Figure 5. The TraceTales integration application for STELINA.



THEME 3. COMMUNITY EMPOWERMENT: ENHANCING FISHER CAPACITY, BENEFITS AND RESILIENCE

HIGHLIGHTS:

- Mentored over 105 fisher 'champions' from Indonesia Archipelagic Waters (IAW), 54 percent of whom are women, as catalysts for positive change in their communities and the fisheries sector.
- Supported training for fishers and suppliers on cold chain and fish handling to improve the quality of catch and reduce post-harvest loss.
- Delivered a customised and innovative financial literacy framework to build the resilience of small-scale fisher household livelihoods.
- Promoted the second successful registration of a Fish Aggregating Device (FAD) nationally, setting a precedent for more comprehensive FAD management and sustainable fisheries management practices across Indonesia.

IMPROVING FISHERIES MANAGEMENT WITH COMMUNITY STAKEHOLDERS

Achieving sustainable fisheries management is more about managing the fisheries stakeholders (fishers, fish collectors, processors) than directly managing the actual resources. Transitioning to sustainable fisheries management requires individuals and societies to utilise resources sustainably and comply with government policies and regulations. Government frameworks and management instruments will only succeed where resource users understand their purpose and the socio-economic benefits they provide.

With a fisheries sector dominated by small-scale fishers, including 137,340 tuna fishing vessels in IAW[23], the Ministry of Marine Affairs and Fishereis (MMAF) faces challenges of practicality and scale in translating fisheries improvement policies to fishers. However, achieving these policies' purpose to benefit community-level stakeholders is imperative to combat small-scale fisher households' typical vulnerability to high levels of poverty, declining ecosystem health, and climate change impacts.

The Consortium supported government stakeholders at the local level by working to build fishing communities understanding of policies with a view to increasing acceptance of and compliance with government regulations. At the same time, the Consortium uplifted small-scale fishers' voices in fisheries management and built their capacity to operate for economic benefit within the MMAF's sustainable fisheries management policy framework.

Consortium members' experiences in developing individual fisher and fishing cooperative capacity at the local level provide an invaluable flow of information from the ground up. Consortium members' capacity-building support can be divided into three distinct areas:

1. Capacity for operating at sea
2. Capacity for catch handling
3. Business capacity.

PROMOTING SUSTAINABLE FISHERIES LIVELIHOODS



KEY SUPPORT

Delivered targeted training to fisher champions in sustainable fishing practices

105 FISHER CHAMPIONS

54 % WOMEN





> **"I'm thrilled to be part of the beach clean-up event as it provides a deeper understanding of the danger of ocean waste, especially for our livelihoods.**
>
> — Sahidah, a member of the coastal community in Bone

MENTORING FISHERS TO CHAMPION CHANGE

Consortium member MDPI identified and mentored 105 fisheries 'champions' from various sites, 54 percent of whom are women, as catalysts for positive change in their communities and the fisheries sector. Champions were trained in four key areas:

1. Importance of data for fisheries management — to help them motivate fishers to log fishing trips and catch data.
2. Public speaking and leadership — to build their confidence to present to their communities and in formal settings, like FCMCs.
3. Sustainable fisheries management — to become conduits for information and sustainable practices to spread throughout their fishing community.
4. Social media training — to build the skills to amplify their voice.

On World Fisheries Day 2023, MDPI and fisheries champions promoted legal and regulated fisheries and the sustainable management of fish stocks to nearly 800 coastal community members across eight provinces. Discussions with fishery stakeholders emphasised how critically important fisher data is for informed policymaking and encouraged fishers to record details for every fishing trip.

Other discussions focused on responsible fishing practices and the negative impact of discarded waste in the marine environment on fish stocks, fish quality, and public health. Fisher champions organised coastal clean-up events as an opportunity for the community to demonstrate their commitment to caring for the environment and cooperating for sustainable fisheries and livelihoods for communities.



