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SOUTHEAST ASIAN FISHERIES DEVELOPMENT CENTER
MARINE FISHERY RESOURCES DEVELOPMENT AND MANAGEMENT DEPARTMENT

SUBANG, MALAYSIA
22 – 24 OCTOBER 2025

REPORT ON THE REGIONAL TECHNICAL CONSULTATION ON THE HARMONIZATION OF SIMPLE AND PRACTICAL INDICATORS FOR SUSTAINABLE PELAGIC FISHERIES IN SOUTHEAST ASIA

Report on the Regional Technical Consultation on The Harmonization of Simple and Practical Indicators for Sustainable Pelagic Fisheries in Southeast Asia

USJ Summit Hotel, Subang, Malaysia

22 – 24 October 2025

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ACRONYMS

AMSs	ASEAN Member States
CPUE	Catch Per Unit Effort
DOF	Department of Fisheries
E	Exploitation Rate
FAD	Fish Aggregating Devices
FRI	Fisheries Research Institute
GT	Gross Tonnages
GRT	Gross Registered Tonnages
JAIF	Japan-ASEAN Integration Fund
LBI	Length-Based Indicator
LBSPR	Length-Based Spawning Potential Ratio
LCCC	Length-Converted Catch Curve
MMAF	Ministry of Marine Affairs and Fisheries
MSY	Maximum Sustainable Yield
RTC	Regional Technical Consultation
UMT	Universiti Malaysia Terengganu

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22 – 24 Oct 2025
Subang, Malaysia

I. INTRODUCTION AND OPENING OF THE MEETING

1. SEAFDEC/MFRDMD organized the Regional Technical Consultation on the Harmonization of Simple and Practical Indicators for Sustainable Pelagic Fisheries in Southeast Asia from 22 to 24 October 2025 in Subang, Malaysia. The event was funded by the Japan-ASEAN Integration Fund (JAIF). The meeting was attended by representatives from Brunei Darussalam, Cambodia, Indonesia, Malaysia, Myanmar, Thailand, and Viet Nam; representatives from the Fisheries Research Institute (FRI) Kampung Acheh, Perak and FRI Bintawa, Sarawak; representatives from the Department of Fisheries (DOF) Sabah and the Department of Marine Fisheries Sarawak; two resource persons from Universiti Malaysia Terengganu (UMT); as well as the Chief, Deputy Chief, Special Departmental Coordinator, and officials from SEAFDEC/MFRDMD. The list of participants appears in **Annex 1**.

2. The meeting was officiated by the Chief of SEAFDEC/MFRDMD, *Mr. Abd Haris Hilmi Ahmad Arshad*. In his speech, he welcomed all participants to the Regional Technical Consultation (RTC) and shared the project's objectives and previous activities. He also elaborated on the definition and significance of indicators in supporting the sustainability of pelagic resources. *Mr. Abd Haris Hilmi* expressed his hope that the information gathered from country presentations and discussions during the three-day course would contribute to the harmonization of indicators, thereby strengthening the foundation for joint monitoring, reporting, and adaptive management of pelagic fish resources. He also conveyed his gratitude to the Japan-ASEAN Integration Fund for supporting the project. His opening remarks appear as **Annex 2**.

II. ADOPTION OF THE AGENDA INTRODUCTION TO THE FISHING CAPACITY PROJECT

3. The agenda of this meeting was presented by Project Coordinator, *Ms. Mazalina Ali* to the participants and was adopted without any amendment. It appears as **Annex 3**, together with the provisional prospectus of the meeting.

4. *Ms. Mazalina* also presented the project titled “Introduction to the Implementation and Assessment of the ASEAN Regional Plan of Action for the Management of Fishing Capacity.” She shared an overview of the project, its objectives, six key outputs, and the corresponding sub-activities under each output. Additionally, she presented the activities that had already been conducted. Her presentation appears as **Annex 4.**

III. OVERVIEW OF THE FEEDBACK ON REGIONAL FISHERIES INFORMATION SYSTEM/ MECHANISMS QUESTIONNAIRE

5. The resource person, *Assoc. Prof. Dr. Rumeaida Mat Piah* shared an Overview of the Current Status of the Regional Fisheries Information and Mechanism in the Asian Region. This overview was based on the summary of feedback collected from the second questionnaire submitted by ASEAN Member States (AMSs) during the RTC held in May 2025. Her presentation appears as **Annex 5.**

6. All AMSs responded supportively to the summary, providing constructive feedback, including corrections and additional information related to their respective sections. Their input aimed to enhance clarity and accuracy, ensuring that the final version effectively reflects the collective perspectives on regional fisheries information systems and mechanisms. All corrections have been accepted and incorporated into the revised draft.

IV. INTRODUCTION TO SIMPLE AND PRACTICAL INDICATORS FOR SUSTAINABLE PELAGIC FISHERIES

7. *Assoc. Prof. Dr. Rumeaida* presented the Introduction to Simple and Practical Indicators for Sustainable Pelagic Fisheries. She shared the definition of indicator, the use of indicators, four types of indicators which are Ecological (Biological) indicators, Economic indicators, social indicators and Governance and Compliance indicators. She also shared ten (10) case studies and key lessons for practical implementation in pelagic context. Her presentation appears as **Annex 6.**

V. COUNTRY PRESENTATION ON INDICATORS FOR SUSTAINABLE PELAGIC FISHERIES

8. The representative from Brunei Darussalam, *Ms. Siti Nur Nisrina Matali* presented Simple and Practical Indicators for the Sustainable Management of Pelagic Fisheries in Brunei Darussalam. Brunei DS utilizes a biological indicator (Catch per Unit Effort -CPUE), economic indicator (value of landings) and social indicator (number of active licences). Her presentation appears as **Annex 7**.

9. *Mr. Jamil Musel* from FRI Bintawa Sarawak inquired about tuna purse seine vessels registered in Brunei Darussalam for operations in Zone 4. The representative from Brunei, *Ms. Desimawati Metali*, replied that while Brunei operates tuna longline vessels in Zone 4, most of its vessels use purse seines in that area. *Mr. Jamil* also asked whether fish aggregating devices (FADs) are deployed in Zone 4. In response, *Ms. Desimawati* mentioned that Brunei Darussalam has deployed several FADs more than 20 nautical miles from the coastline to help aggregate fish.

10. *Mr. Irman Isnain* from DOF Sabah inquired about the size of purse seine vessels operating in Zone 4 in terms of gross registered tonnage (GRT). In response, *Ms. Desimawati* stated that the vessels typically range from 150 GT to 850 gross tonnages (GT).

11. *Assoc. Prof. Dr Rumeaida* requested clarification regarding Brunei Darussalam's data, noting that while the country possesses CPUE and price data, it has not conducted continuous analyses. In response, *Ms. Desimawati* explained that Brunei Darussalam performs such analyses on a required basis, depending on when the information is needed.

12. The representative from Cambodia, *Dr. Chea Tharith* presented Simple and Practical Indicators for the Sustainable Management of Pelagic Fisheries in Cambodia. Cambodia utilizes biological indicators such as CPUE, length-based indicators (LBIs), length base spawning potential ratio (LBSPR), catch-maximum sustainable yield. Besides that, Cambodia also utilizes economic indicator (value of landings), social indicator (number of active fishers) and environment indicator (bycatch ratio). His presentation appears as **Annex 8**.

13. *Mr. Jamil* inquired whether there was a specific design of midwater trawl responsible for contributing 14% of the pelagic catch in Cambodia. *Dr. Chea* responded that Cambodia's midwater trawl vessels already feature built-in designs, as they were purchased from neighbouring countries. *Mr. Jamil* also asked if there are a specific zone and seasons for midwater trawl operations. *Dr. Chea* explained that these vessels typically operate in areas with depths greater than 20 meters throughout the year. However, there is a fishing limitation from January to March due to the mackerel spawning season.

14. The representative from Viet Nam, *Dr. Vu Viet Ha* inquired about the current status of anchovy stocks, noting that the main anchovy fishing grounds are located along the border between Cambodia and Viet Nam. He also asked about the main fishing gear used for anchovy. In response, *Dr. Chea* stated that the main gear employed is the anchovy purse seine. He further explained that there is currently no available information on the stock status of anchovy, but Cambodia plans to include anchovy stock assessment in its fisheries resource management framework starting next year.

15. *Mr. Irman* asked whether the closed season affects all fishers, including those targeting demersal species. The representative from Cambodia, *Mr. Leng Syvann*, responded that the restriction applies only to mackerel, which are not allowed to be fished from January to March in some zone/area. However, fishers are permitted to catch other species during this period.

16. The representative from Indonesia, *Ms. Arinta Dwi Hapsari* presented Simple and Practical Indicators for the Sustainable Management of Pelagic Fisheries in Indonesia. She explained that Indonesia utilizes indicators such as landing data (production and effort), biological data, CPUE, number of fishers, and bycatch ratio. Additionally, she shared about the implementation of the One Data Program, which is carried out by the Ministry of Marine Affairs and Fisheries (MMAF). Her presentation appears as **Annex 9**.

17. *Mr. Sallehudin Jamon* from FRI Kampung Acheh, Perak asked why the exploitation rate shown in slide no. 6 exceeds 1, noting that the maximum exploitation rate is typically 1. In response, *Ms. Arinta* explained that the National Commission of Fish Resources Assessment

(Komnas KAJISKAN) categorizes exploitation rates as follows: values below 0.5 indicate moderate-exploitation, values between 0.5 and 1.0 indicate fully-exploited, and values above 1.0 indicate over-exploitation.

18. Deputy Chief of SEAFDEC/MFRDMD, *Dr. Masahito Hirota* inquired about possible solutions to address limited data and data collection infrastructure. In response, the representative from Indonesia, *Mr. Mohamad Aris Setiawan Indrianto*, stated that Indonesia is currently planning to redesign its port and non-port sampling systems. *Ms. Arinta* seconded with *Mr. Mohamad Aris Setiawan,* and further explained that following the redesign of these sampling systems, Indonesia will proceed with improving its data collection infrastructure.

19. The representative from Malaysia, *Mr. Ryon Siow* presented Simple and Practical Indicators for the Sustainable Management of Pelagic Fisheries in Malaysia. Malaysia employs biological indicators (CPUE, Size distribution and composition, spawning stock biomass), economic indicators (value of landings, and number of licensed vessels), social indicators (number of licensed fishers), and environmental indicators (bycatch ratio and encroachment into sensitive areas). His presentation appears as **Annex 10**.

20. The representative from Myanmar, *Mr. Soe Win* presented the Simple and Practical Indicators for the Sustainable Management of Pelagic Fisheries in Myanmar. During his presentation, he shared biological parameters for seven pelagic fish species based on data collected in 2019. However, Myanmar is preparing to implement regional indicators. His presentation appears as **Annex 11**.

21. *Mr. Jackson Clive Jusak* inquired about the significant increase in landings in Ayeyarwaddy in slide no.9, asking whether it was a result of the conservative closed season implementation. *Mr. Soe* replied that according to 2018 research, the close season could be set from April to June. Previously, all offshore fishing was closed from June to August.

22. *Assoc. Prof. Dr. Rumeaida* inquired about additional indicators used in Myanmar beyond biological parameters, biomass, and catch rate. In response, *Mr. Soe* clarified that the data presented in slide no. 11 represented biomass estimates from a survey conducted specifically in the Yangon area.

23. The representative from Thailand, *Ms. Nuengruetai Yoknoi* presented Simple and Practical Indicators for the Sustainable Management of Pelagic Fisheries in Thailand. She shared that Thailand utilizes CPUE as a key indicator to estimate the Maximum Sustainable Yield (MSY) for certain pelagic fish species and anchovy, in both the Gulf of Thailand and the Andaman Sea. Her presentation appears as **Annex 12**.

24. *Mr. Abd Haris Hilmi* inquired about the dominant anchovy species in Thailand. In response, the representative from Thailand, *Mr. Sakol Pheaphabrattana*, stated that *Encrasicholina heteroloba* is the predominant anchovy species found in Thai waters.

25. The representative from Viet Nam, *Dr. Vu Viet Ha* presented Simple and Practical Indicators for the Sustainable Management of Pelagic Fisheries in Viet Nam. He explained that for multiple species assessments, Viet Nam utilizes biological indicators (C/MSY and F/F_{MSY}). For single species assessments, the country applies the Exploitation Rate (E) derived from the Length-Catch Converted Curve (LCCC) method, as well as the Length-Based Spawning Potential Ratio (LBSPR) approach. His presentation appears as **Annex 13**.

VI. CRITERIA AND PRINCIPLES FOR HARMONIZING INDICATORS

26. *Assoc. Prof. Dr. Rumeaida* presented the criteria and principles for harmonizing indicators. She outlined eight (8) key criterias essential for this process: (i) Relevance, (ii) Simplicity and Practicality, (iii) Measurability, (iv) Sensitivity, (v) Robustness, (vi) Comparability, (vii) Policy Relevance, and (viii) Stakeholder Acceptance. Additionally, she shared four literature reviews highlighting global initiatives aimed at harmonizing fisheries indicators and data systems. She also presented a historical timeline of the SEAFDEC project titled Identification of Indicators for Sustainable Development and Management of Capture Fisheries, which was conducted from 2003 to 2005. Her presentation appears as **Annex 14.**

VII. DRAFTING HARMONIZED SIMPLE AND PRACTICAL INDICATORS FOR SUSTAINABLE PELAGIC FISHERIES

27. For this agenda, *Assoc. Prof. Dr. Rumeaida* introduced four (4) tasks. The first task is to understand the Regional Guidelines on the Use of Indicators for the Sustainable Development and Management of Capture Fisheries in the Asian Region. The second task involves compiling the indicators currently used by AMSs and identifying their potential as well as the challenges associated with them. The third task focuses on selecting and harmonizing relevant indicators and variables. Finally, the fourth task is to prepare a draft of the harmonized indicators. Her presentation appears as **Annex 15.**

28. She began with Task 1, elaborating the Regional Guidelines on the Use of Indicators for the Sustainable Development and Management of Capture Fisheries in the Asian Region, which were prepared and established by SEAFDEC in 2005 (SEAFDEC/MFRDMD, 2005). The adopted regional guidelines 2005 appear as **Annex 16**.

29. *Assoc. Prof. Dr. Rumeaida* then shared a compilation of indicators currently used by AMSs based on the country's presentation. The indicators were listed according to the type of indicators, i.e. Biological, Economics, Environment, Social and Governance. This summary highlights the diversity of approaches across the region and serves as a foundation for identifying common practices, challenges and gaps in the use of fisheries-related indicators.

30. Moving on to Task 3, *Assoc. Prof. Dr. Rumeaida* led the discussion on selecting and harmonizing indicators for all AMSs. She shared that the simple and practical indicators should, (i) Requiring minimal and readily available data e.g., catch statistics, fleet numbers, age of entrants, number of fishers, (ii) Ensure repeatability & trend detection (applied regularly

and consistently), (iii) Link indicator to management action, (iv) Complement with other data where possible, (v) Realistic and manageable, (vi) Tailor to the pelagic domain, (vii)Data quality & fishers' engagement matter, indicator choice must reflect data reality, and (viii) Use visualization & thresholds: Simple indicators work best when thresholds are defined (e.g., > 30% immature fish triggers review) or when trends are visualized clearly for managers/fishers.

31. All participants were actively involved in the discussion. They explored various biological, economic, environmental and social indicators, and collectively selected those deemed suitable to apply across all AMSs. The discussion also covered potential indicators that may be adopted in the future to enhance regional fisheries management and sustainability efforts.

32. For Task 4, *Assoc. Prof. Dr. Rumeaida* presented a draft report titled Harmonization of Indicators for Sustainable Pelagic Fisheries in Southeast Asia. The report outlines the objectives, provides background information, and includes a list of selected indicators and variables, along with proposed approaches for reporting and monitoring. She then shared a summary of the selected and potential indicators for each category, including biological, economic, environmental, and social indicators. A standardized template for country-level reporting will also be incorporated into the final report. The draft report appears as **Annex 17.**

33. *Ms. Marlinda Anim Marham* from DOF Malaysia suggested that the report should include examples on how countries have adopted the harmonized indicators in their management, to be presented in the annex. In response, *Assoc. Prof. Dr. Rumeaida* informed that the country's information will be incorporated into the RTC report.

34. *Mr. Ryon* seconded *Ms. Marlinda Anim*'s suggestion to highlight the use of indicators in AMSs fisheries management. Furthermore, *Assoc. Prof. Dr. Rumeaida* proposed to use the application of the indicator as one of the management components. *Mr. Ryon* agreed with her suggestion, noting that the application of indicators would ultimately be utilized in management processes regardless.

35. During the discussion on the frequency of country reporting, *Assoc. Prof. Dr. Rumeaida* initially proposed an annual reporting schedule. However, *Mr. Ryon* noted that the frequency or timeframe is typically determined by SEAFDEC. Ultimately, the RTC meeting agreed to omit the reporting frequency, but it will be decided later by the relevant organization (ie SEAFDEC/MFRDMD).

36. *Mr. Ryon* provided his insight on the next steps for AMSs. He suggested that they begin by preparing their first reports using the recommended format.

37. *Assoc. Prof. Dr. Rumeaida* emphasized that the report will help assess whether AMSs are able to analyze trends using the indicators selected during the session. She noted that the harmonized indicators chosen during this RTC are simple, one for each category.

38. *Assoc. Prof. Dr. Rumeaida* has once again presented the draft report on harmonizing indicators.

39. *Dr. Hirota* inquired about the type of mortality rate used by AMS, noting that multiple mortality rate models exist globally (such as those provided by FAO and other organizations).

40. *Mr. Sallehudin, Dr. Chea,* and *Dr. Ha* agreed that AMSs generally use length frequency data in the FISAT software through the Length-Converted Catch Curve (LCCC) analysis to estimate mortality rates.

41. *Ms. Arinta* shared that Indonesia typically employs several methods to calculate mortality rates, and then selects the most reliable result.

42. *Mr. Abd Haris Hilmi* inquired about which species group of pelagic fish should be reported. *Assoc. Prof. Dr. Rumeaida* supported his suggestion to finalize the selected species group during this RTC.

43. *Assoc. Prof. Dr. Rumeaida* presented the dominant pelagic fish species identified across AMSs, based on data collected during the first RTC. It was observed that no single species was consistently dominant across all AMSs. Therefore, it is recommended that each AMS report using the dominant pelagic species specific to their respective country.

44. In response to *Dr. Chea*'s inquiry regarding the differentiation between *Rastrelliger kanagurta* and *R. brachysoma*, due to the differing growth parameters of the two species, *Assoc. Prof. Dr. Rumeaida* clarified that Length-Based Indicators (LBIs) have been identified as potential indicators that can be considered in the future. Therefore, all AMSs are advised to initially focus on reporting using CPUE as a start, as it has been selected as the primary biological indicator during this RTC.

45. In response to *Mr. Sallehudin* inquiry regarding the selection of specific fishing areas, the RTC meeting acknowledged that there is no common fishing area shared among all AMSs. Consequently, it was agreed to adopt the FAO fishing area classification (FAO 57 and FAO 71) for reporting purposes.

VIII. FINALIZATION OF THE QUESTIONNAIRE ON CONSERVATION EFFORTS AND MANAGEMENT STRATEGIES IN AMSS

46. All participants actively involved in discussion regarding the questionnaire on Conservation Efforts and Management Strategies in AMSs. The latest version of the questionnaire appears as **Annex 18.**

IX. CONCLUSION AND WAY FORWARD

47. *Ms. Mazalina* presented the way forward for the project. AMSs are required to submit their country reports using the agreed format by the end of November 2025. Subsequently, a summary or compilation of these reports will be published. Her presentation appears as **Annex 19**.

X. CLOSING SESSION

48. Deputy Chief of SEAFDEC/MFRDMD, *Dr. Masahito Hirota* expressed his gratitude to all participants for their attendance and active participation in the discussions. He shared his hope that this project's output can provide supportive information to your countries for the future planning of the regional action for the management of fishing capacity. Finally, he formally closed the meeting. His closing remarks appear as **Annex 20.**

ANNEX 1

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ANNEX 2

OPENING REMARKS

Regional Technical Consultation on The Harmonization of Simple and Practical Indicators for Sustainable Pelagic Fisheries in Southeast Asia

22 – 24 Oct 2025
Subang, Malaysia

By Mr. Abd. Haris Hilmi Ahmad Arshad, Chief of SEAFDEC/MFRDMD

بِسْمِ اللهِ الرَّحْمٰنِ الرَّحِيْمِ

السَّلَامُ عَلَيْكُمْ وَرَحْمَةُ اللهِ وَبَرَكَاتُهُ

And a very good morning.
Our resource persons, Assoc. Prof. Dr. Rumeaida Mat Piah and Dr. Abdullah Mohamad from University Malaysia Terengganu

Dr. Masahito Hirota, Deputy Chief of SEAFDEC/MFRDMD
Ms. Mazalina Ali, Project Coordinator for the Regional Project of Fishing Capacity and also Special Departmental Coordinator of SEAFDEC/MFRDMD

Representative from Brunei Darussalam,
Representative from Cambodia,
Representative from Indonesia,
Representative from Malaysia,
Representative from Myanmar,
Representative from Thailand,
Representative from Vietnam.

Representatives from the Department of Fisheries Sabah,
Fisheries Research Institute Kg. Acheh Perak,
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FRI Bintawa Sarawak,
Department of Marine Fisheries Sarawak,
officers and staffs from SEAFDEC/MFRDMD

Ladies and gentlemen,

First of all, I warmly welcome you to The Regional Technical Consultation (RTC) on the Harmonization of Simple and Practical Indicators for Sustainable Pelagic Fisheries in Southeast Asia starting from today until 24 October 2025.

This RTC is an activity under the project entitled “Implementation and Assessment of the ASEAN Regional Plan of Action (RPOA) for Management of Fishing Capacity” starting from April 2024 to March 2026, involves fisheries management agencies across ASEAN Member States (AMSs), excluding Lao PDR. This project is funded by Japan-ASEAN Integration Fund (JAIF), and it aims to strengthen regional cooperation and enhance fisheries information systems through the implementation of RPOA-Capacity, focusing on selected pelagic species to promote sustainability and responsible resource management.

Since the beginning of this project, SEAFDEC/MFRDMD has conducted several key activities such as two questionnaires were developed last year. The first questionnaire addressed on national capacity profiles, the implementation status of the RPOA, and the ASEAN Guidelines IUU. The second questionnaire focused existing fisheries information systems in AMSs. Feedback from the AMSs were presented during the RTC held in February and May this year.

Ladies and gentlemen.

Today’s RTC marks the next phase, which is on third output of the project, ‘Simple and practical indicators are standardized in supporting the planning and monitoring of sustainable fisheries of pelagic fish’. The main purpose of this three-day RTC Meeting is to share information on the indicators used by AMSs for sustainability of pelagic fish resources.
The Regional Guidelines for Responsible Fisheries in Southeast Asia under the area of Fisheries Management has mentioned about indicators. Indicator is a performance-based variable, measure or index that provides information on the condition and status of fisheries resources.

Indicators in pelagic fisheries management could be on biological and population indicators, ecosystem and environmental indicators, and management and performance indicators.

At the end of this meeting, I hope that the information gathered from the country presentations and the discussion among us will benefit the harmonization of the indicators. It will not only enhance the comparability of information across AMSs but also strengthen the foundation for joint monitoring, reporting, and adaptive management of pelagic fish resources. This collaborative effort is expected to pave the way for a more coherent and regionally aligned set of practical indicators that reflect the shared priorities and realities of ASEAN Member States.

Your participation and input throughout this meeting are essential to ensuring that we could move forward with effective solutions and continued promising collaboration to promote sustainability and responsible resource management.

Finally, on behalf of SEAFDEC/MFRDMD, I would like to express my gratitude and appreciation to our resource persons, all representatives, Dr. Masahito Hirota, Ms. Mazalina Ali, and meeting secretariats for attending and making it reality. With that, I officially open “The Regional Technical Consultation (RTC) on the Harmonization of Simple and Practical Indicators for Sustainable Pelagic Fisheries in Southeast Asia,”.

Thank you very much.

Regional Technical Consultation on The Harmonization of Simple and Practical Indicators for Sustainable Pelagic Fisheries in Southeast Asia

22-24 October 2025
Subang, Malaysia

PROVISIONAL PROSPECTUS

1. **Background**

Pelagic fisheries play a vital role in the socio-economic and food security landscape of Southeast Asia, contribute significantly to the total marine capture fisheries production in the region. These species form the backbone of many coastal and island communities' livelihoods and are integral to regional and international seafood trade. Pelagic fisheries consistently contributed approximately 45–60% of the total marine capture fisheries production in Southeast Asia. Countries such as Indonesia, Philippines, Thailand, and Viet Nam are among the largest producers, contributing substantial volumes of pelagic fish both for domestic consumption and export markets. In recent years, the region has seen an increase in demand for pelagic species, driven by population growth, changing consumption patterns, and international market pressures.

The sustainability of pelagic fisheries in Southeast Asia is under growing pressure due to overfishing, illegal, unreported and unregulated (IUU) fishing, habitat degradation, climate change, and limited management capacity. The transboundary nature of many pelagic fisheries, coupled with disparities in data collection and monitoring among ASEAN Member States (AMSs), further complicates effective regional management. In response, regional and international frameworks have emphasized the importance of using indicators to assess the status and sustainability of fisheries. However, many existing indicators are overly complex or lack harmonization, limiting their practical application.

To address these challenges, there is an urgent need to harmonize simple and practical indicators that are scientifically valid, easy to implement, and adaptable to the diverse conditions across Southeast Asia. Indicators such as Catch Per Unit Effort (CPUE), Spawning Potential Ratio (SPR), Bycatch Ratio, and Species Composition Index can serve as essential tools for harmonizing data collection, supporting evidence-based management, and promoting sustainable pelagic fisheries across the region. These indicators should support national and regional efforts to achieve sustainable fisheries, in line with key policy frameworks such as the ASEAN-SEAFDEC Resolution and Plan of Action on Sustainable Fisheries for Food Security, the FAO Code of Conduct for Responsible Fisheries, and the United Nations Sustainable Development Goals (particularly SDG 14 – Life Below Water).

In this context, the Regional Technical Consultation (RTC) provides a platform for AMSs, technical experts, and regional organizations to share experiences, review existing national indicator systems, and collaboratively develop a harmonized set of simple and practical indicators for sustainable pelagic fisheries in Southeast Asia. The outcomes of this consultation will contribute to strengthening regional cooperation, promoting responsible fisheries, and ensuring the long-term sustainability of vital pelagic resources for current and future generations.

2. **Objective of the RTC**

The RTC aims to:

1. Exchange information on existing national and regional indicators used to monitor and assess the sustainability of pelagic fisheries in Southeast Asia.
2. Develop a harmonized set of simple and practical indicators that are scientifically sound, regionally applicable, and easy to implement.

3. **Expected Outputs**

The RTC is expected to produce:

- A compilation of existing indicators for pelagic fisheries sustainability,
- A draft set of harmonized simple and practical indicators for sustainable pelagic fisheries.

4. **Date and Venue of the RTC**

Regional Technical Consultation on the Harmonization of Simple and Practical Indicators for Sustainable Pelagic Fisheries in Southeast Asia will be held from 22nd to 24th October 2025 in Subang, Malaysia.

5. **Participants of the Meeting**

It is envisaged that the participants of the meeting will be:

a. Two resource persons,
b. Two representatives from AMSs except Lao PDR and Malaysia,
c. Representatives from Department of Fisheries (DOF) Malaysia, DOF Sabah, Department of Marine Fisheries Sarawak, Fisheries Research Institute (FRI) Kg. Acheh, and FRI Bintawa,
d. Chief, Deputy Chief, Project Coordinator, and relevant officers from SEAFDEC/MFRDMD.

6. **Tentative Agenda**

Agenda 1: Opening Session
Agenda 2: Adoption of Agenda and Introduction of the project
Agenda 3: Overview of the Feedback on Regional Fisheries Information System/ Mechanisms Questionnaire
Agenda 4: Introduction to Simple and Practical Indicators for Sustainable Pelagic Fisheries
Agenda 5: Country Presentations on Indicators for Sustainable Pelagic Fisheries
Agenda 6: Criteria and Principles for Harmonizing Indicators
Agenda 7: Drafting Harmonized Simple and Practical Indicators for Sustainable Pelagic Fisheries
Agenda 8: Finalization of the Questionnaire on Conservation Efforts and Management Strategies in AMSs
Agenda 9: Conclusion and Way Forward
Agenda 10: Closing Session

Secretariat and Correspondence

All correspondence regarding the Regional Technical Consultation should be addressed to:

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mazalina@seafdec.org.my
Special Department Coordinator
SEAFDEC/MFRDMD, Kuala Terengganu, Malaysia
Tel: 609 – 61759

PROVISIONAL TIMETABLE

21 Oct 2025 (Tuesday)	
15:00 –	Check-in hotel
Day 1 (22 Oct 2025, Wednesday) ***Moderator: Ms. Hamizah Nadia Alias @ Yusof***	
08:30 – 09:00	Registration
Agenda 1: Opening of the Meeting	
09:00 – 09:10	Opening Address *by Chief of SEAFDEC/MFRDMD*
Agenda 2: Adoption and Introduction of the Project	
09:10 – 09:20	Adoption of the Agenda *by Ms Mazalina Ali, Project Coordinator*
09:20 – 09:30	Introduction of the Project *by Ms Mazalina Ali, Project Coordinator*
Agenda 3: Overview of the Feedback on Regional Fisheries Information System/ Mechanisms Questionnaire ***Chairperson: Chief of SEAFDEC/MFRDMD***	
09:30 – 10:30	Overview of the Feedback on Regional Fisheries Information System/ Mechanisms Questionnaire *Facilitator: Resource Persons*
10:30 – 11:00	Group Photo and Morning Break
Agenda 4: Introduction to Simple and Practical Indicators for Sustainable Pelagic Fisheries	
11:00 – 11:30	Introduction to Simple and Practical Indicators for Sustainable Pelagic Fisheries *by Resource Person*
Agenda 5: Country Presentation	
11:30 – 11:50	Brunei Darussalam
11:50 – 12:10	Cambodia
11:10 – 12:30	Indonesia
12:30 – 12:50	Malaysia
12:50 – 14:30	Lunch Break

14:30 – 14:50	Myanmar
14:50 – 15:10	Thailand
15:10 – 15:30	Viet Nam
15:30 – 16:00	Tea Break
Day 2 (23 Oct 2025, Thursday) ***Chairperson: Chief of SEAFDEC/MFRDMD***	
Agenda 6: Criteria and Principles for Harmonizing Indicators	
09:00 – 10:30	Criteria and Principles for Harmonizing Indicators *by Resource Person*
10:30 – 11:00	Morning Break
Agenda 7: Drafting Harmonized Indicators	
11:00 – 13:00	Drafting Harmonized Indicators
13:00 – 14:30	Lunch Break
14:30 – 16:00	Drafting Harmonized Indicators cont.
16:00 – 16:30	Tea Break
Day 3 (24 Oct 2025, Friday)	
Agenda 8: Finalization of the Questionnaire on Conservation Efforts and Management Strategies in AMSs ***Chairperson: Chief of SEAFDEC/MFRDMD***	
09:00 – 10:00	Summary of Harmonized Indicators *Facilitator: Resource Persons*
10:00 – 10:30	Finalization of the Questionnaire on Conservation Efforts and Management Strategies in AMSs *Facilitator: Resource Persons*
Agenda 9: Conclusion and Way Forward of the Project	
10:30 – 10:45	Way Forward *by Ms Mazalina Ali, Project Coordinator*
10:45 – 11:15	Lunch Break
11:15 – 11:45	Adoption of the meeting report
Agenda 10: Closing of the Meeting	
11:45 – 12:00	Closing Session *by Deputy Chief of SEAFDEC/MFRDMD*
25 Oct 2025 (Saturday)	
08:00 – 12:00	Check-out hotel

The Regional Technical Consultation on the Harmonization of Simple and Practical Indicators for Sustainable Pelagic Fisheries in Southeast Asia

22-24 Oct 2025
Subang, Malaysia

Introduction of the Project

By Mazalina Ali

SEAFDEC/MFRDMD

Introduction

- Fish and fishery products are becoming increasingly important as primary sources of protein for many people in the world, most especially for those in the Southeast Asian region.
- In 2021, Southeast Asia accounted for approximately 21% of the total global fishery production. The region is a leading producer, with Indonesia and Vietnam being major contributors

Introduction

- Southeast Asia's capture fisheries production is facing long-term challenges, with potential catch declining significantly due to overfishing and climate change, though there was a short-term recovery in 2024 following a marginal decline in 2023.
- Overfishing in Southeast Asia's coastal waters has been reported since the 1970s, driven by overcapacity, high demand and population growth.

