

Indonesia
Snapper
Consortium



2019–2023

STATE OF THE FISHERY

SNAPPER FISHERY



Highlighting Fisheries Management Areas
(WPP) 713, 718 & 573



Produced by: Blue-Green Advisors Ltd team with support from the Indonesia Snapper Consortium members, and the fisher communities of Saleh Bay

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Production date: April 2024

Cover photo: Fish catch ©

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Supported by: The David and

Lucile Packard Foundation

Grant. No. 2022-74073 and the

Walton Family Foundation

Grant No. 0010683

Suggested citation: Blue-

Green Advisors Ltd. 2024.

2019-2023 State of the Fishery:

Indonesian Snapper Fishery.

The authors take full responsibility for all errors in this report and warmly welcome feedback from stakeholders and partners eager to help us enhance it. Please send your comments to hello@bluegreenadvisors.com

CONTENTS

RINGKASAN EKSEKUTIF	1
Rekomendasi utama	3
EXECUTIVE SUMMARY	4
Key Recommendations	6
INTRODUCTION	7
CONTEXTUAL OVERVIEW	9
FISHERIES SECTOR OVERVIEW	10
Evaluation Framework	10
Outcome Evaluation	12
CONCLUSIONS AND RECOMMENDATIONS	17
ANNEXES	19
Acronyms and Abbreviations	58
Resources	60

RINGKASAN EKSEKUTIF

Laporan *State of the Fishery 2019–2023*, sebuah upaya kolaboratif oleh tim Blue-Green Advisors Ltd (BGA), anggota Konsorsium Perikanan Kakap Indonesia, dan komunitas nelayan Teluk Saleh, menyajikan evaluasi komprehensif tentang perikanan kakap di Indonesia, dengan fokus pada Wilayah Pengelolaan Perikanan (WPP) 713, 718, dan 573. Studi lima-tahun ini didukung oleh *David and Lucile Packard Foundation*, *Walton Family Foundation*, dan *United States Agency for International Development* (USAID), mengungkapkan wawasan signifikan tentang tantangan dan peluang dalam sektor ini, menyoroti kenyataan yang mengkhawatirkan tentang keadaan penangkapan ikan kakap yang berlebihan dan kesehatan biologis yang buruk.

Meskipun terdapat investasi besar, dampak yang diharapkan belum sepenuhnya terwujud karena asumsi awal mengabaikan kompleksitas dan konektivitas perikanan kakap. Penekanan pada pengumpulan data stok ilmiah membayangi upaya untuk meningkatkan tata kelola, pengembangan kebijakan, dan penegakan hukum. Ketergantungan pada kapten kapal yang dibayar untuk pengumpulan data menimbulkan kekhawatiran keberlanjutan dan menetapkan preseden yang berpotensi bermasalah.

Laporan ini menunjukkan peran penting penilaian dalam mengukur kinerja dan keberhasilan. Seperti Lord Kelvin, seorang fisikawan dan insinyur matematika



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“

*If you can't measure it,
you can't improve it.*

terkenal, pernah berkata, 'Jika Anda tidak dapat mengukurnya, Anda tidak dapat memperbaikinya.' Kutipan ini menggarisbawahi pentingnya data yang konsisten dan andal di seluruh indikator, geografi, dan periode waktu. Tanpa data seperti itu, menjadi sulit untuk menilai kemajuan, mengidentifikasi area untuk perbaikan, dan membuat keputusan berdasarkan informasi.

Laporan ini menggarisbawahi kebutuhan kritis akan pendekatan yang berimbang, yang mengintegrasikan strategi berbasis data dengan kerangka kerja tata kelola dan kebijakan yang kuat. Proses kolaboratif, manajemen adaptif, dan keterlibatan pemangku kepentingan yang komprehensif sangat penting. Peran fasilitator yang netral, seperti BGA, dengan keahlian pengelolaan perikanan, terbukti sangat berharga dalam

memfasilitasi dialog inklusif, mendorong konsensus, dan menyelaraskan upaya menuju tujuan bersama. Dukungan BGA dalam menyediakan laporan tahunan ini, memberikan data kinerja penting, dan memfasilitasi kegiatan Konsorsium membutuhkan biaya yang sangat rendah, sebesar kurang dari 0,5% dari total dana yang diinvestasikan oleh tiga donor sepanjang umur proyek.

Secara krusial, laporan ini menunjukkan peran penting pengukuran dalam menilai kinerja dan keberhasilan. Data yang tidak konsisten dan tidak dapat diandalkan lintas indikator, geografi, dan periode waktu menghambat penilaian kemajuan, identifikasi area untuk perbaikan, dan pengambilan keputusan yang berinformasi. Protokol pengumpulan data yang terstandarisasi dan sistem pemantauan serta evaluasi yang kuat sangat diperlukan. Perikanan kakap di Indonesia menjadi salah satu dari sedikit, jika ada, perikanan yang secara konsisten melacak data dan kinerja, meskipun banyak inisiatif yang bertujuan untuk meningkatkan pengelolaan perikanan.



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Rekomendasi utama

- ❏ Menerapkan pendekatan berbasis data untuk pengelolaan perikanan, memanfaatkan kumpulan data yang luas untuk menginformasikan perbaikan tata kelola dan pengambilan keputusan, dengan penekanan kuat pada analitik dan wawasan.
- ❏ Menetapkan kerangka pengukuran kinerja yang komprehensif yang mencakup aspek sosial, ekologi, dan ekonomi dari pengelolaan perikanan, menetapkan target yang jelas dan terukur dan secara teratur memantau kemajuan.
- ❏ Memprioritaskan pengumpulan data yang akurat dan komprehensif, melibatkan berbagai pihak pengumpul data, ilmuwan warga, dan mempertimbangkan kompensasi yang sesuai.
- ❏ Mendorong lingkungan belajar kolaboratif dengan secara terbuka berbagi pelajaran yang telah dipelajari, berkontribusi pada repositori praktik terbaik yang mendorong inovasi dan ketahanan. Memfasilitasi sinergi dan kolaborasi di antara pemangku kepentingan untuk memfasilitasi pertukaran pengetahuan dan tindakan kolektif.
- ❏ Memperkuat kerangka kerja tata kelola dan kebijakan, memastikan strategi berbasis data didukung oleh kerangka kerja kelembagaan yang kuat dan implementasi yang efektif. Meningkatkan kolaborasi antara manajemen dan penegakan hukum untuk tata kelola perikanan yang lebih kohesif.

Studi jangka panjang ini meletakkan dasar bagi pendekatan yang dapat dilacak untuk pengelolaan perikanan di Indonesia. Dengan megadopsi strategi berbasis data, proses kolaboratif, menjembatani inisiatif, dan fokus tanpa henti pada pelacakan kinerja, para pemangku kepentingan dapat bekerja menuju masa depan di mana perikanan dikelola dengan efisiensi, transparansi, dan integrasi yang belum pernah terjadi sebelumnya.

Seperti kata pepatah, “tanpa target, Anda akan meleset setiap saat.” Dukungan berkelanjutan, ditambah dengan komitmen kuat untuk pemantauan dan evaluasi yang kuat, akan sangat penting dalam mengatasi tantangan yang terus-menerus dan mengkatalisasi perubahan sistemik dalam perikanan kakap Indonesia dan sekitarnya.



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EXECUTIVE SUMMARY

The 2019–2023 State of the Fishery report, a collaborative effort by the Blue–Green Advisors Ltd (BGA) team, Indonesia Snapper Consortium members, and fisher communities of Saleh Bay, offers a comprehensive evaluation of the Indonesian snapper fishery, focusing on Fisheries Management Areas (*Wilayah Pengelolaan Perikanan* – WPP) 713, 718, and 573. This five-year study, supported by the David and Lucile Packard Foundation, the Walton Family Foundation, and the United States Agency for International Development (USAID), reveals significant insights into the challenges and opportunities within the sector, highlighting the alarming reality of the snapper fishery's overfished state and poor biological health.

Despite substantial investments, the anticipated impacts have not been fully realized due to initial assumptions underestimating the complexity and connectivity of the snapper fishery. The emphasis on scientific stock data collection overshadowed efforts to improve governance, policy development, and enforcement. The reliance on paid boat captains for data collection raises sustainability concerns and sets a potentially problematic precedent.

The report demonstrates the vital role of measurement in gauging performance and success. As Lord Kelvin, the renowned mathematical physicist and engineer,



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“

*If you can't measure it,
you can't improve it.*

once said, *'If you can't measure it, you can't improve it.'* This quote underscores the fundamental importance of consistent, reliable data across indicators, geographies, and time periods. Without such data, it becomes challenging to assess progress, identify areas for improvement, and make informed decisions.

The report underscores the critical need for a balanced approach integrating data-driven strategies with robust governance and policy frameworks. Collaborative processes, adaptive management, and comprehensive stakeholder engagement are crucial. The role of a neutral convener, such as BGA, with fishery management expertise, proved invaluable in facilitating inclusive dialogue, fostering consensus, and aligning efforts towards shared objectives. BGA's support in providing this annual report, delivering

essential performance data, and facilitating the Consortium's activities came at a remarkably low cost, amounting to less than 0.5% of the total funds invested by the three donors throughout the project's lifespan.

Crucially, the report demonstrates the vital role of measurement in gauging performance and success. Inconsistent and unreliable data across indicators, geographies, and time periods hinder progress assessment, identification of areas for improvement, and informed decision-making. Standardized data collection protocols and robust monitoring and evaluation systems are imperative. The Indonesian snapper fishery stands out as one of the few, if any, fisheries consistently tracking data and performance, despite numerous initiatives aimed at improving fishery management.



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Key Recommendations

❏ Implement a data-driven approach to fishery management, utilizing extensive datasets to inform governance improvements and decision-making, with a strong emphasis on analytics and insights.

❏ Establish a comprehensive performance measurement framework encompassing social, ecological, and economic aspects of fishery management, setting clear, measurable targets and regularly monitoring progress.

❏ Prioritize accurate and comprehensive data collection, engaging a broader range of data collectors, citizen scientists, and considering appropriate compensation.

❏ Foster a collaborative learning environment by openly sharing lessons learned, contributing to a repository of best practices that encourage innovation and resilience. Encourage bridging and collaboration among stakeholders to facilitate knowledge exchange and collective action.

❏ Strengthen governance and policy frameworks, ensuring data-driven strategies are supported by robust institutional frameworks and effective implementation. Enhance collaboration between management and law enforcement for more cohesive fisheries governance.

❏ Develop cost-effective and sustainable data collection methods that can be maintained by local organizations, ensuring the long-term viability of these efforts. Build endogenous capacity and foster local ownership in data collection and management.

This longitudinal study lays the foundation for a traceable approach to fishery management in Indonesia. By embracing data-driven strategies, collaborative processes, bridging initiatives, and a relentless focus on tracing performance, stakeholders can work towards a future where fisheries are managed with unprecedented efficiency, transparency, and integration.

As the adage goes, “without a target, you will miss it every time.” Continued support, coupled with a strong commitment to robust monitoring and evaluation, will be vital in overcoming persistent challenges and catalyzing systemic change in the Indonesian snapper fishery and beyond.



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INTRODUCTION

About this report

This report marks the fifth annual 'State of the Fishery' review for the Indonesian snapper and grouper fisheries, spanning the years 2019 to 2023. It encompasses collaborative work supported by the David and Lucile Packard Foundation and the Walton Family Foundation. This edition provides a comprehensive analysis of the data and insights accumulated over the five-year project life, with a focus on initiatives at both the regional level and within West Nusa Tenggara province. Moreover, it underscores the successful partnership and coordination among stakeholders in promoting the integrated improvement of fisheries, encompassing governance, industry engagement, environmental and stock sustainability, and community aspects.

In this concluding report, our objective is to deliver a more thorough analysis across a broader spectrum of indicators, including an overview of labor and human rights issues in Indonesia's small-scale fisheries.

We recognize all contributing partners for their generous data sharing and invaluable input. Key contributors to this report include members of the Snapper Consortium, Sustainable Fisheries Partnership (SFP), Wildlife Conservation Society (WCS), Yayasan Konservasi Alam Nusantara (YKAN), and the Rekam Nusantara Foundation (RNF). In previous iterations, contributors also included the Tropical Landscapes Finance Facility (TLFF) and the Ocean Conservancy.

Despite thorough attention and consultation with all partners to validate these data sets and conclusions, Blue-Green Advisors Ltd (BGA) acknowledges any unintentional errors that may have occurred. We welcome constructive feedback from all stakeholders and partners, which can be submitted by direct email to us at hello@bluegreenadvisors.com.



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Limitation to this report

While encompassing a broad scope across three Fisheries Management Areas (*Wilayah Pengelolaan Perikanan* – WPPs) 718, 713, and 573, this report encounters several limitations that must be acknowledged. Primarily, the data and updates on interventions presented are confined to those supplied by members of the Snapper Consortium, restricting the breadth of information available. Furthermore, certain datasets have not been updated, attributed to challenges such as Consortium members' inability to track consistently and monitor or discontinue interventions at the grassroots level.

Adjustments in methodology and approach have also led to the exclusion of some data, deemed incomparable with previous time series analyses, thus potentially affecting longitudinal consistency. Additionally, the periodicity of data availability poses a challenge, with some datasets being

biannual due to the nature of data collection processes, which may not align with the annual reporting cycle.

To streamline the report and facilitate analysis, the summary table predominantly features data on common species, with more detailed analyses relegated to the annex. This decision was made to simplify the narrative and focus on the most pertinent information, though it may limit the depth of insights into less common species.



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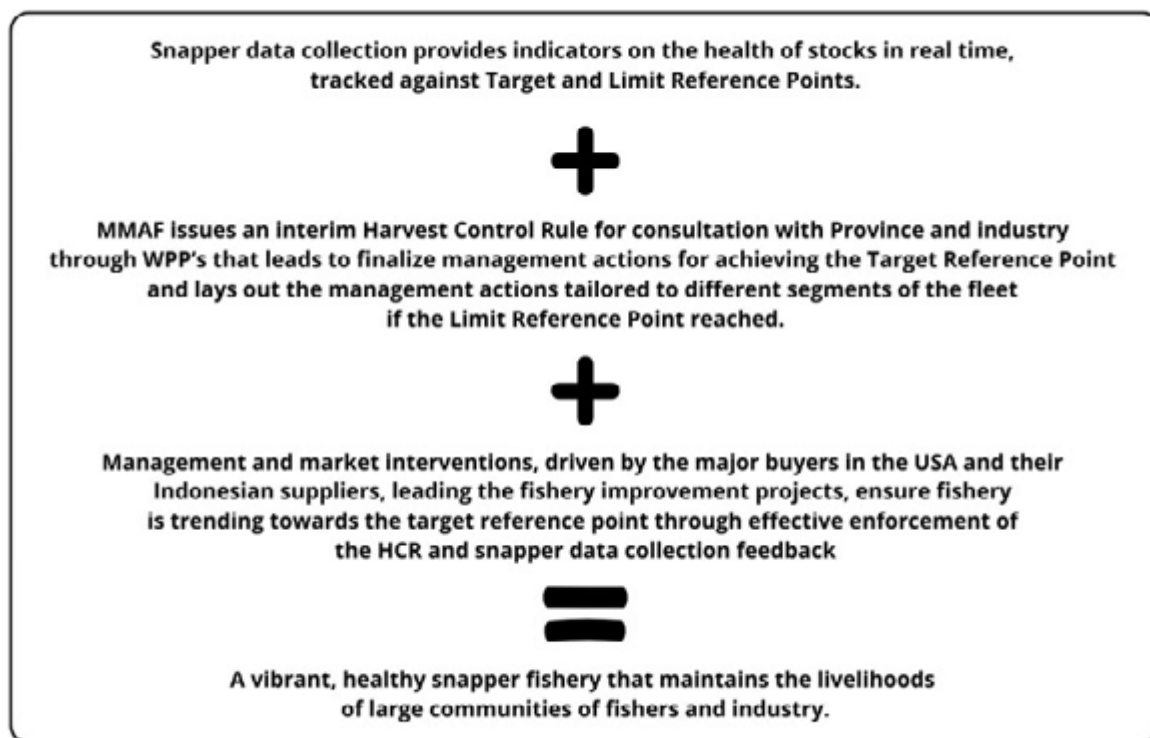
CONTEXTUAL OVERVIEW

Framework overview

To optimize the review of the Consortium program's execution from 2019 to 2023, we returned to the Theory of Change (ToC) framework initially agreed upon at the program's inception. The ToC outlines the Consortium's goal to maintain fish stock stability while ensuring the prosperity and well-being of dependent fishing communities and industry. Achievement of these goals is structured around three main pillars spanning distinct areas:

1. Implement real-time monitoring of snapper stock health against a standardized academically recognized¹ protocol with predefined benchmarks.
2. Collaboratively develop and enhance a Harvest Control Rule led by the National Ministry of Marine Affairs and Fisheries (MMAF) with input from the Consortium members, provincial and industry stakeholders, devising specific management plans for the different fishing fleet segments (dropline, handline, longline, etc.).
3. Strengthen fishery governance by building strategic alliances with key buyers and suppliers, enforcing regulations and leveraging data feedback for continuous improvement.

The Consortium Theory of Change (Drawn up by Consortium members from 2017–2019)



¹ Hordyk, A., Ono, K., Valencia, S., Loneragan, N. and Prince, J., 2015. A novel length-based empirical estimation method of spawning potential ratio (SPR), and tests of its performance, for small-scale, data-poor fisheries. *ICES Journal of Marine Science*, 72(1), pp.217–231. <https://academic.oup.com/icesjms/article/72/1/217/815772>

2019–2023

FISHERIES SECTOR OVERVIEW

Evaluation Framework

SNAPPER INDICATORS MATRIX						
Indicator	WPP / Location	Year				
		2019 Baseline	2020	2021	2022	2023
A: Spawning potential ratio (SPR) indicating stock status of snapper species across WPP 713, 718 and 573 (<i>L. malabaricus</i>)	Saleh Bay	25	-	29	26	23
	WPP 713	8	12	8	-	-
	WPP 718	7	7	14	-	-
	WPP 573	8	7	5	-	-
B: Catch per unit effort (CPUE) for a subset of priority fishing gears in selected fishing grounds	Saleh Bay	6.33	6.48	8.12	7.3	7.02
	WPP 713	20.89	26.84	14.34	-	-
	WPP 718	81.16	5.23	6.16	-	-
	WPP 573	14.48	13.93	14.31	-	-
C: Fishing capacity for snapper	Total	86,733.00 GT	-	70,470 GT	-	-
D: Real-time availability and use of national-level and WPP-level fish monitoring data to inform Snapper Fishery Management and Harvest Strategy	WPP 713	Level 2	Level 2	Level 3	Level 3	Level 3
	WPP 718	Level 2	Level 2	Level 2	Level 2	Level 2
	WPP 573	Level 2	Level 2	Level 2	Level 2	Level 3
E: Progress towards government adoption of National Snapper Fishery Management Plan	Total	Stage 1	Stage 3	Stage 4	Stage 4	Stage 4
F: Progress towards government adoption of Snapper Harvest Strategy and Grouper Harvest Strategy for each priority WPP	WPP 713	Stage 2	Stage 2	Stage 2	Stage 2	Stage 2
	WPP 718	Stage 0	Stage 0	Stage 0	Stage 0	Stage 0
	WPP 573	Stage 0	Stage 0	Stage 0	Stage 1	Stage 2
G: Progress toward integration of science and local knowledge into the WPP-level Harvest Strategy	WPP 713	Stage 0	Stage 1	Stage 2	Stage 3	Stage 3
	WPP 718	Stage 0	Stage 1	Stage 2	Stage 2	Stage 2
	WPP 573	Stage 0	Stage 1	Stage 2	Stage 2	Stage 3

Note: The assessment compares the current values against established baselines.