FISHER CAPACITY FOR OPERATING AT SEA

NAVIGATING BARRIERS TO COMPLIANCE WITH FISHERY REGULATIONS

In Indonesian fishing communities, high rates of non-compliance with government regulations on licensing and permitting are often due to complicated and burdensome administrative processes. The implementation of policies on-the-ground in remote sites in eastern Indonesia is challenged by a lack of supporting infrastructure, limited human resources and capacity, and poor understanding of the purpose and mechanisms of policy instruments.

Consortium members work to build understanding among fisher communities about how licensing and permitting support sustainable and equitable fisheries management and help fishers navigate the necessary steps to achieve compliance. Consortium member MDPI worked with port management units at five sites to support fishers to register their vessels and cooperated with government fisheries extension staff in six provinces to facilitate small-scale fishers' certification in safety-at-sea, navigation, first aid and fishing operations.

In a bid to encourage compliance with fish aggregating device (FAD) permitting and in preparation for FAD restrictions under the Tuna IAW Harvest Strategy, Consortium member MDPI collaborated with district fisheries offices to raise fishers' awareness of the requirements and process to obtain FAD permits (SIPR). To secure a FAD installation



permit, fishers must be members of a cooperative, possess a fishing vessel, and hold a fishing permit. Although the application process is online, it can take up to seven months to finalise and the online platform is a barrier for fishers with under-developed digital literacy.

Consortium member MDPI has been proactive in advancing FAD registration, organising forums, conducting socialisation activities, hosting webinars, and engaging government stakeholders in exploring solutions to managing and registering FADs at the provincial and regional levels. Culminating in the second successful anchored FAD registration in Indonesia, this multi-stakeholder process generated much learning about the registration process to share with other FAD operators. This second FAD permit is for purse seine operations, showing that registration is attainable by all segments of the fisheries sector, and signalling an opportunity for more comprehensive FAD management to promote sustainable fisheries practices across Indonesia.

SUPPORTING SMALL-SCALE FISHER CERTIFICATIONS AND VESSEL REGISTRATIONS



KEY SUPPORT

Cooperated with port and fisheries staff to support small-scale fisher compliance



593 CERTIFIED FISHERS &

729 VESSELS REGISTERED

FISHER CAPACITY FOR CATCH HANDLING

> **"[Following the visit to fish processing facilities] I am now aware how important it is to maintain fish quality in the field.**
>
> — Sugen Kapoa, Latamiha Fishers' Association member

BUILDING TECHNICAL CAPACITY

Driven by the demands of the international market for evidence that fish products meet food safety standards, and a desire to increase the quality of fish for export, the MMAF stipulates[24] that fishing boat crews should be certified in good fish handling. In support of this aim, Consortium members supported training sessions for fishers and suppliers on cold chain and fish handling to improve the quality of catch and reduce post-harvest loss. The Good Fish Processing and Handling Training (CPIB) can be targeted at fishers and their fish handling practices on board to maintain fish quality and market value or at suppliers and mini plants, focusing on meeting food safety and hygiene standards before the fish reaches bigger processing plants. In total, 523 fishers, fish collectors, and suppliers were trained through Consortium members' (MDPI and YII) initiatives in Phase Two.

In Maluku, Consortium member YII facilitated an Instructor Team from Ambon Fisheries Port (PPN) to deliver CPIB to tuna fishers and collectors. The collaboration successfully provided participants with a detailed overview of fish handling techniques and safe and hygienic methods on board, at landing and for cold storage. Following training, the 80 fishers and fish collectors had an opportunity to apply their new knowledge in a practical session before completing the test for certification.

BUILDING KNOWLEDGE

To enable tuna fishers to better understand processing procedures for catches certified as Fair Trade, Consortium member MDPI invited Indonesia archipelagic waters (IAW) handline fishers to visit fish processing facilities in Buru, Maluku. Fisher association members observed the handling hygiene standards and the fish traceability systems necessary to quality for eco-labelling. The head of the processing facility welcomed the fishers' interest in learning fish handling techniques to preserve their catch, while the fishers were pleased to observe their catch being appropriately handled and inspired to apply best-practice handling techniques at sea.