IMPLEMENTATION AND ASSESSMENT OF THE ASEAN REGIONAL PLAN OF ACTION FOR THE MANAGEMENT OF FISHING CAPACITY

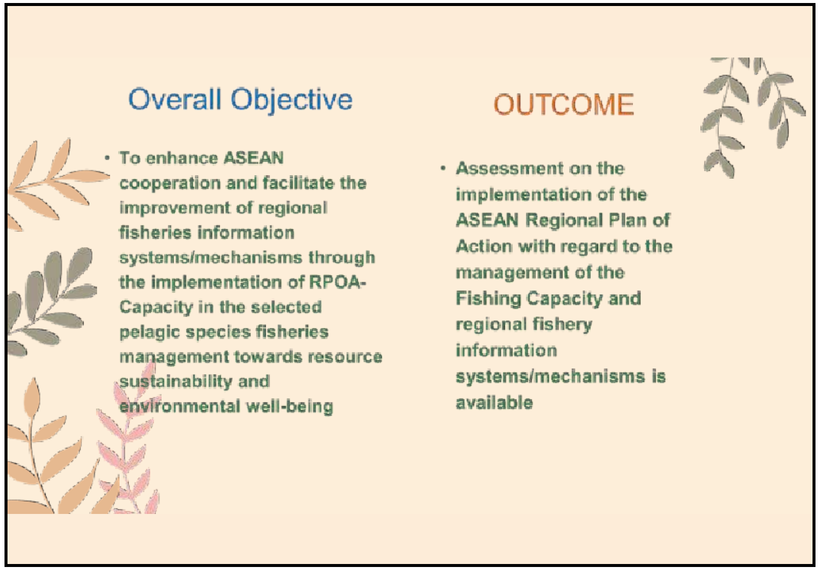
Project duration: 2 years (22 April 2024 - 21 April 2026)

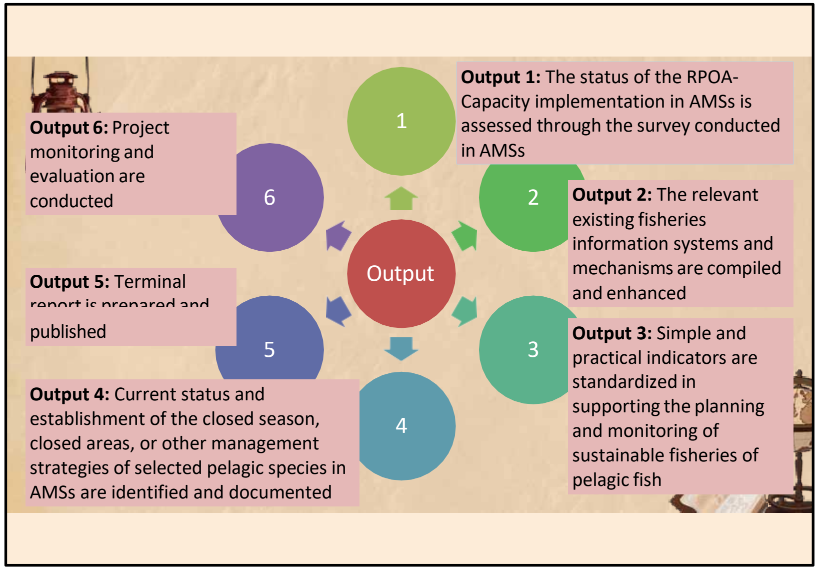
Donor: Japan-ASEAN Integration Fund (JAIF)

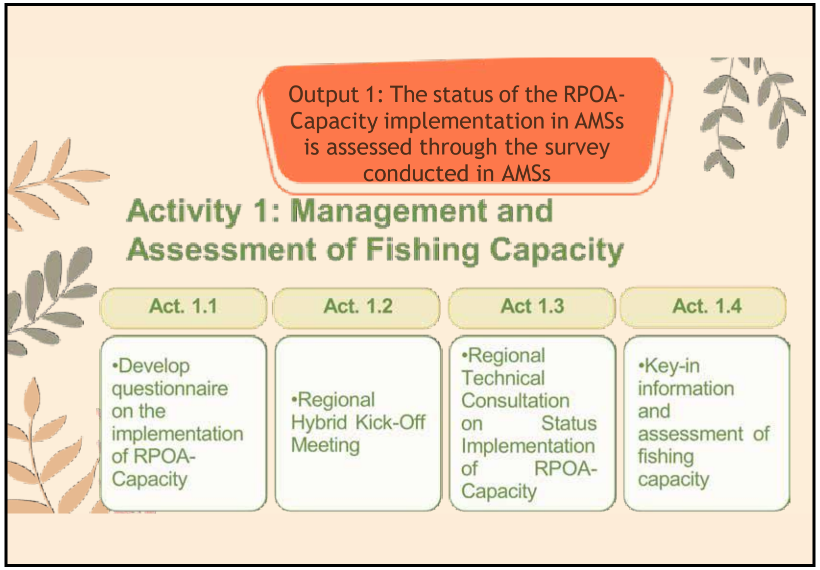
- To enhance the cooperation in the AMSs in the governance of the transboundary fishing capacity in the Southeast Asia region and move towards the development of a Fisheries Management Plan.

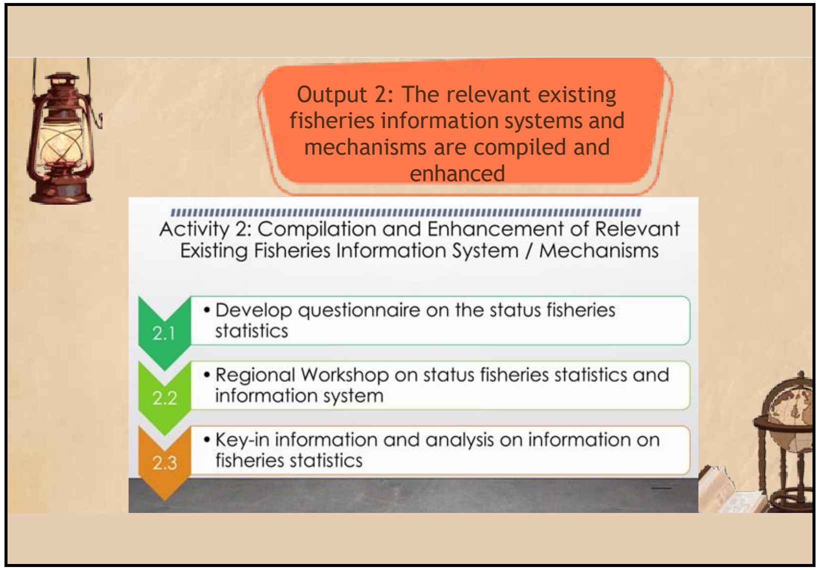
GOAL

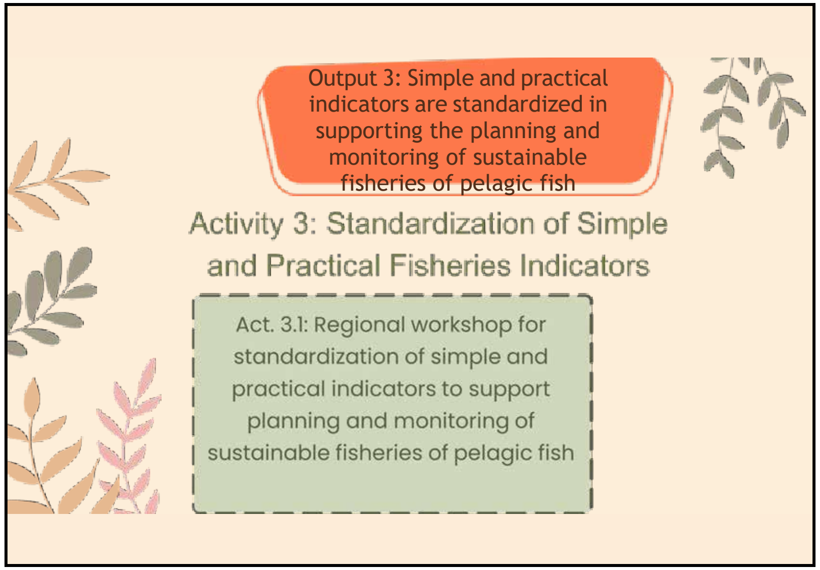

Aligned with the:
• Resolution on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2030 No. 7 and 8
• Plan of Action for ASEAN Region Towards 2030 under A. Planning and Information, and B. Fisheries Management
Supports the implementation of SDG Goal 14 “Conserve and sustainably use the oceans, seas and marine resources for sustainable development”

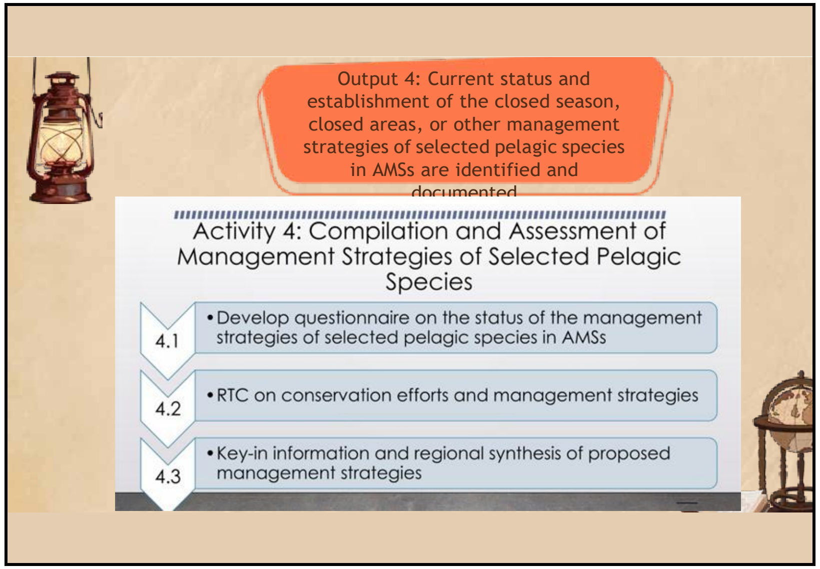

Overall Objective
• To enhance ASEAN cooperation and facilitate the improvement of regional fisheries information systems/mechanisms through the implementation of RPOA-Capacity in the selected pelagic species fisheries management towards resource sustainability and environmental well-being
OUTCOME
• Assessment on the implementation of the ASEAN Regional Plan of Action with regard to the management of the Fishing Capacity and regional fishery information systems/mechanisms is available

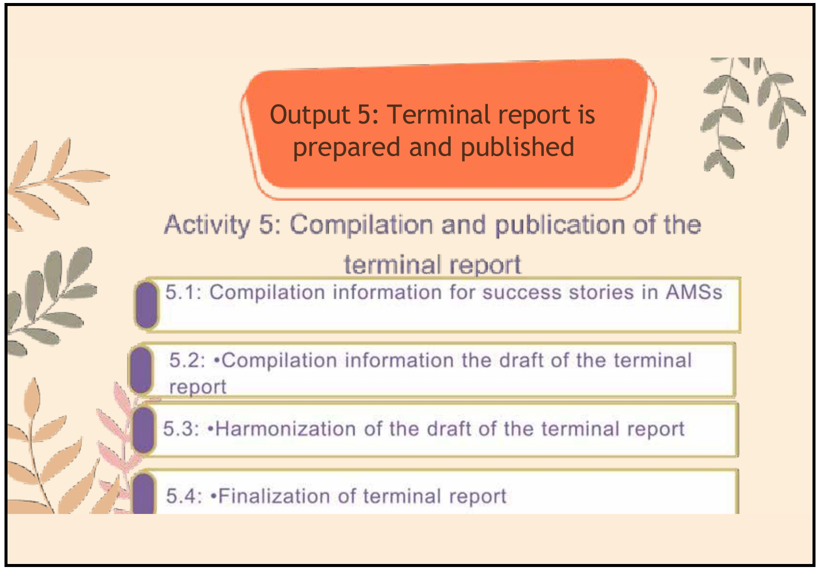

1
Output 1: The status of the RPOA-Capacity implementation in AMSs is assessed through the survey conducted in AMSs
2
Output 2: The relevant existing fisheries information systems and mechanisms are compiled and enhanced
3
Output 3: Simple and practical indicators are standardized in supporting the planning and monitoring of sustainable fisheries of pelagic fish
4
Output 4: Current status and establishment of the closed season, closed areas, or other management strategies of selected pelagic species in AMSs are identified and documented
5
Output 5: Terminal
published
6
Output 6: Project monitoring and evaluation are conducted
Output


Output 1: The status of the RPOA-Capacity implementation in AMSs is assessed through the survey conducted in AMSs
Activity 1: Management and Assessment of Fishing Capacity
Act. 1.1
•Develop questionnaire on the implementation of RPOA-Capacity
Act. 1.2
•Regional Hybrid Kick-Off Meeting
Act. 1.3
•Regional Technical Consultation on Status Implementation of RPOA-Capacity
Act. 1.4
•Key-in information and assessment of fishing capacity


Output 2: The relevant existing fisheries information systems and mechanisms are compiled and enhanced
Activity 2: Compilation and Enhancement of Relevant Existing Fisheries Information System / Mechanisms
2.1
• Develop questionnaire on the status fisheries statistics
2.2
• Regional Workshop on status fisheries statistics and information system
2.3
• Key-in information and analysis on information on fisheries statistics


Output 3: Simple and practical indicators are standardized in supporting the planning and monitoring of sustainable fisheries of pelagic fish
Activity 3: Standardization of Simple and Practical Fisheries Indicators
Act. 3.1: Regional workshop for standardization of simple and practical indicators to support planning and monitoring of sustainable fisheries of pelagic fish


Output 4: Current status and establishment of the closed season, closed areas, or other management strategies of selected pelagic species in AMSs are identified and documented
Activity 4: Compilation and Assessment of Management Strategies of Selected Pelagic Species
4.1
• Develop questionnaire on the status of the management strategies of selected pelagic species in AMSs
4.2
• RTC on conservation efforts and management strategies
4.3
• Key-in information and regional synthesis of proposed management strategies


Output 5: Terminal report is prepared and published
Activity 5: Compilation and publication of the terminal report
5.1: Compilation information for success stories in AMSs
5.2: •Compilation information the draft of the terminal report
5.3: •Harmonization of the draft of the terminal report
5.4: •Finalization of terminal report

Output 6: Project monitoring and evaluation are conducted

Activity 6: Project Monitoring and Evaluation

6.1 • Project midterm review and evaluation meeting

6.2 • Terminal project monitoring and evaluation meeting

Overall Progress & Workplan

Overall Progress & Workplan

	2024		2025				2026	
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Outputs 1: The status of the implementation of RPOA-Capacity in AMSs is assessed through the survey conducted in AMSs								
Activity 1: Management and Assessment of Fishing Capacity								
Sub-Activity 1.1: Workshop for Developing Questionnaire for Management and Assessment of Fishing Capacity	X							
Sub-Activity 1.2: Regional Hybrid Kick-Off Meeting and Finalization of the Questionnaire		X						
Sub-Activity 1.3: Regional Technical Consultation (RTC) on Fishing Capacity Profiles and Implementation Status of the RPOA-Capacity in the Asian Region			X					
Sub-Activity 1.4: Workshop on the Analysis of the Regional Fishing Capacity				X				

Overall Progress & Workplan

	2024		2025				2026	
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Output 2: The relevant existing fisheries information systems and mechanisms are compiled and enhanced								
Activity 2: Compilation and Enhancement of Relevant Existing Fisheries Information System / Mechanisms								
Sub-Activity 2.1: Workshop for developing questionnaires on the current status of existing fisheries statistics and information or relevant system in AMSs		X						
Sub-Activity 2.2: The Regional Technical Consultation (RTC) on Current Status of the Regional Fisheries Information or Mechanism in the Asian Region				X				
Sub-Activity 2.3: Workshop on the Assessment of Regional Fisheries Information/Mechanism Questionnaire					X			

Overall Progress & Workplan

	2024		2025				2026	
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Output 3: Simple and practical indicators are standardized in supporting the planning and monitoring of sustainable fisheries of pelagic fish								
Activity 3. Standardization of Simple and Practical Fisheries Indicators								
Sub-Activity 3.1: Regional Technical Consultation on the Harmonization of Simple and Practical Indicators for Sustainable Pelagic Fisheries in Southeast Asia						X		

Overall Progress & Workplan

	2024		2025				2026	
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Output 4: The current status on conservation and management strategies of selected pelagic fishes in AMSs are identified and documented								
Activity 4: Compilation and Assessment of Management Strategies of Selected Pelagic Species								
Sub-Activity 4.1: Workshop for Developing Questionnaire on the Conservation Efforts and Management Strategies in AMSs					X			
Sub-Activity 4.2: Regional Technical Consultation (RTC) on Conservation Efforts and Management Strategies of Selected Pelagic Fisheries Resources in AMSs						X		
Sub-Activity 4.3: Workshop on the Analysis of Regional Management Strategies of Selected Pelagic Fisheries Resources in AMSs Questionnaire							X	

Overall Progress & Workplan

	2024		2025				2026	
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Output 5: Terminal report is prepared and published								
Activity 5: Compilation and publication of the terminal report								
Sub-Activity 5.1: Workshop on Compilation information for the success stories in AMSs							X	
Sub-Activity 5.2: Workshop on Compilation information for the draft of the terminal report							X	
Sub-Activity 5.3: Workshop on Harmonization of the draft of the terminal report							X	
Sub-Activity 5.4: Workshop on Finalization of terminal report								X

Overall Progress & Workplan

	2024		2025				2026	
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Output 6: Project monitoring and evaluation are conducted								
Activity 6: Project monitoring and evaluation								
Sub-Activity 6.1: Midterm Review and Evaluation Meeting				X				
Sub-Activity 6.2: Project terminal review and evaluation workshop								X

THE REGIONAL TECHNICAL CONSULTATION ON THE HARMONIZATION OF SIMPLE AND PRACTICAL INDICATORS FOR SUSTAINABLE PELAGIC FISHERIES IN SOUTHEAST ASIA
22-24 Oct 2025

OVERVIEW ON THE CURRENT STATUS OF THE REGIONAL FISHERIES INFORMATION OR MECHANISM IN THE ASEAN REGION

INTRODUCTION

The questionnaire consist of:
PART 1: Marine Capture Fisheries
PART 2: Employment in Marine Capture Fisheries
PART 3: Inland Fisheries
PART 4: Recreational Fisheries
PART 5: Import and Export
PART 6: Fisheries Product/Commodities/Supply Chain
PART 7: Additional Information

The questionnaire was:
1. Presented to AMSs during RTC that was held in 25-27 February 2025
2. Distributed to nine (9) AMSs focal points in March 2025.
3. Feedback on the questionnaire was presented by seven (7) AMS representatives (Brunei Darussalam, Cambodia, Indonesia, Malaysia, Myanmar, Thailand and Viet Nam) during the Regional Technical Consultation (RTC) on the Current Status of Regional Fisheries Information Systems/Mechanism that was held in 28-30 May 2025 at TAMU Hotel & Suites, Kuala Lumpur.

2

Fishing effort recorded in marine capture fisheries

AMS	Fishing vessel		Fishing vessel by type		Fishing gears per vessel		Each type of fishing gears for that year	
	L	U	L	U	L	U	L	U
Brunei DS	✓	✗	✓	✗	✓	✗	✓	✗
Cambodia	✓	✗	✓	✗	✓	✗	✓	✗
Indonesia	✓	✓	✓	✓	✓	✓	✓	✓
Malaysia	✓	✗	✓	✗	✓	✗	✓	✗
Myanmar	✓	✗	✓	✗	✓	✗	✓	✗
Philippines	✓	✗	✓	✗	✓	✗	✓	✗
Singapore	✓	✗	✓	✗	✓	✗	✓	✗
Thailand	✓	✓	✓	✓	✓	✓	✓	✓
Viet Nam	✓	✗	✓	✗	✓	✗	✓	✗

Note: L=licensed, U=unlicensed

All nine (9) AMSs have formal data for fishing effort for licensed fishing vessels, but lacking information for unlicensed fishing vessels except for Indonesia and Thailand

3

INTRODUCTION

Fisheries information and mechanisms encompass the processes of collecting, managing, and disseminating data about fisheries.

Collecting data and information is a crucial foundation for informed decision-making where management authorities must ensure that collected data are properly analyzed, effectively disseminated, and appropriately applied in policy and planning processes (FAO, 1997).

Questionnaire-based approach was adopted to compile information on the relevant existing fisheries information systems and mechanisms of AMSs.
-The questionnaire was designed **to gather information on existing fisheries information** systems and mechanisms across all AMSs, **identifying current practices** and **gaps that could be addressed in future initiatives**.

4

Three most dominant types of fishing vessels on pelagic fish production

AMS	Most dominant	Second dominant	Third dominant
Brunei DS	Purse Seine	Pole and Line	Drift Gill Net
Cambodia	Bottom/ midwater trawl	Gill/ drift net	Anchovy seine net
Indonesia	Purse Seine	Hook and Lines	Gillnet
Malaysia	Purse Seine	Drift Net	Trawler
Myanmar	Purse Seine	Gillnetter (Drift)	Long Line
Philippines	Tuna Purse Seine	Tuna Hand line	Ring net
Singapore	Gill netter	-	-
Thailand	Purse Seine	Gillnet	Pair trawl
Viet Nam	Purse seine	Gill net	Falling net

Purse seine is the most dominant fishing vessel in AMSs which is listed by Brunei Darussalam, Indonesia, Malaysia, Myanmar, Thailand and Vietnam. Singapore only listed gill netter as a fishing vessel on pelagic fish production.

5

Type of fishing effort recorded during fishing operation for each fishing gear

Criteria	Brunei DS	Cambodia	Indonesia	Malaysia	Myanmar	Philippines	Singapore	Thailand	Viet Nam
	Purse Seine	Bottom/midwater trawl	Purse Seine	Purse Seine	Purse Seine	Tuna Purse Seine	Gill netter	Purse Seine	Purse Seine
Trips per month	✓	✓	✓	✓	✓	* Philippines answered YES for all for commercial vessels (not the three type of fishing vessels)	N/A	✓	✓
Days per trip	✓	✓	✓	✓	✓			✓	✓
Hour per trip	✓	✓	✓	✗	✗			✓	✗
Haul per days	✗	✗	✓	✗	✗			✓	✓
Haul per hour	✗	✗	✓	✗	✗			✓	✓
Hour of fishing operation per day	✗	✗	✓	✗	✗			✓	✗
The number of traps per boat	✗	✗	✗	✗	✗			✗	✗
Trap setting	✗	✗	✗	✗	✗			✗	✗
Hour of trap submerged in the water (soaking time)	✗	✗	✗	✗	✗			✗	✗
The number of hooks	✗	✗	✗	✗	✗			✗	✗
Hook setting	✗	✗	✗	✗	✗			✗	✗

6

Location of data collection

AMS	Government fish landing port			Private fish landing port - Company			Private fish landing port - Individual		
	C	S	R	C	S	R	C	S	R
Brunei DS	✓	✓	✗	✗	✗	✗	✗	✓	✗
Cambodia	✗	✗	✗	✓	✓	✗	✓	✓	✗
Indonesia	✓	✓	✗	✓	✓	✗	✓	✓	✗
Malaysia	✓	✓	✗	✓	✓	✗	✓	✓	✓
Myanmar	✓	✓	✗	✗	✓	✗	✗	✓	✗
Philippines	✓	✓	✗	✓	✓	✗	✓	✓	✗
Singapore	✓	✗	✗	✗	✗	✗	✗	✗	✗
Thailand	✓	✓	✗	✓	✓	✗	✗	✗	✗
Viet Nam	✓	✗	✗	✗	✗	✗	✓	✓	✗

Note: C= commercial fisheries; S= small scale fisheries; R= recreational fisheries

In Indonesia, in addition to government and private fish landing ports, the data was also collected from other locations such as fish stalls. Similarly with Cambodia where the landing at individual stalls (village landing) also is recorded.

7

Source of marine landing data

AMS	Enumerator-private			Enumerator-government			Fisheries officer/personnel			Fisher's record (catch log book/ sales receipt)			Electronic catch reporting system		
	C	S	R	C	S	R	C	S	R	C	S	R	C	S	R
Brunei DS	✗	✗	✗	✓	✗	✗	✓	✓	✗	✓	✗	✗	✓	✗	✗
Cambodia	✓	✗	✗	✓	✗	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗
Indonesia	✓	✓	✗	✓	✓	✗	✓	✓	✗	✓	✓	✗	✓	✓	✗
Malaysia	✗	✗	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Myanmar	✗	✗	✗	✓	✓	✗	✓	✗	✗	✓	✓	✗	✗	✗	✗
Philippines	✗	✗	✗	✓	✓	✗	✓	✓	✗	✓	✓	✗	✗	✗	✗
Singapore	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
Thailand	✓	✓	✗	✓	✓	✗	✗	✗	✗	✓	✓	✗	✓	✓	✗
Viet Nam	✓	✓	✗	✓	✗	✗	✗	✗	✗	✓	✗	✗	✓	✗	✗

Note: C= commercial fisheries; S= small scale fisheries; R= recreational fisheries

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Method of data collection

AMS	From all landing			Subsampling (e.g. Stratified Random Sampling)		
	C	S	R	C	S	R
Brunei DS	✓	✗	✗	✗	✓	✗
Cambodia	✗	✗	✗	✓	✓	✗
Indonesia	✓	✓	✗	✓	✓	✗
Malaysia	✓	✗	✗	✓	✓	✓
Myanmar	✓	✓	✗	✓	✗	✗
Philippines	✗	✗	✗	✓	✓	✗
Singapore	✓	N/A	✗	✗	N/A	✗
Thailand	✓	✓	✗	✓	✓	✗
Viet Nam	✗	✗	✗	✓	✓	✗

Note: C= commercial fisheries; S= small scale fisheries; R= recreational fisheries; N/A= Not Available

Type of landing data recorded

AMS	Species name			Genus name			Local name			English/common name			Fish group			Category		
	C	S	R	C	S	R	C	S	R	C	S	R	C	S	R	C	S	R
Brunei DS	✓	✓	✗	✓	✓	✗	✓	✓	✗	✓	✓	✗	✓	✓	✗	✓	✓	✗
Cambodia	✗	✗	✗	✓	✓	✗	✓	✓	✗	✓	✓	✗	✓	✓	✗	✓	✓	✗
Indonesia	✓	✓	✗	✓	✓	✗	✓	✓	✗	✓	✓	✗	✓	✓	✗	✓	✓	✗
Malaysia	✗	✗	✗	✗	✗	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Myanmar	✓	✓	✗	✗	✗	✗	✓	✓	✗	✓	✓	✗	✓	✗	✗	✓	✗	✗
Philippines	✓	✓	✗	✓	✓	✗	✓	✓	✗	✓	✓	✗	✓	✓	✗	✗	✗	✗
Singapore	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗
Thailand	✓	✓	✗	✗	✗	✗	✓	✓	✗	✗	✗	✗	✓	✓	✗	✓	✓	✗
Viet Nam	✗	✗	✗	✗	✗	✗	✓	✓	✗	✗	✗	✗	✓	✓	✗	✓	✓	✗

Note: C= commercial fisheries; S= small scale fisheries; R= recreational fisheries; N/A= Not Available

Brunei Darussalam, Indonesia, Myanmar, Philippines and Thailand recorded the landing up to species name

The frequency of landing data recording

AMS	Daily			Weekly			Monthly			Annually			Occasionally		
	C	S	R	C	S	R	C	S	R	C	S	R	C	S	R
Brunei DS	✓	✓	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗
Cambodia	✗	✗	✗	✓	✗	✗	✓	✓	✗	✓	✗	✗	✓	✗	✗
Indonesia	✓	✓	✗	✓	✓	✗	✓	✓	✗	✓	✓	✗	✓	✓	✗
Malaysia	✗	✗	✗	✗	✗	✗	✓	✓	✓	✓	✓	✗	✗	✗	✗
Myanmar	✓	✓	✗	✗	✗	✗	✓	✗	✗	✓	✗	✗	✓	✗	✗
Philippines	✓	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
Singapore	✗	✗	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗
Thailand	✓	✓	✗	✓	✓	✗	✓	✓	✗	✓	✓	✗	✗	✗	✗
Viet Nam	✗	✗	✗	✗	✗	✗	✓	✓	✗	✗	✗	✗	✓	✓	✗

Note: C= commercial fisheries; S= small scale fisheries; R= recreational fisheries

Collection of landing data

AMS	Fishing gear			Fishing vessels size (GRT/GT/length)			Fishing area		
	C	S	R	C	S	R	C	S	R
Brunei DS	✓	✓	✗	✓	✗	✗	✓	✗	✗
Cambodia	✓	✓	✗	✓	✓	✗	✓	✓	✗
Indonesia	✓	✓	✗	✓	✓	✗	✓	✓	✗
Malaysia	✓	✓	✓	✓	✓	✓	✓	✓	✓
Myanmar	✓	✓	✗	✓	✓	✗	✓	✓	✗
Philippines	✓	✓	✗	✓	✓	✗	✓	✓	✗
Singapore	✗	✗	✗	✗	✗	✗	✗	✗	✗
Thailand	✓	✓	✗	✓	✓	✗	✗	✗	✗
Viet Nam	✓	✓	✗	✓	✗	✗	✓	✗	✗

Note: C= commercial fisheries; S= small scale fisheries; R= recreational fisheries

Singapore's seafood production from local capture fisheries makes up a small quantity; hence there is no breakdown available.

Recording of landing data by size

AMS	Length			Weight			Grade of size (e.g., small, medium, large)		
	C	S	R	C	S	R	C	S	R
Brunei DS	✓	✓	✗	✓	✓	✗	✓	✓	✗
Cambodia	✗	✗	✗	✗	✗	✗	✓	✓	✗
Indonesia	✓	✓	✗	✓	✓	✗	✓	✓	✗
Malaysia	✓	✓	✓	✓	✓	✓	✓	✓	✓
Myanmar	✓	✗	✗	✓	✗	✗	✗	✗	✗
Philippines	✓	✓	✗	✓	✓	✗	✗	✗	✗
Singapore	✗	✗	✗	✗	✗	✗	✗	✗	✗
Thailand	✗	✗	✗	✓	✓	✗	✗	✗	✗
Viet Nam	✓	✓	✗	✓	✓	✗	✗	✗	✗

Note: C= commercial fisheries; S= small scale fisheries; R= recreational fisheries

Length data is obtained only through research activities (Malaysia and Myanmar), and size grading is limited to certain species.
Brunei Darussalam and Indonesia collect length and weight data for both commercial and small-scale fisheries through random sampling.
Vietnam stated that length and weight data is species-specific and project-dependent.