 No data
 Up - increase or improvement compared to the previous year or baseline.
 Same as previous year or baseline.
 Down - decrease or decline compared to the previous year or baseline.

SNAPPER INDICATORS MATRIX

Indicator	WPP / Location	Year				
		2019 Baseline	2020	2021	2022	2023
H: Resources allocated to compliance in WPP 713, 718 and 573	WPP 713	Milestone 0	Milestone 0	Milestone 0	Milestone 0	Milestone 0
	WPP 718	Milestone 0	Milestone 0	Milestone 0	Milestone 0	Milestone 0
	WPP 573	Milestone 0	Milestone 0	Milestone 0	Milestone 0	Milestone 0
I: Policy white papers endorsed by stakeholders	Total	0 paper	2 papers	2 papers	3 papers	4 papers
J: WPP Council Consultative and Scientific Panels functional and achieving milestones	WPP 713	Milestone 1	Milestone 0	Milestone 0	Milestone 0	Milestone 0
	WPP 718	Milestone 0	Milestone 0	Milestone 0	Milestone 0	Milestone 0
	WPP 573	Milestone 0	Milestone 0	Milestone 0	Milestone 0	Milestone 0
K: Increase in resource allocation to Saleh Bay snapper management	Total	USD 48,490.71	USD 48,180.73	USD 23,295.00	USD 97,846.93	USD 169,472.00
L: Improved local stakeholder engagement in snapper fishery management	Saleh Bay	15 groups	15 groups	15 groups	20 groups	22 groups
	Alas Strait	7 groups	10 groups	10 groups	14 groups	14 groups
	Cempi Bay	2 groups	2 groups	2 groups	3 groups	3 groups
	Waworada Bay	4 groups	4 groups	4 groups	4 groups	4 groups
	Sape Strait	1 group	1 group	1 group	1 group	1 group
M: Provincial fisheries management groups demonstrating progress towards adaptive management of snapper fishery	Total	2 PTFs	2 PTFs	2 PTFs	2 PTFs	1 PFT
N: Indonesian Demersal Association (ADI) adopting a business plan and actively complying with a code of conduct	Total	Stage 0	Stage 0	Stage 2	Stage 2	Stage 2
O: Fishery Improvement Projects (FIPs) achieving positive performance	Total	0 FIP	0 FIP	0 FIP	0 FIP	0 FIP
P: Mapping of snapper supply chains	Total	0 %	81.42 %	77.90 %	0 %	0 %
Q: Effective application of traceability by FIP member companies	Total	0 FIP Member	0 FIP Member	0 FIP Member	0 FIP Member	0 FIP Member
R: Indonesian media references to sustainable Snapper fisheries	Total	40 articles	17 articles	28 articles	69 articles	38 articles

Outcome Evaluation

Below is a compilation of indicators, grouped by their respective clusters. For an in-depth explanation of each, please refer to Annex 1.

Data insights: Fisheries Health Improvement

The data reveals mixed trends across different regions in the snapper fishery. The SPR, a key indicator of stock status, shows some regions initially improving, followed by declines, especially in Saleh Bay. This highlights the need for better management to ensure sustainable use of snapper species. Optimal SPR levels for long-living species like snapper should be 40 % or above, but most stocks have SPRs below 10 %, indicating significant overfishing.

Positively, the CPUE in Saleh Bay, where resources were invested in governance, has consistently improved. However, the decline in CPUE in other regions (WPP 713, 718, and 573) suggests overfishing.

Integrating science and local knowledge into management is crucial for effective and sustainable harvest strategies. Progress has been made in adopting National Snapper Fishery Management Plans and Harvest Strategies across WPPs, but varied progress across regions shows that a one-size-fits-all approach won't work. Tailored management addressing regional challenges and leveraging local insights is needed.



Integrating science and local knowledge into management is crucial for effective and sustainable harvest strategies.

Governance Enhancement

Resource Allocation and Compliance:

Indicators related to compliance resources (Indicator H) and traceability by FIP companies (Indicator Q) remained unchanged across WPPs. This stagnation is concerning and requires further investigation and action.

Engagement and Empowerment: Local stakeholder engagement (Indicator L) has improved in Saleh Bay, Alas Strait, and Cempi Bay. This community involvement is essential for effective management and sustainability. Engaging local stakeholders helps assess fishery health and ensures relevant management strategies.

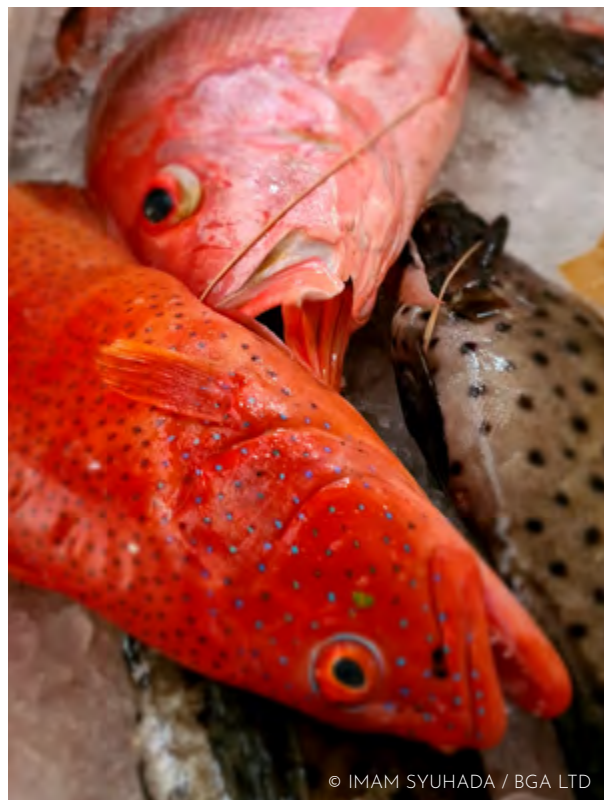
Market Interventions and Collaboration:

The consistent status across FIPs (Indicator O) suggests a need for reevaluation or revitalization to achieve positive performance shifts. FIPs are critical for driving sustainability, and their stagnant status calls for deeper examination of challenges and opportunities.

Supply Chain Mapping and Media

References: Efforts to map snapper supply chains (Indicator P) have improved, increasing understanding of market dynamics and areas for sustainability enhancement. However, fluctuating media references to sustainable snapper fisheries (Indicator R) underscore the importance of continuous public engagement and advocacy.

Tracking these indicators provides valuable data for evaluating management practices and identifying areas for improvement. Mixed results highlight the complexity of sustainable fishery management and the need for adaptive strategies.



Moving forward, continuous monitoring and stakeholder engagement are essential. Transparency, lesson-sharing, and accountability are crucial. Building a culture of openness, collaboration, and continuous improvement can strengthen sustainable fishery management in Indonesia. This requires collective efforts from governments, industry, communities, and conservation organizations working towards thriving fisheries that support livelihoods, biodiversity, and food security.

The Consortium

The Snapper Consortium's five-year journey has been marked by achievements and challenges. Despite members not officially meeting for over two years, their collective impact is significant. For more information on the Consortium's previous work, please see the [2022 report](#).

The Consortium's effectiveness and efficiency, particularly in reporting and project execution, highlight the importance of a neutral convenor. This convenor, with deep understanding of fishery management and facilitation skills, fostered a collaborative environment and aligned diverse participants towards shared objectives.

Remarkably, the Consortium maintained full working status during the challenges posed by the COVID-19 pandemic, ensuring uninterrupted data collection, sharing, and analysis and support across the various stakeholders.

The experience of the Snapper Consortium underscores the inefficiencies inherent in uncoordinated approaches to sustainable fishery management and conservation. Without the guidance of an objective facilitator to champion data-driven strategies, foster consensus, and cultivate partnerships, efforts often result in duplicated initiatives and unclear roles among stakeholders. The Consortium's adoption of a leadership model centered on neutrality, expertise, and facilitation has proven enlightening. This structured approach not only minimizes redundancies but also clarifies stakeholder responsibilities and enhances coordination. Furthermore, the regular availability of annual data sets provides a transparent platform for all parties—donors and grantees alike—to collaboratively learn, reduce



overlaps, and ensure strategic alignment. Thus, emphasizing the critical need for structured leadership in driving the efficient advancement of collaborative environmental goals efficiently and proactively.

The experience of the Snapper Consortium underscores the inefficiencies inherent in uncoordinated approaches to sustainable fishery management and conservation.

Critical Reflections

Pluses

- + Substantial investments in the snapper fisheries, reaching tens of millions of dollars, have demonstrated a strong commitment and coordination across multiple donors was a real plus. These investments have led to tangible improvements in fishery health, such as increased stakeholder engagement and the development of a harvest strategy, which is a significant step towards sustainable fishery management.
- + The extensive data collection efforts have resulted in one of the most comprehensive datasets for any fishery in the region. This dataset has been actively utilized to inform decision-making processes, including the development of management plans and the identification of priority areas for conservation efforts.
- + The progress made in developing a harvest strategy in collaboration with the MMAF marks a significant milestone towards sustainable fishery management. Although catch allocation between the various fleets remains unaddressed, this achievement lays the groundwork for future improvements in the management of the snapper fishery.
- + The implementation of a standardized data collection methodology to assess the stock ensures consistency and comparability across different contexts. This approach promotes better collaboration and knowledge sharing among stakeholders, enabling the replication of successful practices and facilitating the identification of common challenges.



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Deltas

- △ The initial assumptions about the homogeneity and isolation of the snapper fishery proved to be incorrect, leading to a misunderstanding of its complexity and connectivity. This oversight resulted in interventions that were not always well-suited to the local context, limiting their effectiveness and impact. Future efforts must prioritize a deeper understanding of the ecosystem's interconnectedness and the socio-economic factors influencing the fishery.

△ The heavy emphasis on data collection and the associated costs overshadowed efforts to improve governance, policy development, and enforcement of fisheries management. For example, while comprehensive stock assessments were conducted, there was limited progress in strengthening the institutional frameworks necessary to translate this data into effective management actions. Balancing investments in data collection with efforts to build robust governance structures and enforcement mechanisms is crucial for driving meaningful change.

△ The reliance on paid boat captains for data collection raises concerns about the sustainability and potential biases in the data. This approach may not foster local ownership and could create a dependency on external funding. Exploring alternative methods that build local capacity, such as training community members or partnering with local institutions, could help ensure the long-term viability and reliability of data collection efforts.

△ The lack of progress in establishing the Fisheries Management Area Governance bodies was a significant setback, as these entities were expected to play a crucial role in implementing the governance approach advocated by the lead implementer. This challenge highlights the need for adaptive management and the importance of regularly reassessing assumptions and strategies considering evolving realities on the ground. Future initiatives must prioritize the development of effective governance structures that can support the sustainable management of the fishery.

△ The focus on third-party certification systems, such as the Marine Stewardship Council (MSC), was inappropriate given the current state of the snapper stock and the significant costs associated with such systems. Pursuing certification at this stage diverts resources from more pressing needs, such as improving fishery management and rebuilding depleted stocks. Furthermore, the high costs of certification may create barriers for small-scale fishers and limit the inclusivity of the fishery. It is crucial to prioritize investments in addressing the fundamental challenges facing the fishery before considering certification.

As we reflect on these pluses and deltas, it is evident that the path to sustainable fishery management is a complex and iterative process. By openly acknowledging our successes and shortcomings, we can build a stronger foundation for future interventions. Moving forward, it is essential to prioritize continuous learning, adaptation, and collaboration among stakeholders. By leveraging the lessons learned and maintaining a commitment to evidence-based decision-making, we can work towards a more sustainable and resilient future for the Indonesian snapper fishery.

CONCLUSIONS AND RECOMMENDATIONS

The five-year longitudinal study on the Indonesian snapper fishery has revealed a complex tapestry of challenges and opportunities, underlining the critical importance of a holistic approach that seamlessly integrates data-driven strategies with robust governance and policy frameworks. The study has exposed the alarming reality of the snapper fishery's overfished state and poor biological health, emphasizing the urgent need for transformative action to prevent further depletion and ensure the long-term sustainability of this invaluable resource.

The insights gained from this five-year longitudinal study underscore the critical importance of measurement in driving effective fishery management. As Lord Kelvin wisely noted, *'If you can't measure it, you can't improve it.'* This quote encapsulates the key lesson from this work: without consistent, reliable data and robust monitoring and evaluation systems, it becomes nearly impossible to assess progress, identify areas for improvement, and make evidence-based decisions.

The study has also highlighted the pitfalls of initial assumptions about the fishery's homogeneity and isolation, leading to a gross underestimation of its complexity and interconnectedness. This serves as a clarion call for a more nuanced understanding of the ecosystem's dynamics and the socio-economic factors that shape the fishery. The dangers of overemphasizing scientific stock data collection at the expense of efforts to strengthen governance, policy development, and enforcement have also been brought to the fore.

The emergence of a neutral convener with expertise in fishery management as a critical factor in facilitating inclusive dialogue, fostering consensus, and aligning efforts towards shared objectives underscores the paramount importance of bridging and collaboration among stakeholders. By leveraging analytics and insights to draw data-driven conclusions, we can create a solid foundation for evidence-based decision-making and targeted interventions.

The study has also revealed the crucial role of tracing performance in driving effective fishery management. As the saying goes, "without a target, you will miss it every time." This adage holds true for the Indonesian snapper fishery, where the lack of clear performance targets and monitoring has hindered progress towards sustainability. Remarkably, despite numerous initiatives aimed at improving fishery management, few – if any – other fisheries are consistently tracking their data and performance, making the Indonesian snapper fishery a rare exception.



RECOMMENDATIONS

To translate these insights into tangible outcomes, we propose a set of actionable recommendations:

- ❏ Implement a data-driven approach to fishery management, utilizing extensive datasets to inform governance improvements and decision-making, with a strong emphasis on analytics and insights.
 - ❏ Establish a comprehensive performance measurement framework that encompasses social, ecological, and economic aspects of fishery management, enabling progress tracking and identification of areas requiring intervention. Set clear, measurable targets and regularly monitor progress towards these goals.
 - ❏ Prioritize accurate and comprehensive data collection, engaging a broader range of data collectors, citizen scientists, and considering appropriate compensation for their efforts. Leverage technology and Internet of Things (IoT) solutions to streamline data collection and analysis.
 - ❏ Foster a collaborative learning environment, openly sharing lessons learned and contributing to a growing repository of case studies and best practices. Encourage bridging and collaboration among stakeholders to facilitate knowledge exchange and collective action.
 - ❏ Strengthen governance and policy frameworks, ensuring that data-driven strategies are supported by robust institutional frameworks and effective implementation. Enhance collaboration between management and law enforcement for more cohesive fisheries governance.
 - ❏ Develop cost-effective and sustainable data collection methods that can be maintained by local organizations, ensuring the long-term viability of these efforts. Build endogenous capacity and foster local ownership in data collection and management.
- By implementing these recommendations and maintaining a steadfast commitment to evidence-based decision-making, stakeholders and policymakers can pave the way for a more sustainable, inclusive, and effectively managed Indonesian snapper fishery. The insights gained from this study should serve as a springboard for refining strategies and achieving more substantial, impactful outcomes in the future. Through collaborative efforts, bridging initiatives, and a relentless focus on tracing performance, the sector can chart a course towards a more prosperous and sustainable future for Indonesia's fisheries, safeguarding this invaluable resource for generations to come.

ANNEXES

Annex 1: Snapper Fisheries Indicators

In order to measure the Consortium's progress toward its goal, various indicators have been independently established, guided by the Theory of Change (ToC). This ToC is designed to achieve a thriving and sustainable snapper fishery that supports livelihoods for the community and the industry. This is ensured when the fishery is backed by reliable data monitoring stock health, backed by established fisheries management, and reinforced through market-driven interventions that apply harvest control rules across different management levels.

While we recognize the existence of other potential data that could serve as substitutes or complement these indicators, the Consortium members (Ocean Conservancy, Sustainable Fisheries Partnership (SFP), Tropical Landscapes Finance Facility (TLFF), Wildlife Conservation Society (WCS), Yayasan Konservasi Alam Nusantara (YKAN), Rekam Nusantara Foundation (RNF), and the Indonesian Demersal Association (ADI)) has decided to use a specific set of agreed-upon data for each indicator.

The indicators are:

1. Fishery Health
2. Institutions, Governance, Management, and Policy
3. Industry Initiatives
4. Communications

Additionally, these indicators are intended to, but not limited to:

- Track progress, evaluate effectiveness, and showcase lessons from the implementation of the snapper initiative across the Consortium;
- Align methods used for monitoring and evaluation;
- Capture and integrate learnings into the strategies of both implementers and donors;
- Assist with monitoring, evaluation, and learning for implementing partners and the donors (USAID, the David and Lucile Packard Foundation, and the Walton Family Foundation); and
- Provide proxies that allow for tracking and adaptive learning for the Consortium's ToC for the fishery.



Indicator A:

Spawning Potential Ratio (SPR) indicating stock status

SPR is a crucial metric that the Snapper Consortium utilizes to monitor the health of the snapper stock effectively. It serves as an index of recruitment to the snapper fishery, representing the unfished spawning potential preserved under the Snapper Harvest Strategy. However, it's crucial to note that the calculation methodologies for this key indicator of stock status vary between YKAN and WCS.

YKAN employs a unique method that is rooted in the Indonesian Fisheries Information System (I-Fish) community's automatic length-frequency distribution reporting system. This approach, which enables species-specific, length-based assessment of the fishery, incorporates elements from the catch-length frequencies surrounding a concept akin to length-based SPR (LBSPR). These elements include (a) minimum size as traded, (b) proportion of immature fish in the catch, (c) current exploitation level, (d) proportion of mega-spawners in the catch, and (e) SPR.

Conversely, WCS employs the LBSPR assessment method proposed by Hordyk et al. (2015). This approach compares the length composition of adult catches to local estimates of the size at first maturity (L_{50}) using estimates of life history ratios (LHR): L_{50}/L_{∞} and M/k . Here, L_{50} is the length at which 50% maturity is achieved, L_{∞} is the asymptotic size as determined by the von Bertalanffy growth equation, M denotes the rate of natural mortality, and k represents the Brody growth coefficient, as defined by the von Bertalanffy growth equation².