FISHER BUSINESS CAPACITY

The MMAF encourages the professionalisation and modernisation of fishing cooperatives as a poverty alleviation mechanism for coastal communities. In line with this directive, Consortium members support fishing cooperatives to improve member financial literacy and organisational professionalism.

Consortium member FairTrade USA (FTUSA) interviewed certified fishers in Seram and Buru about their experience with group dynamics and mechanisms that are most effective for building coherent groups. Discussion on forming and operating cooperatives focused on FTUSA principles, such as meeting culture, documentation, transparency, accountability, and financial literacy. FTUSA and MDPI collaborated to engage fishers in Fairtrade Committees to develop best approaches and practices for community engagement, especially for fishing cooperatives that need access to external funding and have limited NGO support.

BUILDING FOUNDATIONAL HOUSEHOLD FINANCIAL LITERACY

Consortium member MDPI applies customised and innovative tools to build the resilience of small-scale fisher household livelihoods. Guided by their assessment of what kind of training would benefit fishers the most in improving their economic condition, in 2021, MDPI developed a financial literacy framework focused on enhancing fishers' capacity for money management and increasing the role of women in developing the coastal economy.

At its essence, the financial literacy program was intended to build the fishers' resilience to fish seasonality and unexpected events such as natural disasters, illness, and accidents at sea through improved capacity for financial management. MDPI developed a fun and engaging training package centred on a simulation game called 'Si Keong Nelayan' designed specifically for coastal communities. MDPI trained over 1,140 members from 52 fisher associations at sites around IAW across five provinces, including fishers, fishers' wives and youth. The training was also intended to increase the role of women in developing coastal livelihoods and particularly in the fisheries sector. Following the training, coastal households had an increased understanding of financial management and improved capacity to make appropriate business decisions by prioritising their needs.



©FTUSA

The success of the first phase of financial management training inspired Consortium member MDPI to apply the same principles to developing a second phase of financial literacy capacity building in late 2022. The second training phase reached 250 fishing households, using a new centrepiece game called “Si Kompas Nelayan”. The game teaches participants to prioritise their needs and make financial plans to achieve their targets through business development and investment. Improved financial literacy at the household level is anticipated to enable fishers to manage their finances with confidence and, in the long term, lead to improved and sustainable livelihoods. Fishers reported the training helped them to better understand how to prioritise their needs and save for short, medium and long-term goals.

During both phases of the financial literacy capacity-building, Consortium member MDPI greatly exceeded planned targets and the programs’ successful uptake has resulted in strong interest from other NGOs and government fisheries offices. MDPI has responded by developing financial literacy video tutorials for stakeholders interested in collaborating to deliver the training to the communities in which they work. Plans for a third phase of financial literacy training are in development, and likely to focus on how to access formal and informal financial institution financing. By offering progressive training ‘building blocks’ to coastal communities, MDPI sustains fishers’ interest in financial management and increases its impact in these communities.

> **“We have more clarity in achieving our targets of buying boat engines for the next year. In a month, we must set aside at least 500,000 rupiah.”**
>
> — Mr. Badrun and his wife, East Lombok fisher household.

PROFESSIONALISING FISHER COOPERATIVES

The success of fisher cooperatives requires competency in organisation and leadership. However, many coastal cooperatives lack the necessary skills for success and have limited formal education to apply to their business ventures. Consortium member MDPI aims to strengthen individuals' ability to run fisher-led cooperatives and set them up for institutional success. Financial management training sessions for cooperative members focused on bookkeeping and using mobile applications, financial reporting, budgeting, and organisational management are key to developing cooperative capacity. Organisational professionalism was also addressed in training on preparing for annual member meetings, compiling management and supervisory reports, and evaluating and making annual work plans.