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The landing of fish by category

AMS	Commercial fish			Trash fish		
	C	S	R	C	S	R
Brunei DS	✓	✓	✗	✓	✗	✗
Cambodia	✓	✓	✗	✓	✓	✗
Indonesia	✓	✓	✗	✓	✓	✗
Malaysia	✓	✓	✓	✓	✓	✓
Myanmar	✓	✓	✗	✓	✗	✗
Philippines	✓	✓	✗	✗	✗	✗
Singapore	✓	✗	✗	✓	✗	✗
Thailand	✓	✓	✗	✓	✓	✗
Viet Nam	✓	✓	✗	✓	✓	✗

Note: C= commercial fisheries; S= small scale fisheries; R= recreational fisheries

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The type of data recorded for employment status

AMS	Fishing gear			Fishing vessels (by size)			Fishing zone/area			Gender			Age		
	N	I	U	N	I	U	N	I	U	N	I	U	N	I	U
Brunei DS	✓	✓	✗	✗	✓	✗	✗	✓	✗	✓	✓	✗	✓	✓	✗
Cambodia	✓	✗	✗	✓	✗	✗	✓	✗	✗	✓	✗	✗	✓	✗	✗
Indonesia	✓	✗	✗	✓	✗	✗	✓	✗	✗	✓	✗	✗	✓	✗	✗
Malaysia	✓	✓	✗	✓	✓	✗	✓	✗	✗	✓	✗	✗	✓	✗	✗
Myanmar	✓	✓	✗	✓	✓	✗	✓	✓	✗	✓	✓	✗	✓	✓	✗
Philippines	✓	✗	✗	✓	✗	✗	✓	✗	✗	✓	✗	✗	✓	✗	✗
Singapore	✓	✗	✗	✓	✗	✗	✓	✗	✗	✓	✗	✗	✓	✗	✗
Thailand	✓	✓	✗	✓	✓	✗	✓	✓	✗	✓	✓	✗	✓	✓	✗
Viet Nam	✓	✗	✗	✓	✗	✗	✓	✗	✗	✓	✗	✗	✓	✗	✗

AMS	Ethnicity			Marital status			Employment status			Fisher category			Ownership status		
	N	I	U	N	I	U	N	I	U	N	I	U	N	I	U
Brunei DS	✓	✓	✗	✓	✓	✗	✓	✓	✗	✓	✓	✗		✓	✗
Cambodia	✗	✗	✗	✗	✗	✗	✓	✗	✗	✓	✗	✗		✗	✗
Indonesia	✗	✗	✗	✓	✗	✗	✓	✗	✗	✓	✗	✗		✗	✗
Malaysia	✓	✓	✗	✗	✗	✗	✓	✓	✗	✓	✓	✗		✓	✗
Myanmar	✗	✗	✗	✗	✗	✗	✓	✓	✗	✗	✗	✗		✗	✗
Philippines	✓	✗	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗		✗	✗
Singapore	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓	✗	✗		✗	✗
Thailand	✓	✓	✗	✗	✗	✗	✓	✓	✗	✓	✓	✗		✓	✗
Viet Nam	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗		✗	✗

Note: N= National, I=Foreign, U=Unspecified

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Number of personnel according to fisheries section

AMS	Onboard (crew)			Fishing port			Fish processing facility		
	N	I	U	N	I	U	N	I	U
Brunei DS	✓	✓	✗	✗	✓	✗	✓	✓	✗
Cambodia	✓	✗	✗	✓	✗	✗	✓	✗	✗
Indonesia	✓	✗	✗	✓	✗	✗	✓	✗	✗
Malaysia	✓	✓	✗	✓	✓	✗	✓	✓	✗
Myanmar	✓	✓	✗	✓	✗	✗	✓	✗	✗
Philippines	✓	✗	✗	✗	✗	✗	✗	✗	✗
Singapore	✓	✗	✗	✗	✗	✗	✗	✗	✗
Thailand	✓	✓	✗	✗	✗	✗	✗	✗	✗
Viet Nam	✓	✗	✗	✗	✗	✗	✗	✗	✗

Note: N= National, I=Foreign, U=Unspecified

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Additional information

Criteria		Brunei DS	Cambodia	Indonesia	Malaysia	Myanmar	Philippines	Singapore	Thailand	Viet Nam
State presenting the Catch Per Unit Effort (CPUE) of the landing		✓	✓	✓	✗	✓	✓	N/A	✓	✓
State calculates the economic value of the fish resources		✓	✓	✗	✓	✓	✓		✓	✓
State recorded the amount of bycatch landed		✗	✓	✗	✓	✓	✓		✓	✓
The state recorded the amount of 'discard'.		✗	✓	✗	✗	✗	✗		✗	✗
If Yes, please mention the method of data collection		✗	FCMAS/ Logbook	✗	✗	✗	✗		✗	✗
State recorded the environmental data	pH	✓	✗	✗	✓	✗	✗		✓	✓
	Salinity (PSU)	✓	✗	✗	✓	✗	✗		✓	✓
	Temperature (°C)	✓	✗	✗	✓	✓	✗		✓	✓
	Type of sediment	✗	✗	✗	✓	✓	✗		✓	✓
	Depth (m)	✗	✗	✗	✓	✓	✗		✓	✓
	Conductivity (µS/cm)	✗	✗	✗	✓	✗	✗		✓	✓
	Total dissolved solids (mg/L)	✗	✗	✗	✓	✗	✗		✗	✓
	Total dissolved oxygen (mg/L)	✓	✗	✗	✓	✗	✗		✓	✓
	Water current	✗	✗	✗	✓	✓	✗		✓	✓
	Wind speed	✗	✗	✗	✓	✓	✗		✗	✓
	Climate change related data	✗	✗	✗	✓	✓	✗		✓	N/A
State recorded the supply chain of the landings (e.g., main producer to the consumer)		✓	✗	X	✗	✓	✗		✓	✗
State recorded the distribution of the fish by life stages (e.g., larva, juvenile, adult)		✗	✗	✗	✗	✓	✗		✓	✓

Inland fisheries

Criteria		Brunei DS	Cambodia	Indonesia	Malaysia	Myanmar	Philippines	Singapore	Thailand	Viet Nam
State recorded the landing from inland fisheries		✗	✓	✓	✓	✓	✗	N/A	✓	✗
State recorded the landing by	Species name	✗	✓	✓	✗	✓	✗		✗	✗
	Local name	✗	✓	✓	✓	✓	✗		✓	✗
	English name/common name	✗	✓	✓	✓	✓	✗		✗	✗
	Water bodies (e.g.: Rivers, lakes, dams)	✗	✓	✓	✓	✓	✗		✓	✗
	Fishing vessels	✗	✓	✓	✗	✓	✗		✗	✗
	Fishing gears	✗	✓	✓	✗	✓	✗		✓ (Gillnet, fish trap, harpoon)	✗
State recorded the values of landings by species based on	Wholesale price	✗	✓	✓	✓	✗	✗		✓	✗
	Retail price	✗	✓	✗	✓	✗	✗		✓	✗
State recorded the number of fishers involved in inland fisheries		✗	✓	✓	✓	✓	✓		✓	✗

Recreational fisheries

Criteria		Brunei DS		Cambodia		Indonesia		Malaysia		Myanmar		Philippines		Singapore		Thailand		Viet Nam	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
State recorded the number of recreational fishers		✓	✗	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗		✗
State recorded the catch from recreational fishers		✗	✗	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗		✗
If yes, state recorded the catch by	Area	✗	✗	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗		✗
	Water bodies	✗	✗	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗		✗
	Fishing gear	✓	✗	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗		✗
	Species name	✗	✗	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗		✗
	Genus name	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗		✗
	Local name	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗		✗
	Common name/English name	✗	✗	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗		✗

Note: M= Marine; F= Freshwater

Import and export of fishery commodities in AMSs

Criteria		Brunei DS		Cambodia		Indonesia		Malaysia		Myanmar		Philippines		Singapore		Thailand		Viet Nam	
		M	X	M	X	M	X	M	X	M	X	M	X	M	X	M	X	M	X
State recorded the total value of fishery commodities that has been exported/imported		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	N/A		✓		✓	✓
State recorded the export/import commodities by	Country	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓		✓	✓
	Region	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓		✗	✗
	Resource composition (e.g., live, frozen, chilled.)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓		✓	✓
	Values	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓		✓	✓
State recorded the method of transportation		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓		✓	✓

Note: M= Import; X= Export

Fisheries product/ commodity/ supply chain

Criteria		Brunei DS	Cambodia	Indonesia	Malaysia	Myanmar	Philippines	Thailand	Viet Nam
State recorded the utilization of the landing		✓	✓	✓	✓	✓	✓	✓	✗
If yes, state recorded the utilization/product (fish, squid, crustaceans, shrimps, prawns and other aquatic invertebrates:	Live	✗	✗	✓	✓	✓	✓	✗	✗
	Fresh	✓	✓	✓	✓	✓	✓	✓	✗
	Frozen-whole	✓	✓	✓	✓	✓	✗	✓	✗
	Chilled- whole	✓	✓	✓	✓	✓	✓	✓	✗
	Frozen-fillet	✓	✓	✓	✗	✓	✗	✓	✗
	Chilled- fillet	✓	✓	✓	✗	✓	✗	✓	✗
	Processes as fish meal for non-human consumption	✗	✓	✓	✗	✓	✗	✓	✗
	Processes as fish oil	✗	✗	✓	✗	✓	✗	✗	✗
	Processes as liver oil	✗	✗	✓	✗	✓	✗	✗	✗
	Prepared/preserved	✓	✓	✓	✗	✓	✗	✓	✗
	Salted	✓	✓	✓	✗	✓	✗	✓	✗
	Dried	✓	✓	✓	✗	✓	✗	✓	✗
	Other, specify:	✗	✗	✓	✗	✓	✗	✓	✗

Fisheries product/ commodity/ supply chain

Criteria		Brunei DS	Cambodia	Indonesia	Malaysia	Myanmar	Philippines	Thailand	Viet Nam
Other commodities (marine and freshwater) of the state also include:	Seaweed	✗	✗	✓	✗	✓	✓	✓	✗
	Ornamental Fish	✓	✗	✓	✓	✓	✗	✓	✗
	Aquatic plants	✓	✗	✓	✓	✗	✗	✗	✗
State recorded the product was marketed/distributed nationally based on	Location	✓	✓	✓	✗	✓	✓	✓	✗
	Volume	✓	✓	✓	✗	✓	✓	✓	✗

Fisheries information systems/ mechanisms in AMSs

Criteria	Brunei DS	Cambodia	Indonesia	Malaysia	Myanmar	Philippines	Singapore	Thailand	Viet Nam
State has fisheries statistics and information system	✓	✓	✓	✓	✓	✓	✗	✓	
State has centralized information systems	✓	✓	✓	✓	✓	✗	✗	✓	
State has systematic fish landing data collection nationally	✓	✓	✓	✓	✓	✓	✓	✓	
State has collaboration between fishers and government personnel in data collection process	✗	✓	✓	✓	✓	✗	✓	✓	
State develops systematic analysis of landing data	✗	✓	✓	✓	✓	✓	✗	✓	
State publicly shares the information on the landing data	✗	✗	✓	✓	✓	✓	✗	✓	

Fisheries information systems/ mechanisms in AMSs

Criteria	Brunei DS	Cambodia	Indonesia	Malaysia	Myanmar	Philippines	Singapore	Thailand	Viet Nam
Fisheries statistical database/website are easily access by the public	✗	✗	✓	✓	✓	✓	✗	✓	
State has mechanisms for sharing data with regional and international bodies	✓	✓	✓	✓	✓	✓	✓	✓	
State ensures the system is compatible with other regional or global fisheries databases, ensuring smooth data exchange	✓	✗	✗	✓	✗	✗	✗	✓	
State share stock status of the resources with regional and international bodies	✓	✓	✓	✗	✓	✓	✗	✓	

CONCLUSION

MARINE CAPTURE FISHERIES

Fishing Effort & Vessel Characteristics: Most AMSs have comprehensive data on fishing effort for licensed vessels but lack data on unlicensed ones. Data on vessel characteristics for commercial vessels is generally well-documented, while information for small-scale vessels is limited.

Landing Data: Landings are typically recorded by fishing gear, vessel size, fishing area, and species name or local names. Data collection occurs mainly at government landing ports, with some AMSs also using private ports or village stalls. Subsampling is a common method.

Data by Size and Fish Categories: Length, weight, and size grade data are collected inconsistently, often species-dependent. Most AMSs record commercial fish landings; trash fish data is more limited.

Employment: Information on national fishers is widely available (categorized by gear, vessel, zone, gender, and age). Data on foreign fishers is scarce, available in only a few

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CONCLUSION

ADDITIONAL DATA

CPUE & MSY: All AMSs except Malaysia report Catch Per Unit Effort (CPUE), with Thailand using it to estimate Maximum Sustainable Yield (MSY).

Environmental Data: Only a few AMSs, such as Thailand and Vietnam, collect detailed environmental data. Environmental data was collected mostly through research activities and by other agencies such as the Department of Environment.

Bycatch & Discards: Bycatch data is collected by most AMSs however discard data is more limited.

Supply Chain & Life Stage Data: Supply chain information is recorded in several AMSs, and data on fish life stages is available in Myanmar, Thailand, and Vietnam which mostly from research activity.

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CONCLUSION

INLAND AND RECREATIONAL FISHERIES

Inland Fisheries: Data is available in Cambodia, Indonesia, Myanmar, Malaysia, and Thailand. Landing data is recorded by species or local name, with varying coverage of vessel and gear types.

Recreational Fisheries: Data is limited; only Malaysia and Brunei Darussalam provide some level of information.

TRADE AND VALUE CHAIN

Imports & Exports: All AMSs except Singapore have detailed trade information. Thailand has a robust digital traceability system, integrating customs and fisheries data.

Fishery Products & Commodities: All AMSs except Vietnam have comprehensive records of fishery products, including live, fresh, salted, and ornamental products, along with supply chain distribution.

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CONCLUSION

INFORMATION SYSTEMS AND DATA SHARING

System Availability: All AMSs except Singapore have fisheries statistics systems. Systems are centralized, except in Philippines and Singapore.

Public Access: Data is publicly available in some AMSs, like Indonesia and Thailand, while others like Brunei Darussalam and Cambodia require requests.

Regional/Global Compatibility: Only Brunei Darussalam and Thailand report system compatibility with regional/global databases. Most AMSs share stock status data with organizations such as SEAFDEC and FAO.

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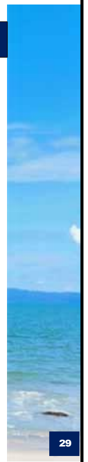
RECOMMENDATION

Expand Data Coverage to Include Small-Scale, Inland, and Recreational Fisheries
-Develop standardized data collection frameworks for small-scale and inland fisheries, including unlicensed vessels and informal sectors.

Improve Collection and Integration of Environmental and Ecosystem Data
-Integrate environmental indicators (e.g., water quality, habitat status) into national fisheries information systems.
-Promote collaboration between fisheries agencies and environmental departments to ensure consistent data sharing.

Standardize Reporting on Bycatch, Discards, and Fish Life Stages
-Develop regional protocols to systematically collect data on bycatch and discards, including species composition and volume.

Strengthen Public Accessibility and Transparency
-Promote the public dissemination of fisheries statistics through national portals or dashboards and encourage regular publication of fisheries reports in user-friendly formats to engage policymakers, researchers, and the public.



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THE REGIONAL TECHNICAL CONSULTATION ON THE HARMONIZATION OF SIMPLE AND PRACTICAL INDICATORS FOR SUSTAINABLE PELAGIC FISHERIES IN SOUTHEAST ASIA

22-24 Oct 2025

Rumeaida Mat Piah, Faculty of Fisheries and Aquaculture Sciences, Universiti Malaysia Terengganu

PART 1: INTRODUCTION TO SIMPLE AND PRACTICAL INDICATORS FOR SUSTAINABLE PELAGIC FISHERIES

INTRODUCTION

INDICATOR:
Definition: Indicator is a performance-based variable, measure or index that quantify, summarize and simplify information on complex issues. Indicator provides information on the condition and status of fisheries and fisheries resources.

USE OF INDICATOR:
The purpose of an indicator is to enhance communication, transparency, effectiveness and accountability in fisheries management.

For effective implementation of fisheries management, indicators could be used in all management process: Planning, Communication, Monitoring and Evaluation.

Performance indicators measure the **effectiveness of fishery management** actions implemented to meet policy objectives.

INTRODUCTION

Identification of policy and management objectives → Identification of relative reference points → Identification of performance indicators → Identification of variables for estimation

Choice of indicator
Choice of data variables-
[logistics and costs)

- the operational characteristics of the fishery
- the total number of variables which can realistically be collected
- the number of indicators which a variable can be used for;
- how often the data needs to be collected; (or the variable needs to be sampled)
- the expected data quality and quantity that can be obtained;
- issues of standardization.

The indicators should be **simple**, **easily understood** and **scientifically valid** to act as a communication tool among stakeholders and other interested parties.

INTRODUCTION

Simple and practical indicators for **sustainable pelagic fisheries** are measurable and easy-to-use tools that help assess the health and sustainability of fisheries targeting species like sardines, mackerel, tuna, and anchovies.

Ecological (Biological) Indicators
-These focus on the health of fish populations and ecosystems.
-Can be used to monitor the state of exploitation of the fishery, but are inadequate to assess the performance of the fisheries sector as a whole.

Social Indicators
-These assess how fisheries affect people and communities.
-take into account the diversity of needs and practices of different groups of people within the fisheries sector. .

Economic Indicators
-These reflect the viability of the fishing industry
- measure the relative importance of the fishery to the nation or region at the macro- or micro-economic level.

Governance and Compliance Indicators
- needed to monitor the effectiveness of management measures and reduce conflict.

Fisheries assessments should always combine biological, economic, socio-cultural and compliance indicators to guide management decisions

SIMPLE AND PRACTICAL INDICATORS

ECOLOGICAL (BIOLOGICAL) INDICATORS

Catch Per Unit Effort (CPUE)
What it shows: Abundance trends of target species.
Why it matters: Declining CPUE suggests overfishing or stock decline.

Spawning Stock Biomass (SSB)
What it shows: Reproductive capacity of the stock.
Why it matters: Low SSB indicates risk of stock collapse.

Size or Age Structure of Catch
What it shows: Health and resilience of population.
Why it matters: Lack of older/larger fish may indicate overfishing.

Bycatch Rate
What it shows: Impact on non-target species.
Why it matters: High bycatch affects ecosystem balance.

Fishing Mortality Rate (F)
What it shows: Pressure on fish stock from fishing.

ECONOMIC INDICATORS

Profitability (Revenue vs Costs)
Simple version: Are fishers making a living?
Why it matters: Unsustainable fisheries often become economically unviable.

Catch Value per Unit Effort
What it shows: Economic return relative to effort.
Why it matters: Can reveal declining resource value.

Market Stability or Price Trends
What it shows: Supply-demand balance and market health.
Why it matters: Stable prices can support long-term viability.

SIMPLE AND PRACTICAL INDICATORS

SOCIAL INDICATORS

Employment in Fishing Sector
What it shows: Job creation and community reliance.
Why it matters: Loss of jobs may indicate decline or inequity.

Stakeholder Participation in Management
What it shows: Co-management and compliance likelihood.
Why it matters: Inclusive governance supports sustainability.

Access to Resources
What it shows: Fair distribution of fishing rights.
Why it matters: Equity is key for long-term success.

GOVERNANCE AND COMPLIANCE INDICATORS

Existence of Catch Limits or Quotas
What it shows: Whether basic controls are in place.
Why it matters: Essential for managing effort and preventing overfishing.

Enforcement Effectiveness
Simple version: Are rules being followed?
Why it matters: Without enforcement, rules are meaningless.

Monitoring Coverage
What it shows: Quality of data and oversight.
Why it matters: Monitoring is crucial for informed decisions.

CASE STUDIES

CASE STUDY 1: STOCK ASSESSMENT AND SUSTAINABLE POTENTIAL OF SKIPJACK TUNA (*Katsuwonus pelamis*) IN SIBOLGA WATERS FOR OPTIMIZED FISHING PRACTICES (Limbong et al., 2025)

Indicators used: CPUE (Catch per Unit Effort), MSY (Maximum Sustainable Yield), and Total Allowable Catch (TAC)

What they found: The CPUE rose from ~0.639 tons/trip in 2018 → 0.764 in 2019 → dropped in 2020-2021, then bounced back in 2022.

Assessment: The Schaefer surplus production model was used to estimate MSY, and results indicated that fishing effort was exceeding sustainable thresholds—i.e. the fishery was fully exploited, tending towards overfishing.

Management implication: Set TACs, regulate effort, adjust gear, etc.

CASE STUDIES

CASE STUDY 2: INSTITUTE FOR EUROPEAN ENVIRONMENTAL POLICY (IEEP) – DANISH PELAGIC FISHERIES IN THE NORTH SEA

Indicator methods used:
Socio-economic “state” indicators: such as fleet capacity, employment in the fishery, value of landings, changes in product mix.

Why it is “simple & practical”:
The indicators are based on routinely collected data (landings, fleet stats, employment data) rather than full ecosystem modelling.
They enable comparisons over time and between fleets to evaluate policy outcomes.

Limitations:
These indicators don’t directly measure stock abundance or ecosystem health; they are proxies.
They rely on basic data being available and accurate; in many pelagic contexts data may be sparse.

CASE STUDIES

CASE STUDY 3: TRADITIONAL PURSE SEINE SMALL PELAGIC FISHERY - LIKUPANG VILLAGE, NORTH SULAWESI, INDONESIA (Pratasik et el., 2020)

Indicator methods used:
Size composition of catches (length frequency).
Proportion of immature fish in catches (size at first maturity vs caught size).

Why this is simple & practical:
Measuring fish length and checking maturity is a relatively low-cost monitoring approach compared with full stock assessments.
The metric (e.g., high share of immature fish) is directly interpretable—indicating risk of over-exploitation of the recruitment.
This type of indicator can be applied regularly (e.g., monthly sampling) and give early warning signs.

Key take-aways / insights:
The study found a wide size range and a high catch of small (immature) individuals of *Decapterus macrosoma*, which suggests risk of stock depletion. Based on indicators they recommended mesh-size adjustment of purse seines to reduce catch of small immature fish.

Limitations / caveats:
Length/maturity data may still require fish sampling and trained personnel
The indicator depends on consistent sampling design (time, gear, location) to allow trend detection.

CASE STUDIES

CASE STUDY 4: INDIAN MACKEREL FISHERY, PENINSULAR MALAYSIA (Ismail et al., 2022)

Indicators: This case used system dynamics modelling to capture multiple indicators: fishing effort, stock dynamics, revenue, possibly size structure, and catches.

Findings: The model showed that current practices would lead to declining stock levels and reduced sustainability if effort and certain policies aren’t adjusted. The system dynamics allowed exploring “what-if” scenarios (e.g. reducing effort, changing management).

Implications: Provides a tool for managers to assess thresholds (e.g. maximum acceptable fishing effort), foresee stock depletion, and helps plan policies (e.g. limiting number of boats, modifying season, etc.)

CASE STUDIES

CASE STUDY 5: EAST COAST MALAYSIA (EXAMPLE ACOUSTIC + BIOLOGICAL SAMPLING) — MALAYSIA (SMALL PELAGIC BIOMASS MAPPING) (Hashim et al., 2017)

Simple indicators used: acoustic backscatter / biomass estimates (t/km^2) paired with trawl/midwater catches to ground-truth species composition; spatial density maps as an indicator of relative abundance.

What it showed: split-beam acoustic surveys produced spatially explicit density/biomass estimates for small pelagic species (e.g., Decapterus, Selar, Megalaspis), useful as a monitoring indicator of stock distribution and relative abundance.

Data required & practicality: requires an echosounder survey + occasional trawl/target sampling for species ID. More resource-intensive than simple length sampling, but provides fast, spatially extensive indicators that are highly informative for pelagic shoaling species. Training and calibration essential.

Implementation notes: full acoustic surveys are too costly, consider periodic (multi-year) acoustic “snapshots” or collaborate with regional agencies/SEAFDEC training to build capacity. (SEAFDEC)

CASE STUDIES

CASE STUDY 6. INDIAN PELAGIC / TUNA FISHERIES (COASTAL & OCEANIC TUNA) — INDIA / INDIAN OCEAN-Nisar et al., 2021

Simple indicators used: standardized CPUE (catch per unit effort) time-series and simple data-limited stock indicators (CMSY/BSM, catch-based proxies).

What it showed: CPUE and catch-based approaches have been successfully used as practical indicators to provide stock-status signals for several tuna species where full assessments are unavailable; these indicators can support management advice in data-limited pelagic fisheries.

Data required & practicality: vessel logbook data (catch by species, effort e.g., hooks-hours, trips) — many industrial/tuna fleets already keep these; standardization (season, area, gear) is important. Highly practical for fleets with logbooks or observer programs.

Implementation notes: standardize CPUE (GLM or simple stratification), track trends and define pragmatic thresholds (e.g., sustained CPUE decline of X% over Y years triggers management review). Combine with size data where possible.

CASE STUDIES

CASE STUDY 7. TAWI-TAWI / MANILA BAY REGION, PHILIPPINES (RING-NET / SMALL-PELAGIC FISHERIES) (Aripin & Shower, 2000)

Simple indicators used: length-frequency series, growth & mortality parameter estimates from routine landing samples (used to compute exploitation rate E and trends).

What it showed: length-frequency monitoring provided estimates of growth (L_∞, K) and exploitation patterns for Sardinella and other small pelagics — information useful to indicate changing exploitation and to trigger management attention.

Data required & practicality: regular landing samples (lengths by species) and basic length-based analyses (e.g., ELEFAN, routine L-F stats). Practical for fisheries where ringnet/purse seine landings are accessible

Implementation notes: combine with simple CPUE proxies when possible (catch per trip or catch per net) to better interpret abundance vs size-structure changes.

CASE STUDIES

CASE STUDY 8. YORON ISLAND, KAGOSHIMA PREFECTURE — LOCAL SUSTAINABILITY INDICATORS

Context: A study on Yoron Island (southern Japan) developed locally relevant sustainability indicators for small-scale coastal fisheries, engaging fishers and community members in indicator selection to ensure practicality and acceptance.

Key Indicators Used:
- Security level (livelihood stability of fishers)
- Fishing management indicator (presence of management rules and compliance)
- Succession rate (number of younger generation entering the fishery)

Findings:
The indicators reflected social sustainability aspects, not just catch or biological data.
Stakeholders identified succession rate as central to long-term fishery resilience.
The participatory process made the indicators more meaningful and applicable for local management.

Practical Lessons: Indicators can be simple (e.g., number of young fishers, rule compliance) yet meaningful. Participatory development increases adoption by local communities.

Reference: Makino, M., Matsuda, H., & Sakurai, Y. (2005). Developing a local sustainability index for fisheries: A study from Yoron Island, Kagoshima, Japan. Marine Policy, 29(1), 9–23. https://doi.org/10.1016/j.marpol.2004.02.001

CASE STUDIES

CASE STUDY 9. SHIRETOKO WORLD NATURAL HERITAGE AREA, HOKKAIDO — ECOSYSTEM-BASED FISHERIES INDICATORS

Context: The Shiretoko area in northern Hokkaido adopted a co-management approach integrating fisheries and ecosystem conservation, under Japan's first World Natural Heritage site management plan.

Key Indicators Used:
- Ecological indicators: species abundance, sea-ice presence, ecosystem health status.
- Social indicators: number of active fishers, human resource capacity, local governance strength.
- Management indicators: level of compliance with community-based rules

Findings: A combination of simple ecological (species presence) and social (number of trained fishers) indicators effectively linked ecosystem and fisheries management.The approach demonstrated that local knowledge can complement scientific monitoring

Practical Lessons:Select a small, mixed set of indicators: biological + social + institutional.Indicators should be simple, measurable, and meaningful to both managers and fishers.

Reference: Makino, M., & Matsuda, H. (2011). Co-management in the Shiretoko World Natural Heritage Area: Linking ecosystem and community-based management. Marine Policy, 35(3), 449–458. https://doi.org/10.1016/j.marpol.2010.11.018
Makino, M. (2011). Marine Ecosystem-based Management in Japan: Institutional Linkages among Coastal and Fisheries Management. Tokyo: Fisheries Agency of Japan / Shiretoko Data Center. https://shiretokodata-center.env.go.jp/data/research/paper/Makino%20%26%20Matsuda%20(2011).pdf

CASE STUDIES

CASE STUDY 10.KYOTO PREFECTURE COASTAL AREA (SEA OF JAPAN) — ECOSYSTEM SHIFTS AND FISHERIES INDICATORS

Context: Researchers examined ecosystem and fisheries indicators to evaluate regime shifts (from cold to warm periods) and their impacts on coastal fisheries in Kyoto Prefecture, using Ecopath modelling and catch data.

Key Indicators Used:
- Catch trend indicators: total catch and species composition by year.
- Ecosystem indicators: trophic structure, fishing impact on ecosystem functioning.
- Environmental indicators: sea surface temperature (proxy for regime change).

Findings:
Simple catch and species composition indicators clearly showed shifts in dominant species (e.g., sardine decline, mackerel increase).Ecosystem-level indicators provided additional context on functional changes in the system.

Practical Lessons: Even without complex modelling, monitoring catch trends and species composition provides early warnings of ecological shifts.These indicators can be maintained using existing fisheries logbooks and port data.

Reference: Wada, T., Masuda, R., Shida, O., Yamashita, N., & Yamamura, O. (2023). Impacts of regime shifts on the coastal fisheries ecosystem in the Sea of Japan: A comparison of ecosystem indicators derived from Ecopath models. Fisheries Science, 89(4), 455–472. https://doi.org/10.1007/s12562-023-01691-9

KEY LESSONS FOR PRACTICAL IMPLEMENTATION IN PELAGIC CONTEXT

Opt for indicators requiring **minimal data** but still meaningful: For many pelagic fisheries data is limited, so indicators like length-frequency, interaction rates, or basic socio-economic stats are valuable. Use **readily available data**: e.g., catch statistics, fleet numbers, age of entrants, number of fishers.

Ensure **repeatability & trend detection**: Simple indicators are most useful when they are applied regularly and consistently (same gear, same seasonal window) so trends become detectable. Monitor over time: A single snapshot is less useful—trends matter.

Link indicator to management action: The indicator must lead to some kind of response (gear change, area/season closure, monitoring increase) to be valuable. Indicators are most useful when they trigger actions (e.g., if succession rate drops below threshold, then training program introduced).

Complement with other data where possible: While simple indicators are helpful, combining them with environmental data (oceanography) or stock surveys strengthens interpretation (e.g., how physical processes affect pelagic stocks).

KEY LESSONS FOR PRACTICAL IMPLEMENTATION IN PELAGIC CONTEXT

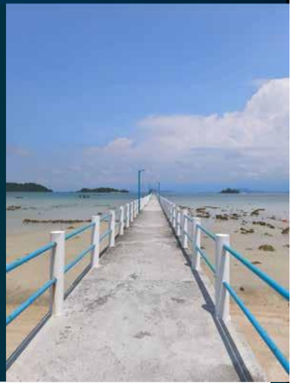
Be **realistic** about what the indicator implies. Choose a small set of indicators (3-6) that span ecological, fisheries, and social/human dimensions. This ensures manageability

Tailor to the pelagic domain: Pelagic fisheries often operate at broader scales (open-ocean, high mobility, mixed species). Indicators need to consider that (gear-independent, broad spatial coverage, less discrete habitats).