Five-year assessment (2019–2023)

The five-year assessment of the snapper fishery across several Fisheries Management Areas (*Wilayah Pengelolaan Perikanan* – WPPs), such as 713, 718, and 573, was only feasible for the first three years (2019–2021) due to the absence of a Crew-Operated Data Recording System (CODRS) program that gathers data in these target areas in the last two years. Generally, the assessment of the four target species (*Pristipomoides multidens*, *Lutjanus malabaricus*, *Aphareus rutilans*, and *Epinephelus areolatus*) in the WPPs revealed mixed variations and a significant decline in stocks, with several species, especially in area 573, showing a trend towards extinction. Given the current SPR levels, it may be challenging for this fishery stock to recover to a condition that can sustain fisheries.

Observations on a smaller scale in Saleh Bay, West Nusa Tenggara, indicate that although the fishery's status was in a better condition than that in the WPPs, the stock is also experiencing a decline, albeit slightly above the limit reference point. According to Prince et al. (2015), these levels are not sustainable, and for some species with an SPR level of 5 or lower, it is nearly impossible to achieve improvement in fisheries.

Temporary changes in fishing grounds by several fishers at the WPP level, along with the introduction of new fishing gear in the Saleh Bay area, have complicated some SPR calculations. These changes have significantly impacted the length-frequency composition of the total catch, which is essential for SPR calculations. However, this knowledge is very valuable to the management body for anticipating seasonal changes and understanding how the fishery will adapt to the introduction of new gear or boats.

² Hordyk, A., Ono, K., Valencia, S., Loneragan, N.R., and Prince, J. 2014. A novel length-based empirical estimation method of spawning potential ratio (SPR), and tests of its performance, for small-scale, data-poor fisheries <https://doi.org/10.1093/icesjms/fsu004>

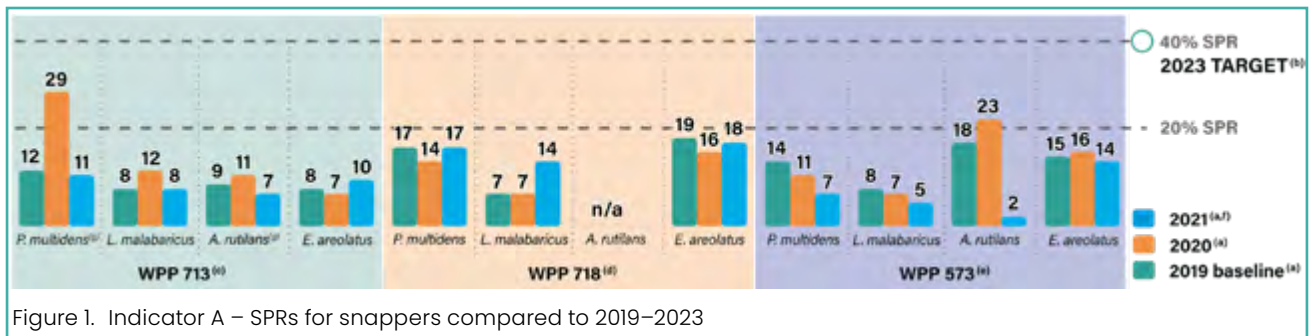


Figure 1. Indicator A – SPRs for snappers compared to 2019–2023

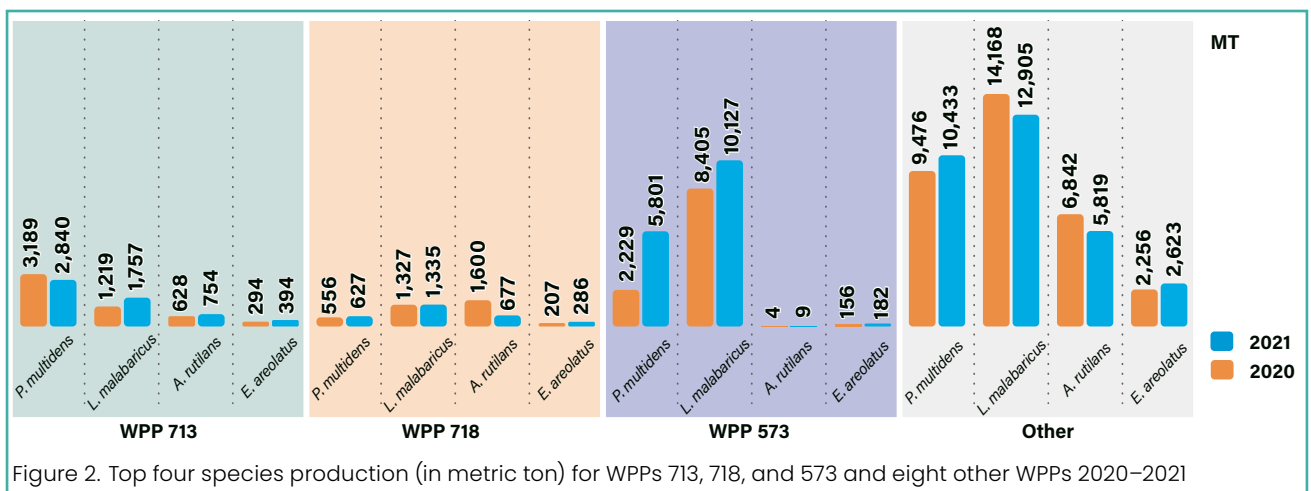


Figure 2. Top four species production (in metric ton) for WPPs 713, 718, and 573 and eight other WPPs 2020–2021

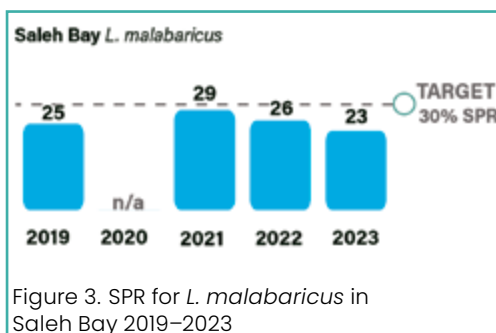


Figure 3. SPR for *L. malabaricus* in Saleh Bay 2019–2023

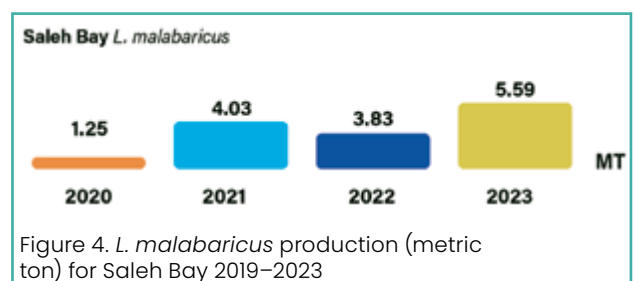


Figure 4. *L. malabaricus* production (metric ton) for Saleh Bay 2019–2023

Notes:

- YKAN changed its formula for calculating SPR at the end of 2020 based on updated life history parameters of the species. The 2020 SPRs were calculated using the new formula. Accordingly, the baseline SPRs (2019) were recalculated and updated to account for this change (i.e., the 2019 values shown here were revised from those presented in the 2019 State of the Fishery report). (See [YKAN Snapper Technical Report, Section 2.3, 23 February 2021](#)). All values are approximate and do not include error bars.
- The target is stated as “SPR ... stabilized by 2023 and moving towards 40%”
- Mous, IGede & Pet. 2020. Assessment of Snapper Fishery in WPP 713 (Draft). [TNC-IFPC. BRPLDemersalWPP713.pdf](#)
- Mous, IGede & Pet. 2020. Assessment of Snapper Fishery in WPP 718 (Draft). [TNC-IFPC. BRPLDemersalWPP718.pdf](#)
- Mous, IGede & Pet. 2020. Assessment of Snapper Fishery in WPP 573 (Draft). [TNC-IFPC. BRPLDemersalWPP573.pdf](#)
- Trends are not interpretable for data from 2020 to 2021 as the 2021 data do not represent all fleet segments (YKAN has been winding down the monitoring program) and differences may be caused by sampling technicalities. 2021 data source reports are available at this link: <https://kkp.go.id/brsdm/brpl/page/5676-kajian-stok-demersal>. For WPP 713: *Kajian Stok Berbasis Panjang dari Kumpulan Spesies yang Tertangkap di Laut Dalam pada Perikanan Demersal dengan Target Ikan Kakap pada WPPNRI 713 di Perairan Selat Makasar*; for WPP 718: *Kajian Stok Berbasis Panjang dari Kumpulan Spesies yang Tertangkap di Laut Dalam pada Perikanan Demersal dengan Target Ikan Kakap pada WPPNRI 718 di Perairan Laut Arafura*; and for WPP 573: *Kajian Stok Berbasis Panjang dari Kumpulan Spesies yang Tertangkap di Laut Dalam pada Perikanan Demersal dengan Target Ikan Kakap pada WPPNRI 573 di Perairan Laut Timor*
- Species *A. rutilans* and *P. multident* are caught by all types of boats and all kinds of fishing gears. But for fishing gear, most *A. rutilans* are caught by dropline.



Indicator B:

Catch Per Unit Effort (CPUE) for a subset of priority fishing gears in selected fishing grounds

CPUE³ is the rate at which snappers are caught and is used to provide an index of stock abundance. It can be calculated using the catch (kg) of snappers taken by the number of hooks set per day of fishing, or per gross ton (GT) of vessel capacity per day. Representative sub-sampling of the main fishing gears⁴ in each WPP (713, 718, and 573) provides an estimate of the level of effort applied to the fishery. For future iterations of this report, collective pooling of the raw data and the application of a single analysis method will be conducted to ensure standardization of the results across the different fleets and allow for cross-site comparisons.

Five-year assessment (2019–2023)

Conducting stock assessments in Indonesian fisheries presents a significant challenge due to the need for human resources, funding, and institutional will. From the 2019–2023 period, comprehensive fisheries data were only attainable in the first three years of this consortium’s operation. Comprehensive datasets for measuring fishery health, including CPUE at the WPP level, were achievable exclusively through CODRS surveys conducted by YKAN, which was not available in 2022 and encountered modifications in 2003. Despite having three years of consecutive comprehensive data, establishing a CPUE benchmark or reference for subsequent years proved unfeasible. This issue signifies a considerable vulnerability in Snapper fisheries management, mainly due to the utilization of multiple fishing gears and the various fleet classes exploiting this resource, which complicates the acquisition of precise data necessary for formulating gear- and fleet-specific management measures.

Even without WPP-level data for the last two years (2022 and 2023), the average CPUE at this broader management level has typically been higher than the local CPUE from Teluk Saleh’s coastal snapper fishery between 2019 and 2021, especially when focusing on the nano and small vessel categories. Moreover, since 2021, there’s been a significant drop in CPUE in Teluk Saleh, a trend that mirrors changes seen in other indicators of stock health.

³ CPUE does not provide a complete picture of a fishery. Generally, CPUE data are utilized to track trends in biomass over extended periods. However, as an isolated metric, CPUE is of little significance and can’t be compared across sites. The metric depends heavily on a multitude of contextual details such as the targeted species, the fishing techniques employed, local conditions, and fishing pressure. Substantial timelines of CPUE data trends are required before drawing conclusions—typically a minimum of 5 to 10 years.

The value in presenting and tracking CPUE lies in the discussions revolving around the factors influencing the trend. These factors include pricing, price incentives, fishing behavior, gear types, technology advancements, and other modifications to boats and fishing activities. Such conversations can elevate CPUE to a valuable indicator status. It’s crucial to interpret CPUE within this broader context, making it an instrumental piece of the puzzle in understanding a fishery’s health and sustainability.

⁴ While not reported here, CPUE data for trap, bottom-set line, gillnet, and mixed gears were also collected and are available in the full indicator dataset.

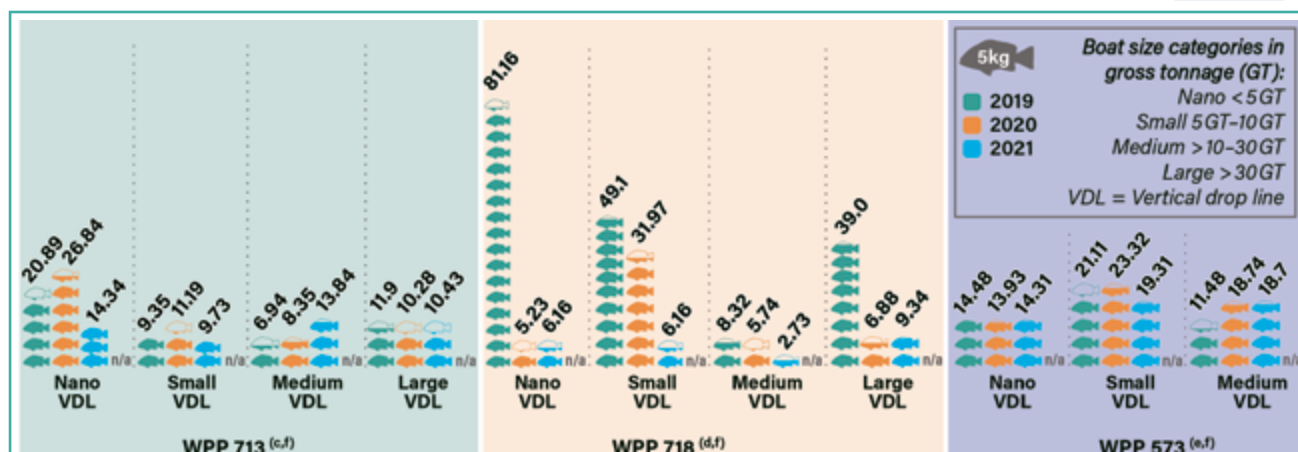


Figure 5. Indicator B - CPUE for snapper (kg per GT per day) using vertical drop line (VDL) in WPP 713, 718 and 573 from 2019–2021

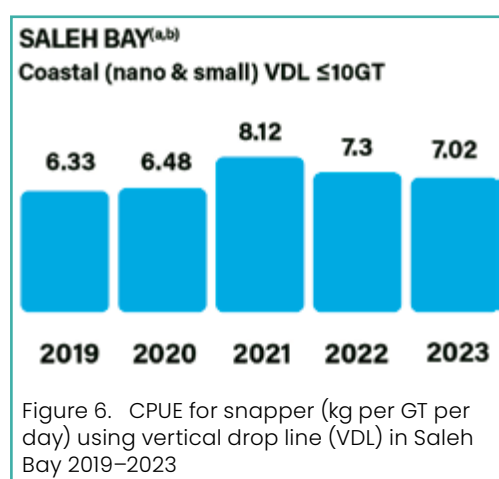


Figure 6. CPUE for snapper (kg per GT per day) using vertical drop line (VDL) in Saleh Bay 2019–2023

Notes:

- This is using the average method / nominal CPUE. For snapper only.
- 2019 to 2023 data for Saleh Bay was adjusted by WCS using the Fishing Power Index for speargun as a standard
- [FishSnapperWPP713_data 2020.pdf](#)
- [IFishSnapperWPP718_data 2020.pdf](#)
- [IFishSnapperWPP573_data 2020.pdf](#)
- Trends are not interpretable for data from 2020 to 2021 as the 2021 data do not represent all fleet segments (YKAN have been winding down the monitoring program) and differences may be caused by sampling technicalities. 2021 data sources are available at this link: [Indicator B](#)



Indicator C: Fishing capacity for snapper

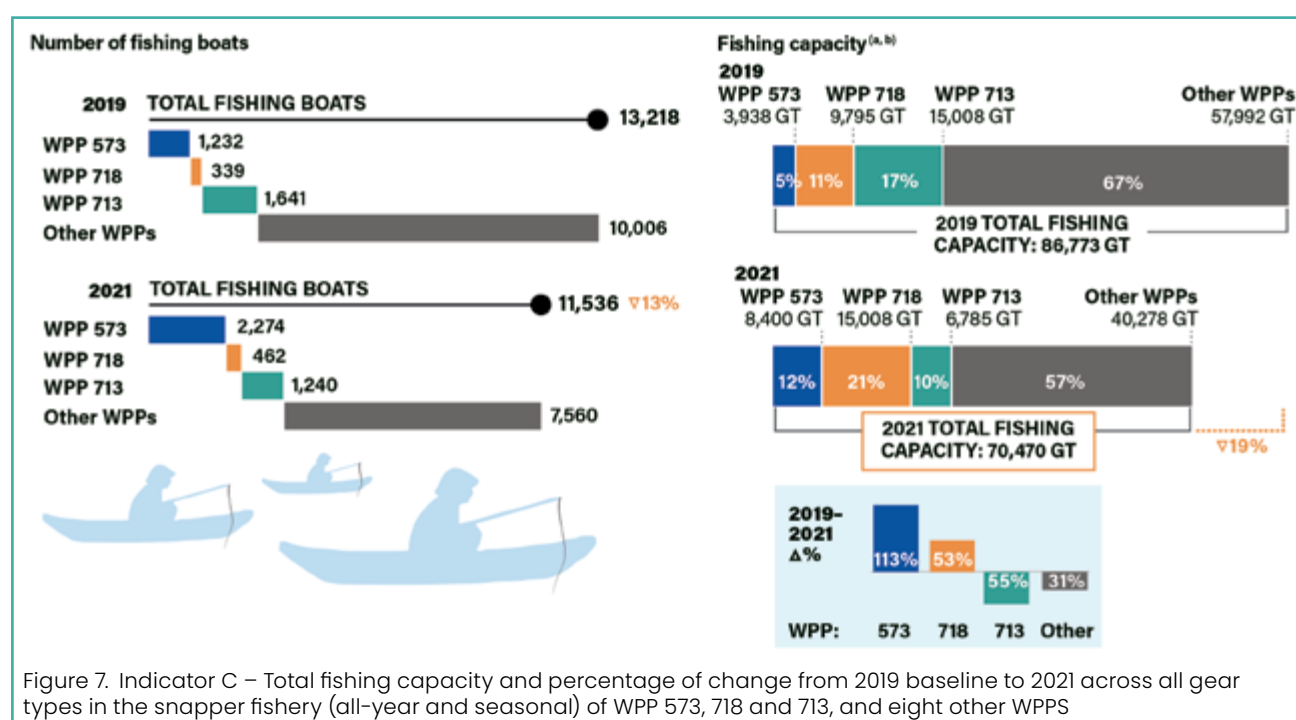
This indicator tracks the estimated total capacity in gross tonnage of snapper fishing vessels. It is based on a biennial Indonesia-wide survey of the snapper fishery fleet.

Five-year assessment (2019–2023)

The most effective approach to fisheries management in Indonesia involves controlling the fishing effort. Given the variety of fishing gear and vessel sizes in this multi-gear fishery, fishing capacity emerges as a clear metric for tracking. This indicator accurately represents the total fishing effort within the fishery. The Consortium, through YKAN, updates this metric every two years, targeting a minimum of three data collections by the end of 2023. However, the 2023 data collection will see minor adjustments, with YKAN planning a slight reduction in scope relative to previous years. Consequently, the data from 2023 might show minor variations compared to the records from 2019 and 2021.