THEME 4. COLLECTIVE ACTION: BUILDING AN EFFECTIVE TUNA CONSORTIUM

HIGHLIGHTS:

- Provided critical coordination support to accelerate collaborative efforts to refine and implement the Tuna IAW Harvest Strategy.
- Deepened the collaboration between the Tuna Consortium and the Ministry of Marine Affairs and Fisheries (MMAF) to accelerate the Consortium's work and advance sustainable tuna fisheries policies and programs.
- Advocated for fisher perspectives in the management decision-making processes at the national level and amplified the voice of the small-scale fisheries sector.

STRENGTH OF THE CONSORTIUM

In the past two and a half years, the Consortium strengthened its impact as it aligned on a common goal and objectives, broadened its base of partners within the MMAF, and intensified technical support for improving fisheries data collection and management.

The Consortium has proven highly valuable to its members and stakeholders from the industry and the scientific and fisher communities. The Consortium's internal and external collaborative approach, especially in assisting with the engagement around the Tuna IAW Harvest Strategy finalisation, has helped to ensure that different perspectives were considered and integrated into the management strategies. With Resonance as a central coordination point, identifying and fostering collective implementation, Consortium members dedicated more time to supporting the Tuna IAW Harvest Strategy development and promoting stakeholder engagement.

The Consortium is committed to continuing its work with the MMAF, industry, communities and other stakeholders to ensure the right conditions are in place to support the implementation of the Tuna IAW Harvest Strategy and key management measures. The Consortium will expand its work on building long-term resilience in supply chains and communities, including identifying climate risks and incorporating resilience actions to help ensure fisheries' long-term sustainability and adaptability.


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©RESONANCE

Over the past two and a half years, the collaboration between the Consortium and the Government of Indonesia has expanded. Initially, the Consortium primarily worked with the MMAF, particularly the Directorate General of Capture Fisheries (DGCF). During this second phase, the Consortium deepened its engagement with the DGCF and broadened its collaboration with other relevant departments in the MMAF, with critical coordination support provided by Resonance. This broader engagement has been crucial for advancing the Consortium's work, which requires close collaboration with specific departments or agencies at the national level and for implementation in the provinces. Some key relationships and engagements that benefited from strategic partnership support are summarised below.

Directorate General of Strengthening Competitiveness of Marine and Fisheries Products: The Consortium supported the Fisheries Marketing Department to achieve numerous milestones, such as declaring 2024 the Indonesian Year of Tuna during the National Fish Day celebrations in November 2023 and promoting Indonesian Sustainable Tuna at the Boston Seafood Expo North America, March 10-12, 2024, with participation from 14 Indonesian companies, including members of Indonesian Pole and Line and Handline Association (AP2HI).

Directorate General of Marine and Fisheries Resources Surveillance: Consortium members were involved in various surveillance system activities, including implementing the Vessel Monitoring System (VMS) in Fisheries Management Areas (FMA) 713, 714, and 715 in preparation for the Tuna IAW Harvest Strategy implementation. Moving forward, Consortium member YKAN will focus on disseminating practical monitoring to the 18 provinces in IAW.

Marine and Fisheries Human Resources Extension and Development Agency (BPPSDMKP): The Agency actively participated in capacity-building and training sessions implemented by Consortium members. Consortium member MDPI is working on a formal engagement with BPPSDMKP to provide certification and scholarship opportunities for fishers.

National Research and Innovation Agency (BRIN): Consortium advisors and members contributed to and facilitated the finalisation of the harvest control rules. Throughout the Tuna IAW Harvest Strategy development process, Consortium members and the MMAF presented research findings for discussion with BRIN's scientific experts.



MAINTAINING THE MOMENTUM FOR SUSTAINABLE TUNA MANAGEMENT IN IAW IN THE YEARS AHEAD

The finalisation and launch of the Tuna IAW Harvest Strategy document was a great stride towards sustainable tuna fisheries management in Indonesia.