Data quality & fishers' engagement matter: Many simple indicators depend on logbook accuracy, observer data, or fishers' cooperation. Building trust and transparency helps. Some fisheries may not have detailed species breakdowns or ecological surveys, so indicator choice must reflect data reality.

Use **visualization & thresholds**: Simple indicators work best when thresholds are defined (e.g., > 30% immature fish triggers review) or when trends are visualized clearly for managers/fishers.

Thank You



DEPARTMENT OF FISHERIES

Simple and Practical Indicators for the Sustainable Management of Pelagic Fisheries in Brunei Darussalam

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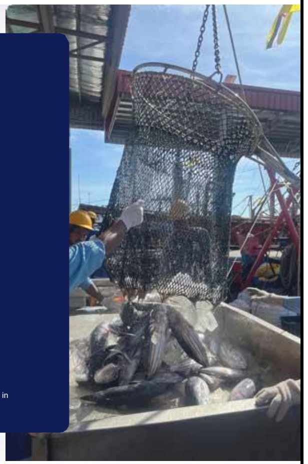
Department of Fisheries

22 October 2025

Regional Technical Consultation on the Harmonization of Simple and Practical Indicators for Sustainable Pelagic Fisheries in Southeast Asia
22-24 Oct 2025 I Subang, Malaysia



PELAGIC FISHERIES IN BRUNEI DARUSSALAM

Pelagic Fisheries Operators

Pelagic fisheries in Brunei Darussalam are carried out by both **small-scale fishers** mainly operating in coastal waters (0-7 nm) and **commercial fishing vessels** operating above 7 nm within Brunei's Exclusive Economic Zone (EEZ).

1 COMMERCIAL FISHERIES INDUSTRY

2 SMALL-SCALE FISHERIES INDUSTRY

Fishing Zonation

Importance

- The fisheries sector plays a significant role in the national economy, with the capture fisheries industry continuously contributing about **83% of the country's total fish supply (2024)**.
- Most pelagic species are traded and consumed **locally**, ensuring a stable and affordable supply of fresh fish for the population
- The sector also provides employment and income for many small-scale local fishers and fish sellers, supporting the livelihoods of local communities.
- Approximately 40% of tuna catches are exported overseas, i.e., to China & Japan, offering opportunities for Bruneian fishers and processors to participate in high-value international markets.
- Pelagic fisheries contribute to economic diversification and encourage the adoption of improved handling and quality

PELAGIC FISHERIES IN BRUNEI DARUSSALAM

Common Species, Fishing Gears, and Fishing Ground

Common Name	Scientific Name	Fishing gear involved	Fishing Ground
Yellowfin tuna	*Thunnus albacores*	Commercial Fishing Vessels: Purse Seine & Longliner	Zone 4
Skipjack tuna	*Katsuwonus pelamis*	Commercial Fishing Vessels: Purse Seine	Zone 4
Frigate tuna	*Auxis thazard*	Commercial Fishing Vessels: Purse Seine	Zone 4
Narrow-barred Spanish mackerel	*Scomberomorus commerson*	Commercial Fishing Vessels: Purse Seine Small Scale Fishers: Gillnets	Zone 1 &2
Indian mackerel	*Rastrelliger kanagurta*	Commercial Fishing Vessels: Purse Seine Small Scale Fishers: Gillnets	Zone 1 &2
Scad nei	*Decapterus spp.*	Commercial Fishing Vessels: Purse Seine Small Scale Fishers: Gillnets	Zone 2 & 4

Fishing Zonation

INDICATORS FOR SUSTAINABLE MANAGEMENT

Indicators used in Brunei Darussalam

Category	Indicator	Purpose	Data Source	Frequency of monitoring	Responsible agency
Biological	***Catch Per Unit Effort (CPUE)*** • **Catch Per Day (per gear)**	• Provides a practical proxy for abundance without full scientific stock surveys • Assess stock status to guide management measures	Landing Data Form	-	DOF
Economic	Value of Landings	• Evaluate the economic performance of the fisheries sector	Average Landing Price	Annual	DOF
Social	Number of Active Licenses	• Track number of commercial vessels • Track number of small-scale fishers • Assess Fishing Pressure	License Registry	Annual	DOF

DATA COLLECTION AND MONITORING

- Monthly Data Form – form provided by DOF distributed manually to fishers
- Through social media - supplementary information on fishing activities and market prices.
- Random Sampling - daily visit to stalls and slipways

Fishing Operation

- *Date of operation*
- *Location of Operation*
- *Species of Fish Caught*
- *Weight of Fish Caught*

Market

- *Price per Kg*
- *Sales Revenue*
- *Expenses*

APPLICATION OF INDICATORS

Assess Catch Effort

- CPUE (Catch Per Day) is used to assess catch effort per gear, over time
- Information needed: number of active licenses.

Evaluate Economic Performance

- The value of landings reflects the contribution of fisheries to the national economy.

Support Management Decisions

- Indicators guide policy measures such as fishing restrictions, licensing quotas, and management.

CHALLENGES AND GAPS

Limited Capacity for Scientific Stock Assessment per species
Limited expertise and human resources to conduct detailed scientific stock assessments for selected species.

Limited Data Collection:
Incomplete catch and effort data, especially from small-scale fishers, makes it difficult to accurately assess fish stocks.

Overexploitation of fish stocks:
Lack of accurate data, increased demand, and limited enforcement capacity may lead to the overexploitation of nearshore stocks.

Shared stocks:
Many pelagic and tuna species are migratory, requiring regional collaboration for sustainable management. Brunei is currently observers for WCPFC & IOTC.

FUTURE PLANS AND RECOMMENDATIONS

Assessment of CPUE Data

- To conduct regular assessments and monitoring of CPUE data to track changes and identify trends by fishing gear type.

Improved Data Collection System

- Development of a web-based data entry platform and business intelligence dashboards linked to a central database for better data traceability, analysis, and management.
- Estimated Implementation Timeline: By end of 2026.

Catch Per Unit Haul (CPUH)

- To be applied for gears such as purse seines to enhance the accuracy of catch and effort estimation.
- Need capacity building needed to conduct this initiatives

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Regional Technical Consultation on the Harmonization of Simple and Practical Indicators for Sustainable Pelagic Fisheries in Southeast Asia

- **Simple and Practical Indicators for the Sustainable Management of Pelagic Fisheries in CAMBODIA**

Dr. CHEA Tharith
Marine Fisheries Research and Development Institute (MaFReDI)
Mr. LENG Syvann
Department of Fisheries Conservation/FiA

22-24 Oct 2025
Subang, Malaysia

Introduction

- The pelagic fisheries in Cambodia focus on harvesting small to medium-sized schooling fish such as anchovy, sardine, and mackerel, which provide food security and livelihoods.
- Fishing activities concentrate on inshore and offshore areas by using gears such as trawl nets, gill nets, purse seines, and other fishing gears.
- Management measures are taken to ensure sustainable resource use, including law enforcement, monitoring catch trends, and deploying artificial reef.

Importance of pelagic fisheries to national economy, food security, and livelihoods

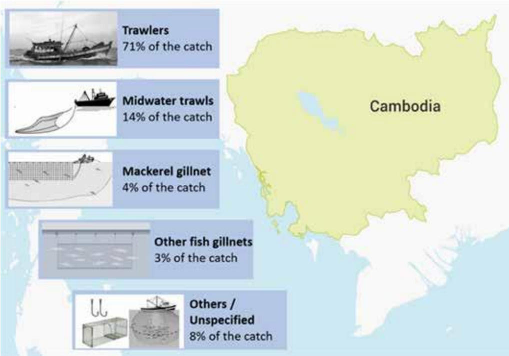
- Pelagic fisheries in Cambodia play a vital role in the national economy, food security, and livelihoods, and contribute significantly to fish production, trade, and employment, supporting coastal economies and related industries.
- Pelagic species include mackerel, sardine, and anchovy providing affordable protein and essential nutrients, and ensuring food security for local communities.
- The sector also sustains the livelihoods of many small-scale fishers and women involved in processing and marketing, making it essential for both economic growth and social well-being

Major pelagic species and fishing grounds in Cambodia

- The major pelagic species in Cambodia include **Indian mackerel (*Rastrelliger kanagurta*)**, **short mackerel (*Rastrelliger brachysoma*)**, **anchovies (*Stolephorus* spp.)**, **sardines (*Sardinella* spp.)**, **scads (*Decapterus* spp.)**, **trevallies (*Caranx* spp.)**, and **tunas (*Euthynnus affinis*)**.
- The main **fishing grounds** for these pelagic species are located along Cambodia's **coastal provinces—Koh Kong, Preah Sihanouk, Kampot, and Kep**—within the **Gulf of Thailand**. Small-scale fishers typically operate in nearshore areas, while commercial vessels target offshore waters where pelagic species are more abundant.
- These fishing grounds are important for both local consumption and supplying raw materials to processing industries.

Fishing gears and fleets

- Trawlers in catch
  Midwater trawlers
- Fish gillnet
- Mackerel gillnets
- Other fish gillnets
- Unspecified gears



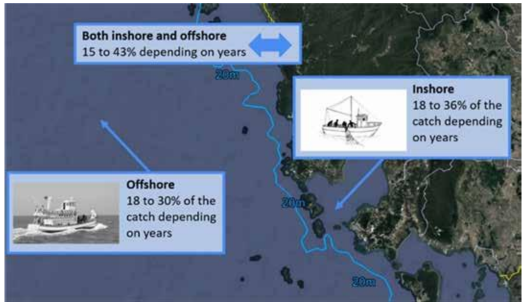
Fishing gears and fleets (continue)

The **fleets** consist of both **small-scale (artisanal)** fishing boats, typically with engines below 40 horsepower and operating nearshore, and **commercial vessels** with higher engine power that operate offshore in the Gulf of Thailand. These fleets collectively form a vital component of Cambodia's marine fisheries sector.

Total length classes (m) of marine fishing vessel	Koh Kong	Preas Sihanouk	Kampot	Kep	Grand Total
<6	917	34	4	0	955
6 - <12	1777	1563	718	290	4348
12 - <18	720	893	311	304	2228
18 - <24	67	43	6	0	116
≥24	10	0	0	0	10
Grand Total	3491	2533	1039	594	**7657**

Fishing gears and fleets (continue)

	2021	2022	2023	2024
Inshore (<20m)	N/A	39	36.7	58.13
Offshore (>20m)	N/A	18	36.43	26.93
Both	N/A	43	26.66	15



Recent trends in catch and effort

	2021	2022	2023	2024
Total Cambodia	181,740 (under 70% activity hypothesis)	259,615 (original) 114,084 (revised)	83,800.45	153,754
Total rounded up	182,000	114,000	83,000	154,000

Vessel-Gear Category	Recorded Landings	CPUE	E (%)	Effort	Monthly Vessel Yield (kg)	Active Vessels (85%)	Total Monthly Yield (T)	Total (%)
Very small<6 meter	10	12.1	10.5	19.9	241.3	775.2	187	1.5
Small-scale 6-<12 meter	551	40.0	5.3	19.5	780.3	2,658.0	2,074.0	16.2
Trawl 6-<12 meter	387	91.7	14.1	18.9	1,736.8	952.0	1,653.0	12.9
Trawl 12-18 meter	242	831. 8	14.0	20.7	17,214.1	339.2	5,838.0	45.6
Trawl 18-<24 meter	21	902. 5	20.7	20.9	18,824.4	42.5	800.0	6.2
Other gears 12-18 m	541	47.9	6.1	18.1	866.0	1,588.7	1,376.0	10.7
Other gears 18-<24 m	40	265. 6	65.2	21.3	5,651.0	55.3	312.0	2.4
Large-scale 24+ meter	2	464 2.0	53.0	14.5	67,309.0	8.5	572.0	4.5
Monthly Total Estimated Catch								12,813.0

Key Issues and Challenges in Pelagic Fisheries in Cambodia

- **Overfishing and Declining Stocks**
  Increasing fishing pressure, especially from trawl and purse seine fleets, has led to decline in pelagic fish abundance and size composition, threatening long-term sustainability.
- **Limited Scientific Data and Stock Assessment**
  There is insufficient biological and catch data to properly assess pelagic fish stocks, making it difficult to determine Maximum Sustainable Yield (MSY) and establish effective management measures.
- **Weak Monitoring, Control, and Surveillance (MCS)**
  Limited enforcement capacity and insufficient use of Vessel Monitoring Systems (VMS) leading to practise illegal, unreported, and unregulated (IUU) fishing, particularly in offshore areas.

Key Issues and Challenges in Pelagic Fisheries in Cambodia (continue)

- **Use of Unsustainable or Illegal Fishing Gears**
  The continued use of fine-mesh nets and light-luring methods in some areas leading to catching juvenile fish and bycatch, and causing impacts on stock regeneration.
- **Climate Change and Environmental Degradation**
  Changes in sea temperature, pollution, and habitat degradation affect pelagic fish distribution, spawning grounds, and productivity.
- **Socioeconomic Vulnerability of Small-Scale Fishers**
  Many coastal fishers depend on pelagic fishing only for income and food, but face high fuel costs, low fish prices, and limited alternative livelihoods.
- **Limited Institutional and Technical Capacity**
  Constraints in research facilities, limited human resources and budgets for effective resource management.

Concept of Indicators Used

- The concept of indicators used for pelagic fisheries in Cambodia focuses on integrating biological, ecological, and socioeconomic factors into assessing the sustainability of fishing activities.
- These indicators include measurements of fish stock status (such as catch per unit effort and species composition), ecosystem health, and the economic and social well-being of fishing communities.
- These indicators are applied to monitor the trends of pelagic fish resources, evaluate fishing pressure, and guide management measures to ensure sustainable resources utilization, and to improve local livelihoods.

Indicators for Sustainable Management

Category	Indicator	Purpose	Data Source	Frequency of Monitoring	Responsible Agency
Biological	Catch per unit effort (CPUE), Length-based indicators (LBIs), Length-based spawning potential ratio (LBSPR), Catch-Maximum Sustainable Yield	Assess stock status	Logbook data/ paper form	Quarterlv	MaFReDI
Economic	Value of landings	Evaluate economic performance	Market data	Annual	FiA/Fisheries Statistics Division
Social	Number of active fishers	Track employment trends	License registry	Annual	FiA
Environmental	Bycatch ratio	Monitor ecosystem impact	Observer data	Annual	MaFReDI

Data Collection and Monitoring

- Methods or systems used for data collection
- Tools or technologies applied (Paper forms, monitoring program)
- Data management and validation procedures (Technical workshops and presentation of results during the TWG-Fi;)

Application of Indicators

- Key indicators are carried out such as catch per unit effort, species composition, and size distribution, inform management measures including effort control, closed seasons, and minimum size limits.
- For instance, monitoring declines in catch rates can trigger restrictions on fishing days or vessel operations, while data on the size structure of fish populations helps set legal size limits to protect juveniles.
- Seasonal patterns in reproduction identified to support the establishment of temporary fishing bans, and ensure sufficient time for stock recover.

Challenges and Gaps

- Limited scientific data, especially stock abundance, reproductive biology, and ecosystem interactions
- Limited human resources and budgets
- Gaps in capacity or coordination among agencies
- Limited the use of modern technologies (e.g., GIS, VMS) and monitoring of fishing effort,
- Lack the capacity for sustainable management planning, causing the difficulty of long effective and sustainable resource protection and conservation.

Future Plans and Recommendations

Future plans

- focusing on strengthening fisheries management through improved data collection, enforcement of regulations, and application of modern technologies like VMS and GIS.

Recommendations

- Enhancing capacity building, promoting sustainable fishing practices, and implementing ecosystem-based management to ensure long-term resource sustainability;
- Integrating indicators into management plans;
- Collaborating and sharing information and experiences of pelagic fishery management among ASEAN Member States
- Establishing Regional Technical Working Network on pelagic fisheries

Conclusion

- Pelagic Fisheries in Cambodia are vital for livelihoods and food security. But they face challenges like overfishing, illegal practices, and limited data.
- Those indicators are carried out to take management measures including fishing effort control, closed seasons, and size limits.
- Law enforcement, modern technologies, and capacity building are strengthened and promoted to ensure sustainable and resilient fisheries.
- Actively engages in regional cooperation to share knowledge, harmonize policies, and address transboundary challenges are enhanced to safe the long-term health of aquatic resources.

Thank you for your consideration

Simple and Practical Indicators for the Sustainable Management of Pelagic Fisheries in Indonesia

Arinta Dwi Hapsari
Moh. Aris Setiawan

Junior Capture Fisheries Production Specialist
Directorate of Fish Resources Management
Directorate General of Capture Fisheries

DIRECTORATE OF FISH RESOURCES MANAGEMENT

The Blue Economy Policy for Indonesia Emas

Conserving the seas and the resources | Ensuring Sustainable Fisheries Activities | Ensuring Sustainable Marine Ecology

Expanding the protection, reducing negative impacts of human activities, preserving and maintaining the quality of marine ecosystems and their ecosystem services

DIRECTORATE OF FISH RESOURCES MANAGEMENT 2

Quota-Based Fishing Policy

Quota-Based Fishing aims to preserve sustainable fish resources, improve the welfare of fishermen, and advance the Indonesia's fisheries sector

Potential

Potential fish resources in Indonesia amount to 12.01 million tons per year, with a Total Allowable Catch (TAC) of 8.6 million tons per year

Regulations

- Law No. 31/2004 on Fisheries
- Law No. 7/2016 on Protection and Empowerment of Fishermen, Fish Farmers, and Salt Farmers
- Government Regulation No. 21/2021 on Spatial Planning
- Government Regulation No. 11/2023 on Measured Fishing
- Ministerial Regulation No. 28/2023 on Regulation for Implementing Government Regulation No. 11/2023

Strategies

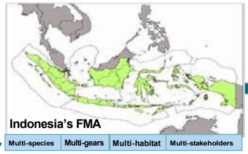
- Determining 6 zones of quota-based measured fishing
- Modernization of integrated and environmentally friendly fishing ports
- Modernization of fishing vessels
- Quota-based measured fishing implementation modelling in Zone 3
- Development of Merah Putih Fishermen Village
- Strengthening vessel licensing data collection and capture fisheries' information system
- Strengthening fish resources' surveillance and monitoring system
- Improving quality of fisheries' products and enhancing downstream industries
- Strengthening human resource competence and enhancing protection of fishermen

Targets

- Preservation of fish stocks
- Increasing fishermen's welfare
- Increasing marine and fisheries contribution for national economy
- Developed and competitive Indonesia's fisheries industry
- Achieving Legal, Regulated, and Reported Fishing in Indonesia

DIRECTORATE OF FISH RESOURCES MANAGEMENT 3

Fisheries Management in Indonesia



Potential of Fisheries
MSY, TAC, and Utilization Rate are different in each FMA. It have been established based on stock assessment conducted by the National Fish Stock Assessment Commission

Governance
Comprehensive Fisheries Governance is needed and designed according to the right scale and in accordance with the characteristics of fisheries in each FMA

FMP
FMP is a guideline for stakeholders to implementation of sustainable fisheries management in FMA. The FMP is prepared from the inputs of all stakeholders according to their respective roles

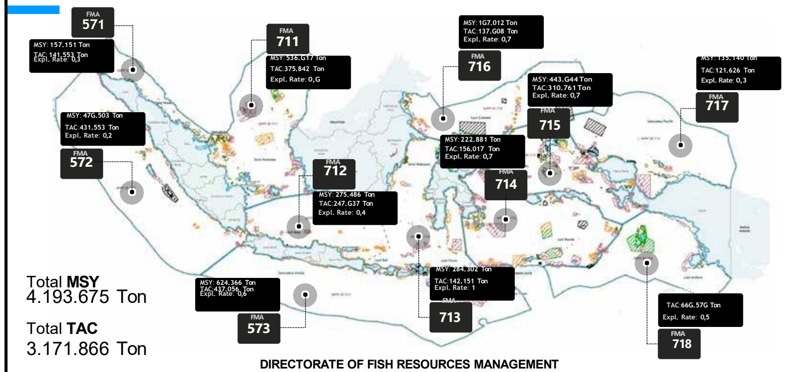
Institution
Fisheries Management Unit as a forum for coordination and synergy between stakeholders to increase optimalization and coordination of the implementation of fisheries management in FMA.

Recommendation of Management Action
Recommendations for Management action direction in as implementation of FMP

DIRECTORATE OF FISH RESOURCES MANAGEMENT 4

MSY, TAC, and Exploitation Rate of Small Pelagic

Ministerial Decree of Marine Affairs and Fisheries No. 19/2022



Total **MSY**
4.193.675 Ton

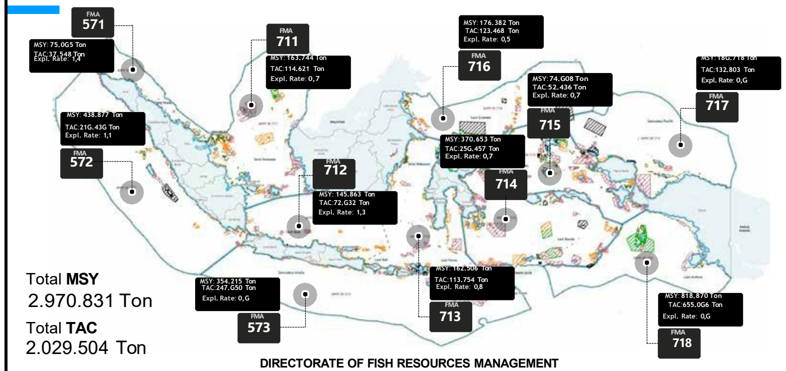
Total **TAC**
3.171.866 Ton

DIRECTORATE OF FISH RESOURCES MANAGEMENT

5

MSY, TAC, and Exploitation Rate of Large Pelagic

Ministerial Decree of Marine Affairs and Fisheries No. 19/2022 (Species Managed by Tuna RFMO are Excluded)



Total **MSY**
2.970.831 Ton

Total **TAC**
2.029.504 Ton

DIRECTORATE OF FISH RESOURCES MANAGEMENT

6

Pelagic Fishery in Indonesia

Top 5 Pelagic Fishes
Neritic Tuna
Scads
Mackerels
Sardinella
Anchovy

Top 4 Fishing Gears
Gill Net
Purse Seine
Handline
Lift Nets

Challenges
Ecosystem degradation
The increase in sea surface temperature by 1 - 1.2°C by 2050
2,000 islands are to disappear by 2030 due to sea level rise.
La Nina and El Nino recurrence periods are shorter (2 - 3 years).
80% of coral reefs coverage is at risk of bleaching by 2030
Frequency, intensity, & duration of extreme weather are increasing
35% of Indonesia's fish stocks experienced overexploitation in 2022
Marine litter and plastic waste

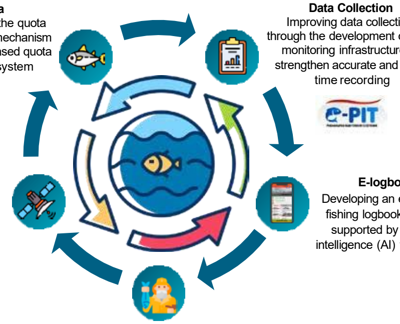
DIRECTORATE OF FISH RESOURCES MANAGEMENT

7

Enhancing Fisheries Governance

Quota
Transforming the quota management mechanism into a vessel-based quota allocation system

Data Collection
Improving data collection through the development of data monitoring infrastructure to strengthen accurate and real-time recording



Electronic Monitoring
Planning and implementing an integrated electronic monitoring system

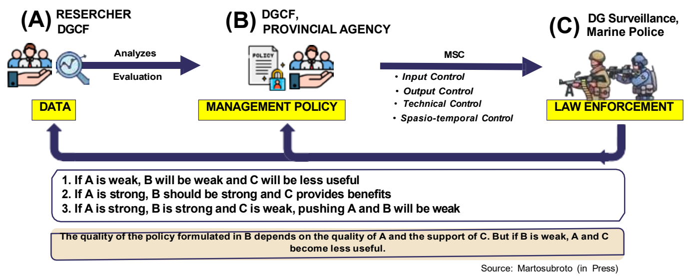
E-logbook
Developing an enhanced fishing logbook system, supported by artificial intelligence (AI) technology

Transforming the observer governance system
by encouraging the active role of industry stakeholders

DIRECTORATE OF FISH RESOURCES MANAGEMENT

8

The Importance of Data in Fisheries Management



Source: Martosubroto (in Press)

Indicators for Sustainable Management

Indicator	Purpose	Data Source	Frequency of Monitoring	Responsible Agency
Data Landing (Production and Effort)	Assess stock status	Statistic, Landing Data at Port and Non-Port	Annual	DGCF
Biological Data	Assess stock status	Port Sampling, Sampling by Research	Annual	DGCF, Research Institute
Catch per Unit Effort (CpUE)	Monitoring and Evaluation	Logbook and Observer on Board	Annual	DGCF
Number of Fishers	Track employment trends	Statistic	Annual	DGCF
Bycatch Ratio	Monitor ecosystem impact	Port Sampling, Observer on Board, Logbook	Annual	DGCF, Research Institute

Current Data Management System

One Data Program – MMAF

- Marine and Coastal Data: Based on 11 FMAs - **Permen KP No.18 Tahun 2014**
- Inland Fisheries : **Permen KP No.9 Tahun 2020**
- One Data Program: **Ministerial Decree Number 61/2020**

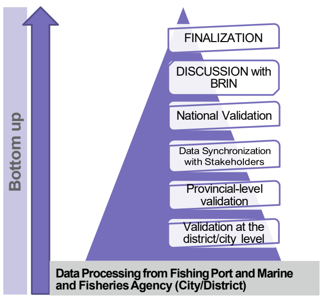
Data collection is carried out by the Directorate/Center as a Data Producer coordinated by the Secretariat of the Directorate General/Agency as the Echelon I Data Unit (Ministerial Decree Number 61/2020: articles 12-14).

The Secretary of the Directorate General/Agency and the Director/Head of the Center should immediately take consolidation steps and start implementing KP data collection starting in January 2021 using the One Data Application to maintain data standards and interoperability.

In terms of data collection, Data Producers and Echelon I Data Units use data from the Main Actors in the Marine and Fisheries Sector (KUSUKA) and Master Data that has been determined

The development of applications and infrastructure to support data collection within the scope of Data Producers and Echelon I Units is reviewed by the Inspectorate General, Planning Bureau, and Pusdatin

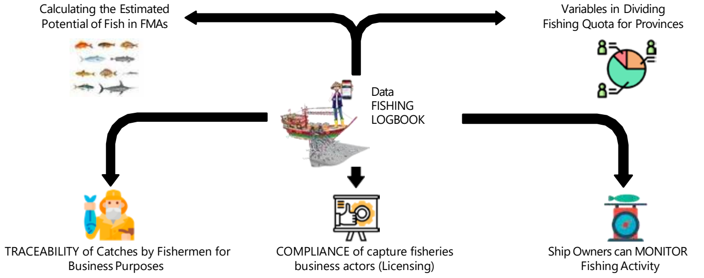
Inspectorate General oversee the implementation of data collection in 2021 so that it runs well.



Redesigning Port and Non-Port Sampling Framework

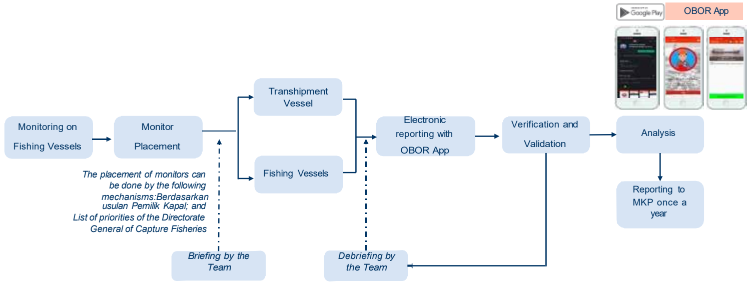
Monitoring System on Fisheries Management

The Role of Fishing Logbook Data in Fisheries Management

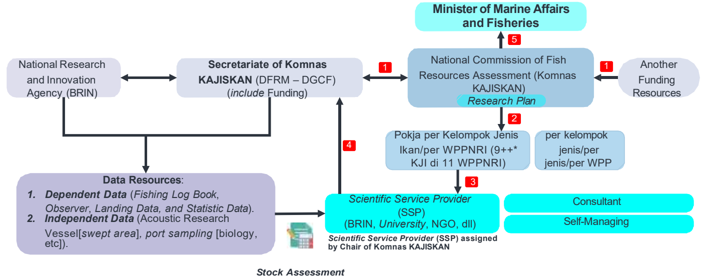


Monitoring System on Fisheries Management

The Role of Observer on Board in Fisheries Management

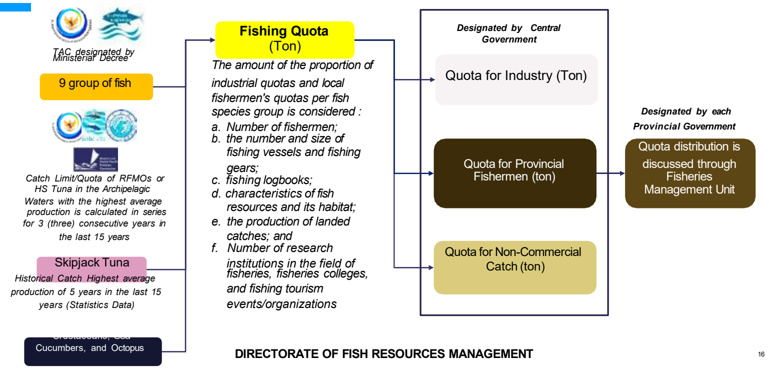


Flow of Fish Stock Assessment as the Application of the Indicators



* *Fish Groups/Fish Species include Large Pelagic, Small Pelagic, Demersal Fish, Reef Fish, Snapper, Grouper, Penaeid Shrimp, Squid, Lobster, Crab, Crab, Clam, Sea Cucumber, Octopus, Albakory, Bigeye Tuna, Yellowfin Tuna, Southern Bluefin Tuna, Skipjack, and lobster postlarva.*

Quota Based Fisheries as the Application of the Indicators



Challenges and Future Plans

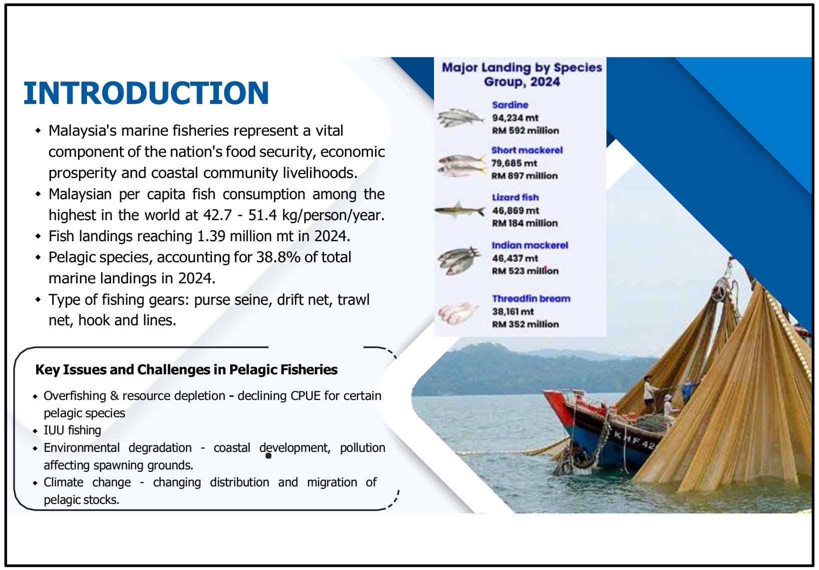
Challenges	Future Plans
▪ Fishermen still realize the importance of reporting their fishing logbooks ▪ The large size of Indonesia means that data collection requires high costs and considerable human resources. ▪ Limited data and data collection infrastructure at non-port landing sites. ▪ Institutional changes in research in Indonesia necessitate adjustments in fisheries management.	▪ Socialization and assistance for fishermen in reporting fishing logbook. ▪ Determining data collection locations that can represent the fisheries conditions in each FMA, through a port/non-port sampling program. ▪ Provision of data collection infrastructure at the sampling port/non-port program location. ▪ Integrating data collection activities from research institutions, universities, and NGOs as a basis for fisheries management.