From the two-year dataset (2019 and 2021), an interesting phenomenon was observed in some WPPs where seasonal vessels outnumbered resident vessels, accounting for about 60% to 65% of the total fleet. This dynamic movement highlights the opportunistic behavior of fishers who target specific species like shrimp, small pelagic fish, and flying fish in WPP 718, along with snapper. Meanwhile, fishers in WPP 573 focus on demersal fish, as well as large pelagic species like tuna and small pelagic fish. Considering the significant presence of seasonal fleets, it's essential to address the impact of these migrating fishers as they shift their fishing grounds.

This indicator underlines the necessity of gathering catch and effort data to formulate biological reference points (BRPs). Depending solely on the SPR as a reference point may not fully capture the dynamic changes of the fleet in the specified location.



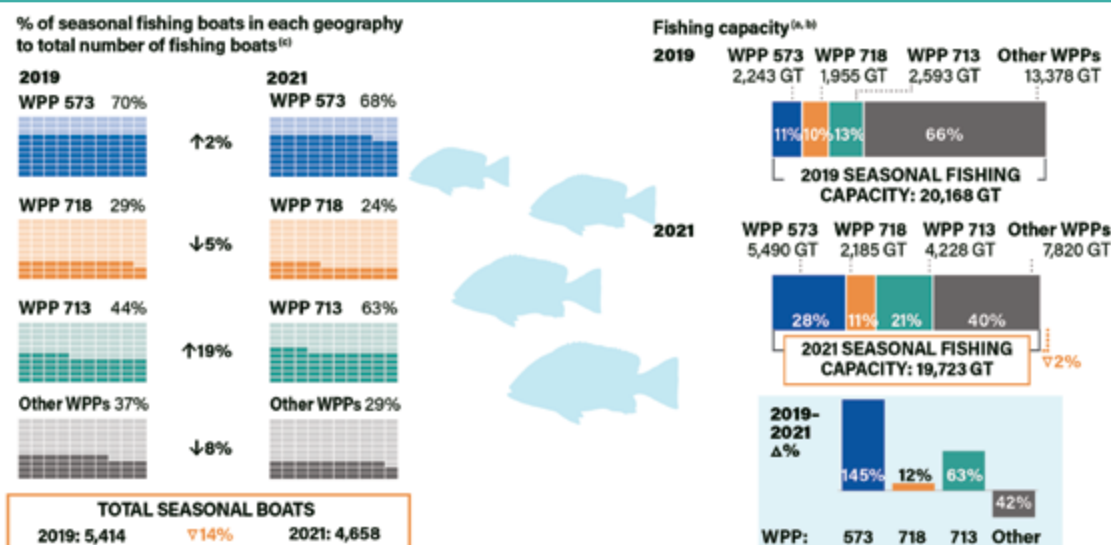


Figure 8. Fishing capacity and percentage change from 2019 baseline to 2021 across all gear types in the seasonal snapper fishery of WPP 573, 718 and 713, and eight other WPPs^(c)

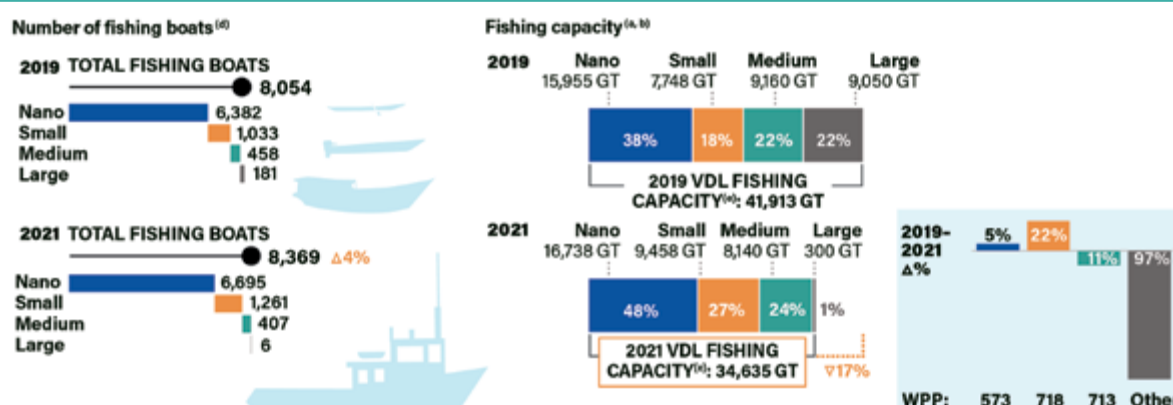


Figure 9. Vertical drop line (VDL) fishing capacity from 2019 baseline to 2021 in the snapper fishery of WPP 573, 718 and 713, and eight other WPPs

Notes:

- Owing to the absence of concrete tonnage data, the fishing capacity (FC) baseline values for 2019 are derived from the "midrange gross tonnage" (GT) as opposed to the "median GT" (MGT), taking into account the minimum and maximum size limits of the various vessel size categories (refer to the boat size categories table below). It's critical to note that midrange is a rather non-robust statistic, rendering these values far from an accurate measure of FC. However, these are currently the only metrics at our disposal for this purpose across different geographical areas. As such, they will need to serve as our operational measure until more precise data can be collected. This approach underscores the importance of ongoing efforts to enhance data quality and precision in fisheries management to ensure accurate assessments and effective decision-making.
- 2021 data: [Indicator C](#)
- The fishery has a lot of unlicensed boats that are fishing seasonally, which makes management even more complicated.
- Boat size:

Boat size:	Definition	min GT	max GT	MGT
Nano	<5GT	0	5	2.5
Small	5-10GT	5	10	7.5
Medium	>10-30GT	10.01	30	20
Large >	30GT	30.01	70	50
- VDL is presented here as it is the most common gear in use by the larger fleet (medium and large boats). For future reports, there is an opportunity to present more details about the other gears being used. Some fishers (especially small-scale fishers) regularly change gear, making gear use difficult to track and manage.

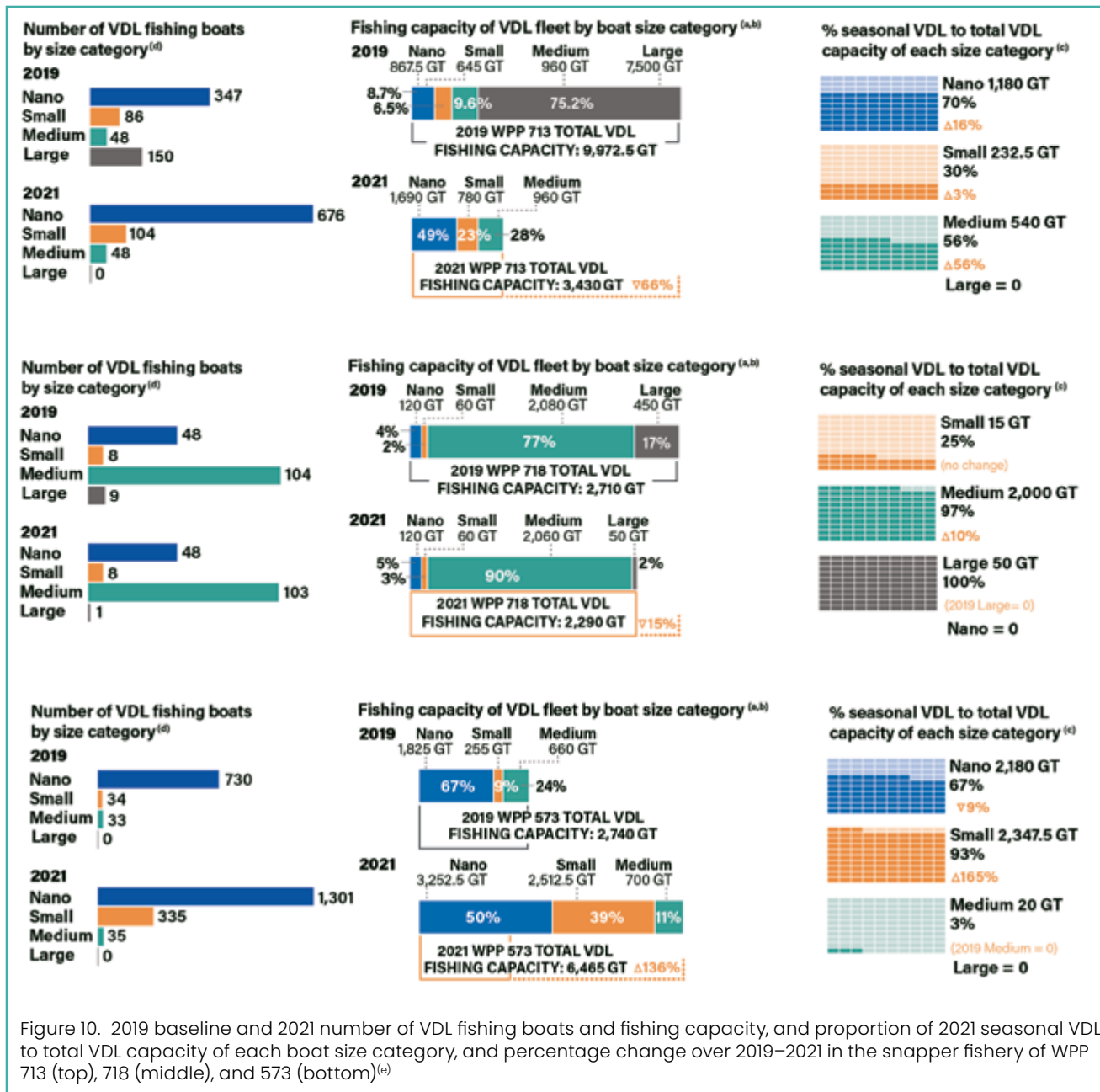
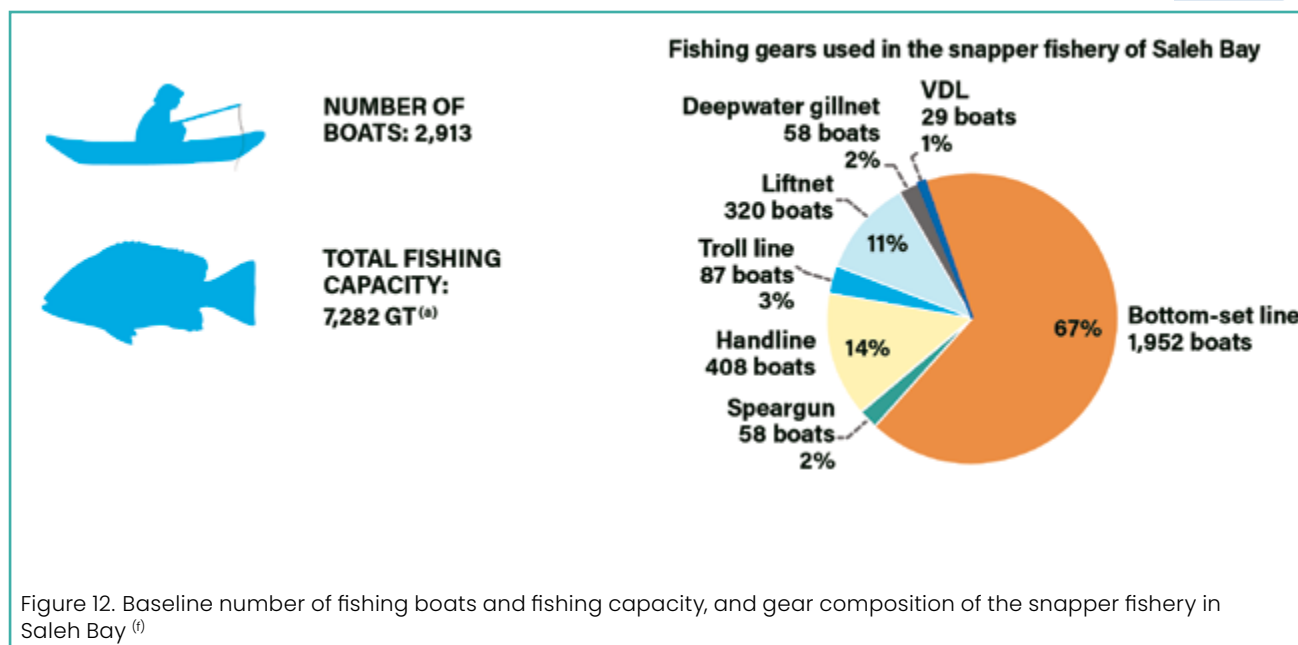


Figure 11. 2019 baseline and 2021 number of VDL fishing boats and fishing capacity, proportion of 2021 seasonal VDL to total VDL capacity of each boat size category, and percentage change over 2019–2021 in the snapper fishery of the eight WPPs outside the consortium's priority areas^(e)



Notes:

a) Saleh Bay serves as a model for localized fishery management.



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Indicator D: Real-time availability and use of national- and WPP-level fish monitoring data to inform snapper fishery management and harvest strategy

This indicator is designed to track the adoption of science-based adaptive management and decision-making practices by the Ministry of Marine Affairs and Fisheries (MMAF) and WPP Council. It specifically focuses on their use of data from WCS and YKAN CODRS concerning snapper species, which represent 90% of the total catch volume recorded by vessels monitored by YKAN. The adoption is evidenced by the achievement of three milestones by the MMAF and the WPP Councils:

Milestone 1. Submission of the data to e-BRPL (Balai Riset Perikanan Laut/Marine Fisheries Research Center)

Milestone 2. Real-time analysis and publication of the data by the MMAF-BRPL

Milestone 3. Revised harvest strategy with adjusted limit and target reference points and management interventions for WPPs 713, 718, and 573, based on the data and analysis of the real-time dataset.

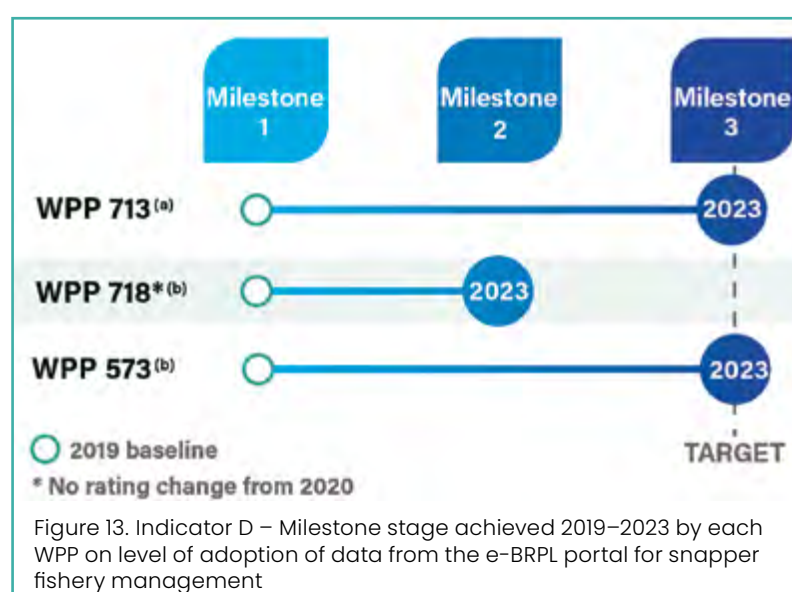
Notes:

- a) For the analysis and publication, you may reach out to the MMAF Center for Fisheries Research.
- b) HS docs for Snapper & Grouper can be viewed in [Indicator D](#)

Five-year assessment (2019–2023)

Data collection at both the WPP and provincial levels plays a crucial role in the decision-making and policy formulation processes in the MMAF. Data on vessel numbers and fish catches per WPP, however, have been unavailable since the CODRS program by YKAN concluded in 2021. At the provincial level, particularly in Saleh Bay, data is gathered by WCS and further analyzed and processed by various institutions within the scientific committee (FIP2B) operating under the Fisheries Management Commission in West Nusa Tenggara province. These datasets have been instrumental in developing harvest strategies and conducting scientific studies, which are vital components of the policy document creation process.

Although the e-BRPL is no longer managed and updated by the MMAF Center for Fisheries Research (PUSRISKAN), the data remains accessible to researchers, enabling them to conduct analyses on fisheries. However, the reports generated from the portal are no longer operational. With the current transition of e-BRPL data submission, the report only highlights the highest achievements of this indicator. MMAF used these data significantly in developing WPP 713 and 573 harvest strategy documents.





Indicator E:

Progress towards government adoption of National Snapper Fishery Management Plan

The National Snapper Fishery Management Plan (RPP) describes risks, actions, and measurable outcomes (harvest strategy, harvest control rules and tools, monitoring system, and capacity building to be applied across all WPPs). This indicator measures progress towards government adoption of the RPP using a four-stage rating system:

Stage 1. RPP drafted – 2019

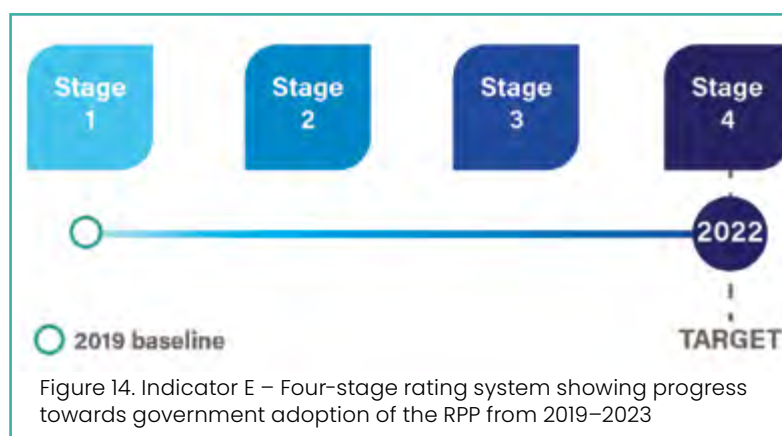
Stage 2. Draft RPP consulted to priority WPPs (713, 718, and 573) and respective Provincial Governments – 2020

Stage 3. Draft RPP finalized, incorporating feedback from the consultations – 2021

Stage 4. RPP legally adopted by the MMAF Directorate General of Capture Fisheries (DJPT) – 2022

Five-year assessment (2019–2023)

The Directorate General of Capture Fisheries has officially issued the RPP document, as evidenced by Decree Number 123/2021. This approval signifies the successful attainment of the indicator, which has been documented in the 2022 report.