Regionally, the Government of Indonesia deserves recognition as the first coastal developing state to present a tuna harvest strategy in the Western and Central Pacific Fisheries Commission (WCPFC) forum.

Over the coming years, the operationalisation of the Tuna IAW Harvest Strategy as a responsive fisheries management tool is anticipated to have a meaningful impact on tuna fish stocks and the marine environment's overall health in IAW.

The immediate hurdle to operationalising the Tuna IAW Harvest Strategy will be gaining support for the management measures among provincial and local governments and the 10,000 fishers in the key provinces in IAW. The subsequent challenges will be to devise and execute management actions to decrease catches by 10 percent in the identified area over the next three years, enforce spatial closures and expand fish aggregating device (FAD) registration and management. Management measures, such as setting a total allowable catch per FMA or restricting the use of FADs, will require extensive facilitation with small-scale fishers to succeed.

The MMAF recognizes the critical need for ongoing collaboration between government agencies, scientific experts, NGOs, and fisher associations to achieve stakeholder engagement and buy-in to these management processes. Defining the roles among government and non-government stakeholders under each management measure is already under consideration in conjunction with finalising the National Tuna Action Plan to guide sustainable tuna management through to 2029.

> **“ The Harvest Strategy is the key to the success of tuna management in IAW over the coming years.**
>
> — Dr. Toni Ruchimat, Policy Advisor to the Indonesia Tuna Consortium

Looking ahead, there is a pressing need to institutionalise fisheries data collection and its application under the Tuna IAW Harvest Strategy and identify the financial and human resources needed to carry out this vital work in the future. The work achieved in determining data sets and parameters to inform tuna fisheries management decisions has provided the MMAF with a blueprint for data collection that will need to be resourced to serve improved fisheries management over the coming years. Opportunity also exists to activate the role of Indonesian academia in providing vital research (based on the data collected) to the MMAF to inform management and policy decisions.

Overall, the experience of developing the Tuna IAW Harvest Strategy shows that with strong stakeholder engagement and a coordinated approach to fisheries policy, data-driven and evidence-based responsive fisheries decision-making is achievable in Indonesia. The implementation of the Tuna IAW Harvest Strategy over the coming years presents an opportunity for the MMAF to sustain this commitment to managing tuna resources sustainably for the benefit of its people and their livelihoods into the future.