Conclusion

- Indonesia has been developing indicators for sustainable management, namely MSY, TAC, Exploitation Rate, and CpUE.
- Indonesia commits to improving data collection by redesigning port sampling, strengthening e-Logbook, observer data, and Fisheries Management Unit.

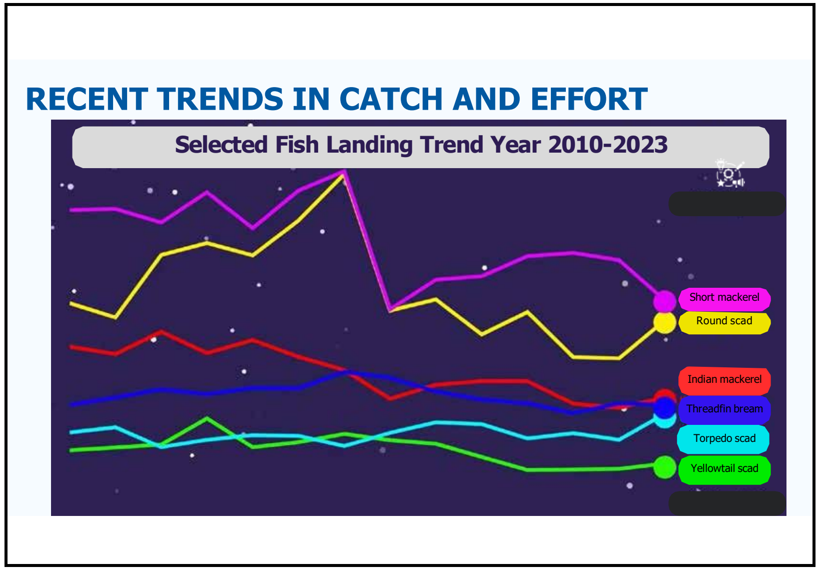
THANK YOU

Simple and Practical Indicators for the Sustainable Management of Pelagic Fisheries in Malaysia
Presented by:
Ryon Siow
Senior Researcher
Department of Fisheries Malaysia
22 October 2025



INTRODUCTION
• Malaysia's marine fisheries represent a vital component of the nation's food security, economic prosperity and coastal community livelihoods.
• Malaysian per capita fish consumption among the highest in the world at 42.7 - 51.4 kg/person/year.
• Fish landings reaching 1.39 million mt in 2024.
• Pelagic species, accounting for 38.8% of total marine landings in 2024.
• Type of fishing gears: purse seine, drift net, trawl net, hook and lines.
Key Issues and Challenges in Pelagic Fisheries
• Overfishing & resource depletion - declining CPUE for certain pelagic species
• IUU fishing
• Environmental degradation - coastal development, pollution affecting spawning grounds.
• Climate change - changing distribution and migration of pelagic stocks.
Major Landing by Species Group, 2024
Sardine
94,234 mt
RM 592 million
Short mackerel
79,685 mt
RM 897 million
Lizard fish
46,869 mt
RM 184 million
Indian mackerel
46,437 mt
RM 523 million
Threadfin bream
38,161 mt
RM 352 million

LANDING BY SPECIES GROUP, 2023 - 2024
(in metric tonne)
2024
2023
Pelagic 539,994 492,661
Demersal 338,928 327,410
Trash fish 262,463 212,868
Shrimp 102,825 97,966
Squid 58,624 58,385
Mixed fish 48,294 38,875
Crab 17,126 14,067
Shellfish 10,783 9,583
Others 10,178 15,007
Oceanic 2,917 3,454
Contribution in 2024
Crab 1.2%
Squid 4.2%
Shrimp 7.4%
Pelagic 38.8%
Trash fish 18.9%
Demersal 24.3%



RECENT TRENDS IN CATCH AND EFFORT
Selected Fish Landing Trend Year 2010-2023
Short mackerel
Round scad
Indian mackerel
Threadfin bream
Torpedo scad
Yellowtail scad

CONCEPT OF INDICATORS USED

- Malaysia adopt "simple and practical indicators" because they are cost-effective, easy to interpret and can be applied even where data and technical capacity are limited.
- The aim is to create a set of signals that can be monitored consistently to detect trends and support adaptive management.

Objectives of using indicators

- **Monitoring Sustainability** - indicators help track the condition of fish stocks, ecosystems and fishing activities.
- **Supporting Decision-Making** - managers rely on indicators to adjust policies, set quotas, design seasonal closures or introduce gear restrictions.
- **Evaluating Management Performance** - indicators show whether management measures are effective.
- **Building Adaptive Capacity** - by tracking changes regularly, indicators enable managers to respond to unexpected changes through adaptive management.

INDICATORS FOR SUSTAINABLE MANAGEMENT

Category	Indicator	Purpose	Data Source	Frequency of Monitoring	Responsible Agency
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Environmental	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Encroachment into sensitive areas	Track IUU fishing activities	VMS data, enforcement record	Annual	DOFM/MMEA/Marine Police/Navy

DATA COLLECTION AND MONITORING

METHODS AND SYSTEM USED FOR DATA COLLECTION

Data is collected through a combination of fishery-dependent and fishery-independent methods to capture both fishing activity and biological information.

- Landing site monitoring - provides routine information on catch trends and fishing effort.
- Logbooks for deep sea fishing vessels
- Sampling surveys - biological sampling
- Fishery-independent surveys - conduct scientific surveys

TOOLS AND TECHNOLOGIES APPLIED

- VMS and AIS system to monitor vessel movement and detect fishing patterns
- Fish forecasting system for purseiner
- e-logbooks system - pilot project for deep sea fishing vessels
- QR code - to determine the identification and authenticity of local deep sea fishing vessels.

DATA MANAGEMENT AND VALIDATION PROCEDURES

Centralized databases:

- Licensing Database (e-Lesen)
- Fish Landings Data Collection and Database (e-SMPP)
- National Survey Database (in Fisheries Resource Management System - MyFiRSt)

Cross-checking and verification:

- In-situ observation for fish landing data
- Data from different sources i.e census, logbooks and VMS are compared to identify inconsistencies or potential misreporting.

APPLICATION OF INDICATORS

How the Indicators Are Used in Management

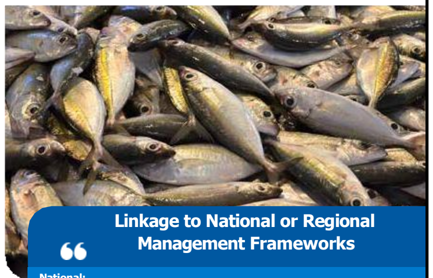
Effort control - when indicators e.g. declining CPUE (Catch per Unit Effort) authorities can limit the number of fishing days or cap allowable fishing trips to relieve pressure on stocks.

Closed seasons or areas - biological indicators e.g. spawning periods inform the timing of seasonal closures to protect critical life stages and spawning grounds of pelagic species.

Size limits - indicators on length-at-capture or maturity size guide minimum size regulations, ensuring that fish have a chance to reproduce before being caught.

Examples of Management Decisions or Actions Based on Indicator Results

Malaysia's pelagic fisheries: National landing data indicating declining trends for small pelagics such as anchovies prompted stricter licensing quotas alongside seasonal and area closures to protect spawning stocks.



Linkage to National or Regional Management Frameworks

National:

Malaysia integrate indicators into national fisheries policies and stock assessment reports. These indicators feed directly into decision-making by DOF, guiding licensing, enforcement and conservation measures

Regional:

For highly migratory pelagic species and seer fish, indicators are shared within RFMOs e.g. IOTC. These bodies rely on common indicators—like stock biomass, fishing mortality rates, and CPUE trends—to set region-wide conservation measures, allocate quotas, and coordinate seasonal closures across member states.

CHALLENGES AND GAPS

Limitations in Data Collection or Indicator Reliability

- **Limited coverage and accuracy:** Relying on catch statistics and logbooks that may be incomplete, delayed, or inaccurately reported.
- **Sparse biological data:** Indicators like size-at-maturity or spawning biomass require scientific surveys and regular sampling, which are often limited by budget and technical capacity.
- **Uncertainty in migratory species data:** Pelagic species often cross national boundaries, making it difficult to track their populations accurately with national-level data alone.
- **Indicator sensitivity:** Some simple indicators (e.g. CPUE) can be misleading if fishing technology improves, leading to "hyperstability" where CPUE remains high even as stocks shrink.

Technical, Financial or Institutional Challenges

- **Technical limitations**: Data analysis tools, skilled personnel, and standardized methodologies are often lacking.
- **Financial constraints:** Sustained funding is needed for monitoring programs and scientific surveys.

Gaps in Capacity or Coordination Among Agencies

- **Human resource gaps:** Shortage of trained stock assessors, data analysts and field enumerators.
- **Coordination challenges:** certain agencies often work in silos, with limited data sharing or joint planning.
- **Lack of integrated databases:** different datasets are not interoperable, delaying timely indicator analysis.

FUTURE PLANS AND RECOMMENDATIONS

Proposed Improvements in Indicators or Data Systems:

- **Enhancing data collection systems** - upgrading e-logbooks, VMS/AIS, establish mobile-based reporting and installation Data Collection Camera integrated with AI at fish landing jetty for fish species identification
- **Strengthening biological monitoring** - expanding landing site sampling, scientific surveys and establish observer programs.
- **Improving indicator sensitivity and robustness** - complementing simple indicators like CPUE with additional biological and spatial indicators can reduce misinterpretation.

Plans for Integrating Indicators into Management Plans or Decision-Making

- Embedding indicators in FMPs - Indicators should be explicitly linked to reference points (e.g. biomass thresholds or effort levels) that trigger predetermined management responses e.g closed seasons.
- Regular reporting and review cycles - annual/biannual indicator assessments can be institutionalized to inform policy decisions, licensing adjustments and conservation measures in a timely way.
- Decision-support tools - integrating indicator data into management information systems allows decision-makers to visualize trends and evaluate scenarios quickly, making the process more transparent and responsive.

Areas for Regional Collaboration and Technical Support

- ☑ **Standardizing regional indicators** - Countries can work through regional bodies to adopt common indicators and reference points for shared pelagic stocks.
- ☑ **Capacity building and technology transfer** - regional programs can provide training, technical support, and shared platforms to strengthen national capabilities, especially for countries with limited resources.
- ☑ **Climate and ecosystem monitoring** - coordinated monitoring of oceanographic and ecological indicators can help predict shifts in pelagic species distribution due to climate change, enabling adaptive, region-wide management strategies.

CONCLUSION

- Key findings show that simple and practical indicators—such as CPUE trends, catch statistics, biological measures, and compliance records.
- Indicators contribute to sustainability by providing early warning signals of stock decline, informing measures like effort control, seasonal closures, and size limits, and helping evaluate the effectiveness of management strategies.
- Despite progress, challenges remain in data quality, technical capacity, and institutional coordination. Addressing these gaps through improved data systems, stronger analytical capacity and clearer links between indicators and management actions will be essential.
- Malaysia remains committed to enhancing its indicator systems and integrating them more systematically into fisheries management plans and strengthening regional collaboration.

THANK YOU

FOR YOUR ATTENTION

Ministry of Agriculture, Livestock and Irrigation

Department of Fisheries

Simple and Practical Indicators for Sustainable Management of Pelagic Fisheries in Myanmar

Presented by

Soe Win , Assistant Director

&

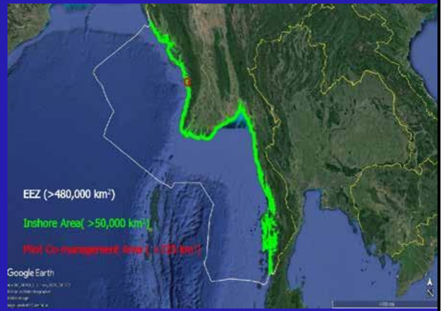
Zaw Khine Assistant Director

Date: 22 – 24 OCTOBER 2025

Venue : Subang , Malaysia

Contents

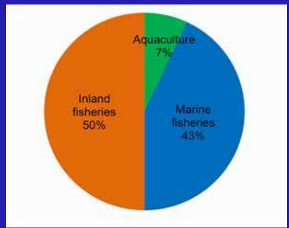
- Introduction
- Fishing gear used trends
- Landing data of pelagic species
- Data Collection Survey and Methods
- Management Measure and Intended conservation
- Challenges



2

Introduction

Fisheries sector in Myanmar



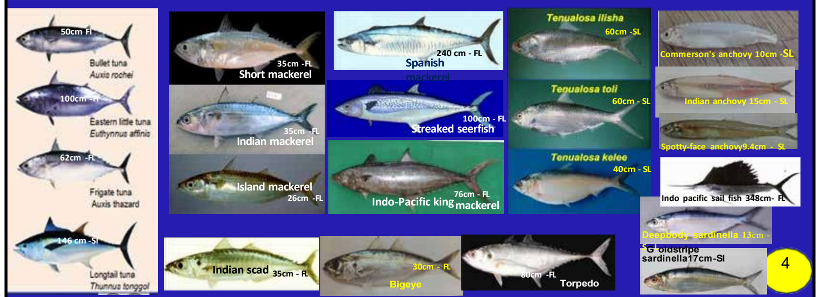
- In Myanmar, fisheries sector classified into three categories, there are namely freshwater inland fisheries, marine fisheries and aquaculture
- Inland fisheries consist of leasable fisheries and open fisheries are prominent and mainly produce the freshwater fish.
- Leasable fisheries can be conducted for the management of indigenous fish and fisheries habitat conservation, capture based system for sustainable fish production.
- Open fisheries can be permitted for small scale and subsistence fisher only.
- oThe Fiscal Year 2023-2024, the country's total production f fish was 6.3 million MT .Marine fisheries include inshore fisheries and off-shore fisheries, 57% are engaged in freshwater fisheries an 43% in marine fisheries by Economic, Food Security and Livelihood.

3

Introduction

PELAGIC TARGET SPECIES FOUND IN MYANMAR WATER

(a) Myanmar found neritic tuna 5 species, mackerel 3 species, seer fish 4 species ,scad 7 species, anchovy 4 species,Sardne 6 species , marlin and 3 hillsa are major species.



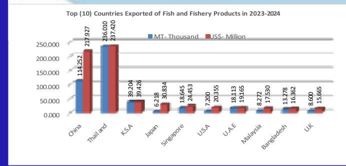
4

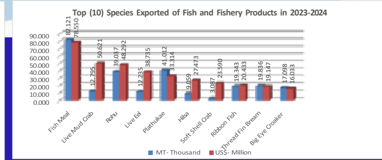
Introduction

- Dried fish of Indo-pacific king mackerel and fresh Hilsa are very popular all over the country. Pelagic of *R.kanagurta ,R brachysoma* fish meal were inportant top 10 export listed .
- Pelagic species were caught local purse seines in Rakhine , Purse Seine fishing gear in Yangon and driftnet fishing gear in Tanintharyi fishing ground .
- It is difficult to collect the real data and information of Indo-pacific king mackerel, neritic tunas because of the fishermen directly dry the fish and distribute throughout the country as a dried fish. And hilsa species are direct delivery from boat to the nearest cold store factory. And short mackerel and Indian mackerel also fish meal factory .
- In addition, it is also difficult to estimate the number of local in–shore fishing boats as the number increase every year.. Pelagic species are operated by fishermen for only six months a year.
- Marine debrid questionaries information has been sent to Malaysia SEAFDEC-MFRDMD in last month.

5

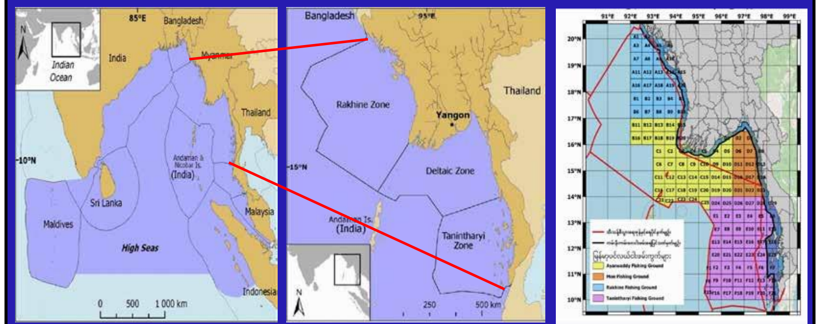
Top (10) Countries Exported of Fish and Fishery Products in 2023-2024





6

Myanmar EEZ and Pelagic Species fishing areas



Myanmar is demarcated 4 fishing ground- local vessel have to operate fishing one or two adjiacent fishing grounds.

- (Inner shoreline) In-shore : No more fishing 50 HP engine, 40 feet , length
- (shoreline outside) Off shore : More than fishing 50 HP engine, 40 feet , length ,
- Mesh Sized Measures::Closed Mesh sized for trawl and stow net – not less than 2 inches (Fish) 1.5 inches (shrimp), For Drift Net not less than 4 inches.
- In 2004 close foreign vessel. Measure fishing days at the sea, Inspection and law enforcement .

7

Pelagic Fishing Gear Used in Myanmar (2023-2024) fiscal year

Vessel Type/ Mesh Size (inches) & hook Number.	GRT							Total
	5<	5-10	10-20	20-50	50-100	100-200	200>	
Purse Seine / 2 >			1	80	64	138	9	292
Gill nets / 4 >		16	92	196	31	1		336
Hooks & Lines / 100			1	2	1			4
Stow Net / 2 >		3	59	276	148	104	4	594
Falling Net / 1 >			17	208	70			295
Total		19	170	762	314	243	13	1521

No	Stte/Region	Trawl	Purse Seine	Drift Net	Stow net	Long line	Stick-held falling net	Trap	Total	Crew
1	Yangon region	625	52	2	147	1		22	849	
2	RaKhine state							2	3	
3	Tanintharyi region	790	235	15		3	295	74	1399	
4	Ayawaddy region			144	339				483	
5	Mon state			175	108				283	
	Total	1421	292	336	594	4	295	98	3040	

8

Pelagic Species Total catch Landing Data

Yangon

Year	Total Landing Data (ton)	Remark
2009-10	955	
2010-11	628	
2011-12	1241	
2012-13	909	
2013-14	1015	
2014-15	966	
2015-16	1194	
2016-17	1491	
2017-18	785	
2018-19	256	
2019-20	935	
2020-21	480	
2021-22	510	
2022-23	655	
2023-24	7968.50	

Ayeyarwaddy

Year	Total Landing Data (ton)	Remark
2009-10		
2010-11		
2011-12		
2012-13		
2013-14		
2014-15	10.78	
2015-16	71.00	
2016-17	59.90	
2017-18	25.29	
2018-19	17.92	
2019-20	21.02	
2020-21	15.86	
2021-22	22.77	
2022-23	16.55	
2023-24	282.73	

Mon

Year	Total Landing Data (ton)	Remark
2009-10		
2010-11		
2011-12		
2012-13		
2013-14		
2014-15	46.53	
2015-16	69.05	
2016-17	64.82	
2017-18	70.55	
2018-19	71.22	
2019-20	157.37	
2020-21	73.51	
2021-22	90.45	
2022-23	77.22	
2023-24	72.64	

Tanintharyi

Year	Total Landing Data (ton)	Remark
2009-10		
2010-11		
2011-12		
2012-13		
2013-14		
2014-15	287.41	
2015-16	401.61	
2016-17	358.10	
2017-18	414.68	
2018-19	320.91	
2019-20	432.20	
2020-21	413.39	
2021-22	232.11	
2022-23	382.98	
2023-24	560.65	

9

Materials and Methods

Data Collection

Length frequency distribution collected the data seasonally from Ei Phyo Yatana Jetty in Yangon landing site.

Data analysis

- Parameter of the length-weight relationship were obtained by fitting the power function.
- Length measurements were pooled and monthly data were analyzed using FISAT II software (Version 1.2.2).

10

Summary of Biological Parameter by Pelagic Species(2019)

No	Species	Year	L∞	K	ϕ	M	F	Z	E	Lr	L50%	Lm	L0
1	*Rastrelliger brachisoma*	2019	35	3.36	3.61	3.72	1.77	5.49	0.32	12	16.46	17	0.1
2	*Megalaspis cordyla*	2019	56.75	0.88	3.45	1.35	0.59	1.94	0.30	10	14.54	22	0.46
3	*Scombromorus guttatus*	2019	73.2	0.73	3.59	1.11	1.09	2.2	0.49	13	14.02	40	0.5
4	*Euthynus affinis*	2019	64.05	1.01	3.61	1.42	1.02	2.44	0.42	30	44.11	39.8	0.5
5	*Auxis thazard*	2019	38.5	0.9	3.12	1.53	1.43	3.26	0.53	17	29.33	29.5	0.5
6	*Tenualosa illisha*	2019	55.1	0.52	3.19	0.97	3.44	4.41	0.78	21	28.82	41.5	0.3
7	*Chirocentrus nudus*	2019	75	1.15	3.81	1.49	2.12	3.61	0.59	31	36.4	45	0.8

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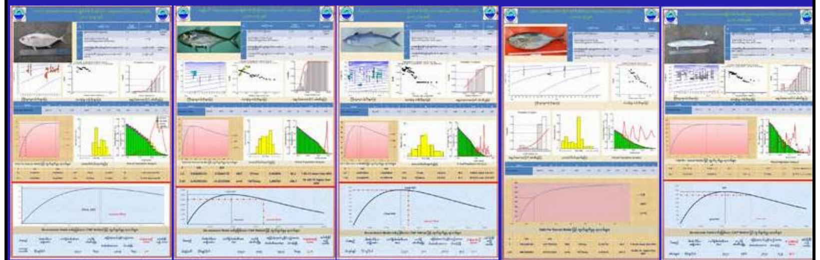
Pelagic Fish Stock Assessment Results



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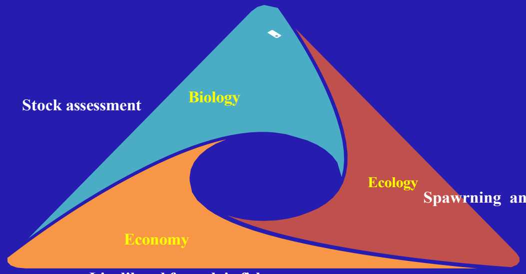
STATUS OF RESEARCH AND CONSERVATION ACTIVIES



Experiences in Stock Assessment of Fisheries Resources

Dr. Fridtjof nansen survey vessel research-

1979 - September/October (Post Monsoon)
1980 - March/April r (Pre Monsoon)
2013 - November/December (Post Monsoon)
2015 – April/June (Pre Monsoon)
2018- August/September (Monsoon)

2018 –Survey on Distribution of eggs and Larvae Environmen factors - micro-plastic, pollution etc.. at least1412 species in 262 families (excluding Invertebrate) were found in 2020 print field identification guide .

Fish Biomass 1979/80 = 1 MMT for pelagic
Fish Biomass 2013/15 = 0.19 MMT (80% decline)
Fish Biomass 1979/80 = 0.75 MT for demersal
Fish Biomass 2013/15 = 0.32MT(60-%fish Existence has decline) during 30 year .

MV-SEAFDEC-2, 2007 (Tanintharyi)

- ❖ The Total catch was separated into two major group : Fish & Invertebrate
- ❖ In term of fish composition, at least 113 species in 62 families (excluding shark) were catch

Operation	16
Station	16
Depth (m)	41-94
Total Catch (kg)	1434.44
Towing time (min)	1 time/60 min
Fish Wt.(Kg)	1062.12
Invert Wt. (kg)	372.32
Total CPUE	74.0 kg

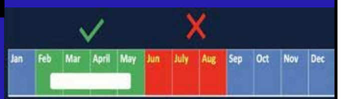
Currently, Myanmar is conducting the research survey using the M.V. SEAFDEC 2 research vessel in the Tanintharyi Fishing Ground at in shore, where research has not been done with plans to begin in Feb-Mar 2025.

Management measure of sparwning time (April - June)

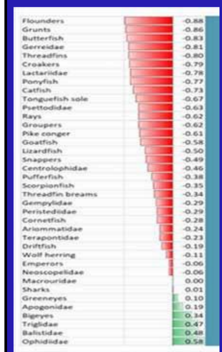
Low abundance of fish eggs was found during the cruise 2018 cruise. Also, abundance of ripe and running fish in the trawl hauls was low. Hence, both the ichthyoplankton and the trawl sampling are consistent indicating that August-September is off spawning season.

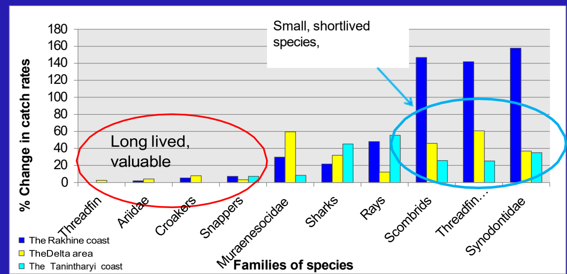
This is also confirmed by literature on spawning shows that spawning periods of fish in Myanmar waters and waters of the East Coast of India.

Literature indicate that main spawning period is during the cold season. This is also consistent with our survey results who show that primary production is highest before the monsoon season. Juvenile fish should start feeding in the period most favourable for their survival. Food availability is one of the key factors determining this.



Pelagic groups species composition and catch per unit effort



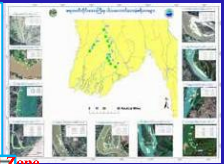


Since In 2015 survey Leiognathids was frequent in the catches with (53 kg/h) followed by several pelagic groups such as engraulids (17 kg/h), hairtails (13 kg/h), and carangids (11 kg/h).

Hilsa Fish Conservation Zone in Myanmar

DoF are working with other relevant Ministries , Universities and NGO to develop technologies to monitor and enforce MPAs to ensure continuous fish stocking in Myanmar water.Research on the spawning seasonality of hilsa in Myanmar indicates one main spawning peak in September - October (particularly September).

Ayawaddy dalta Zone



Mon Coastal Zone

Table 1. Population parameters of [illegible] in Myanmar water

(From October, 2012 to September 2013)

Parameters	Study areas					
	Inland water			Marine water		
	[illegible]	[illegible]	[illegible]	[illegible]	Yangon	[illegible]
Asymptotic length (L_∞) cm	61.95	53.55	61.59	60.90	59.85	59.85
Growth constant (K)	0.700	[illegible]	0.850	[illegible]	0.740	[illegible]
Growth performance (Φ')	3.429	3.449	3.514	3.472	3.423	[illegible]
Natural mortality (M)	1.154	[illegible]	1.310	[illegible]	1.208	1.271
Fishing mortality (F)	[illegible]	1.299	1.954	[illegible]	2.207	1.873
Total mortality (Z)	3.964	2.707	3.264	3.464	[illegible]	3.144
Exploitation level (E)	0.708	[illegible]	[illegible]	[illegible]	[illegible]	0.596
Sample number (N)	1477	971	1163	[illegible]	[illegible]	1577

Rakhine Coastal Zone

Myanmar DoF were banned 17 safety zones to protect Hilsa species female and Larvae in 2022. Namely,Ayawaddy region area, Mon state and Rakhine state . During the close season ,the local Dof and NGO provided food to joint patrols with community . And providing alternative job by hilsa fishermen in Myanmar's close season period. and local level. According to SDG 14 target , only 5% of all Myanmar 's water were protected .

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Challenges

Discuss challenges and opportunities to get reliable data

Problem :

1. **Direct export to neighbouring countries. (eg. Tanintharyi – Thailand, and Rakhine – Bengladish)**
2. **Use carrier vessel . IUUfishing also in-shore and off-shore fishing**
3. **To collect and analysis the fishery data the real base line data every year (Catch and Effort) State ,District , Township and lack of systematic datacollection. Need to do technical skill for analyze. Lack of technology access to local community.**
4. **Study scientific, publish internationally – stock status, feeding pattern, gonad maturity , etc.**
5. **Strongly participation of Policy maker concentration**
6. **But, still difficult to implement in all coastal area because of country situation.**

Conclusion

Negotiation of key indicator is expected to become a sustainable fisheries.Myanmar is preparing to implement regional indicators.

Myanmar concludes by saying that our country should work together cooperaton with the AMS to protect the conservation of pelagic species. Thank you .