Notes:

- Stage 1 started; RPP in initial drafting process
- Final draft RPP consulted to the public in September 2020 and reviewed by the MMAF Legal Bureau
- RPP has been established with DG of Capture Fisheries Decree No 123/2021 [Kepmen KP 123 Tahun 2021 RPP Kakap Kerapu.pdf](#)



Indicator F:

Progress towards government adoption of Snapper Harvest Strategy and Grouper Harvest Strategy for each priority WPP

A Harvest Strategy⁵ defines harvest control rules, management interventions, target (40% SPR) and limit reference points (20% SPR) for the most abundant species in the catch (90% of volume). This indicator measures progress towards government adoption of a Snapper Harvest Strategy and a Grouper Harvest Strategy each for WPP 713, 718 and 573 using a three-stage rating system:

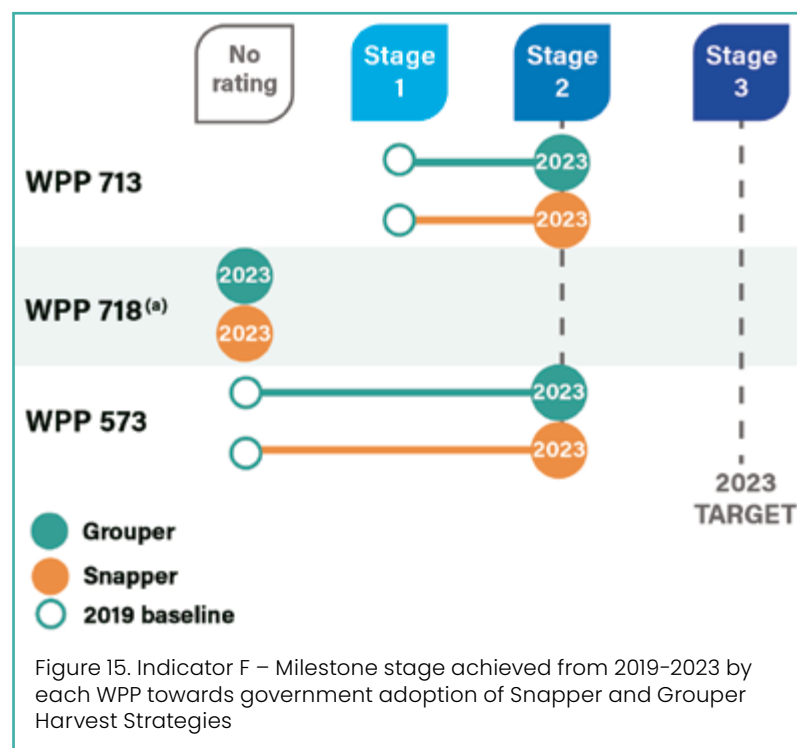
Stage 1. Harvest Strategy drafted for each priority WPP – 2019

Stage 2. Draft Harvest Strategy consulted with respective priority WPP and Provincial Governments – 2020

Stage 3. Harvest Strategy issued through a decree by the MMAF DJPT – 2022

Five-year assessment (2019–2023)

Developing the Harvest Strategy (HS) document through its official approval stage is lengthy. For WPP 713, transitioning from the initial draft to the final version of the HS has taken five years. Yet, this duration varies across different WPPs. In the case of WPP 573, the development of the HS was comparatively swift, commencing in 2002 and achieving a ratification-ready final draft by 2023. The progression of the HS document is greatly affected by the program priorities set by MMAF at the national and WPP levels and by the organizational framework governing document legalization, where the interim Director General does not have the authority for document approval. These considerations are pivotal for partners engaged in similar initiatives. Among the three targeted WPPs selected for HS document development, only WPPs 573 and 713 have documents ready for ratification by the appointed Director General of Capture Fisheries.



⁵ See Annex 6 for more information on harvest strategies

Notes:

a) No update from site



Indicator G:

Progress towards government adoption of Snapper Harvest Strategy and Grouper Harvest Strategy for each priority WPP

This indicator involves a consultative process that includes the MMAF, members of the WPP Council Consultative and Scientific Panels, and stakeholders for WPP 713, 718 and 573 to facilitate the integration of science and local knowledge in the drafting of the Snapper and Grouper Harvest Strategies, and adoption at the WPP level of each Harvest Strategy. It is measured using a three-stage rating system:

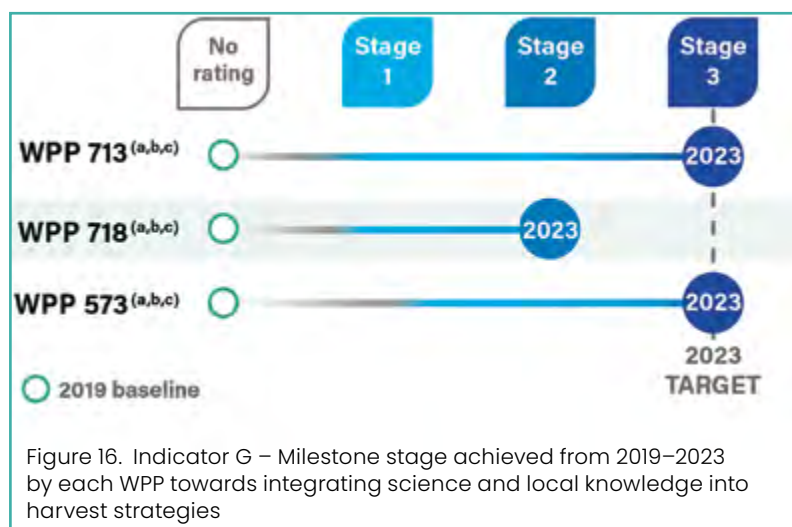
Stage 1. WPP consultative structure in place

Stage 2. Consultations held to integrate local science and knowledge into each Harvest Strategy (WPP 713, 718, 573)

Stage 3. Science- and local knowledge-based Harvest Strategy endorsed and adopted at the WPP level

Five-year assessment (2019–2023)

From 2019 to 2023, the Consortium has integrated scientific research into the creation of management documents for WPP 713 and WPP 573, such as HS and RPP. This integration is highlighted by the availability of scientific studies in these WPPs, which serve as the foundation for developing harvest strategies. This approach has evolved into a systematic and standardized procedure collaboratively undertaken by Consortium members. The methodology for embedding scientific insights and local knowledge into fisheries management documents involves a process from initial consultations to the finalization of documents. However, in WPP 718, there is an absence of progress toward this goal, attributed to the lack of harvest strategy development activities or studies in the area.



Notes:

- a) Minutes of meetings held in 2021 are available at this link: [Indicator G](#)
- b) Minutes of meetings held in 2022 and other supporting documents are available at this link: [Indicator G](#)



Indicator H:

Resources allocated to compliance in WPP 713, 718 and 573

This indicator refers to resources allocated by the Directorate of Fisheries Resources (MMAF-SDI) and the Directorate General of Marine and Fisheries Resources Surveillance (PSDKP) to the implementation of appropriate compliance measures in WPP 713, 718, and 573. It tracks but does not report the actual amount of resources. Instead, it measures and reports resource allocation in terms of four specific milestones:

Milestone 1. The MMAF develops a document each for WPP 713, 718 and 573 outlining compliance risk assessment

Milestone 2. Each WPP Council determines compliance measures based on their respective compliance risk assessment

Milestone 3. WPP Council adopts control system

Milestone 4. The MMAF allocates resources for compliance in WPP 713, 718 and 573

Five-year assessment (2019–2023)

Over the past five years, from 2019 to 2023, there has been no improvement in this indicator across WPPs 713, 718, and 573. Despite a 6.53%⁶ budget increase for the PSDKP station in Tual in 2023, which amounted to over IDR 50.8 billion, it's important to note that the funds are not exclusively allocated for conducting monitoring and surveillance in these three WPPs. The difficulty in tracking this indicator is attributed mainly to the absence of joint initiatives by the PSDKP and SDI to oversee and ensure compliance within these areas. Effective fisheries management at the WPP level is crucial; without it, conducting specific risk assessments and subsequent monitoring and surveillance activities in these WPP zones proves challenging. This gap has been a fundamental weakness of this indicator from its inception through the five-year monitoring period.

6 [2023 Work Agreement for Tual PSDKP Station](#)



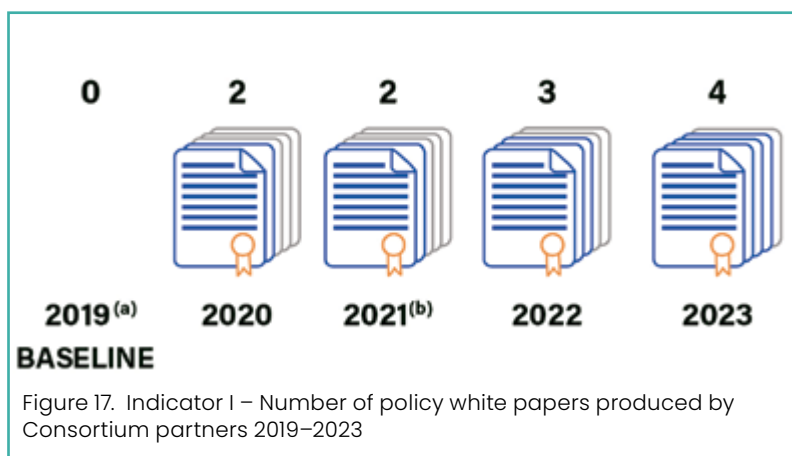
Indicator I:

Policy white papers endorsed by stakeholders

This indicator refers to policy white papers endorsed by civil society and industry stakeholders to the government (MMAF) in support of policy and management improvements for snapper fishery management.

Five-year assessment (2019–2023)

Between 2020 and 2023, the Snapper Consortium has helped develop four policy white papers to support the fisheries within WPPs 713, 718, and 573. This number is slightly lower than the Consortium's target to produce five white papers, primarily due to the national government's lack of focus and attention on these fisheries in WPP 718. Notably, in 2023, the Consortium members supported finalizing a draft Policy for Harvest Strategy for WPP 573. This document results from a collaborative effort among SDI, REKAM, YKAN, and the National Research and Innovation Agency (BRIN) to enhance the sustainability and management of snapper fisheries in WPP 573.



Notes:

- a) Assumed no progress due to lack of information
- b) Finalization and legalization of Grouper and Snapper Harvest Strategy documents developed in 2021 for WPP 713
- c) Scientific review on the status of snapper and grouper fishery in WPP 573
- d) Final Document on Harvest Strategy for WPP 573



Indicator J:

WPP Council Consultative and Scientific Panels functional and achieving milestones

This indicator is measured in terms of the following milestones:

Milestone 1. Consultative and Scientific Panels in each target WPP meet and deliberate on snapper fishery at least twice per year

Milestone 2. Panels review fishery performance, and provide WPP-specific management recommendations released publicly and shared with the MMAF-DJPT

Milestone 3. Each Panel's decision-making processes are shown to respond to all issues identified in relevant research, monitoring, evaluation and consultation in a transparent, timely and adaptive manner, and to take account of the broader implications of decisions in their respective WPP

Five-year assessment (2019–2023)

Despite specific funds allocated for fisheries management across WPPs, the fisheries management councils (*Unit Pelayanan Pengembangan Perikanan* - UPP) and the consultative and scientific panels have faced challenges in effectively producing scientific papers or other key management documents without considerable assistance from external partners. From the beginning of 2019 through 2023, there has been little to no progress across most WPPs after 2019. Nonetheless, members from the scientific and consultative panels have actively participated in discussions to develop Harvest Strategies for selected WPPs. This involvement, though yet to demonstrate leadership in steering discussions on snapper fisheries management, marks a positive step towards collaborative efforts in this area.

Indicator K:

Increase in resource allocation for Saleh Bay snapper management

This indicator tracks the amount of resources allocated to the implementation of the Saleh Bay Snapper Management Plan (Plan) endorsed by the West Nusa Tenggara Provincial Government, industry associations, fishers, and civil society organizations. The Plan aims to improve the management of the Saleh Bay snapper fishery from the general coastline out to 12 nm offshore.

Five-year assessment (2019–2023)

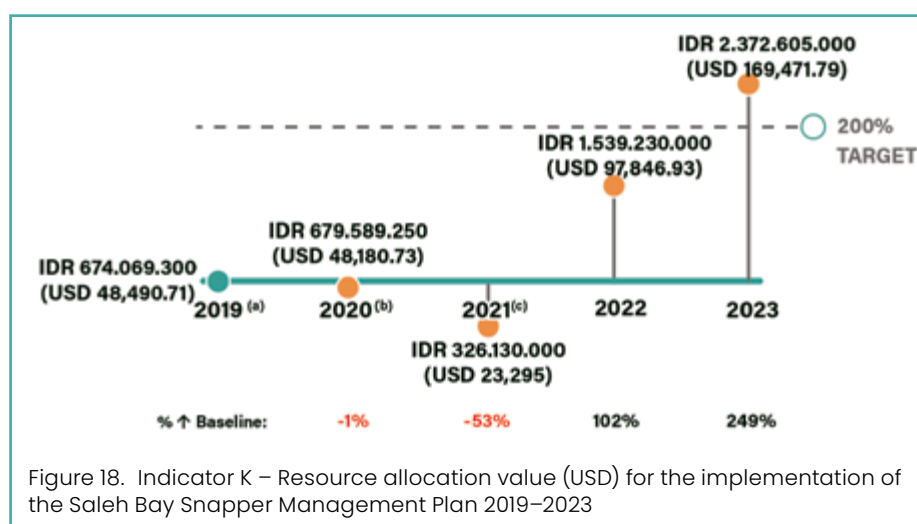
The financial allocation designated by the West Nusa Tenggara government for provincial-level fisheries management experienced a decline in 2020–2021 compared to the 2019 budget allocation. This reduction was attributed to the provincial government reallocating funds to address the COVID-19 pandemic, with the lowest budget allocation recorded in 2021, marking a 53% decrease from the 2019 budget. However, the budget allocation for fisheries programs saw a remarkable rebound, with an increase exceeding 100% in 2022 and reaching a peak of nearly 250% in 2023 compared to the 2019 figures. This substantial growth indicates that the consortium members in the location successfully met and even surpassed their target, aiming for a 200% increase by 2023 compared to the 2019 baseline.

It is crucial to acknowledge that the financial data presented in this indicator, totaling USD 169,472⁷ in 2023, represents the entire expenditure for the capture fisheries program in West Nusa Tenggara province rather than exclusively for a particular fishery. This funding allocation covers various activities, such as purchasing fishing gear, monitoring and surveillance efforts, meetings, and procuring supplementary fishing equipment.

Notes:

- Allocation in 2019 does not include human resources (257 personnel)
- The 2020 budget allocation came from the MMAF's budget for the NTB Provincial Marine and Fisheries Office (DKP). WCS made the best assumption for Saleh Bay (only). Budget allocation is for all fisheries activities under the provincial DKP, specifically for the Saleh Bay area.
- Budget allocation for the fisheries program in Saleh Bay was reduced due to the COVID-19 pandemic. The budget allocation for 2021 was taken from the provincial budget allocation document. These data are available through this link: [Indicator K 2021](#)
- Budget allocation for 2022 is available at this link: [Indicator K \(2022\)](#)

7 [2023 Fisheries Program Budget Allocation for West Nusa Tenggara](#)





Indicator L:

Improved local stakeholder engagement in snapper fishery management

This indicator tracks the number of local village management committees and fishing community co-management groups demonstrating improved engagement in the management of the snapper fishery in five geographic locations in West Nusa Tenggara (Saleh Bay, Alas Strait, Cempi Bay, Waworada Bay, and Sape Strait). These village management committees and local fishing community co-management groups include fishers' groups (*kelompok nelayan*), community surveillance groups (*Pokmaswas*), and women's groups (*kelompok perempuan*). Their level of engagement is measured using a five-stage rating system:

Stage 0. Local stakeholder group loosely organized

Stage 1. Group formally established with registration, constitution, and bylaws

Stage 2. Group holding regular (at least biannual) meetings with at least 50% of members in attendance

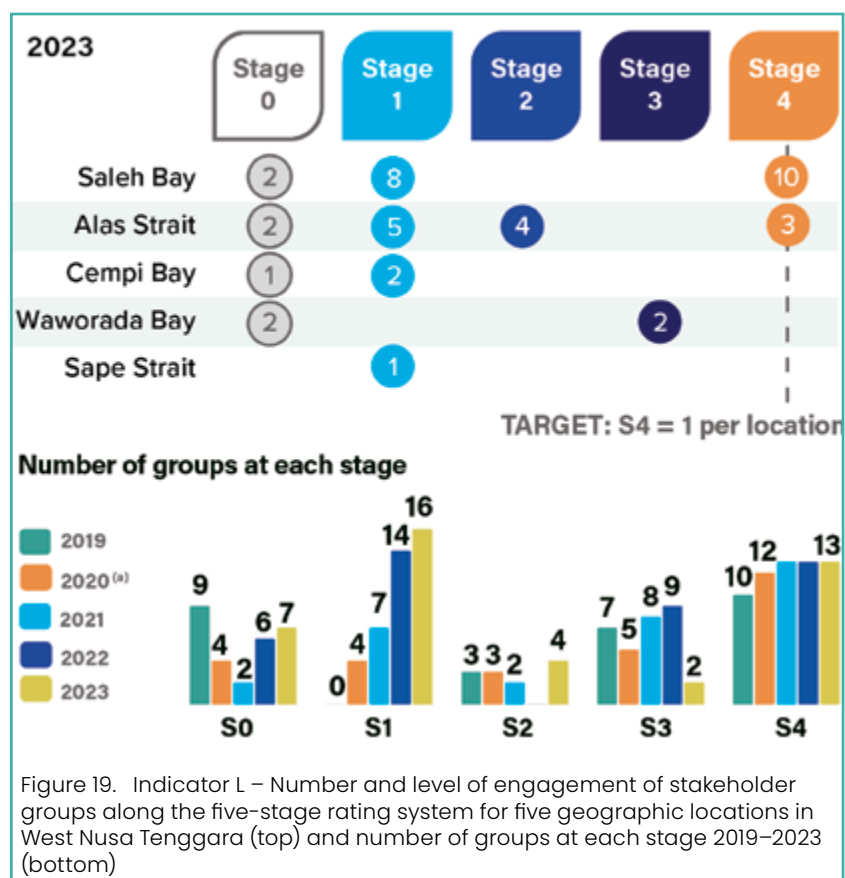
Stage 3. Members disseminating and reinforcing management and supply chain interventions in their communities to increase awareness and compliance by stakeholders

Stage 4. Group making recommendations to management committee on fishery improvements

Five-year assessment (2019–2023)

The effectiveness of community outreach programs, engaging with women, fishermen, and surveillance groups, depends on the active involvement of field officers who guide and support these groups towards shared objectives. The program's success is significantly shaped by the members' and leaders' commitment to aligning personal, group, and programmatic goals. Observations of group interactions in Saleh Bay, Cempi Bay, Waworada Bay, and the Alas Strait reveal diverse engagement levels in fisheries management activities. These levels range from stage 0, representing loosely organized groups, to stage 4, indicating groups with active engagement in the management cycle.

In 2019, WCS launched a community outreach initiative in West Nusa Tenggara with 29 groups aiming to enhance local participation in fisheries management. This initiative saw a consistent increase in involvement, reaching 42 groups by 2022, reflecting growth in group numbers and advancement in their stages. However, by 2023, the total group count remains the same (42), but some groups became inactive in the program. A notable achievement in 2023 was in Teluk Saleh, where the program reached its most advanced stage, with ten groups attaining stage 4 of engagement and showcasing significant progress, while the others remained at the foundational stages of 0 to 1.