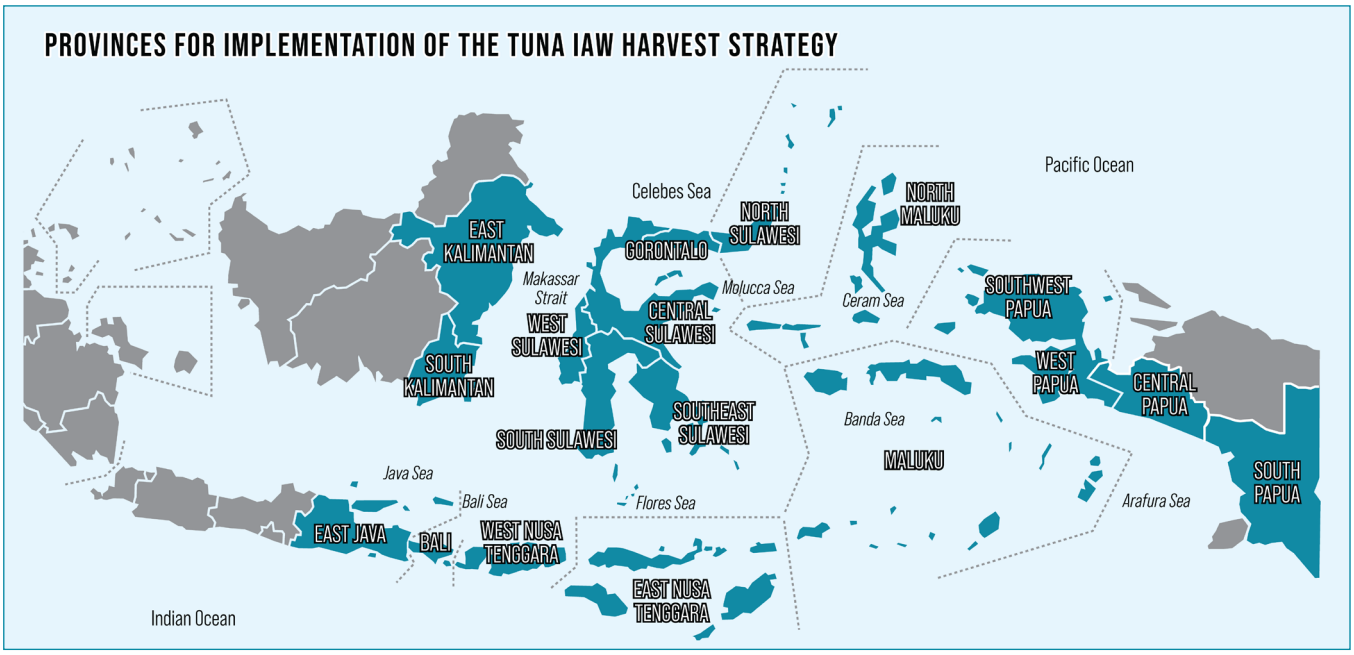


Figure 6. The 18 provinces of IAW.

INDONESIA TUNA CONSORTIUM SUPPORT TO IMPLEMENTATION OF THE TUNA IAW HARVEST STRATEGY (PHASE 3)

During Phase Three, the Consortium, led by Resonance as the secretariat, is prepared to continue supporting the MMAF in implementing the Indonesian Archipelagic Waters (IAW) Tuna Harvest Strategy. This will be done through effective management, monitoring, scientific advisory, and multi-stakeholder engagement at local and international levels. Socialisation meetings and workshops will be organised to engage tuna fisheries stakeholders and enhance coordination. The Consortium plans to facilitate and support training, forums, stakeholder consultations, and data collection efforts to improve evidence-based fisheries management. In addition, the Consortium will work on mechanisms for collecting socio-economic data, gathering and synthesising data for the Tuna IAW Harvest Strategy implementation, and producing technical papers on key management measures. Finally, the Consortium will work with the MMAF to operationalise institutional management systems within the Fisheries Management Area (FMA) mechanism, including developing action plans and coordination meetings.

Expanding on the industry engagement work from Phase Two, the Consortium plans to further its efforts to advocate for sustainable tuna practices in Indonesia and improve market access for the industry and fishing communities. The initiatives will involve testing and encouraging the adoption of more electronic catch and documentation traceability (eCDT) systems, training industry stakeholders on meeting market requirements and labor practices, and assessing climate and socio-economic risks. In response to the growing concern surrounding climate change, the Consortium will consider community and supply chain risks, pinpoint various climate impact and vulnerability scenarios, and communicate climate and social risks and resilience actions to relevant industry stakeholders, government entities, and community stakeholders.

In Phase Three, the Consortium will deepen its support for communities and fishers to engage in sustainable tuna fisheries management, access markets, and build resilient livelihoods. This includes raising awareness, building capacity to access markets, promoting resilient livelihoods, offering financial literacy training, facilitating the creation and maintenance of fisher cooperatives, and improving access to resources and technical support for sustainable fisheries management. By promoting resilient livelihoods and ensuring healthy, sustainable tuna fisheries in Indonesia, the Consortium aims to strike a balance between economic development and conservation, inspiring and motivating all those involved.