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Thank you So Much

Department of Fisheries, Ministry of Agriculture, Livestock and Irrigation, Office No (36), Nay Pyi Taw.
Phone: +95-67-408473 / +95-67-418536
Email; irnp.dof2@gmail.com

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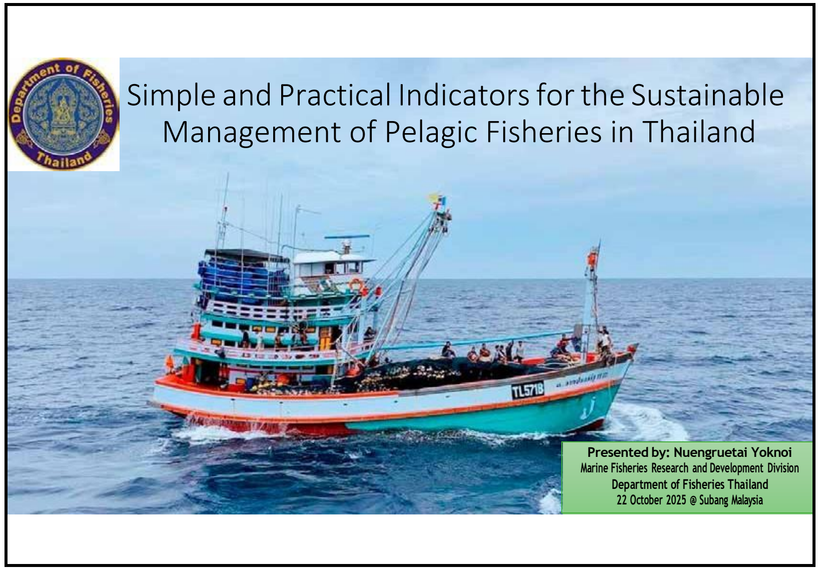
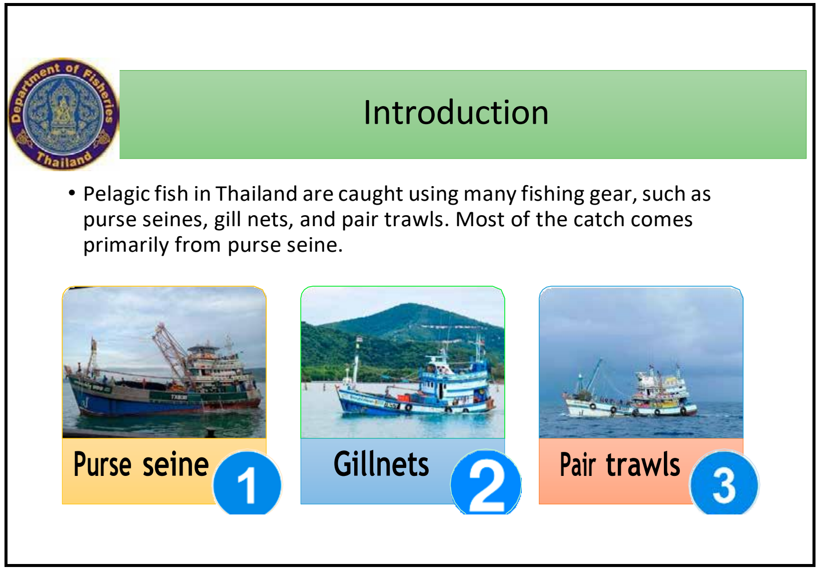
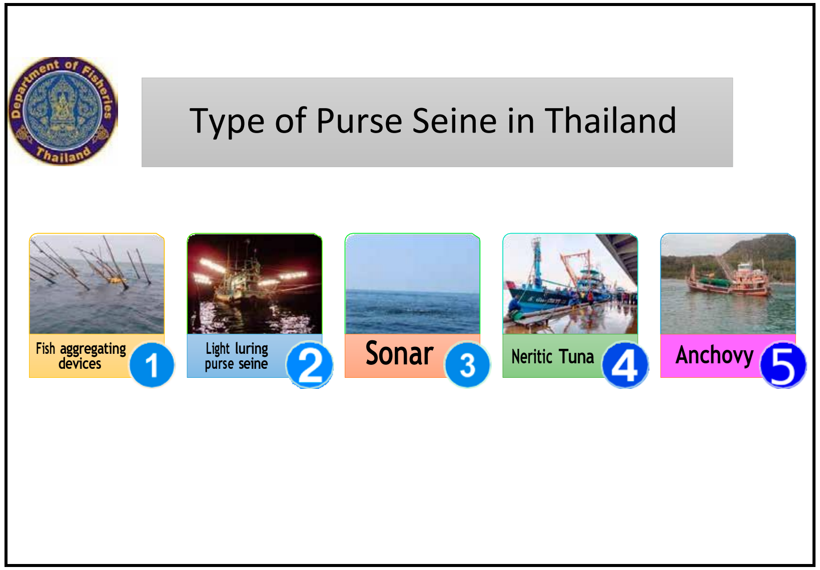
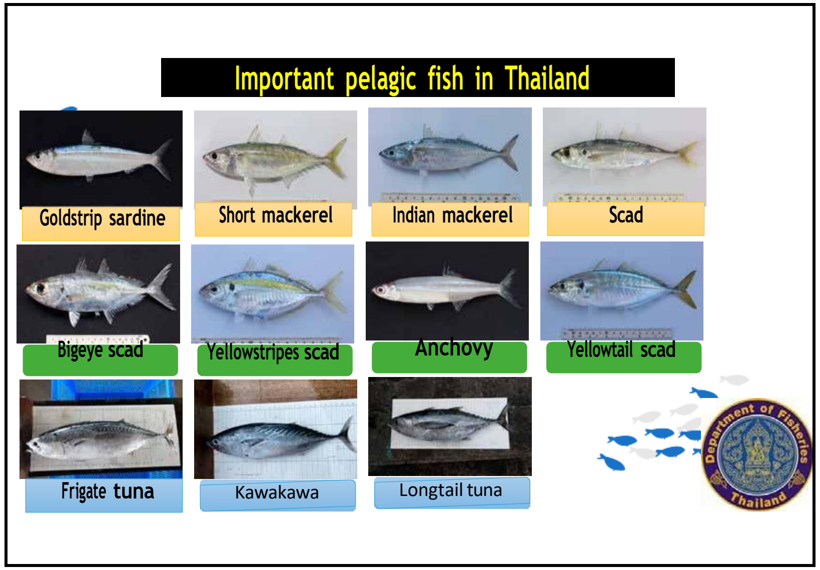
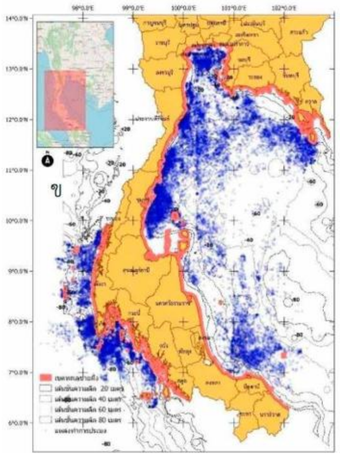

Simple and Practical Indicators for the Sustainable Management of Pelagic Fisheries in Thailand
Presented by: Nuengruetai Yoknoi
Marine Fisheries Research and Development Division
Department of Fisheries Thailand
22 October 2025 @ Subang Malaysia


Introduction
• Pelagic fish in Thailand are caught using many fishing gear, such as purse seines, gill nets, and pair trawls. Most of the catch comes primarily from purse seine.
Purse seine 1
Gillnets 2
Pair trawls 3

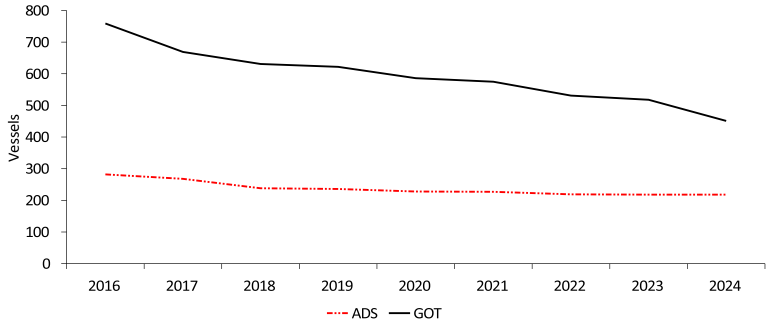

Type of Purse Seine in Thailand
Fish aggregating devices 1
Light luring purse seine 2
Sonar 3
Neritic Tuna 4
Anchovy 5


Important pelagic fish in Thailand
Goldstrip sardine
Short mackerel
Indian mackerel
Scad
Bigeye scad
Yellowstripes scad
Anchovy
Yellowtail scad
Frigate tuna
Kawakawa
Longtail tuna

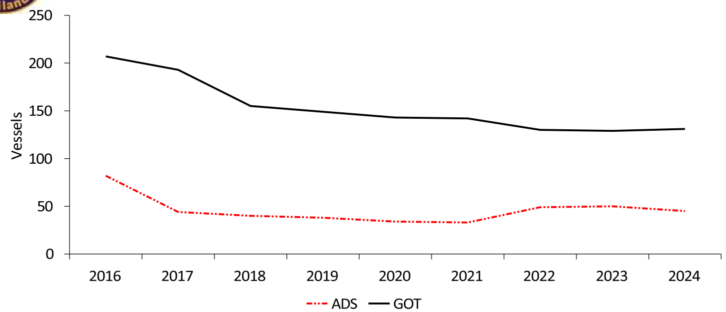
Fishing ground of Purse Seine in Thailand



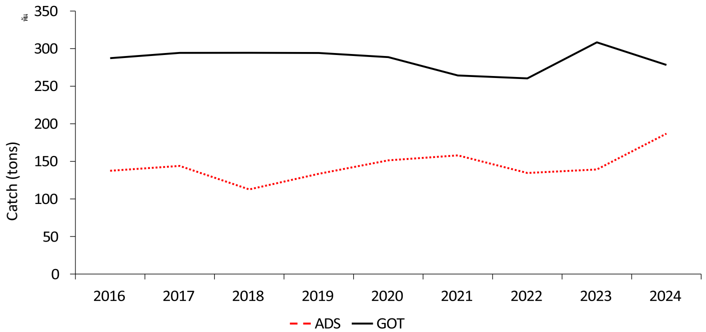
Purse Seine vessel in Thailand



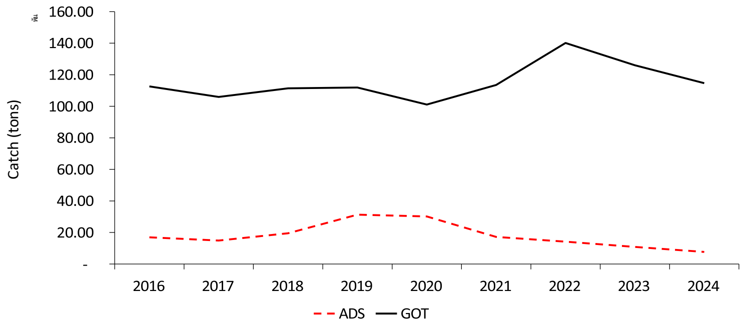
Anchovy purse seine vessel in Thailand



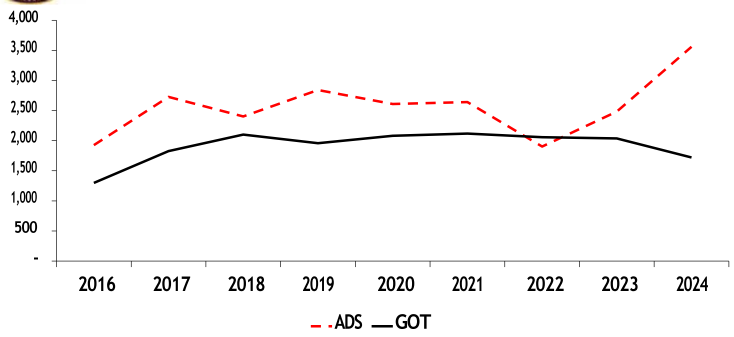
Catch of Pelagic fish in Thailand waters



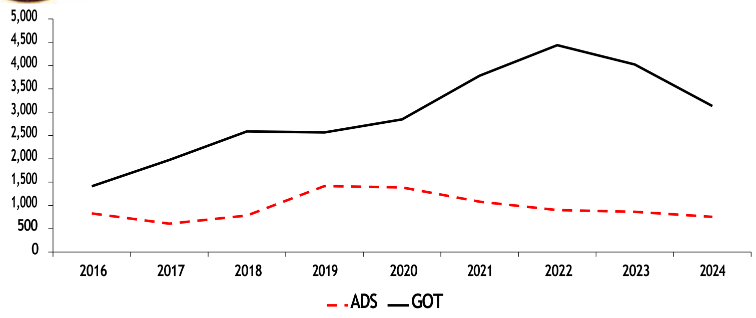
Catch of Anchovy in Thailand waters



CPUE of pelagic fish from purse seine (kg./day)



CPUE of anchovy from anchovy purse seine (kg./day)



Data collection

- Thailand collects pelagic fish data from many of fishing gear
- Fishing logbooks are used in commercial fisheries reporting
- Landing catches are weighted at ports for actual catch from fishing
- Scientific sampling has been conducted on monthly basis, to know fishing efforts and catch composition
- The length of each interested pelagic fish species is measured.
- The collected data is used in stock assessment.
- Used for fishery index e.g. catch rate (CPUE), fishing mortality

Example collection data

Application of Indicators

Maximum Sustainable Yield (MSY) assessment and fishing effort of Pelagic fish in 2024

Area	MSY (tons)	Fmsy (days)	Catch (tons)	Fishing effort (days)	Level of fishing effort (%Fmsy)
Gulf of Thailand	242,686	180,849	237,321	124,535	68.86
Andaman Sea	114,084	47,417	162,380	44,135	93.08

Application of Indicators

Maximum Sustainable Yield (MSY) assessment and fishing effort of Anchovy in 2024

Area	MSY (tons)	Fmsy (days)	Catch (tons)	Fishing effort (days)	Level of fishing effort (%Fmsy)
Gulf of Thailand	190,861	127,917	82,847	28,857	22.56
Andaman Sea	32,880	63,093	7,153	9,259	14.67

Application of Indicators

MSY of some Pelagic fish in the Gulf of Thailand in 2023 by using length-based Thompson & Bell model

	Current		MSY			
Scientific name	Catch (ton)	Biomass	F-factor	Yield (t)	Biomass	B/Bmsy
Pelagic fish						
Rastrelliger brachysoma	41,663.27	9,131.67	1.5	42,552.44	7,542.51	1.21
Rastrelliger kanagurta	29,700.26	18,174.25	1.4	30,177.40	15,112.42	1.20
Sardinella gibbosa	255,255.25	62,781.45	0.5	273,807.18	100,703.42	0.62
Selaroides leptolepis	12,864.46	2,707.28	0.4	14,988.69	5,976.92	0.45
Anchovy						
Encrasicholina heteroloba	34,841.08	17,470.37	3.4	38,085.59	12,067.86	1.45

Application of Indicators

MSY of some Pelagic fish in the Andaman Sea in 2023 by using length-based Thompson & Bell model

	Current		MSY			
Scientific name	Catch (ton)	Biomass	F-factor	Yield (t)	Biomass	B/Bmsy
Pelagic fish						
Rastrelliger brachysoma	9,439.13	1,775.02	0.6	9,759.39	2,301.40	0.77
Rastrelliger kanagurta	13,978.39	9413.31	0.7	14,354.58	12,290.84	0.77
Sardinella gibbosa	10,458.38	2,123.90	0.4	11,474.96	3,410.77	0.62
Selaroides leptolepis	3,888.58	1,023,.97	0.7	4,001.58	1,390.74	0.74
Anchovy						
Encrasicholina heteroloba	6,898.18	3,975.56	3.0	7,874.49	2,366.77	1.68

Application of Indicators

Fishing day/Years Limits in Thailand 2025

Area	Purse seine	Anchovy purse seine	Pair trawls
Gulf of Thailand	255	270	245
Andaman Sea	265	250	275

Application of Indicators

Close area

Gulf of Thailand
1. 15 FEB-15 MAY
2. 16 MAY – 14 JUN
3. 15 JUN – 15 AUG
4. 1 AUG – 30 SEP

Andaman Sea 1 APR -30 JUN

Challenges and Gaps

- The current data collection program do not fully cover artisanal fisheries especially gill nets
- Have few persons working in stock assessment field
- Low cooperation from fishers in data collection
- Field collectors need more training in species identification
- There is limited time available for data collection

Conclusion

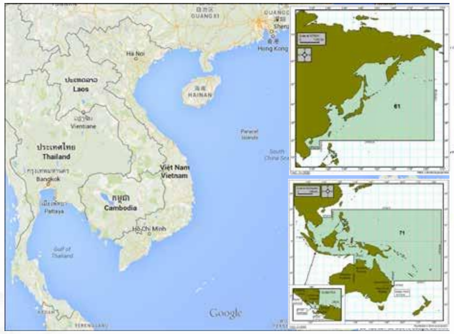
- Pelagic fish can be caught by many fishing gears in Thailand
- There are 4 main fishing gears catching pelagic fishes, purse seine, anchovy purse seine, pair trawl and gill nets
- There are 11 interested pelagic fish species in Thai fisheries
- Data is collected through scientific port sampling on monthly basis
- fishing effort, species composition and length of interested species are collected
- The data is used for stock assessment and be as scientific advices for fisheries management

Simple and Practical Indicators for the Sustainable Management of Pelagic Fisheries in Viet Nam

Vu Viet Ha
Research Institute for Marine Fisheries
Ministry of Agriculture and Environment, Viet Nam

Introduction

The Vietnamese waters

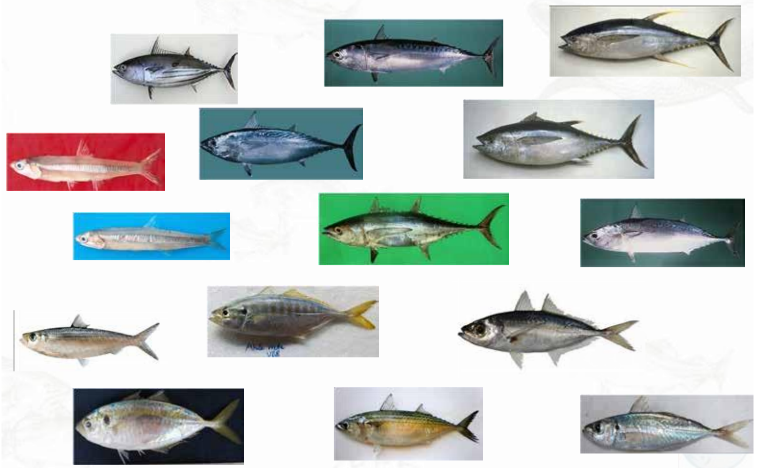


Geographical coverage:
-> 5 management areas:

1) Tonkin Gulf **(TG)**
2) Central waters **(CW)**
3) Southeast waters **(SE)**
4) Southwest waters **(SW)**
5) Offshore waters **(Offshore)**

The marine fisheries resources in Vietnamese waters

Targeted pelagic fishes



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ANNEX 13 VIETNAM

Pelagic Fisheries

1. Purse seine fisheries
2. Drift gill net fisheries
3. Lift net fisheries
4. Falling net fisheries
5. Longline and handline

Concept of Indicators Used

In general, consideration of biological reference points requires consideration of both the **reference point** itself and its associated **indicator**.

What do we mean?

1. **Indicator** – is a quantity used to measure the status of a stock against a given Reference Point.

2. **Reference Point** – the pre-determined level of a given indicator that corresponds to a particular state of the stock that management either seeks to achieve or avoid. e.g. $B_c/B_{MSY} \sim 1$; $F_c/F_{MSY} \sim 1$

Concept of Indicators Used

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MARINE POLICY

www.elsevier.com/locate/marpol

Adaptive fisheries management in Vietnam
The use of indicators and the introduction of a multi-disciplinary Marine Fisheries Specialist Team to support implementation

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Indicators for Sustainable Management

- **Multi-species assessment**
  - C/MSY
  - F/F_{MSY}

If C/MSY > 1
- $F/F_{MSY} < 1$: Under fishing
- $F/F_{MSY} = 1$: Sustainable fishing
- $F/F_{MSY} > 1$: Overfishing

If C/MSY < 1:
- $F/F_{MSY} < 1$: Under fishing
- $F/F_{MSY} = 1$: Overfishing
- $F/F_{MSY} > 1$: Overfishing

Indicators for Sustainable Management

Single species assessment

Exploited rate (E) from LCCC method

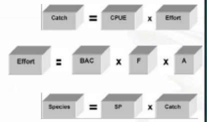
E<0.4; Under fishing
E ~ 0.4-0.6: Sustainable fishing
E~ 0.6-0.8: Risk to Overfishing
E > 0.8: Overfishing

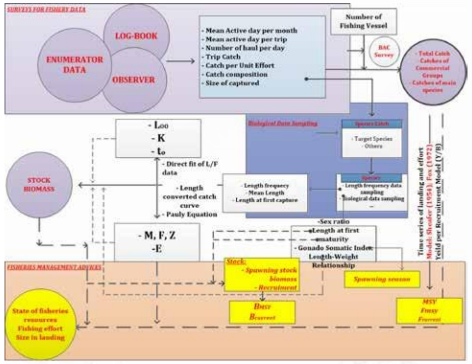
LBSPR

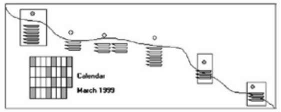
- Target Referent Point: SPR >=0.3
- Limit Referent Point: SPR = 0.2

Data Collection and Monitoring

1. Fisheries Survey
2. Fisheries Independent Survey (FIS)







Data Collection and Monitoring

1. Fisheries Survey
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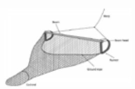
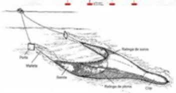
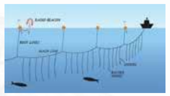
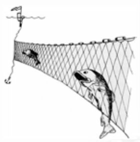
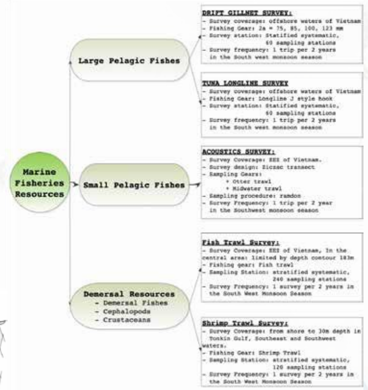










Assessment methodology

- **Stock assessment institution**
  - Research Institute for Marine Fisheries (RIMF) under the Ministry of Agriculture and Rural Development
- **Frequency of assessment**
  - Multispecies assessments
    - Every 5 years (regulated in the Fisheries Law of Vietnam)
  - Single species assessments
    - Ad hoc timing

Stock assessment method

- Multispecies assessments

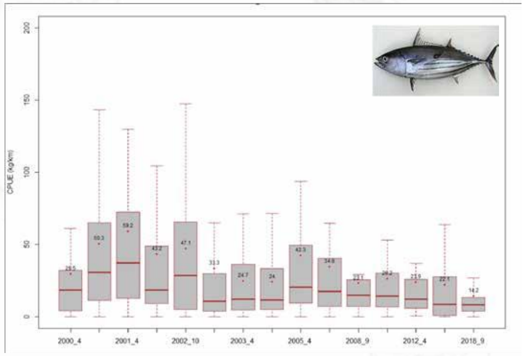
Table: Description of multispecies assessments		
Method	Software package used	Data inputs
Fox production model	- Microsoft Excel - TropFishR Package (R Studio)	· Historical catch and effort

- Single species assessments

Table: Description of single species assessments		
Method	Software package	Comment
Length Converted Catch Curve (LCCC)	FiSAT II	· Determine biological parameters (Linf, K, M, F, Z, E) via FiSAT
Beverton and Holt's yield per Recruit Model (Y/R)	Excel	
LBSPR	- R package - Web-base	· Determine SPR from Catch Length Data · M/K, Lm50, Lm95 from published researches

The time series CPUE of SKJ based on the FIS by gillnet, an example

=> SKJ comprised about 45-75% in total catches of the gillnet surveys



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Exploitation rates and Stock status of some small pelagic fishes in the southwestern waters of Vietnam (LCCC method)

English name	Species	2014-2015 Exploited rate (E)	2014-2015 Stock Status	2017-2018 Exploited rate (E)	2017-2018 Stock Status	2022-2023 Exploited rate (E)	2022-2023 Stock Status
Yellowtail Scad	*Atule mate*	0.50	Sustainable fishing	0.61	Risk to overfishing	0.88	Overfishing
Shorthead Anchovy	*Encrasicholina heteroloba*	0.46	Under-fishing	0.53	Sustainable fishing	0.70	Risk to overfishing
Short Mackerel	*Rastrelliger brachysoma*	0.63	Risk to overfishing	0.66	Risk to overfishing	0.71	Risk to overfishing
Yellowstripe Scad	*Selaroides leptolepis*	0.44	Under-fishing	0.73	Risk to overfishing	0.59	Sustainable fishing
Goldstripe Sardinella	*Sardinella gibbosa*					0.75	Risk to overfishing
Chacunda Gizzard Shad	*Anodontostoma chacunda*					0.56	Sustainable fishing

Multi-species assessment

- C/MSY < 1
- F/FMSY >1

-> Overfishing

Challenges and Gaps

- Multi-species and multi-fishing gears
- Data coverage
- Budget constraints

Future Plans and Recommendations

Future Plans

- Continue long-term data collection to support stock assessment
- Develop a standardized indicator framework for biological, socio-economic, and governance aspects
- Enhance capacity building in data analysis and stock assessment
- Use indicator trends to periodically review and adjust management measures

Recommendations

- Enhance collaboration with neighboring countries for monitoring migratory and transboundary fish stocks.
- Develop joint research and training programs to build technical capacity in stock assessment and sustainable management
- Establish a regional information platform for fisheries statistics, fisheries biology and stock indicators

Conclusion

- Indicators and Referent Points are a way of summarising the outputs of a stock assessment
- They allow:
  - the status of a stock to be assessed
  - The impacts of fishing on a stock to be estimated
  - The performance of the stock against management objectives to be assessed
- Indicators and Referent Points vary through time due to changes in fisheries, catches and the incorporation of new information
- MSY based reference points are currently used by Vietnam

THE REGIONAL TECHNICAL CONSULTATION ON THE HARMONIZATION OF SIMPLE AND PRACTICAL INDICATORS FOR SUSTAINABLE PELAGIC FISHERIES IN SOUTHEAST ASIA

22-24 Oct 2025

Rumeaida Mat Piah, Faculty of Fisheries and Aquaculture Sciences, Universiti Malaysia Terengganu

PART 2: CRITERIA AND PRINCIPLES FOR HARMONIZING INDICATORS

HARMONIZATION INDICATORS

Harmonizing indicators for sustainable pelagic fisheries (or fisheries in general) means ensuring that the indicators are **consistent, complementary, and aligned** with overarching sustainability goals.

Harmonized indicators allow different stakeholders (governments, fishers, NGOs, scientists) to speak the same "language" when assessing sustainability, making comparisons, sharing data, and informing management decisions.

CRITERIA FOR HARMONIZING INDICATORS

1. RELEVANCE

- The indicator must reflect an important aspect of sustainability—biological, economic, environmental, social, or governance.
- It should be appropriate to the fishery (e.g. pelagic, small-scale, industrial).
- Example: CPUE is relevant for biological sustainability in pelagic fisheries; income trends are relevant for socio-economic sustainability.

2. SIMPLICITY AND PRACTICALITY

- Indicators must be simple to measure, interpret, and apply, especially in data-limited contexts.
- They should be cost-effective to collect and not overly complex.

3. MEASURABILTY

- Indicators must be quantifiable or verifiable using available data (e.g. logbooks, landing sites, interviews, satellite data).
- They must have defined units and clear methods of calculation.

CRITERIA FOR HARMONIZING INDICATORS

4. SENSITIVITY

- Should respond predictably and clearly to changes in fishing pressure, stock status, or management actions.
- E.g. CPUE should decrease if the stock declines; average fish size should rise if fishing effort is reduced.

5. ROBUSTNESS

- Indicators should be resistant to manipulation or noise (e.g. shouldn't vary wildly due to short-term fluctuations or biased sampling).
- Standardized methods should be used where possible.

6. COMPARABILITY

- Should allow comparison across time, regions, or fisheries.
- Using harmonized definitions and units (e.g. tons/trip, fish/kg/day) ensures data compatibility.

CRITERIA FOR HARMONIZING INDICATORS

7. POLICY RELEVANCE

- Indicators should inform management decisions—e.g. setting quotas, fishing effort limits, or closed seasons.
- They should be linked to management objectives and reference points (e.g. MSY, limit biomass levels).

8. STAKEHOLDER ACCEPTANCE

- Indicators should be understandable and acceptable to stakeholders, including fishers, managers, and local communities.
- Co-developed or participatory indicators are more likely to be accepted and used.

PRINCIPLES FOR HARMONIZING INDICATORS

INTEGRATION ACROSS DIMENSION

- Harmonized indicators must cover ecological, economic, environment, social, and governance aspects of sustainability (ecosystem-based approach).

COHERENCE WITH INTERNATIONAL FRAMEWORKS

Align with global frameworks like:

- FAO Code of Conduct for Responsible Fisheries
- UN SDGs (especially Goal 14: Life Below Water)
- Marine Stewardship Council (MSC) principles
- Eco-labeling standards

SCALABILITY AND FLEXIBILITY

- Indicators should be usable at local, national, and regional scales.
- They should allow for updating as data quality improves or management evolves.

PRINCIPLES FOR HARMONIZING INDICATORS

USE OF A COMMON INDICATOR FRAMEWORK

- For example, use Pressure-State-Response (PSR) or DPSIR (Drivers-Pressures-State-Impact-Response) models to organize and link indicators logically.

Pressure-State-Response (PSR)
-a model used in fisheries to assess sustainability by analyzing the Pressures (human activities that stress the system), the State (the condition of the fisheries ecosystem), and the Response (actions taken to mitigate negative pressures and improve the state)

Drivers-Pressures-State-Impact-Response (DPSIR)
-a tool for analyzing environmental problems in fisheries by examining the causal chain from cause to effect. It identifies Drivers (socio-economic forces like population growth or demand for fish), which lead to Pressures (actions like overfishing, pollution), which change the environmental State (e.g., fish stock size, habitat quality). These changes have Impacts on ecosystems and society, leading to the need for political or societal Responses (management actions, policies).

PRINCIPLES FOR HARMONIZING INDICATORS

DATA TRANSPARENCY AND STANDARDIZATION

- • Use standard protocols for data collection and processing.
- • Open data sharing improves cross-border effort units, and inter-agency harmonization.

Country	Raw CPUE	Gear Type	Area Covered	Time Period	Result
A	0.8 t/trip	Purse seine	Offshore EEZ	2018-2022	Increasing
B	1.2 t/day	Ring net	Coastal shelf	2019-2023	Decreasing

Example:

Without harmonization (gear standardization, area), these CPUE values are **not comparable**.

A harmonized approach would:

- Standardize by gear type and effort
- Adjust for area/seasonal variation
- Convert all CPUE to tons per unit standardized effort (SPUE)

EXAMPLES OF EFFORTS TO HARMONISE FISHERIES INDICATORS AND DATA SYSTEMS

Initiative 1: Harmonised data exchange standard (UN/FLUX) (EUROPE)

- The EU announced that it will use the new common global standard (UN/FLUX Standard) for exchanging fisheries control data (e-logbook, vessel position) with the North-East Atlantic Fisheries Commission (NEAFC). Oceans and fisheries
- On 29 June 2022 the EU and Norway concluded arrangements to use a common software platform (FLUX) and the UN/FLUX data format for vessel positions and other fishing data.
- Harmonizing format and exchange protocols is essential for cross-border/regional fisheries control and for consistent indicator generation.

EXAMPLES OF EFFORTS TO HARMONISE FISHERIES INDICATORS AND DATA SYSTEMS

Initiative 2: Harmonised collection of recreational fisheries catch data

- The EU adopted a regulation (Implementing Regulation (EU) 2025/274 of 12 Feb 2025) to harmonise the collection of catch data from recreational fisheries in marine coastal areas across Member States.
- The goal: consistent national reporting so that the Commission can compile EU-wide indicator data on recreational catches (previously a data gap).
- This is an explicit indicator harmonisation action: the collection methods, definitions and reporting formats are standardised.

EXAMPLES OF EFFORTS TO HARMONISE FISHERIES INDICATORS AND DATA SYSTEMS

Initiative 3: Simplification & harmonisation of fisheries & aquaculture statistics

- On 30 July 2025, the Commission (European Commission/Scientific, Technical and Economic Committee for Fisheries (STECF)/EU) proposed to replace five existing regulatory frameworks with a single integrated system for fisheries and aquaculture statistics.
- The proposal enables reuse of administrative data, reduces duplication, and supports aggregated figures for international organizations.
- This is an example of institutional harmonization: aligning statistical systems across Member States and indicators internationally.

EXAMPLES OF EFFORTS TO HARMONISE FISHERIES INDICATORS AND DATA SYSTEMS

Initiative 4: Harmonisation of statistics and definitions in Southeast Asia

- SEAFDEC notes that one of the priority issues is **to harmonise standards, definitions and classifications of fishery statistics among Southeast Asian countries** (Improving Fishery Statistics of Southeast Asia Toward the Sustainability of Fisheries and Aquaculture)
- the Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region (adopted 2020) includes: “Apply where appropriate regionally-standardised definitions and classifications for statistical data to facilitate regional compilation, analysis and data exchange.

WHAT WAS HARMONISED / TARGETED FOR HARMONISATION

- Definitions of fishery statistics (e.g., catches, effort, fleet) across countries so that data are comparable.
- Classifications of fisheries (e.g., by gear type, fishing ground) so that regional aggregation is feasible.
- Indicator frameworks: recommending common indicators for sustainable fisheries management.
- Information systems: efforts to build regional mechanisms for sharing data among Member

LESSONS/CHALLENGES

- The process requires commitment by each country to adopt common definitions — but national data systems often use legacy definitions or classifications.
- Harmonisation is not fully achieved yet: SEAFDEC noted that country-profiles still show “some data are not harmonized with other countries”.
- **Good practice:** starting with a limited number of core indicators and standard definitions helps reduce the divergence among countries.

KEY TAKE-AWAYS ON HARMONISATION OF FISHERIES INDICATORS

Objectives: Harmonised indicators/data enable comparable assessments across countries and regions, enable aggregation and meta-analysis, improve policy coherence, reduce reporting burdens, and strengthen regional/international cooperation.

What to harmonise: Definitions (e.g., what constitutes a fishing vessel, or catch), classifications (gear type, species groups), indicator metrics (e.g., catch per unit effort, fleet capacity), data exchange formats, reporting periods/frequencies.