**Notes:**

a) Source: [Indicator L](#) 2020





Indicator M:

Increase in resource allocation for Saleh Bay snapper management

Each Task Force's progress is benchmarked against six stages:

Stage 0. No Provincial Task Force (PTF) formed

Stage 1. PTF legally established by appropriate policy document, such as Regent's or Governor's Decree (*SK Bupati* or *Gubernur*), with representation from various stakeholders (including but not limited to fishers, first-buyers, processors, district and provincial government officials, and industry partners) and inclusive of women and youth

Stage 2. Fisheries management plan, including harvest control rules and intervention options for the fisheries, formally adopted by Provincial Government

Stage 3. Enabling policies to implement the fisheries management plan enacted

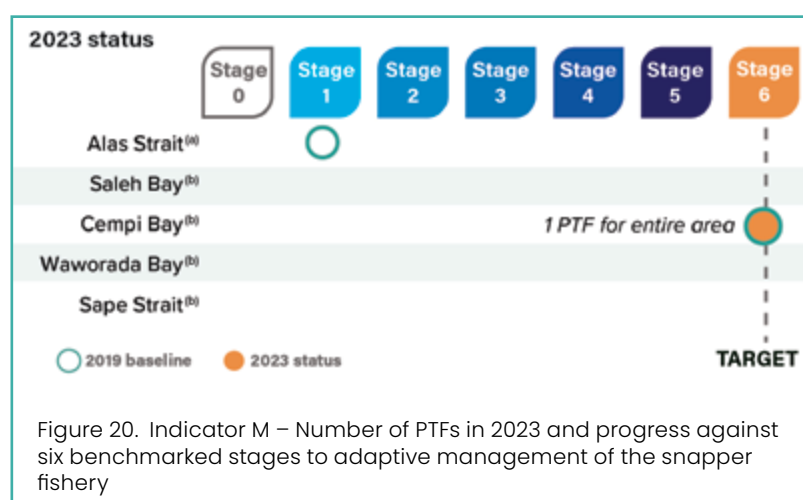
Stage 4. PTF meeting held regularly (at least biennially) to track and assess progress against stated fishery objectives, with representation from all relevant stakeholders

Stage 5. PTF making fisheries management decisions that are consensus-based and recorded through a decree, resolution, working group (*Pokja*) presentation, and/or meeting notes

Stage 6. PTF practicing adaptive management through the incorporation and issuance of fishery management decisions that incorporate the best available science and responds to evolving needs realized through the feedback of management interventions

Five-year assessment (2019–2023)

At the start of 2019, WCS established two PTFs, one for the Alas Strait and one for PTF covering Waworada, Cempi Bay, Saleh Bay, and Sape Strait. The Alas Strait PTF was newly formed and thus was at the initial Stage 1 at the beginning of the Consortium program. In contrast, the PTF for Saleh Bay and the other three locations was already well-developed at Stage 6. Throughout the five years of the Consortium program, from 2019 to 2023, the 2 PTFs representing five locations merged into one PTF in 2023 based on the recent governor decree. This indicates that the PTF in the West Nusa Tenggara province has adopted adaptive management practices in their fisheries' management decision-making processes.



Notes:

- a) Established in Alas Strait in 2019
- b) Established in 2016



Indicator N:

Indonesian Demersal Association (ADI) adopting a business plan and actively complying with a code of conduct

This indicator shows the progress achieved by ADI in adopting a business plan, code of conduct and member audit system, including allocating resources for business and member audit plan implementation to ensure code of conduct compliance. Progress is measured using a five-stage (milestone) rating system:

Stage 1. Business plan adopted by Association members

Stage 2. Code of conduct adopted by Association members

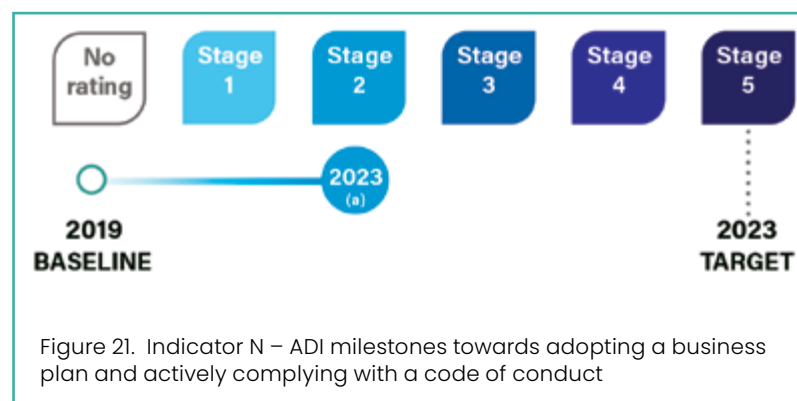
Stage 3. Audit system adopted

Stage 4. Annual budget allocated against business plan activities

Stage 5. Annual audits indicating compliance with the code of conduct

Five-year assessment (2019–2023)

Founded in 2020, the ADI has progressed in various areas, including adopting a Code of Conduct (CoC). This CoC mandates ADI members to support sustainable fisheries management and ensure legal compliance throughout the supply chain, promoting responsible practices, environmental protection, and collaboration in Fishery Improvement Projects. It also requires member participation in ADI activities, compliance with national labor laws, and a focus on employee education. However, despite adopting this set of rules, there needs to be a regular audit mechanism in place to enforce them among ADI members. While ADI has achieved certain milestones, as of 2023, it has yet to establish any business plan, highlighting a gap in meeting the Stage 1 requirements.



Notes:

The ADI Code of Conduct is available through this link: <https://demersal.or.id/code-of-conduct/>



Indicator O:

Fishery Improvement Projects (FIPs) achieving positive performance

This indicator tracks the Marine Stewardship Council (MSC) scores of Indonesia Snapper FIPs as publicly reported on

[FisheryProgress.org](https://fisheryprogress.org), a web portal that provides information on the progress of FIPs on industry standards. The two FIPs representing the snapper work in Indonesia are as follows:

1. Comprehensive Deepwater Groundfish Dropline, Trap and Gillnet FIP (led by YKAN)⁸
2. Comprehensive Indonesian Demersal Association FIP (led by ADI)⁹

The MSC Fisheries Standard uses 28 performance indicators (PIs) against which FIP progress is measured. These PIs sit under three benchmarking principles: Principle 1—Sustainable fish stocks (P1), Principle 2—Minimizing environmental impact (P2), and Principle 3—Effective fisheries management (P3).

Five-year assessment (2019–2023)

In general, the two FIP programs led by YKAN and ADI have yet to achieve the targets to attain scores of at least 80 on the green status. The Deepwater Groundfish Dropline, Trap, and Gillnet FIP achieved advancements from 2019 to 2022, with an increase in the proportion of assessments categorized under green and yellow statuses and a reduction in red status, securing an 'A' rating in 2022. However, in 2023, the FIP encountered challenges, as indicated by a significant rise

in red status (54%) and a fall in green status (15%), resulting in a downgrade to 'C' rating¹⁰.

Conversely, the Indonesia Snapper and Grouper FIP, encompassing bottom longline, dropline, trap, and gillnet methods led by ADI, consistently maintained a 54% green status from 2020 to 2023. This FIP also saw an increase in yellow status and a decrease in red ones, successfully retaining an 'A' rating in 2022 and 2023¹¹, demonstrating sustained progress in its assessment unit.

In addition to these two FIPs, RNF has initiated a FIP profile for snapper and grouper in Saleh Bay, Indonesia, which utilizes bottom longline and handline fishing methods. Initiated in December 2021 and projected to end in December 2024, this comprehensive FIP aims to enhance the sustainability of these fisheries, which are critical both ecologically and economically to the region. However, no specific industry partners are involved in this FIP. Currently, the FIP has achieved "Advanced Progress" and an A rating, indicating significant improvement in practices since its inception.

⁸ [Fishery Progress – Indonesia deepwater groundfish – dropline, longline, trap and gillnet – 2021-09-28.pdf](#)

⁹ [Indonesia snapper and grouper – bottom longline, dropline, trap, and gillnet \(ADI\) 18Jan2022.pdf](#)

¹⁰ Fishery Progress – Indonesia deepwater groundfish – dropline, longline, trap and gillnet – 2023-11-13: <https://bit.ly/3Jw9XBB>

¹¹ Fishery Progress – Indonesia snapper and grouper – bottom longline, dropline, trap, and gillnet (ADI) 2023-10-31: <https://bit.ly/3w3GdcB>

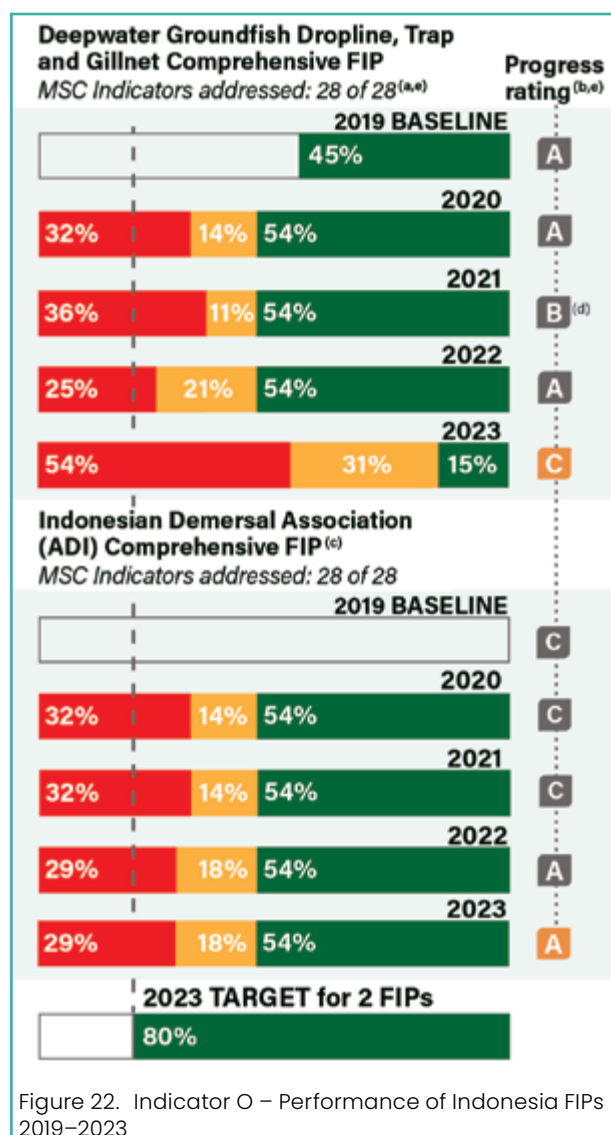


Figure 22. Indicator O – Performance of Indonesia FIPs 2019–2023

Notes:

- Green score – pass without conditions; Yellow score – pass with conditions; Red score – fail
- Progress ratings used by [FisheryProgress.org](https://fisheryprogress.org):
 - A – Advanced Progress: Reserved for comprehensive FIPs that have a Stage 4 or 5 result within the past 12 months
 - B – Good Progress: An FIP that has achieved a Stage 4 or 5 in more than 12 months AND Stage 3 activity in the last year; OR a basic FIP that has achieved Stage 4 or 5 achievements within the past 12 months
 - C – Some Recent Progress: An FIP that has achieved a Stage 4 or 5 result in more than 12 (but less than 24) months but has not generated a Stage 3 result within the past 12 months OR an FIP younger than a year that has never achieved a Stage 4 or 5 result but has completed a Stage 3 activity
 - D – Some Past Progress: An FIP for which the most recent publicly reported Stage 4 or 5 result is more than 24 (but less than 30) months
 - E – Negligible Progress: An FIP older than a year that has not reported a Stage 4 or 5 result in more than 30 (but less than 36) months; OR an FIP younger than 1 year that has not reported a Stage 3 activity
- New FIP, incorporating three FIPs reported in 2019 baseline: the Aru-Arafura Demersal Fish Longline Basic FIP, Makassar Strait Snapper and Grouper Longline and Dropline Basic FIP, and North Java Sea Snapper and Grouper Handline and Dropline Basic FIP.
- Progress rating 'B' was due to finishing the 'Plastic Waste and Abandoned / Lost Fishing Gear Assessment' report in September 2021, earlier than the FIP action plan target date. Several categories of red scoring are now more detailed (<20; 20–39; 40–59) due to breakdown of the below 60 scoring on improvement progress. Breakdown shows the FIP does have progress on some tasks in the red scoring range. Note: Due to rounding of decimal figures, scores total 101%.
- Data sources for both FIPs are available at the following links: 2020 data ([YKAN FIP](#) and [ADI FIP](#)), [2021 data](#) accessed in January 2022, and [2022 data](#) accessed in January 2023.



Indicator P: Mapping of snapper supply chains

This indicator identifies the percentage (by volume) of total snapper production that is tracked through supply chain mapping. The supply chain map describes how the Indonesian snapper supply is feeding into the different markets. Mapping includes price and species at each stage of the supply chain (catch, buyers, aggregators, processors). The supply chain map is updated annually to account for price fluctuations that occur from time to time.

Five-year assessment (2019–2023)

In 2020 and 2021, the CODRS survey was able to map on average 80% of the national snapper production in the snapper fishery supply chain. The data over these two years remained consistent, showing that about 80% of the market flow was aimed at the Asian market, with no new evidence to update this observation.

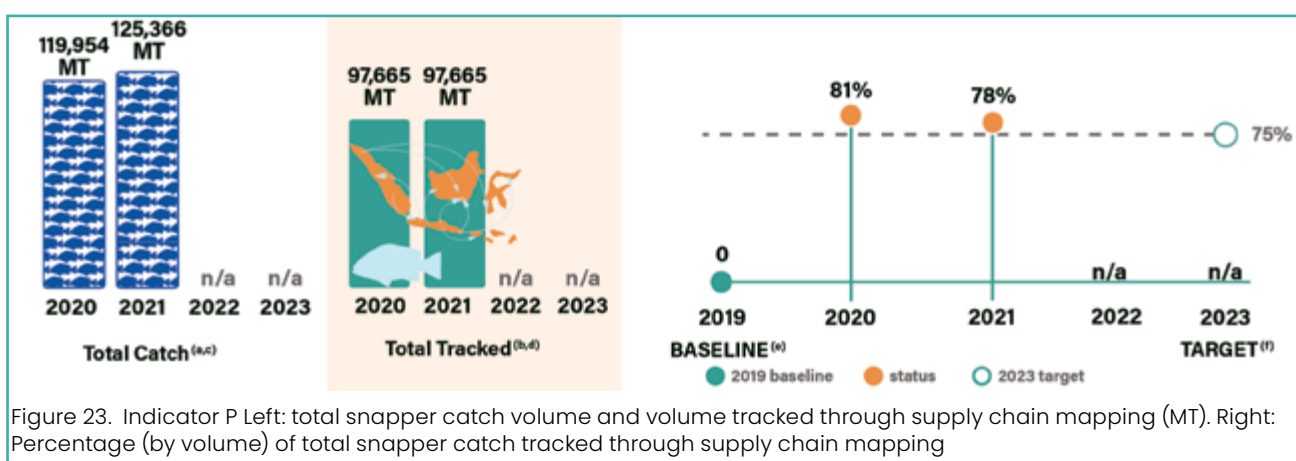


Figure 23. Indicator P Left: total snapper catch volume and volume tracked through supply chain mapping (MT). Right: Percentage (by volume) of total snapper catch tracked through supply chain mapping

Notes:

- 2020 source: Snapper summary report, produced by YKAN. Link to the report: [IndoSnapperSummary.pdf](#)
- 2020 source: Snapper supply lines report produced by YKAN. Link to the document: [SnapperSupplyLines_2020.pdf](#)
- 2021 source: YKAN report. Available at this link: [IFishDeepwaterDemersal_21012022.pdf](#)
- 2021 source: Snapper supply lines report produced by YKAN. Available at this link: [SnapperSupplyLines_21012022.pdf](#)
- Percentage of production tracked/mapped cannot be determined due to lack of information on volume of production tracked/mapped
- Discussions need to take place to explore the link between traceability and actual compliance in the fishery



Indicator Q:

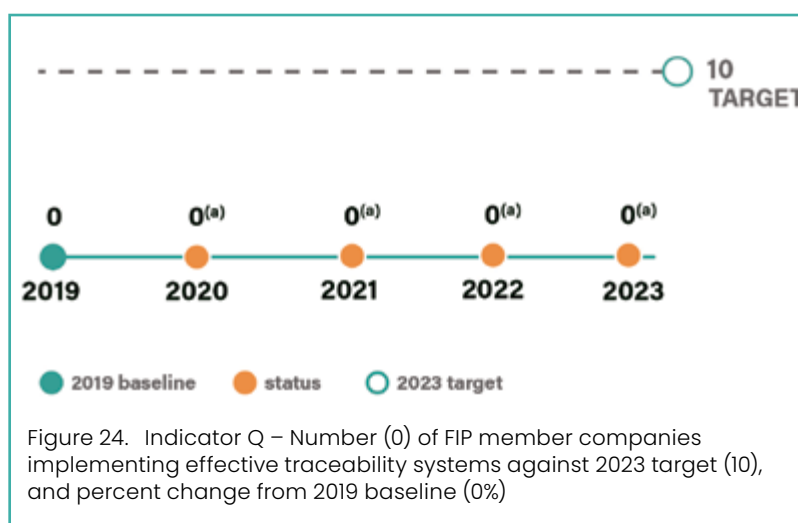
Effective application of traceability by FIP member companies

This indicator tracks the number of FIP member companies that are implementing effective traceability systems. A company is counted when it has a traceability system that:

1. Sources from licensed boats fishing legally
2. Keeps records (boat logbook data) in analog and/or digital format itemizing catch, gear and fishing grounds
3. Maintains landing records
4. Includes an analog and/or digital system for transferring information across the whole supply chain
5. Meets MSC Chain of Custody Standard, ensuring that products are traceable to sustainable fisheries

Five-year assessment (2019–2023)

From 2019 to 2023, ADI-affiliated and non-affiliated companies still faced challenges in fully aligning their fishery products with traceability standards. The primary issue lay in the snapper fishing fleet's absence of necessary boat registration documents, hindering its ability to submit catch reporting through the e-logbook system. This deficiency impedes the company's ability to meet subsequent traceability criteria, such as the Declaration of Landing, catch certificate (SHTI) and chain of custody protocols, essential for maintaining comprehensive traceability standards.



Notes:

- a) Criteria 1 is not applicable since these 3 companies are buyers -- they do not know (and are not required to ascertain) the legality of the fish they buy.