ENDNOTES

1 MDPI, 2023a, Pew Charitable Trusts, 2020.

2 ANTARA, 2024.

3 MMAF, 2018

4 Based on SK no. 47/KEP-DJ PT/2017.

5 Indonesia is an active member of:
(1) Indian Ocean Tuna Commission (IOTC) berdasarkan Peraturan Presiden Nomor 9 Tahun 2007;
(2) Commission for The Conservation of Southern Bluefin Tuna (CCSBT) berdasarkan Peraturan Presiden Nomor 109 Tahun 2007; dan
(3 Western and Central Pacific Fisheries Commission (WCPFC) berdasarkan Peraturan Presiden Nomor 61 Tahun 2013.

6 Keputusan Menteri Kelautan dan Perikanan No. 107 tahun 2015 tentang Rencana Pengelolaan Perikanan Tuna, Cakalang dan Tongkol (RPP-TCT) yang diperbaharui oleh Keputusan Menteri Kelautan dan Perikanan No. 121 tahun 2021.

7 Pers comms Bapak Toni Rachimat.

8 In addition to WCPFC, Indonesia has ratified the following regional cooperation agreements:
(1) Indian Ocean Tuna Commission (IOTC) Agreement through Presidential Decree No. 09 Year 2007.
(2) Convention for the Conservation of Southern Bluefin Tuna (CCSBT) through Presidential Decree No. 109 of 2007.
(3) Agreement for the implementation of the provisions of the UNCLOS of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stock and Highly Migratory Fish Stock or the United Nations Implementing Agreement (UNIA) in 1995 through Act No. 21 of 2009. (MMAF, 2012).

9 There are two main types of reference points used to compare the status of a fishery management system against a desirable (or undesirable) state: limit reference points (LRPs, or Blim and Flim), and target reference points (TRPs, or BTARGET and FTARGET), which are typically based on fishing mortality rate (F-based) or population abundance (B-based).

10 Keputusan Menteri Kelautan dan Perikanan No. 121 tahun 2021

11 Hoshino, 2024.

12 Minister of Marine Affairs and Fisheries of the Republic of Indonesia Number 18 of 2021 (Fishing Gear) article 15

13 Minister of Marine Affairs and Fisheries of the Republic of Indonesia Number 7 of 2022 concerning the Allocation of Rumpon on Fishing Line III at WPPNRI

14 Minister of Marine Affairs and Fisheries of the Republic of Indonesia Number 10 of 2021 (Fishery Activity Standards)

15 Government Regulation Number 11 2023 (Measurable Fisheries)

16 The USAID Ber-IKAN project is a five-year initiative to 2027 that assists Indonesia in protecting its marine biodiversity by supporting sustainable and equitable fisheries management.

17 Kooij, M., et. al. 2023.

18 Fishery improvement projects—or FIPs—are multi-stakeholder efforts to improve fishing practices and management through industry initiatives to meet market demands.

19 Pet, J. S., et. al., 2022.

20 One-by-one is a collective term that incorporates pole-and-line, handline and troll line fishing methods. This way of fishing is highly selective and is environmentally sustainable, socially responsible and supports local economies. See: https://ipnlf.org/what-is-one-by-one-tuna/.

21 Regulation of the Minister of Maritime Affairs and Fisheries Number 33 of 2021 concerning Fishing Logbook provides for small-scale fishers to use a simple eLogbook to report fish catch.

22 Minister of Maritime Affairs and Fisheries of the Republic of Indonesia Regulation Number 29 of 2021 concerning the National Fish Traceability and Logistics System (STELINA)

23 2022 data, Bapak Toni Rachimat.

24 Ministry of Marine Affairs and Fisheries of the Republic of Indonesia Regulation Number 7 of 2019 (Requirements and Procedures for Issuing Certificates of Good Fish Handling Methods)

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About the Tuna Consortium

The Tuna Consortium brings together key stakeholders from across the non-profit, private, and public sectors to support the Ministry of Marine Affairs and Fisheries (MMAF) to establish a harvest strategy that will strengthen tuna fisheries in Indonesia's archipelagic waters.

June 2024