How to do it:

1. Develop a regional agreement or plan of action (e.g., ASEAN Plan of Action, EU regulation).
2. Establish common definitions & classifications.
3. Provide guidelines for data collection and reporting.
4. Build or strengthen regional data systems for sharing/compiling.
5. Provide capacity development support (especially for less-resourced countries).
6. Monitor implementation of harmonisation (are countries adhering?)

KEY TAKE-AWAYS ON HARMONISATION OF FISHERIES INDICATORS

Challenges: Differences in national capacity, legacy data systems, language/terminology differences, costs of upgrading systems, ensuring national commitment, ensuring data quality and comparability.

Lessons:

1. Start with a small set of core indicators,
2. Build consensus on definitions, provide technical support, and use incremental steps (first standardize definitions, then methods, then reporting).

Regional bodies (like SEAFDEC, EU Commission) can facilitate harmonization by providing frameworks, tools, and standards.

HISTORY/TIMELINE OF INDICATORS IN ASEAN

1

The **“Identification of Indicators for Sustainable Development and Management of Capture Fisheries”** is one of the projects formulated under the Special **5-Year Program** of SEAFDEC to support ASEAN Member Countries in the implementation of the Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region adopted at the Millennium Conference held in November **2001**.

2

The **use of indicators of sustainability is a tool to monitor and control the development and management of fisheries** in ASEAN and would be developed and used by relevant national management authorities. This was **endorsed by the National Coordinators Meeting held in Bangkok, Thailand, from 17-19 June 2002.**

HISTORY/TIMELINE

3

This **First Regional Technical Consultation (RTC)** was organized from **16-18 September 2002** with the **objectives** outlined below to support fisheries management through the use of a range of suitable indicators.

1. To **present and discuss the proposal for the introduction of the use of indicators** in the ASEAN region.
2. **To identify and test simple and practical indicators** as management tools that can be used in ASEAN Member Countries through pilot projects in interested countries
3. To **identify suitable sites** for the implementation of pilot projects.

At this RTC five pilot projects were accepted for implementation in SEAFDEC Member countries:

Proposal 1: Trawl fishery in Brunei

Proposal 2: Trawl fishery in waters of the northwest coast of Peninsular Malaysia, and based on fishing vessels of less than 70 GRT

Proposal 3: "Mini" purse seine fishery in the northern part of Central Java Sea, Indonesia

Proposal 4: Ringnet fishery in Camotes Sea, Philippines

Proposal 5: The Tam Giang Lagoon fishery, Hue Province, Vietnam

HISTORY/TIMELINE

4

Progress of Project Implementation: 2002-2003

The Philippines started the project on the ringnet fishery operating from Danao City, Cebu, in December 2002. This pilot project focuses on the small pelagic fishery. Resource and biological indicators have been selected. Existing data on this fishery are being compiled and new data are being collected under a regular sampling program that was started.

Malaysia started a pilot project in early 2003, focusing on the trawl fishery (covering vessels of <40 GRT) in the States of Kedah and Perlis on the north-west coast of Peninsular Malaysia.

Indicators selected are fleet, socio-economic and environmental indicators and these have been agreed upon following a series of meetings, discussions and workshops with stakeholders.

Thailand started a pilot study on the trawl fishery in Pran Buri, Prachuab Khiri Khan District. A meeting with stakeholders was held in July 2003. Currently, stakeholders including fishers, are actively involved in this project. Existing data are being compiled and new data are being collected through a regular sampling program.

Selected indicators include resource, fleet, economic and social indicators.

Brunei Darussalam is studying the use of indicators for the management of the trawl fishery beginning September 2003. Existing data on the fishery selected are being compiled while regular sampling programs have been planned.

Indonesia initiated a study on a traditional demersal fishery in Pekalongan, Central Java, beginning July 2003. Existing data on the fishery selected are being compiled while regular sampling programs have been planned.

HISTORY/TIMELINE

5

Second Regional Technical Consultation on the Use of Indicators for the Sustainable Development and Management of Capture Fisheries in the ASEAN Region
9- 11 March 2004
Kuala Lumpur, Malaysia

Objectives

1. To present and discuss the achievements made in the implementation of pilot projects on the use of indicators in selected fisheries in ASEAN SEAFDEC countries.
2. To make proposals for improved fisheries management by using indicators.
3. To formulate the plan of action for 2004 / 2005.
4. To present and discuss the procedures for the identification and selection of indicators for the sustainable development and management of capture fisheries.
5. To prepare the draft regional guidelines on the use of indicators for improved fisheries management.

Information and Linkages of SEAFDEC Fisheries Management (CFM) Related Programs (As of January 2004)

8. Identification of Indicators for Sustainable Development and Management of Capture Fisheries in the ASEAN Region	Provides a practical and effective tool for management planning and actions particularly applicable for tropical multifisheries, which are easily understood by fishery managers, fishers and other stakeholders to ensure their cooperation and compliance. Also provides a tool to tackle with the excessive fishing capacity. Provides close linkages between statistical data and information and their usage.	**RES-3** (HRD and stakeholder involvement) **RES-5** (Delegation of management functions) **RES-7** (Fishery statistics)	**POA-A1** (Innovative fisheries management) **POA-A5** (Fishing capacity) **POA-A6** (Indicators) **POA-A9 & A10** (Fishery statistics) **POA-E1** (Guidelines/standards)	MFRDMD

HISTORY/TIMELINE

Presentation of the pilot studies

PILOT PROJECT* ON THE USE OF INDICATORS FOR THE SUSTAINABLE DEVELOPMENT IN CAPTURE FISHERIES WITH FOCUS ON THE DEMERSAL TRAWL FISHERY OF BRUNEI DARUSSALAM

Ranimah Hj Abd. Wahab and Mariana Hj. Sabtu
Fisheries Department
Ministry of Industry & Primary Resources
Brunei Darussalam

INDICATORS FOR SUSTAINABLE DEVELOPMENT AND MANAGEMENT OF THE DEMERSAL AND SHRIMP FISHERIES IN NORTH COAST OF CENTRAL JAVA WITH SPECIAL REFERENCE TO PEKALONGAN AND ITS ADJACENT WATERS

Duto Nugroho[1], Dyah Retnowati[2], Suherman Banon Atmadjaand[1] Dian Oktaviani[1]

PILOT PROJECT ON THE USE OF INDICATORS FOR THE SUSTAINABLE DEVELOPMENT AND MANAGEMENT OF ZONE B TRAWLERS IN THE STATES OF KEDAH AND PERLIS, MALAYSIA*

Abu Talib Ahmad
Fisheries Research Institute

INDICATORS MADE BASED ON MONITORING OF VIETNAMESE COMMERCIAL MARINE FISHERY

Nguyen Thi Dieu Thuy and Karl Johan Staehr
Assessment of the Living Marine Resources in Viet Nam
Ministry of Fisheries
Viet Nam

TRAWL FISHERY AT PRAN BURI, PRACHUAB KIRI KHAN PROVINCE THAILAND: A PILOT PROJECT ON THE USE OF INDICATORS AS A MANAGEMENT TOOL IN FISHERIES MANAGEMENT *

Ratanawalee Phoonsawat and Jintana Jindalikit
Upper Gulf Marine Fisheries Research and Development Center
49 Soi Phrarachveriyaporn 16
Bangpheung Sub-district
Phrapradaeng District, Samutprakan
10130 Thailand

THE USE OF CPUE, MEAN SIZE AND SIZE OF SPAWNERS AS INDICATORS FOR THE MANAGEMENT OF RINGNET FISHERIES IN CAMOTES SEA

Noel C. Barut
Grace V. Lopez and Eunice C. Bognot
National Fisheries Research & Development Institute
940 Quezon Avenue,
Quezon City, Philippines

At the end of RTC- **three working groups** were created to prepare framework for the draft guidelines on the use of indicators for improved fisheries management in the ASEAN region

HISTORY/TIMELINE

6

Core Group Meeting on the Identification of indicators for Sustainable Development and Management of Capture Fisheries in the ASEAN Region
PENANG, MALAYSIA
1-3 AUGUST 2005

The Meeting was attended by delegates from the implementing countries (Brunei Darussalam, Indonesia, Malaysia, the Philippines and Thailand) and representatives from MFRDMD.

The objectives of this meeting are
- To monitor the achievement of the pilot projects,
- To review the draft guidelines prepared by the Core Group
- To summarize and finalize these drafts.
- To discuss the preparation for the Regional Conference on Adaptive Management and the 3rd RTC, to be held in Vietnam from 10-14 October 2005.

At the end of meeting- **Final Draft** of The Regional Guidelines on the use of Indicators for Sustainable Development and Management for Capture Fisheries in the ASEAN Region was were prepared

HISTORY/TIMELINE

-Core Group Meeting on the Identification of Indicators for the Sustainable Development and Management of Capture Fisheries in the ASEAN Region

Annex 4

Final Draft

The Regional Guidelines on the Use of Indicators for the Sustainable Development and Management of Marine Capture Fisheries in ASEAN Region

Executive Summary

1.0 The Regional Guidelines on the Use of Indicators for the Sustainable Development and Management of Marine Capture Fisheries in the ASEAN region is to assist ASEAN-SEAFDEC member countries in the implementation of Code of Conduct for Responsible Fisheries (CCRF) and the Plan of Action of the ASEAN-SEAFDEC Millennium Conference: Fish for the People, regarding the use of indicators in fishery management.

2.0 The Guidelines is an elaboration of item 7.4.2 ADD.1 of the Regional Guidelines for Responsible Fisheries Management in Southeast Asia.

3.0 The preparation of the Guidelines is based on the experiences of several member countries which conducted pilot projects from 2003 to 2005.

4.0 This Guidelines elaborates the following main topics:-
- 4.1 Definition
- 4.2 How to develop indicators
- 4.3 Use of Indicators
- 4.4 Stakeholder consultation and participation
- 4.5 Development of national system to use indicator
- 4.6 Follow-up actions
- 4.7 Glossary

13. A number of objectives should be developed for each criterion. The objective should be directly related to sustainable development and management e.g. under Resource and Ecological, one of the objectives is to maintain biodiversity; under Fleet is to increase compliance and under Social and economy is to increase/improve income and social well-being.

14. A number of Potential indicators and its reference values should be determine for each objective, e.g. objective is to reduce overfishing.

Indicators	Reference Point
1. CPUE	• 0.81 tons/day (Brunei), • Maintain CPUE at the introduction of trawl by area (Malaysia)
2. Exploitation rate	0.5

(List of the potential Indicators and Reference Point based on the Pilot Project are to be listed as Appendices)

15. The mechanism in choosing the sustainable indicators should be through the consultation of Stakeholder. The most relevant criteria to select based on the experiences from pilot projects are as follows:
- (i) Availability of time series data
- (ii) Understandability and Acceptability
- (iii) Cost effectiveness
- (iv) Practicability/feasibility
- (v) Scientific validation
- (vi) Ability to communicate information among the Stakeholder

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HISTORY/TIMELINE

7

Third Regional Technical Consultation on the Identification of Indicators for Sustainable Development and Management of Capture Fisheries in the ASEAN Region
13-14 October 2005
Hai Phong, Vietnam

Objectives:
- To present and adopt final draft of the Regional Guidelines on the use of Indicators for Sustainable Development and Management of Fisheries in the ASEAN Region
- To discuss the follow up action on the use of indicators in the development and management of capture fisheries in the ASEAN Region

At the end of the RTC, The Regional Guidelines on the use of Indicators for Sustainable Development and Management for Capture Fisheries in the ASEAN Region was adopted

ADOPTED

THE REGIONAL GUIDELINES ON THE USE OF INDICATORS FOR THE SUSTAINABLE DEVELOPMENT AND MANAGEMENT OF CAPTURE FISHERIES IN ASEAN REGION

-The guidelines should be submitted for endorsement by high-level authorities of ASEAN and SEAFDEC
-Reporting platform

WAY FORWARD

STRATEGIC PLAN OF ACTION ON ASEAN COOPERATION ON FISHERIES, 2016-2020 (SECTOR: AGRICULTURE)
SUB-SECTOR: : FISHERIES
RESPONSIBLE WORKING GROUP : ASEAN Sectoral Working Group on Fisheries (ASWGFi)

STRATEGIC THRUST 1: Enhance quantity and quality of production with sustainable, 'green' technologies, resource management systems, and minimize pre- and post-harvest losses and waste

Activities: 1.4.3. Develop **simple and practical indicators** in supporting planning and monitoring of sustainable fisheries.

Sub activity: - Review, update and modify (when necessary) the existing indicators being used (2016-2020)

KPI:- Set of Indicators on sustainable fisheries developed/updated and monitored

Means of verification:- List of simple and practical indicators

WAY FORWARD

STRATEGIC PLAN OF ACTION ON ASEAN COOPERATION ON FISHERIES, 2021-2025 (SECTOR: AGRICULTURE)
SUB-SECTOR: : FISHERIES
RESPONSIBLE WORKING GROUP : ASEAN Sectoral Working Group on Fisheries (ASWGFi)

STRATEGIC THRUST 1: Enhance quantity and quality of production with sustainable, ‘green’ technologies, resource management systems, and minimize pre- and post-harvest losses and waste

Activities: 1.4.2 Enhance regional Fishery Information Systems (FIS) and mechanisms to facilitate sharing, exchange and compilation of statistics and information that are required at the sub-regional and regional level.

Sub activity: - 1.4.2.2 Develop simple and practical indicators in supporting planning and monitoring of sustainable fisheries.

Output indicators: List of indicators on sustainable fisheries is developed.

DRAFTING HARMONIZED INDICATORS

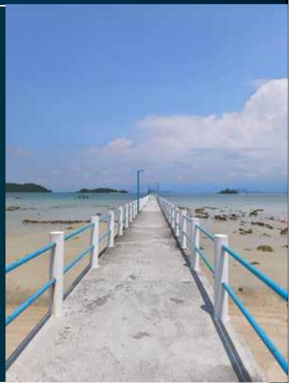
How to do it:

1. Develop a regional agreement or plan of action (e.g., ASEAN Plan of Action, EU regulation).√
2. Establish common definitions & classifications. √
3. Provide and harmonized list of indicators
4. Provide guidelines for data collection (variables) and reporting.
5. Build or strengthen regional data systems for sharing/compiling.
6. Provide capacity development support (especially for less-resourced countries).
7. Monitor implementation of harmonization

ADOPTED

THE REGIONAL GUIDELINES ON THE USE OF INDICATORS FOR THE SUSTAINABLE DEVELOPMENT AND MANAGEMENT OF CAPTURE FISHERIES IN ASEAN REGION

Thank You



THE REGIONAL TECHNICAL CONSULTATION ON THE HARMONIZATION OF SIMPLE AND PRACTICAL INDICATORS FOR SUSTAINABLE PELAGIC FISHERIES IN SOUTHEAST ASIA

22-24 Oct 2025

Rumeaida Mat Piah, Faculty of Fisheries and Aquaculture Sciences, Universiti Malaysia Terengganu

PART 3: DRAFTING HARMONIZED INDICATORS

DRAFTING HARMONIZED INDICATORS

How to do it:

1. Develop a regional agreement or plan of action (e.g., ASEAN Plan of Action, EU regulation). √
2. Establish common definitions & classifications. √
3. Provide guidelines for data collection and reporting.
4. Build or strengthen regional data systems for sharing/compiling.
5. Provide capacity development support (especially for less-resourced countries).
6. Monitor implementation of harmonisation (are countries adhering?)

TASK TODAY

1. Understand The Regional Guidelines on the Use of Indicators for the Sustainable Development and Management of Capture Fisheries in the ASEAN Region
2. Compilation of Indicators currently used by AMS, identify potential and challenges
3. Selecting and Harmonization of Indicators (and variables)
4. Prepare the draft of harmonized indicators

TASK 1: UNDERSTAND THE GUIDELINES

THE REGIONAL GUIDELINES ON THE USE OF INDICATORS FOR THE SUSTAINABLE DEVELOPMENT AND MANAGEMENT OF CAPTURE FISHERIES IN ASEAN REGION

(As in the drive)

TASK 2: COMPILATION OF INDICATORS CURRENTLY USED

LIST OF CURRENT INDICATORS USED BY AMS

	BIOLOGICAL	ECONOMICS	ENVIRONMENT	SOCIAL	GOVERNANCE
Brunei	• Catch Per Unit Effort (CPUE) • Catch Per Day (per gear)	Value of Landings (Average landing price)		Number of Active Licenses	
Cambodia	• Catch per unit effort (CPUE), • Length-based indicators (LBIs), • Length-based spawning potential ratio (LBSPR), • Catch-Maximum Sustainable Yield	Value of landings	Bycatch ratio	Number of active fishers	
Indonesia	• Data Landing (Production and Effort) • Biological Data • Catch per Unit Effort (CpUE)		Bycatch Ratio	Number of Fishers	
Malaysia	• Catch per unit effort (CPUE) • Size distribution and composition • Spawning stock biomass	Value of landings Number of licensed vessels	Bycatch ratio Encroachment into sensitive areas	Number of licensed fishers	

TASK 2: COMPILATION OF INDICATORS CURRENTLY USED

LIST OF CURRENT INDICATORS USED BY AMS

	BIOLOGICAL	ECONOMICS	ENVIRONMENT	SOCIAL	GOVERNANCE
Myanmar	• Biological parameters • Biomass • Catch Rate				
Thailand	• Catch per unit effort (CPUE) (use to calculate MSY) • Catch Rate • Fishing Mortality				
Vietnam	• Fishing Mortality • Exploitation Rate • Length-based spawning potential ratio (LBSPR) • Catch Per Unit Effort (CPUE)				

TASK 2: COMPILATION OF INDICATORS CURRENTLY USED

SUMMARY INDICATORS USED BY AMS

BIOLOGICAL	ECONOMICS	ENVIRONMENT	SOCIAL	GOVERNANCE
• Biological parameters/data • Biomass • Catch Rate/Catch per day • Catch per unit effort (CPUE) • Catch Rate • Fishing Mortality • Exploitation Rate • Length-based spawning potential ratio (LBSPR), • Catch Per Day (per gear) • Length-based indicators (LBIs), • Catch-Maximum Sustainable Yield • Data Landing (Production and Effort) • Size distribution and composition • Spawning stock biomass	• Value of Landings (Average landing price) • Number of licensed vessels	• Bycatch ratio • Encroachment into sensitive areas	• Number of Active Licenses/ • Number of active fishers	

TASK 2: COMPILATION OF INDICATORS CURRENTLY USED

When the indicator is used?	Indicators are used only when needed (e.g. reporting to stakeholders -Not regularly assess -For policy recommendation -analyze by request Thailand has regular stock assessment (used for fisheries management decision)
Specific system	Currently no specific system in place (by request)
Reporting platform	Mostly by request **Indonesia:** '- Regular meeting of Komnas KAJISKAN (National Committe of Fish Resources Assessment)- Scientif panel in Fisheries Management Unit each FMA- Annual Meeting of Fisheries Management Unit each FMA **Malaysia:** National Fisheries Stocks Committees (Scientific, Technical and Steering Committee)
Reporting Frequency	By request (Conducted on an ad-hoc basis to support proposed fisheries management measures). **Annual reporting for Malaysia, Myanmar, Thailand** Indonesia: For stock assessment, it updated regularly every 3 years. For another purposes, it reported by request

TASK 2: COMPILATION OF INDICATORS CURRENTLY USED

CHALLENGES AND GAPS

Limitations in Data Collection or Indicator Reliability

- **Limited coverage and accuracy:** Relying on catch statistics and logbooks that may be incomplete, delayed, or inaccurately reported.
- **Sparse biological data:** Indicators like size-at-maturity or spawning biomass require scientific surveys and regular sampling, which are often limited by budget and technical capacity.
- **Uncertainty in migratory species data:** Pelagic species often cross national boundaries, making it difficult to track their populations accurately with national-level data alone.
- **Indicator sensitivity:** Some simple indicators (e.g. CPUE) can be misleading if fishing technology improves, leading to "hyperstability" where CPUE remains high even as stocks shrink.

Technical, Financial or Institutional Challenges

- **Technical limitations**: Data analysis tools, skilled personnel, and standardized methodologies are often lacking.
- **Financial constraints:** Sustained funding is needed for monitoring programs and scientific surveys.

Gaps in Capacity or Coordination Among Agencies

- **Human resource gaps:** Shortage of trained stock assessors, data analysts and field enumerators.
- **Coordination challenges:** certain agencies often work in silos, with limited data sharing or joint planning.
- **Lack of integrated databases:** different datasets are not interoperable, delaying timely indicator analysis.

TASK 3: SELECTING AND HARMONIZE INDICATOR FOR AMS

SELECT INDICATORS THAT CAN BE USED BY ALL AMS

Harmonized indicators allow different stakeholders (governments, fishers, NGOs, scientists) to speak the same "language" when assessing sustainability, making comparisons, sharing data, and informing management decisions.

- Requiring **minimal and readily available data** e.g., catch statistics, fleet numbers, age of entrants, number of fishers.
- Ensure **repeatability & trend detection (**applied regularly and consistently)
- **Link indicator to management action:**
- **Complement with other data** where possible.
- **Realistic** and manageable. Choose a small set of indicators (3-6) that span ecological, fisheries, and social/human dimensions.
- **Tailor to the pelagic domain:**
- **Data quality & fishers' engagement matter,** indicator choice must reflect data reality.
- Use **visualization & thresholds:** Simple indicators work best when thresholds are defined (e.g., > 30% immature fish triggers review) or when trends are visualized clearly for managers/fishers.

TASK 3: SELECTING AND HARMONIZE INDICATOR FOR AMS

BIOLOGICAL INDICATOR: To assess stock status and sustainability

Category	INDICATOR	UNITS	VARIABLES/DATA
A	• Catch per unit effort (CPUE) **-commercial** **-small scale**	~~Tonnes/day~~ ~~Tonnes/trip~~ Tonnes/fishing days/month	Catch -volume of landing in tonnes Effort -no of vessel
B (Potential Indicator)	**Length based indicators** **-Length-based spawning potential ratio (LBSPR)** **-Fishing and Exploitation Rate** -Certain AMS still depends on research activity to obtain length information Catch composition (by fish groups)		

TASK 3: SELECTING AND HARMONIZE INDICATOR FOR AMS

ECONOMICS INDICATOR: Evaluate economic performance

INDICATOR	UNITS	VARIABLES/DATA
• Value of Landings -Average landing price (Quarter) -monthly net income per fisher (reported annually, lkim) -value of landing (tonnes, price) per month and year -value of landing (total value of landing/year) -income of fisher/trip (unit USD) -fish value/month -value of landing/trip -income of fisher/trip • Number of licensed vessels	value of landing (tonnes, price) per month and year	Volume of landing/month Price of landing/sp/month

TASK 3: SELECTING AND HARMONIZE INDICATOR FOR AMS

SOCIAL INDICATOR: assess how fisheries affect people and communities

INDICATOR	UNITS	VARIABLES/DATA
• Number of Active Licenses	Number of licenses year -fishing vessels -fishing zones/management area	Number of license
• Distribution/utilization of landing • -processing • -fish meal		

TASK 3: SELECTING AND HARMONIZE INDICATOR FOR AMS

ENVIRONMENT INDICATOR: Monitor ecosystem impact

INDICATOR	UNITS	VARIABLES/DATA
• Bycatch ratio • ~~E~~Brunei • myanmar • ~~ncroachment into sensitive areas~~	percent	Volumes or bycatch landing
• Oceanography information • Current dynamics		

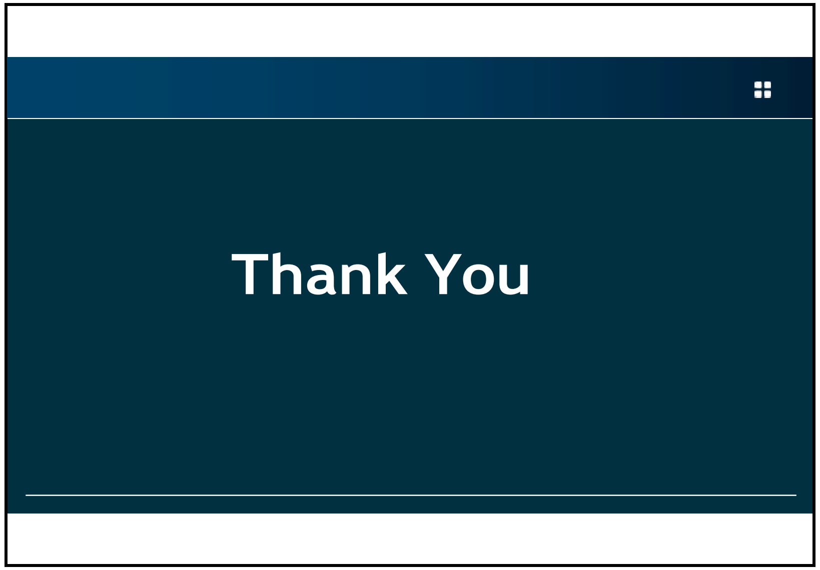
TASK 3: SELECTING AND HARMONIZE INDICATOR FOR AMS

GOVERNANCE INDICATOR: monitor the effectiveness of management measures

INDICATOR	UNITS	VARIABLES/DATA
• Compliance rate?		

TASK 4: DRAFTING HARMONIZED INDICATORS

- DRAFT OF THE HARMONIZED INDICATORS
- TEMPLATE FOR REPORTING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ADOPTED

THE REGIONAL GUIDELINES ON THE USE OF INDICATORS FOR THE SUSTAINABLE DEVELOPMENT AND MANAGEMENT OF CAPTURE FISHERIES IN ASIAN REGION

Executive Summary

1.0 The Regional Guidelines on the Use of Indicators for the Sustainable Development and Management of Capture Fisheries in the ASEAN Region is developed to assist ASEAN member countries in the implementation of the Code of Conduct for Responsible Fisheries (CCRF) as well as the Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region with the emphasis on the use of indicators.

2.0 The Guidelines is an elaboration of the Regional Guidelines for Responsible Fisheries Management in Southeast Asia with emphasis on item 7.4.2 ADD. / (indicators), which was prepared mainly based on experiences of the ASEAN member countries.

3.0 This Guidelines elaborates the following main topics: -

3.1 *Regional Common Understanding of Indicators* - this section explains how "indicators' is perceived in the ASEAN regional context - not a new definition of the terminology. The explanation also includes close linkage with fisheries policy and management.

3.2 *Importance and Roles of in the Use of Indicators* - this section outlines the roles of stakeholders in the development and use of indicators as well as how the consultation and participation of stakeholders should be promoted.

3.3 *Development of Indicators* - this section provides basic elements, criteria and development cycle of indicators as well as interrelationship of respective components.

3.4 *Use of Indicators* - this section elaborates on the issues and consideration that need to be taken into account when using indicators.

3.5 *Development of National System to Use Indicators* - this section outlines basic elements of a national system for using indicators, system development process, and linkage between indicators and supporting data and fishery statistics.

3.6 *Follow-up Actions* - this section suggests actions to be taken by the ASEAN member countries and organizations such as SEAFDEC for future development and promotion of indicators in the ASEAN region.

3.7 *Glossary of Terms* - this section provides definitions of important terminologies cited in the Regional Guidelines to facilitate the readers for their better understanding of the issues.

4.0 This Guidelines is supplemented by selected experiences from the ASEAN member countries, which are given in the Appendixes. This is to clarify potential application of the Guidelines in respective localities.

I. INTRODUCTION

Background

1. In the Code of Conduct for Responsible Fisheries (CCRF) and its overall objectives for sustainable development of fisheries, the need for the use of indicator to determine how well these objectives are being pursued and whether the broader goals of sustainable development are being achieved is stressed.

2. In line with the CCRF, the 'Plan of Action' adopted at the ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security in the New Millennium: "Fish for the People", organized from 19 to 24 November 2001 in Bangkok, Thailand, emphasizes the importance of the use of indicators to support fisheries management in the ASEAN region. As a basis for formulation of guidelines, the Plan of Action, in its item 6 under the Fisheries Management section, states the need to:

   "Formulate guidelines to promote the use of practical and simple indicators for multi-species fisheries as a substitute for classical fisheries management models within the national fisheries management framework, with particular regard to facilitating timely local level fisheries management decisions."

3. The Plan of Action is also supported by the "Regional Guidelines for Responsible Fisheries in Southeast Asia: Responsible Fisheries Management", which indicates that the use of practical and simple indicators should be promoted to augment classical fisheries management models within the national management framework, with particular regards to facilitating timely local level fisheries management decision. Thus, it is encouraged the ASEAN member countries should:

   - Use indicators in support of management tools to achieve sustainable fisheries in the region;

   - Formulate appropriate guidelines for the use of indicators as an effective fisheries management decision-making tool within the national fisheries management framework; and

   - Incorporate appropriate mechanisms for collecting data and information supporting indicators in routine (national fishery statistical system) and non-routine (research) exercises.

Linkages between Indicators and Fisheries Management

4. Considering the nature of fisheries in the region, which is mainly characterized as tropical small-scale multi-species/multi-gear fisheries, the use of indicators for fisheries management in an adaptive manner is seen to be more practical, and easily understood and supported by the stakeholders.

5. Adaptive management is a paradigm shift from predictive approach to adaptive approach. Under a broad co-management concept, adaptive management is an approach where fishery managers react on suit of indicators to undertake assessment of fisheries, resources and eco-system instead of classical stock assessment (e.g. MSY and MEY), incorporating views and knowledge of interested parties in decision-making process using best available information. Adaptive management is by itself a process to achieve management objectives and also a learning process among interested stakeholders about fisheries or system being managed in order to adapt policies and management framework to be more responsive to future condition. The backbone of a good adaptive fisheries management system lies on a good data and information system.

Preparation and Usage of the Guidelines

6. This Guidelines was developed mainly based on the experiences gained from the ASEAN member countries. The experiences include the implementation of pilot projects which were started in 2003 initially in Brunei Darussalam, Indonesia, Malaysia, the Philippines and Thailand and completed in 2005. This Guidelines is supplemented by selected experiences from the ASEAN member countries, which are given in the Appendixes in order to clarify potential application of the Guidelines in respective localities

7. The main objective of the Guidelines is to provide 'inspiration' regional reference or checklist for the ASEAN member countries that are interested in applying indicators for sustainable development and management of fisheries both in inland and marine waters. The Guidelines is not meant to be "implementation guidelines" that are directly applicable to any particular country. The Guidelines is generic in context rather than focusing on specific national situations. It is therefore suggested that the actual application of the Guidelines would require appropriate adjustment or modification, including the terminology used in the guideline so as to fit the national or local specifics on geo-political, social, economic and legal situations.

II. REGIONAL COMMON UNDERSTANDING ON INDICATORS

8. While noting that definitions can be varied, fisheries indicators' is generally referred as a practical tool to support management of fisheries. Indicators provides information on status and trend of fisheries and resources, which can support the decision-making process. There is a close link between policy objectives and the selected indicators in achieving sustainable development goals. Thus, indicators used may include resource/ecological, social and economic indicators to support the management decisions.

III. IMPORTANCE AND ROLES OF STAKEHOLDERS IN THE USE OF INDICATORS

9. Wider and genuine participation of all interested stakeholders is essential for enhancing their understanding, transparency, and accountability on the application and improvement of indicators in response to the management requirements. Consultation and involvement of stakeholders should be enhanced to ensure availability of supporting data. This will in return promote better compliance to management measures by the stakeholders particularly fishers.

10. During the planning stage, consultations with the stakeholders are crucial before the establishment of appropriate indicators. Initial consultations are important steps to introduce the concept of indicators in management, to discuss related issues, to identify the potential indicators and agreement in providing data/information. The subsequent consultations are to present the potential indicators with the latest information, select the appropriate indicators, monitor and evaluate the indicators used, and make appropriate adjustments to the development and use of indicators.