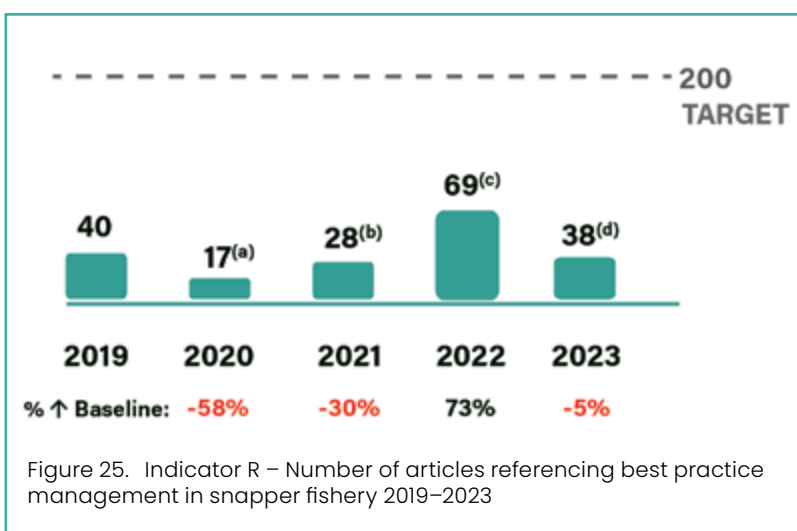
Indicator R:

Indonesian media references to sustainable snapper fisheries

This indicator counts the number of articles containing quotes from leaders (echelon two or higher) in government, marine NGOs, and ADI referencing best practices in snapper fishery management.

Five-year assessment (2019–2023)

In 2023, media coverage on snapper and grouper fisheries saw a notable reduction from the previous year (2022), though it was only 5% lower than the coverage in 2019. In 2022, there was a substantial surge in fisheries-related news, with 69 articles recorded by organizations like YKAN, SFP, WCS, and RNF, marking a significant increase from 2019. The diversity in media coverage ranged across various themes, including management challenges, scientific discoveries, and events related to snapper and grouper fisheries, featured in both local and national electronic media.



Notes:

- a) Data source: [Media reference_indicator R.xlsx](#)
- b) Data source: [Indicator R 2021](#)
- c) Data source: [Indicator R 2022](#)

Annex 2: Safeguarding Human and Labor Rights

Building on the foundation laid by our initial Human and Labor Rights (HLRs) Assessment¹² conducted in the provinces of Lampung and West Nusa Tenggara, this state of the fishery report continues to further explore the results and offer suggestions tailored to the Indonesian setting. Our initial assessment, which concentrated on two key domains—the extent of HLR adherence and the level of equity and equitable opportunity to benefit—has paved the way for further analysis. This section is dedicated to further exploring these domains, enhancing our understanding and contributing positively to the ongoing efforts in promoting human and labour rights in small-scale fishery.

Challenges and Insights from the Fisheries Sector

The findings of the HLRs assessment in the fisheries sector, particularly focusing on small-scale fishers, reveal several critical areas of concern that significantly impact the sustainability of fisheries management and the socio-economic conditions of those involved in the sector. These findings underline the need for an integrated approach to address the challenges faced by fishers, business operators and fishery workers, who are primarily in their productive years and show a keen interest in contributing to the sector. The challenges identified in the fisheries sector, based on our field observations, urgently require immediate attention and can be categorized as follows:

- Complex administrative processes for obtaining fishing licenses and related permits.
- Unequal access to capital or financial aid (loan).
- Insufficient standard human rights protections

A Framework for Action and Improvement

Based on the challenges identified within the fisheries sector, including the complexities of administrative processes, unequal access to capital, and the need for enhanced human and labor rights protections, a set of recommendations has been developed. These are designed to improve the conditions of human and labor rights, specifically addressing the unique obstacles highlighted in our previous assessment.

Streamlining Administrative Processes

The bureaucratic burdens encountered by fishers and businesses in obtaining fishing licenses and related permits have posed significant barriers, hindering both efficient operations and compliance with broader market requirements, such as traceability, in the fisheries sector. To mitigate these challenges, we recommend implementing measures to expedite license processing, thereby reducing wait times and administrative burdens for fishery stakeholders and making the requirements more accessible and understandable.

¹² To add the missing component to previous annual reports, we conducted a first field-based assessment of the conditions of HLRs in one fishery of Saleh Bay in 2022: <https://bit.ly/2022snapperreport>

Enhancing Financial Accessibility

Recognizing the critical role of financial support in the fishery operations, particularly for small-scale fishermen, our recommendations focus on the following approach.

1. **Tailored Financial Products** Develop and promote financial products and services tailored to the specific needs of businesses in the fisheries sector, including establishing loan programs and financial instruments that consider fishery businesses' operational realities. This approach should recognize the seasonal nature of fishing operations. We observed the development of this alternative mechanism by the fishers' group in Teluk Saleh.
2. **Conditional Incentive Mechanisms** Implement and promote incentive programs that encourage sustainable and responsible fishing practices, focusing on offering business loans to small-scale fishermen. This strategy aims to elevate them from labor roles to positions as co-owners and equal business partners, particularly concerning loans among stakeholders in the fishery sector (e.g., from middlemen to fishers).

Strengthening Human Rights Protections

To improve human rights protections in the sector, we recommend two approaches that focus on both operational practices and the broader small-industry environment:

1. Promote and support practices that adhere to human rights standards in both small and large-scale capture fisheries. This includes developing frameworks that guarantee fair treatment, enhance safety at sea, and offer equal opportunities for fishers to form groups.
2. Improve the post-harvest handling and marketing sectors by making accessing compliance documents easier (e.g. KUSUKA card) and supporting the development of small and medium-sized enterprises (SMEs). These actions aim to stimulate economic growth and create work environments that protect worker rights.



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Annex 3: Partnerships and Collaborative Work Highlights

As Consortium members adjust their focus and funding allocations, the availability of indicator data fluctuates annually. In the initial years of implementation, data was more readily available, spanning exclusive economic zones (EEZ), regional waters, and provincial waters, and toward the end of consortium work, fewer organizations were able to sustain the data collection and intervention.

Table 1. Sites and Consortium partners providing primary data

SITES	RESPONSIBLE ORGANIZATIONS ¹³
National and EEZ	YKAN, TLFF, WCS, SFP, ADI
WPP 713 (geographic locations in West Nusa Tenggara – Saleh Bay, Alas Strait)	YKAN, WCS, RNF, SFP
WPP 718	YKAN
WPP 573 (geographic locations in West Nusa Tenggara – Alas Strait, Cempi Bay, Waworada Bay, and Sape Strait)	YKAN, WCS, RNF

Note: The data covers all indicators spread across the three WPPs (713, 718, and 573)



¹³ YKAN undertook comprehensive data collection (2019–2021) in all of Indonesia's WPPs across different fishing gears (e.g., drop lines, longlines, traps, gillnets) and gear sizes, and across four vessel size categories: (1) nano (<5 GT), (2) small (5–10 GT), (3) medium (>10–30 GT) and (4) large (>30 GT).

WCS focuses on three geographies in West Nusa Tenggara Province: (1) Saleh Bay, (2) Cempi Bay, Waworada Bay, and Sape Strait, and (3) Alas Strait.

Fish stock data collection directly interfaces with the MMAF Pusrisan through its Marine Fisheries Research Center

Over the past year, the Snapper Consortium has made significant progress, all thanks to the hard work and dedication of its members. Together, we've taken steps toward sustainability and better support for our communities. Each member has brought their own expertise and commitment to our shared goals. This feature aims to highlight the collective efforts and achievements that have brought us closer to a more sustainable future for snapper fisheries.

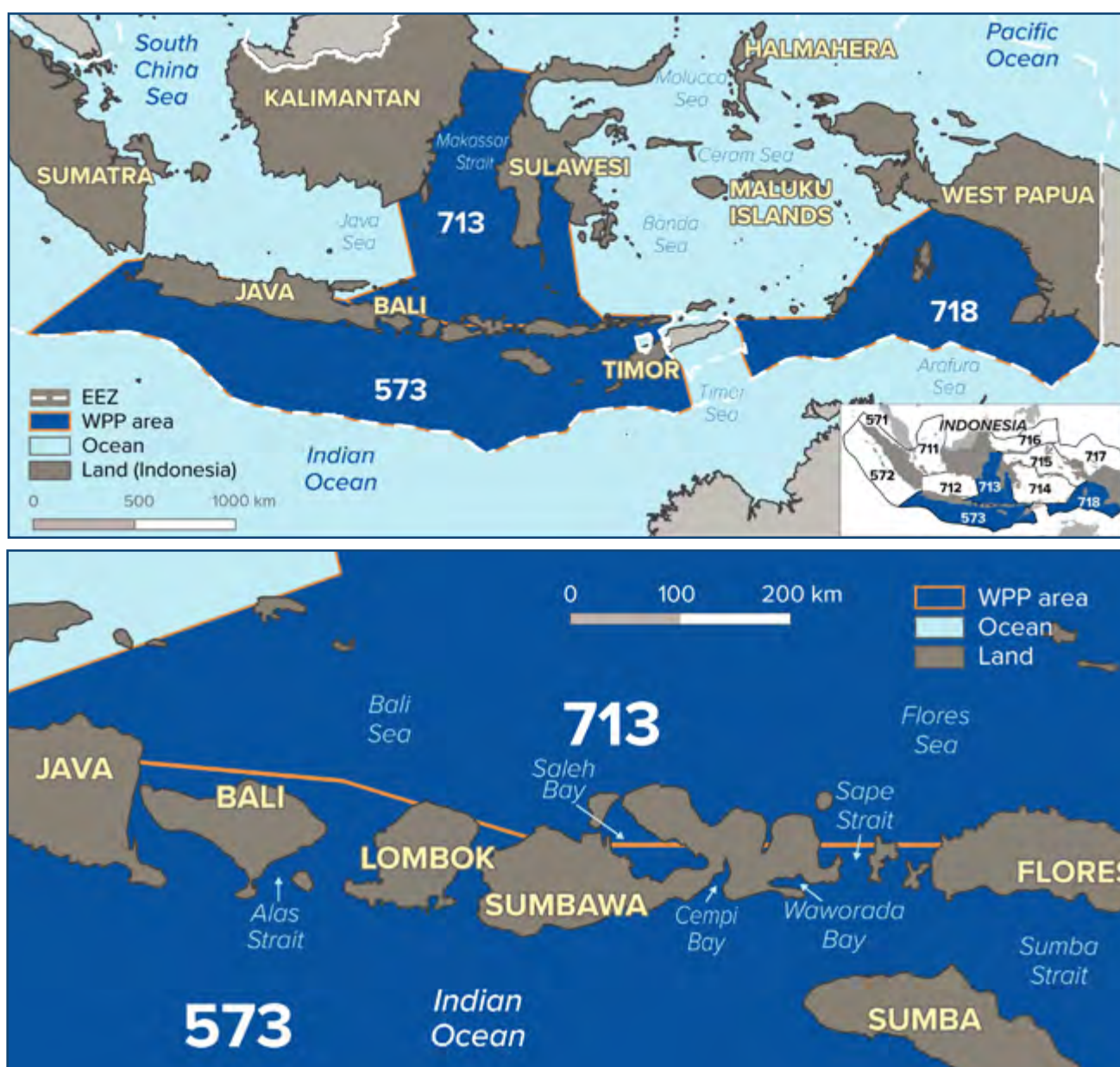


Figure 26. Top: geographical location of WPP 573, 713 and 718. Bottom: Geographical location of sites in WPP 573 and 713, West Nusa Tenggara (NTB)

Rekam Nusantara Foundation

In 2023, RNF significantly advanced snapper management in Indonesia, marked by a series of publications. They released a scientific journal titled "[Untangling the Complexity of Small-Scale Fisheries: Building an Understanding of Grouper-Snapper Fisheries Dynamics in Saleh Bay, West Nusa Tenggara](#)," offering deep insights into local fishery dynamics. Alongside, RNF published a report on "[Supply Chain of Red Snapper Fishery Products in Lesser Sunda](#)," shedding light on the intricacies of Red Snapper's distribution networks. Further enriching their contributions, RNF discussed the [integration of artificial intelligence with fisheries data management](#) in a bulletin, highlighting the fusion of technology and traditional knowledge for sustainable fisheries.

RNF played a key role in the annual stock assessment for snapper and grouper in West Nusa Tenggara, helping evaluate the Fisheries Management Plan of Action's

effectiveness. They also pioneered frame survey workshops to improve fishing vessel data collection, setting a precedent for nationwide implementation.

Supporting the FIP in Saleh Bay, RNF aimed to secure ecolabels for key species, enhancing sustainability and market competitiveness. A June workshop highlighted this project's progress, emphasizing the importance of social responsibility and stock rebuilding strategies.

Lastly, at a national seminar on sustainable fisheries, RNF and the Fisheries Research Center of Indonesia showcased innovative data collection methods through Crowd Data Crawling, furthering the dialogue on snapper fisheries management. These comprehensive efforts by RNF illustrate their critical role in promoting sustainable fisheries management across Indonesia.



Sustainable Fisheries Partnership

In South Sulawesi, SFP has made significant strides in fostering collaborative management efforts for the snapper-grouper fisheries. Operating in full coordination with the Directorate of Fisheries (DKP) of South Sulawesi, SFP expanded its initiatives across five pivotal site areas: Satangnga Island and Galesong in Takalar Regency, Langkai-Lanjukang in Makassar City, and Sarappo Island in Pangkep Regency, in collaboration with Yayasan Konservasi Laut (YKL). These efforts were fueled by the local fishers' keen interest in organizing, inspired by their counterparts in the BSC Fishers' Network (Forkom Nelangsa), leading to significant progress in their collective management endeavors.

Last March 15–16, 2023, SFP hosted a fishers' forum (Rembug Nelayan) for 28 snapper-grouper fishers from these areas. The gathering also saw participation from DKP South Sulawesi, MMAF staff, and leaders from the BSC Fishers Network, highlighting the DKP of South Sulawesi's strong support for the formation of a snapper-grouper fishers' network. Symbolically, the Head of DKP distributed KUSUKA cards to the fishers, facilitating discussions on crucial topics such as legal statutes, vision, mission, functional roles, and leadership structure.

The journey towards formal recognition took a significant step forward on July 14, 2023, with SFP and YKL facilitating a meeting between the fisher representatives and a Public Notary to legalize the network, fully supported by DKP South Sulawesi. This effort culminated in the network's official legalization by the Ministry of Law and Human Rights on August 15, 2023, under the name Forum Komunikasi Nelayan Kakap-Kerapu Indonesia (Forkom Narasi). More than 400 fishers are now listed as members of Forkom Narasi.



Furthering their collaborative efforts, on September 14, 2023, SFP and DKP South Sulawesi engaged in discussions with ADI's Executive Director and the leader of Forkom Narasi regarding the management committee initiatives for snapper-grouper fisheries. This dialogue underscored the ongoing commitment to sustainable management practices within the community.

Between September 28–30, 2023, SFP, YKL, ADI and Forkom Narasi jointly supported the boat registration process for fishers in Langkai and Lanjukang, an essential step towards formalizing fishing activities and enhancing sustainable practices. As a result, total of 100 boats obtained the Ship Nationality Certificate (PAS Kecil). SFP also documented this process, intending to utilize the footage as educational material on best practices for boat registration.

Through these concerted efforts, SFP and its partners have demonstrated a strong commitment to improving the sustainability and legal compliance of snapper-grouper fisheries in South Sulawesi, showcasing the power of collaboration and community engagement in achieving conservation goals.

Yayasan Konservasi Alam Nusantara

YKAN is currently conducting a repeat catch assessment survey spanning from July 2023 through June 2024. This pivotal initiative aims to compare current fish length compositions with those recorded in 2020, thereby determining the ongoing validity of previous data. Should discrepancies arise, YKAN is prepared to conduct a qualitative assessment to ascertain changes in stock health across various species and fishing areas.

The survey meticulously examines a range of fishing methods and vessel sizes across six designated WPPs, encompassing droplines of varying tonnages, traps, and longlines. This breadth of coverage ensures a thorough understanding of fish stock health and sustainability practices within Indonesia's vast maritime domains.

In parallel, YKAN, in collaboration with the Indonesian IT firm PT Intelion, is pioneering the development of an innovative, AI-driven mobile data collection tool. This

groundbreaking technology leverages Android smartphones to automatically identify and measure fish species, streamlining data gathering for YKAN's CODRS system. Initially focusing on four snapper species and six tuna varieties, the tool shows promising results, especially with *Lutjanus malabaricus*, although accuracy levels vary. Continuous enhancements are expected to refine species identification, with the ultimate objective of integrating this technology into the Ministry's e-logbook system, elevating the precision of fishery data collection.

By September 2024, YKAN anticipates presenting a comprehensive report on the repeat survey's findings. Furthermore, we expect to unveil significant advancements in our AI-based species identification tool by March 2024, marking a significant leap forward in marine conservation technology and practices.



Wildlife Conservation Society

In 2023, WCS and its partners, including DKP NTB, Yayasan Rekam Nusantara, and FIP2B, addressed several concerns regarding the MSC certification process, highlighting issues with destructive fishing methods and the diminishing populations of grouper and snapper in Saleh Bay. This collaborative effort led to the revision of the 2018 governor regulation (Pergub 32), culminating in the enactment of Governor Regulation No. 55 in NTB. This new regulation introduces comprehensive harvest control measures, including specific catch size, fishing gear restrictions, designated fishing seasons, and fish trade guidelines, aiming to foster sustainable fishing practices.

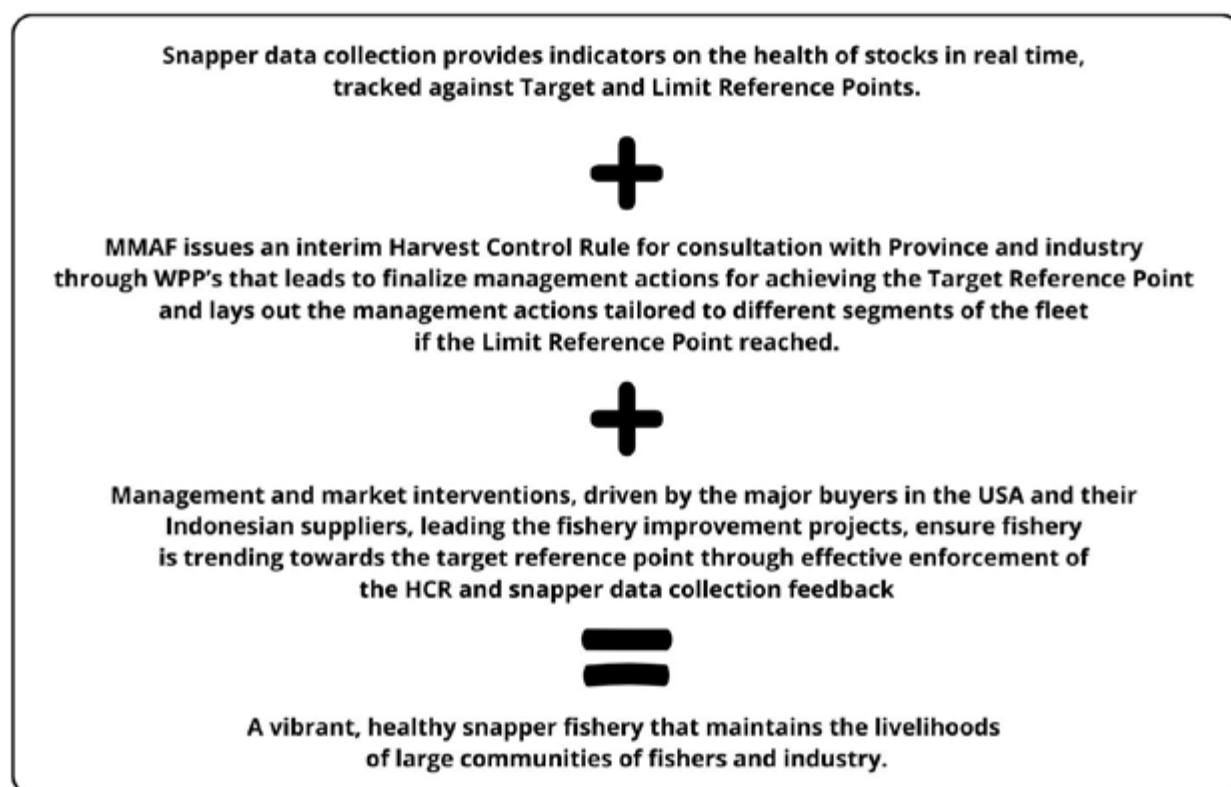
Furthering their commitment to environmental conservation and community welfare, WCS and its partners launched an awareness campaign in October 2023 in Labuhan Sanggoro Village, Saleh Bay. The campaign targeted the detrimental effects of compressor fishing—a practice significantly contributing to the depletion of grouper and snapper stocks.

The event was attended by fifty compressor fishermen and featured health screenings conducted by the Medical Team from the Faculty of Medicine at Universitas Mataram, specializing in Marine Medicine. Additionally, the Social Security Agency (BPJS) employees introduced their suite of insurance products to the fishermen, including work accident insurance (JKK), death insurance (JKM), old age insurance (JHT), and retirement insurance (JP), aimed at providing comprehensive health and social protection.

These initiatives are designed to alleviate the environmental strain caused by compressor fishing and to enhance the fishermen's awareness of health and social security benefits. Through continued efforts and collaboration, WCS and its partners strive to mitigate adverse environmental impacts and promote the long-term sustainability of the grouper and snapper fisheries in Saleh Bay.



Annex 4: Evaluation Framework and Outcome Evaluation



Drawing from these three foundations, we have formulated a methodology that segments the pillars into three distinct outcome categories. Each category will be examined in detail, guided by relevant indicators associated with the respective pillars.

1. Outcome: Improving Fisheries Health

This segment analyzes the Consortium's progress in Fisheries Health Improvement, utilizing Biological Reference Indicators, CPUE, and supplementary data-gathering activities to reinforce these objectives.

Indicator A: SPR

Indicator B: CPUE

Indicator C: Snapper Fishing Capacity

Indicator D: Real-time availability and use of national- and WPP-level fish monitoring data

to inform snapper fishery management and harvest strategy

2. Outcome: Governance Enhancement

This segment analyzes fisheries governance, focusing on the national, WPP, and provincial level, through fishery management document advancement and implementation at these specified levels.

Indicator E: Progress towards government adoption of a National Snapper Fishery Management Plan (RPP)

Indicator F: Progress towards government adoption of a Snapper Harvest Strategy and a Grouper Harvest Strategy for each Priority WPP

Indicator G: Progress towards the integration of science and local knowledge into the WPP-level Harvest Strategy

Indicator H: Resources allocated to compliance in WPP 713, 718 and 573

Indicator I: Policy white papers endorsed by stakeholders

Indicator J: WPP Council Consultative and Scientific Panels Functional

Indicator K: Increase in resource allocation for Saleh Bay snapper management

Indicator L: Improved local stakeholder management in snapper fishery management

Indicator M: Provincial fisheries management groups demonstrating progress towards adaptive management

3. Outcome: Market Interventions and Collaboration Enhancement

This section assesses the impact of US and Indonesian market and management interventions on reaching fishery target reference points, focusing on the enforcement of the Harvest Control Rule.

Indicator N: ADI adopting a business plan and actively complying with a code of conduct

Indicator O: Positive performance achieved for the two comprehensive FIPs

Indicator P: Mapping of snapper supply chains

Indicator Q: Effective application of traceability by FIP member companies

Assessing Progress Against the Framework

Outcome: Improving Fisheries Health

Fishery health indicators at the WPP level and in smaller regions like Saleh Bay indicate a concerning decline. Data for the four primary species indicate widespread overexploitation, with SPR values between 20 and 30%. Still, most species are critically depleted and nearing extinction due to intense overfishing. Despite slightly better exploitation rates in Saleh Bay, the fishery is nevertheless classified as undergoing moderate overfishing.

Achieving a 40% SPR, considered a healthier benchmark for fish stocks, seems nearly unattainable at the WPP level. This is attributed to several factors, notably inadequate data collection practices to support the management that still predominantly depends on third-party organizations like non-government organizations (NGOs) (i.e. CODRs) instead of government-led efforts at both national and WPP levels. This data-collection process is intensive in terms of labor and cost, requiring a committed team for in-depth analysis and translating findings into practical policy recommendations.

Moreover, managing fishing efforts, especially in areas like WPP 713 and 573, is difficult due to the seasonal increase in vessels, complicating effort regulation. In Saleh Bay, the rise in fishing efforts in the recent year is aggravated by non-selective fishing gear, significantly increasing catches and fueling overfishing. Poor management of fishing efforts can lead to unregulated catches and uncertain stock assessments, a critical issue for managing volatile and depleted species such as snapper and grouper.

Our findings highlight the critical need for a more affordable, sustainable data collection method that can be continuously implemented, with leading organizations managing its operation and maintenance.

Outcome: Governance Enhancement

The second-order outcome assessment highlights the Consortium's proactive role in promoting an enabling environment for fisheries management at various levels. This includes assistance in developing key regulations (HS and RPP), strengthening WPP and provincial management bodies, and community groups to adopt and implement effective fisheries management measures. To gauge these efforts, the Consortium members have selected nine indicators, demonstrating a commitment to supporting government capacities across the board to manage fisheries effectively.

Over the last five years (2019–2023), there has been good progress in regulatory development at both WPP and national scales, notably integrating scientific insights into national policy documents (HS and RPP). While acknowledging the nature of the Harvest Strategy and other management frameworks, it's encouraging to see a focus on strengthening the implementation, monitoring, and law enforcement aspects to ensure effective management.

At the WPP level, fisheries management faces challenges due to the management unit at the WPP level (UPP–WPP) has not fully fulfilled its role as the central government's representative. This issue arises from the dependency on priorities and funding allocations set nationally, especially by the Directorate General of Capture Fisheries, for operational activities within their jurisdiction. Additionally, we observed a need to synergize operational activities to enhance collaboration between management and law enforcement for more cohesive fisheries governance,

On a provincial scale, fisheries management, such as in Saleh Bay, has experienced good progress, where engagement by the provincial government and the community can be bridged with support from NGOs and funded through financial contribution from the provincial government in conducting



dialogue on policy formulation and monitoring and implementation of these policies. However, it should be noted that third-party's role in initiating and supporting programs in the provincial level is very limited so that sustainable engagement at this level must be thought out carefully so that this intervention can be institutionalized and implemented by the local government effectively in the future.

The establishment of enabling conditions across various management levels, including national and provincial as well as within local communities, deserves recognition as it provided a solid foundation for these entities to further advance their initiatives.

The second-order outcome assessment indicates significant accomplishments in establishing an enabling environment for fisheries management at national, provincial, and community levels, with notable advancements in regulatory development and integration of scientific knowledge into policy. However, challenges persist at the WPP level due to the limited fulfilment of the UPP–WPP in its representative role, largely due to reliance on national priorities and funding. While provincial efforts like those in Saleh Bay show promise through collaborative engagements, the limited role of third parties after the consortium program ends highlights a need for careful planning to ensure its continuation.

Outcome: Market Interventions and Collaboration Enhancement

The third-order outcome focuses on the shifts in behavior, contributions, and support from markets (buyers), industries (suppliers), government and fishers toward adopting sustainable fisheries practices. It seeks to measure a high level of compliance throughout the entire value chain to promote sustainable fisheries. Out of four indicators, only one provides effective and continuous data contribution, which is the FIP (Fishery Improvement Project) monitoring progress. This is primarily facilitated through [FisheryProgress.org](https://fisheryprogress.org), serving as the main tool for data provision.

Industry engagement in sustainable fisheries initiatives, including compliance with Codes of Conduct, traceability standards, and other market requirements, is significantly influenced by buyer decisions and industry's support. Meanwhile, at the fishers' level, complexities in acquiring necessary legal documentation, such as boat licenses and business permits, impede the adoption and adherence to legal and administrative regulations. These challenges were also highlighted in our Human and Labor Rights (HLRs) assessment.

ADI plays a pivotal role in safeguarding and leading this industry initiative toward sustainability practices, and its members' active participation and willingness are crucial to maintaining its integrity. Although ADI members have agreed to a code of conduct (CoC) before joining, formal enforcement and auditing of their CoC compliance across the supply chain still need to be completed, rendering these codes as mere guidelines with limited adherence. A recent priority program from ADI aims to enhance its FIP profile and boost the marketability of its members in foreign markets. Consequently, this diverts attention from other priorities beyond FIP implementation. With support from SFP, ADI has engaged several buyers to back the FIP implementation for their suppliers. However,



this initiative is still in progress, with no definitive commitments secured yet.

The provincial government has also actively engaged with fishery stakeholders, offering a forum to facilitate meaningful dialogue between fishers, middleperson, academia and civil society. The government's commitment is apparent through dedicated programs, budget allocations, and active participation in fisheries management. Meanwhile, changes in fishers' behavior are noticeable through their adoption of sustainable practices, support for management systems and surveillance, and enhancing their representation through fishers' groups.

The third-order outcome indicates progress in adopting sustainable fisheries practices across industries, government, and fishers, yet challenges persist. While initiatives like ADI's FIP engagement show potential, the lack of formal enforcement of codes of conduct and difficulties in obtaining legal documentation for fishers highlight key areas for improvement. The provincial government's active engagement and program support contribute positively, but more definitive commitments and streamlined regulatory processes are essential for achieving compliance and enhancing the sustainability of fisheries practices.

Annex 5: Accepted International Reference Levels of SPR for Fish Species (snapper / grouper)¹⁴

SPR 10% – is referred to as ‘SPR-crash’ because the supply of young fish to a stock (which fisheries scientists call ‘recruitment’) is expected to be declining year on year at a rapid rate, leading to the crash of the fish stock.

SPR 20% – is referred to as the ‘replacement level’ because, around this level, the recruitment level of a fish stock is expected to be just high enough to replace the adults and keep the stock stable. It is also called by MSC as the ‘point of impaired recruitment’ (PIR) because, below this level, recruitment is expected to start to decline, leading to long-term declines in the stock. In most harvest strategies, it is used as a ‘limit reference point’ (LRP), below which all harvesting of fish must stop so that SPR can increase back to above SPR 20%.

SPR 30–40% – is used as an indication that a stock is around the level likely to produce the maximum sustainable yield (MSY). At this level, a stock should be able to stay abundant and have plenty of reproductive potential, allowing it to grow back after periods of poor environmental conditions or previous episodes of overfishing. This level is used as a target in many harvest strategies.

SPR 50% – is used as an indication that a fishery is around the level of maximum economic yield (MEY), which is characterized by slightly lower total catches than at MSY but much higher catch rates and more significant body size, and thus much more profitable fishing and good and sustainable levels of recruitment. This is why, in many first-world jurisdictions (e.g., Australian Commonwealth fisheries), SPR 50% is the target used in harvest strategies.

SPR 60% – is used as a recovery target reference point. In some jurisdictions, if a fishery becomes depleted below the LRP, this level of SPR must be achieved to correct the depletion and restore the stock as quickly as possible.

Annex 6: Definition of Harvest Strategy

Harvest strategies formalize and make explicit how a fishery will be adaptively managed, the aim being to make the process of adjusting management settings routine, disciplined, transparent, and predictable to all stakeholders, i.e., to stop it being ad hoc and made up as you go along, just responding to crises when and if they happen, and especially to keep it as free as possible from the influence of politics and vested influence (Smith et al. 2008).

The elements of a harvest strategy are:

- a. Explicit management objectives for the fishery translated as explicit reference points;
- b. Indicators of fishery status that can be monitored and assessed in the context of the fisheries objectives and reference points;
- c. An agreed assessment methodology based on the indicators being monitored;
- d. A framework of management regulations that can be incrementally adjusted relative to the assessed status of the fishery, and
- e. Harvest control rules which explicitly define how the management regulations will be incrementally adjusted in response to assessment results.

¹⁴ <http://barefootecologist.com.au/lbspr.html>

Acronyms and Abbreviations

ADI	Asosiasi Perikanan Demersal Indonesia (Indonesian Demersal Association)	GT	gross ton/gross tonnage
BPJS	Badan Penyelenggara Jaminan Sosial Kesehatan (Social Security Agency)	HLR	human and labor rights
BRIN	Badan Riset dan Inovasi Nasional (National Research and Innovation Agency)	IDR	Indonesian rupiah
BRPs	Biological reference points	I-Fish	Indonesian Fisheries Information System
CoC	code of conduct	IoT	Internet of Things
CODRS	Crew-Operated Data Recording System	JHT	Jaminan Hari Tua (old age insurance)
CPUE	catch per unit effort	JKK	Jaminan Kecelakaan Kerja (work accident insurance)
DJPT	Direktorat Jenderal Perikanan Tangkap (Directorate-General of Capture Fisheries)	JKM	Jaminan Kematian (death insurance)
DKP	Dinas Kelautan dan Perikanan (Marine and Fisheries Office)	JP	Jaminan Pensiun (retirement insurance)
EEZ	exclusive economic zone	k	Brody growth coefficient as defined for the von Bertalanffy growth equation
e-BRPL	e-Badan Riset Perikanan Laut (e-Marine Fisheries Research Institute)	kelompok nelayan	fishers' groups
FC	Fishing capacity	kelompok perempuan	women's groups
FIP	fishery improvement project	kg	kilogram
FIP2B	Forum Ilmiah Pengelolaan Perikanan Berkelanjutan (Scientific Forum for Sustainable Fisheries Management)	KUSUKA	Marine and Fisheries Business Actor Card Policy
FRCI	Fisheries Research Center of Indonesia	L50	length at which 50% of the fish are mature
Forkom Narasi	Forum Komunikasi Nelayan Kakap-Kerapu Indonesia	LBSPR	length-based spawning potential ratio
		LHR	life history ratio
		L-infinity	asymptotic size as defined for the von Bertalanffy growth equation

LRP	limit reference point		Fisheries Research)
M	natural mortality rate	RPP	Rencana Pengelolaan Perikanan (Fisheries Management Plan)
MEY	maximum economic yield		
MGT	median gross tonnage	SDI	Sumber Daya Ikan (Directorate of Fisheries Resources)
MMAF	Ministry of Marine Affairs and Fisheries	SFP	Sustainable Fisheries Partnership
MSC	Marine Stewardship Council	SHTI	Surat hasil tangkapan ikan (catch certificate)
MSY	maximum sustainable yield		
MT	metric ton	SK	<i>Surat Keputusan</i> (decree)
NGO	non-governmental organization	SME	small and medium-sized enterprise
nm	nautical mile	SPR	Spawning Potential Ratio
NTB	Nusa Tenggara Barat (West Nusa Tenggara)	SR	Starling Resources
P1	Principle 1: Sustainable fish stocks	SSIC	Sustainable Solutions International Consulting
P2	Principle 2: Minimizing environmental impact	TLFF	Tropical Landscape Finance Facility
P2K2B	<i>Pengelolaan Perikanan Kerapu dan Kakap Berkelanjutan</i> (Sustainable Grouper and Snapper Fishery Management Plan of Action)	TNC	The Nature Conservancy
		ToC	Theory of Change
P3	Principle 3: Effective fisheries management	UPP	Unit Pelayanan Pengembangan Perikanan (Fisheries Management Council in the district level)
PAS Kecil	Ship Nationality Certificate	USAID	United States Agency for International Development
PI	performance indicator	USD	United States dollar
Pokja	working group	VDL	vertical drop line
Pokmaswas	community surveillance group	WCS	Wildlife Conservation Society
PSDKP	Direktorat Jendral Pengawasan Sumber Daya Kelautan dan Perikanan (Directorate General of Marine and Fisheries Resource Surveillance)	WFF	Walton Family Foundation
		WPP	Wilayah Pengelolaan Perikanan (Fisheries Management Area)
PTF	Provincial Task Force	YKAN	Yayasan Konservasi Alam Nusantara
PUSRISKAN	Pusat Riset Perikanan (Center for	YKL	Yayasan Konservasi Laut

Resources

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Scaling Impact through Collaboration, Innovation, and Analytics:

BGA's Integrated Approach to Marine Conservation

At Blue-Green Advisors Ltd (BGA), we are passionate about driving efficient and impactful public and private sector ocean investing. Our integrated approach combines collaboration, innovation, and data-driven insights to create meaningful change. We offer three distinct programs that can be leveraged independently or in combination to develop powerful strategies and approaches that maximize the impact of investments in the marine sector.



Bridging and Collaboration

is essential for fostering partnerships across sectors and geographies. By bringing together diverse stakeholders, we create synergies that amplify the impact of conservation efforts. The success of initiatives like the Blue Swimming Crab and Snapper Consortiums showcases our ability to build alliances that drive sustainable fishery management. Collaboration is key to addressing complex challenges and scaling solutions.



Growth and Innovation

empower clients to scale sustainable practices and technologies. We recognize that environmental sustainability and economic growth are not mutually exclusive. By working closely with partners to identify and nurture innovative solutions, we help create business models that are both financially viable and environmentally responsible. Innovation is crucial for developing new approaches that can transform the marine sector.



Analytics and Insights

leverage data to guide marine conservation strategies and investment decisions. We understand that data-driven insights are essential for informed decision-making. By analyzing complex fisheries data, we provide critical information that helps direct investments towards initiatives with the greatest potential for impact. Our annual reports on Indonesia's blue swimming crab and snapper fisheries exemplify the power of data-driven conservation. Analytics and insights are vital for optimizing resource allocation and measuring the effectiveness of interventions.

As we navigate the complex challenges of marine conservation, we remain dedicated to pushing boundaries and exploring new possibilities. Through strategic partnerships, innovative technologies, and data-driven insights, we are working to secure a thriving future for our oceans.

***Join us in our mission to protect the marine ecosystems that sustain us
all while driving impactful investments in the blue economy.***



2019–2023 State of the Fishery

Snapper Fishery

Fisheries Management Areas (WPP) 713, 718 and 573