IV. DEVELOPMENT OF INDICATORS

Indicators and Supporting Data and Information

11. For sustainable use purposes, indicators should not be developed in isolation but rather be integrated as part of a broader fishery data and information system, which is supported by registration/ records, fishery statistics through census and surveys, and ad-hoc/specific data and information collection or research. These data and information will provide a basis to support indicators. This linkage should be made explicit to maximize the use of fishery data and information to development and management of fisheries. The use of indicators does not only enhance understanding and encourage local authorities to collect supporting data for the local usage but it also contributes greatly to improve the quality of fishery statistics aggregated at the national level.

12. Development of indicators should utilize existing available data and where possible additional required data should be identified and obtained. Selection of indicators must be based on broader perspective, and policy relevant indicators are selected based on data requirements bearing in mind the possible importance of data that is not available. In this process, special attention should also be given to social, economic and ecological indicators.

13. Appropriate and sufficient coverage of sampled data needs to be carefully determined and collected to ensure high quality of data and indicators. The data collection for indicators should be flexible and robust to accommodate a potential change in management instruments and subsequently generate time series for "new indicators" taking into consideration the cost-benefit ratio. Level of aggregation of data supporting indicators should be determined at national and local levels considering the complexity and needs for decision-making process.

Development Process for Indicators

14. The development process for indicators is an evolving on-going learning process. The starting point of this process largely depends on specific situation. The following are suggested key steps in the development process for the use of indicators[1] through stakeholder consultation process.

- *Defining the system scope* - refers to a system to be covered. A system can be a particular fishery or a geographical area.

- *Developing a system framework* - refers to components within the defined system.

- *Specifying criteria, objectives and potential indicators* - refers to criteria, management objectives, and potential indicators that can be used to support the management. This may also include means of verification and sources/suppliers of supporting data.

- *Choosing a set of indicators* - refers to a suit of practical indicators that are perceived appropriate in response to the management requirements.

15. In defining the scope, the system to be covered should be manageable and focused on the sustainable development and management of fisheries. The areas of consideration are:
- Human activities (Stakeholders) - refers to resource utilization either focusing only on fishing activities or including other activities related to fisheries or other users of the area.
- Issues of focus - refers to major issues of concern in the defined system such as excess capacity, overfishing, compliance, endangered aquatic species, critical habitats, interaction between fisheries and other aquatic resource use.
- Geographical boundaries - refers to the boundary of the defined system. This can be all fisheries in a geographical area or a specific sub-sector (commercial, artisanal/traditional) or a specific fishery.
- Contribution of fisheries - refers to the role and contribution of fisheries in the sector or in a broader development objective.

16. Within the defined system, components or elements of the system should be identified. Components or elements may include fisheries sub-sectors or fishing activities (boats, gear, and fishers) in the system. The identified components or elements will then clarify criteria, objectives for the use of indicators, a set of potential indicators and appropriate reference points. It should be noted that under the adaptive fisheries management approach, reference points may not be required as a long-term target. Reference points can however be temporary and used to facilitate monitoring of the progress of the management process.

[1] Refers to the cycle diagram for development of indicators

17. In line with the defined system and identified components, the criteria for selecting indicators includes:
    - Resource and Ecological - e.g. landing volume, juvenile of commercial species, and important aquatic habitats
    - Fishing efforts - e.g. fishing boats, fishing gear, and fishers
    - Social - e.g. employment, education, and literacy
    - Economic -e.g. income, landing values, and fish price

18. A number of objectives should be developed for each criterion. The objective should be directly related to sustainable development and management e.g. under *Resource and Ecological*, one of the objectives is to sustain biodiversity; under *Fishing efforts* is to increase compliance, under *Social* is to increase employment and livelihood level, and under *Economic* is to increase/improve income.

19. Subsequently, potential indicators should be determined for each objective. It should be noted that the usefulness of specific indicators differs between fisheries and geographical areas. Usefulness of selected indicators should be verified through appropriate application to the fisheries. Selection of potential indicators should take into account the following:
    - Availability of time series data
    - Understandability and acceptability
    - Cost-effectiveness
    - Practicability/feasibility
    - Scientific validation
    - Ability to communicate information to stakeholders

V. USE OF INDICATORS

20. The indicators should be simple, easily understood and scientifically valid to act as a communication tool among stakeholders. For effective implementation of fisheries management, indicators could be used in all the management process - planning, communication, monitoring and evaluation in fisheries management. In planning stage, indicators should be used in setting directions for developing management plan and action.

21. Efforts should be made to interpret indicators in such a way to create understanding among concerned stakeholders particularly policy makers, managers and resource users. Indicators could also be used as a tool in monitoring the effectiveness of management action and policies.

22. Use of indicators should be regularly evaluated at appropriate time intervals as part of management process to ensure their relevance to management objectives.

VI. DEVELOPMENT OF NATIONAL SYSTEM TO USE INDICATOR

23. A national system for the use indicators depends on the following components, *inter alia*, registration and records, fishery statistics, research and studies, enforcement activities, and stakeholder consultations.

24. Gathering of data and information should be strengthened. The relevant authority should review and evaluate the current fishery statistical system in order to identify constraints. Mechanisms to improve the system such as standard measurement and definition of variables/data should be developed to ensure national/regional compatibility of data for timeliness, reliability and availability of the information. Data for indicator that cannot be collected by the regular statistical system and routine data sampling such as biological, ecological and social and economic should be collected under non-routine data collection.

25. The relevant authority should establish a mechanism to include application of indicators in fisheries management as well as development of synthesis in various criteria of indicators - resource and ecological, fishing efforts, social and economic. The mechanism can be in the form of a fisheries specialist group[2], which has proven to be useful for condensing indicator information into recommendations to policy, decision makers and managers. This mechanism will in return enhance overall improvement of quality and usage of indicators. Working methods and structure of the fisheries specialist group are important to ensure efficient and effective performance and high quality of the assessment report[3]. Based on the assessment reports, the fisheries specialist group could provide regular advice on the use of indicators in management of the fisheries.

26. As most countries in the ASEAN region, in one way or another has started the use of indicators in fisheries management, at least at the pilot project level, there is a need to mainstream the application of indicators at the national level so as to ensure comparable results. Efforts should be made to develop new indicators in response to the evolving management requirements.

27. National capacity building programs should be developed to support the various steps in the application of indicators.

VII. FOLLOW-UP ACTIONS TO PROMOTE THE USE OF INDICATORS

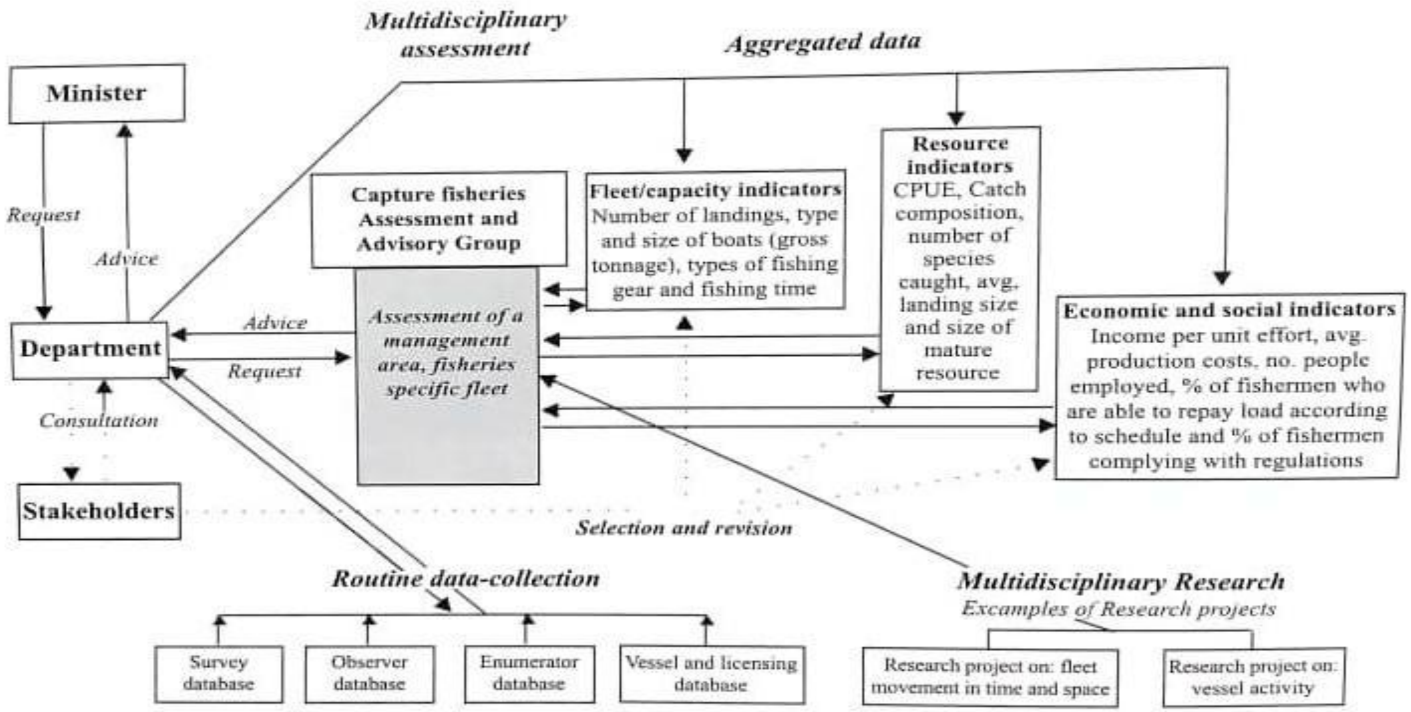
28. It is strongly recommended that practical implementation of ‘indicators' should be further promoted to support fisheries management in the ASEAN region. Appropriate steps to incorporate the application of indicators into the national management framework should be identified and conducted including familiarization on the use of indicators for fisheries management to the stakeholders.

29. Along this line, further exchange of experience and expertise in the application of indicators among countries in the region should be promoted. International/regional organizations including SEAFDEC should provide further technical support in the application of indicators as well as promote sharing of experience and raise up the issue to high-level authority to demonstrate the applicability and benefits to improve management of fisheries towards sustainable development concepts. This includes promotion on the implementation of these Guidelines and development of capacity building.

[2] An example to this mechanism in the Marine Fisheries Specialist Team (MFST) in the case of Vietnam.

[3] Composed of the following sections – introduction, fleet synthesis, resource and eco-system synthesis, catch assessment, conclusion, and recommendation.

Cycle diagram for development and applying indicators in capture fisheries management in SEAFDEC pilot projects



ANNEX 17

HARMONIZATION OF INDICATORS FOR SUSTAINABLE PELAGIC FISHERIES IN SOUTHEAST ASIA

1. Title / Initiative Name:
Harmonization of Indicators for Sustainable Pelagic Fisheries in Southeast Asia

2. Coordinating Body / Lead Institution:
Southeast Asia Fisheries Development Center (SEAFDEC)

3. Participating Countries / Agencies:

1. Brunei Darussalam
2. Cambodia
3. Indonesia
4. Malaysia
5. Myanmar
6. Philippines
7. Thailand
8. Viet Nam

4. Objective / Purpose:

- To standardise fisheries indicators across countries.
- To facilitate regional comparison, aggregation, and policy analysis.
- To improve data quality and support evidence-based fisheries management.

5. Background:
Indicators can be defined as a practical tool to support management of fisheries. Indicators provides information on status and trend of fisheries and resources, which can support the decision-making process.

Harmonized indicators enable various stakeholders such as governments, fishers, NGOs, and scientists to use a common "language" when evaluating sustainability, facilitating comparisons, data sharing, and informed management decisions.

Simple and practical indicators should:

- Requiring minimal and readily available data e.g., catch statistics, fleet numbers, age of entrants, number of fishers.
- Ensure repeatability & trend detection (so that indicators can be applied regularly and consistently)
- Link indicator to management action.
- Complement with other data where possible.
- Realistic and manageable.
- Tailor to the pelagic domain
- Data quality & fishers' engagement matter, indicator choice must reflect data reality.
- Use visualization & thresholds: Simple indicators work best when thresholds are defined (e.g., > 30% immature fish triggers review) or when trends are visualized clearly for managers/fishers.

6. List of indicator and variables selected:

Biological indicator is used to assess stock status and sustainability, economic indicator is used to evaluate economic performance, social indicator is used to assess how fisheries affect people and communities, environment indicator is used to monitor ecosystem impact while governance indicator is to monitor the effectiveness of management measures.

AMS currently uses several indicators to manage pelagic resources. This section provides the list of indicators that have been selected and harmonized for AMS to apply in assessing and reporting on stock status (see **Annex A**).

In this practice, biological, social, economic and environmental indicators are listed and harmonized while governance indicators should be considered in the future.

Nonetheless, AMS may also utilize other suitable indicators to evaluate the status of their respective resources.

7. Reporting and monitoring:

- Template for reporting (see **Annex B**).

ANNEX A: LIST OF INDICATORS

<table>
<tr><th colspan="5">BIOLOGICAL INDICATORS</th></tr>
<tr><th>Category</th><th>Indicators</th><th>Units</th><th>Variables/data</th><th>Notes</th></tr>
<tr><td>Selected Indicators</td><td>Catch Per Unit Effort (CPUE)</td><td>Tonnes/fishing days/month</td><td>Catch
-volume of landing in tonnes
Effort
-no of vessel</td><td></td></tr>
<tr><td rowspan="2">Potential Indicators</td><td colspan="3">Length based indicators
Example:
-Length-based spawning potential ratio (LBSPR)
-Fishing Mortality and Exploitation Rate</td><td rowspan="2">-Certain AMS still depends on research activity to obtain length information</td></tr>
<tr><td colspan="3">Catch composition (by fish groups)</td></tr>
<tr><th colspan="5">ECONOMIC INDICATORS</th></tr>
<tr><td>Selected Indicators</td><td>Value of landing</td><td>Tonnes and price (per month and year)</td><td>Volume of landing/month
Price of landing/month</td><td></td></tr>
<tr><td rowspan="2">Potential Indicators</td><td colspan="3">Income of fisher/trip (unit USD)</td><td></td></tr>
<tr><td colspan="3">Value of landing/trip</td><td></td></tr>
<tr><th colspan="5">SOCIAL INDICATORS</th></tr>
<tr><td>Selected Indicators</td><td>Number of Active Licenses</td><td>Number of licenses/ years
-fishing vessels
-fishing zones/ management area</td><td>Number of licenses</td><td></td></tr>
<tr><td>Potential Indicators</td><td colspan="3">Distribution/utilization of landing
Example:
processing
fish meal</td><td></td></tr>
<tr><th colspan="5">ENVIRONMENT INDICATORS</th></tr>
<tr><td>Selected Indicators</td><td>Bycatch ratio</td><td>Percent</td><td>Amount of bycatch landed
Total landing</td><td></td></tr>
<tr><td>Potential Indicators</td><td colspan="3">Environmental data (SST)
Oceanography information
Current dynamics</td><td></td></tr>
</table>

- **Selected Indicators: Indicators chosen by AMS for use in assessing stock status.**
- **Potential Indicators: Indicators identified for possible future use.**

ANNEX B: Template for Country Reporting

Title: Status of *[selected pelagic fish group]* assessed by *[mention the indicators selected: ecological or social or environment or economics or compliance indicators]*

Prepared by:
[Name of Presenter] [Designation, Organization/Department] [Country]

Abstract
Summary of the project

1.0 Introduction
Overview of the stock
Current management measures
Problems faced related to pelagic resources

2.0 Objectives

3.0 Materials and Methods
*Indicators used
*Data collection
*Data analysis

4.0 Results
*Trend/value of the indicator over time

5.0 Discussion
*Current status of the stock
*Implications for the management of the stock
*Application of indicators in management-how indicators can be applied in decision making process

Challenges and limitations
Limitations in data collection or indicator reliability
Technical, financial, or institutional challenges
Gaps in capacity or coordination among agencies

Future Plans and Recommendations
Proposed improvements in indicators or data systems
Plans for integrating indicators into management plans or decision-making
Areas for regional collaboration and technical support

6.0 Conclusion
Key findings and takeaways
Summary of indicators contributing to sustainable management
Country's commitment to continued improvement and regional cooperation

7.0 References
8.0 Acknowledgement
Items marked with an asterisk (*) are compulsory.

COMPILATION AND ASSESSMENT ON THE CONSERVATION EFFORT AND MANAGEMENT STRATEGIES OF PELAGIC SPECIES

OVERVIEW OF THE QUESTIONNAIRE

1 The objective of this questionnaire is:
i. To obtain and compile the information on the current conservation efforts and management strategies of pelagic species conducted by AMSs
ii. To analyse the gaps in the conservation efforts and management strategies of pelagic species in AMSs countries
iii. To obtain and compile potential strategies for better conservation efforts and management of pelagic species

2 This set of questionnaires is divided into **FIVE** parts, which are:
i. Part 1
ii. Part 2: A & B
iii. Part 3
iv. Part 4
v. Part 5

3 To make it easy to navigate, this questionnaire was designed by using **TWO** colors, which are:
i. Light green indicates questions that been asked.
ii. Light yellow designates the respondent's answer space.

4 This questionnaire consists of two types of questions, which are:
i. Open-ended question: The respondent needs to fill in relevant answers.
ii. Closed-ended question: The respondent needs to choose between the options provided (e.g. **YES/NO**).

5 If you have any inquiries, please contact our secretariat, **Miss Mazalina Ali at mazalina@seafdec.org.my or +609-6175940 / +609-6177867 / +609-6171543.**

6 Please answer all questions.

Please provide the following information:	
Name of country	
Contact person	
Designation	
Email address	
Name of organization	
Date of filling out this questionnaire	

Glossary	
Term	**Definition**
AIS	Automatic Identification System
Bycatch	Refers to the unintended capture of non-target species while fishing for a specific type of fish or seafood.
Climate-driven shifts	Changes in species distribution caused by warming oceans, changes in sea ice, increased storm frequency, and ocean acidification
Community-based allocations	Involve granting resource use rights, like fishing or carbon emission allowances, to a community or group rather than individuals or companies, aiming to achieve social, economic, and environmental goals
Discard	Refers to the portion of the catch that is thrown back into the sea—either dead or alive—instead of being landed or kept.
Ecosystem services	Also known as environmental services, are all those benefits that an ecosystem provides to society, and which influence the health, quality of life, and economic development of the people who make it up (benefits that human get from nature)
FAD	Fish Aggregating device
Fishing vessel	A fishing vessel is a type of boat or ship that is specifically used for catching fish in the sea.
Forage fish	Small schooling species of fish that serve as prey for larger ecologically, recreationally, culturally, and commercially important fish, marine mammals, and sea birds
Gear marking	The practice of physically or electronically marking fishing gear to establish ownership and legality, prevent abandoned, lost, or otherwise discarded fishing gear (ALDFG), combat illegal, unreported, and unregulated (IUU) fishing, reduce gear conflicts, and enhance safety at sea
Individual transferable quotas (ITQs)	Allocation of shares or portions of a total allowable catch (TAC) to individual fishers, vessels, communities or others with an interest in the fishery
IUU fishing	Illegal, unreported, unregulated fishing
Pelagic fish	Refers to fish that live in the pelagic zone of the ocean, which means they inhabit the open water column, not near the bottom (benthic zone) or the shore (coastal areas). These fish are typically found in the midwater or surface layers of the sea.
Predator-prey dynamics	Complex interactions between predator and prey fish species. Example: Predation can regulate the dynamics of prey populations directly by reducing recruitment and survival. Prey can also influence predators as prey quantity and quality affect feeding rates, growth, and reproductive success of predators.
Restocking	The release of hatchery seed to rebuild severely depleted fish stocks
Sea ranching	Release of hatchery seed in-put, grow and take operations
Slot Limit/ harvest limit	A slot limit is a type of fisheries regulation that specifies a size range of fish that must be released, while allowing fish both smaller and larger than that range to be harvested (harvest of intermediate size fish).
Stock enhancement	The release of hatchery seed to improve self-sustaining populations
TED	Turtle Excluder Device
Total Allowable Catches (TACs)	A catch limit, expressed in weight, that sets the maximum amount of a specific fish species or stock that can be harvested from a particular fishery during a given period, usually a year
VMS	Vessel Monitoring System

PART 1: MAIN ISSUES IN THE FISHERIES OF PELAGIC SPECIES OF AMS			
The questions in this section are intended to obtain information regarding pelagic fish fisheries issues in each country. ***Pick and rank by order the TOP 5 issues that occur in your country.**			
No.	**Item**		**Top 5 issues**
i	Please select the main issues related to the management of pelagic resources in AMS	IUU (illegal, unreported, unregulated) fishing	
		Changes in species distribution	
		Overfishing	
		Overcapacity	
		Use of unsustainable fishing gears	
		Increase of fishing effort	
		Lack of management and conservation measures	
		Lack of data collection at fish landing sites	
		Lack of regulated/ authorised fish landing site	
		Lack of capacity in data collection	
		Lack of systematic data collection	
		Lack of regular fish stock assessment	

PART 2: CURRENT CONSERVATION EFFORTS AND MANAGEMENT STRATEGIES					
A. Current conservation efforts and management strategies implemented					
This section contains questions about the current management measures and conservation efforts for pelagic fisheries in AMS. Select YES if these measures and efforts are currently being implemented in your country, and provide specific details. ***This question pertains to management measures and conservation efforts that have already been implemented and are not in a trial, pilot, or experimental phase.**					
No.	**Item**			**YES/ NO**	**Specify:**
i	Output control: catch Limits and Quotas	Total Allowable Catches (TACs) set based on stock assessments			
		Allocation of quotas among fleets or vessels			
		Minimum fish size limit			
		Maximum fish size limit			
		Slot limit			
		Catch prohibition of certain pelagic species			
		Other (Please specify)			
ii	Gear Regulations and Selectivity Improvements	Use of circle hooks			
		Bycatch/ incidental reduction devices/ mitigation (e.g., Pinger, bird-scaring lines)			
		Control on gear modification (e.g., Prohibit high opening of trawl net)			
		Control on fishing aids in driftnets and purse seine operation (e.g., Intensity of lights, FADs, fish site identification, fish finder)			
		Gear marking			
			Mesh size control		

		Control on gear specification	Cod end mesh size		
			Depth of the net		
			Length of net		
			Other (Please specify)		
iii	Fishing Effort/ Input control	Limitation of the number of fishing vessels			
		Limitation of the number of fishing gears			
		Licensing and vessel registration system			
		Control on the carrier vessel and mother boat	Size		
			Numbers		
		Control on horsepower of fishing vessels			
		Control the number of light boats			
		Control of light usage on fishing vessel	Intensity of light		
			Colour of light		
			Use of underwater light		
			Other (Please specify)		
iv	Spatial and Temporal Closures	Marine protected areas (MPAs)			
		Closed season			
		Closed area			
		Other closures (Please specify)			
v	Ecosystem-Based Approaches	Monitoring predator-prey dynamics			
		Monitoring forage fish exploitation			
		Monitoring climate-driven shifts in pelagic ecosystems			
		Protecting ecosystem services, not just target species			
		Other (Please specify)			
vi	Monitoring, Control, and Surveillance (MCS)	Vessel Monitoring Systems (VMS)			
		Automatic Identification System (AIS)			
		e-Navigation			
		Manual logbooks			
		Electronic logbooks			
		Onboard observers			
		Port State Measures to prevent IUU fishing			
		Other (Please specify)			
vii	Resource enhancement measures	Deployment of artificial reef			
		Sea Ranching, Stock Enhancement, Restocking			
		Habitat restoration and rehabilitation			
		Fisheries Refugia			
		Other (Please specify)			

<table>
<tr><td colspan="5">PART 2: CURRENT CONSERVATION EFFORTS AND MANAGEMENT STRATEGIES</td></tr>
<tr><td colspan="5">B. Current regulatory and governance frameworks to implement conservation goals effectively.</td></tr>
<tr><td colspan="5">This section contains questions about the Current regulatory and governance frameworks for pelagic fisheries in AMS. Select YES if these regulatory and framework are currently being implemented in your country, and provide specific details.

*This question pertains to management measures and conservation efforts that have already been implemented and are not in a trial, pilot, or experimental phase.</td></tr>
<tr><td>No.</td><td colspan="2">Item</td><td>YES/ NO</td><td>Specify:</td></tr>
<tr><td rowspan="8">i</td><td rowspan="8">Governance</td><td>National Management Plans</td><td></td><td></td></tr>
<tr><td>Country adopt regional regulation and management measures
(e.g., FAO Code of Conduct for Responsible Fisheries)</td><td></td><td></td></tr>
<tr><td>Periodically revise regulation or management measures</td><td></td><td></td></tr>
<tr><td colspan="2">Main agency in the country responsible to formulate the management measure of pelagic resources (Please specify)</td><td></td></tr>
<tr><td>Country has fishers' association</td><td></td><td></td></tr>
<tr><td>Country adopting precautionary approach</td><td></td><td></td></tr>
<tr><td>Country adopting marine spatial planning</td><td></td><td></td></tr>
<tr><td>Country has MCS system</td><td></td><td></td></tr>
<tr><td rowspan="3">ii</td><td rowspan="3">Rights-Based Management</td><td>Individual transferable quotas (ITQs)</td><td></td><td></td></tr>
<tr><td>Community-based quota allocations</td><td></td><td></td></tr>
<tr><td>Co-management with fishing communities, especially for small-scale (artisanal/ traditional) pelagic fisheries.</td><td></td><td></td></tr>
<tr><td rowspan="2">iii</td><td rowspan="2">Adaptive Management</td><td>Incorporating new data and scientific advice into dynamic decision-making.</td><td></td><td></td></tr>
<tr><td>Adjusting strategies in response to climate change impacts
(e.g., Shifting distributions of tuna stocks).</td><td></td><td></td></tr>
<tr><td rowspan="3">iv</td><td rowspan="3">Traceability and Market-Based Tools</td><td>Eco-certifications
[(e.g., Marine Stewardship Council (MSC)]</td><td></td><td></td></tr>
<tr><td>Catch documentation schemes</td><td></td><td></td></tr>
<tr><td>Trade restrictions on IUU (illegal, unreported, unregulated) products</td><td></td><td></td></tr>
<tr><td rowspan="3">v</td><td rowspan="3">Capacity Building and Stakeholder Engagement</td><td>Train local managers and fishers in data collection and stock assessment</td><td></td><td></td></tr>
<tr><td>Engagement with fishers to enhance compliance</td><td></td><td></td></tr>
<tr><td>Inclusive governance involving governments, NGOs, industry, and communities</td><td></td><td></td></tr>
<tr><td rowspan="3">vi</td><td colspan="3" rowspan="3">List of pelagic fish group/ species that have their own management plans</td><td>i.</td></tr>
<tr><td>ii.</td></tr>
<tr><td>iii.</td></tr>
</table>

PART 3: CHALLENGES IN IMPLEMENTATION OF CURRENT CONSERVATION AND MANAGEMENT STRATEGIES			
Please determine the challenges faced in implementing management measures, conservation efforts on pelagic fisheries in AMS. Select YES for the challenges faced by your country, and provide specific details. ***Pick and rank by order the TOP 5 challenges that occur in your country.**			
No.	**Item**	**Top 5 challenges**	**Specify:**
i	IUU (illegal, unreported, unregulated) fishing		
ii	Limited cooperation from fishers		
iii	Limited cooperation from other stakeholders		
iv	Limited support from government		
v	Climate change and distributional shifts of species		
vi	Lack of Monitoring, Control, and Surveillance (MCS)		
vii	Financial/ budget constraint		
viii	Overlapping of jurisdiction		
ix	Limited capacity (e.g., stock assessment, enforcement)		
x	Limited capability (e.g., stock assessment, enforcement)		
xi	Regulatory limitation and gaps		
xii	Lack of awareness among fishers		
xiii	Lack of compliance among fishers		
xiv	Inconsistency in governance mechanism		

PART 4: POTENTIAL NEW STRATEGIES IN CONSERVATION EFFORTS AND MANAGEMENT OF PELAGIC FISH			
This section aims to obtain input regarding strategies and approaches that will be taken by AMS in the management and conservation of pelagic fisheries in the future. Select YES for the related strategies in your country, and provide specific details. ***Can choose more than one**			
No.	**Item**	**YES/ NO**	**Specify:**
i	Introduction of more sustainable fishing gears		
ii	Introduction of new fishing gear technologies		
iii	Development of more efficient post-harvest and processing equipment		
iv	Monitoring predator-prey dynamics		
v	Monitoring forage fish exploitation		
vi	Monitoring climate-driven shifts in pelagic ecosystems		
vii	Protecting ecosystem services, not just target species		
viii	Train local managers and fishers in data collection and stock assessment		
ix	Engagement with fishers to enhance compliance		
x	Inclusive governance involving governments, NGOs, industry, and communities.		
xi	Considering socioeconomic of fishers in formulation of management measures		
xii	Deployment of artificial reef		
xiii	Adopting artificial intelligence (AI) technology in data collection		
xiv	Increase financial/ funding/ allocation		
xv	Establish/ strengthen co-management with communities		
xvi	Other (Please specify)		

PART 5: SUCCESS STORIES	
This section is for sharing success stories related to the management and conservation of pelagic fish in each AMS. ***You can share more than one success story with us. This success story will be presented during regional technical consultation (RTC).**	
No.	**Success story**
i	
ii	
iii	

The Regional Technical Consultation on the Harmonization of Simple and Practical Indicators for Sustainable Pelagic Fisheries in Southeast Asia

22-24 Oct 2025
Subang, Malaysia

Way Forward

By Mazalina Ali

SEAFDEC/MFRDMD

Way Forward

- Report on Overview of the Feedback on Regional Fisheries Information/ Mechanisms Questionnaire will be published and distribute to AMSs.
- Format report on the Harmonized Simple and Practical Indicators for Pelagic Fisheries will be sent to AMSs. AMSs need to send the country report based on the agreed format by end of November 2025.
- After that, the report will be compiled, published and d s bute to AMSs.

Way Forward

- Questionnaire on Conservation Efforts and Management Strategies in AMSs will be send to AMSs by end of this month.
- AMSs need to send feedback questionnaire by end of November 2025.
- Participants from AMSs will present the feedback during the RTC that will be held from 17 to 19 Dec 2025.

Way Forward

	2024	2026			
	Dec	Jan	Feb	Mar	Apr
Output 4: The current status on conservation and management strategies of selected pelagic fishes in AMSs are identified and documented					
Activity 4: Compilation and Assessment of Management Strategies of Selected Pelagic Species					
Sub-Activity 4.2: Regional Technical Consultation (RTC) on Conservation Efforts and Management Strategies of Selected Pelagic Fisheries Resources in AMSs	X				
Sub-Activity 4.3: Workshop on the Analysis of Regional Management Strategies of Selected Pelagic Fisheries Resources in AMSs Questionnaire		X			

Way Forward

	2024	2026			
	Dec	Jan	Feb	Mar	Apr
Output 5: Terminal report is prepared and published					
Activity 5: Compilation and publication of the terminal report					
Sub-Activity 5.1: Workshop on Compilation information for the success stories in AMSs			X		
Sub-Activity 5.2: Workshop on Compilation information for the draft of the terminal report			X		
Sub-Activity 5.3: Workshop on Harmonization of the draft of the terminal report				X	
Sub-Activity 5.4: Workshop on Finalization of terminal report					X

Way Forward

	2024	2026			
	Dec	Jan	Feb	Mar	Apr
Output 6: Project monitoring and evaluation are conducted					
Activity 6: Project monitoring and evaluation					
Sub-Activity 6.2: Project terminal review and evaluation workshop					X

THANK YOU

CLOSING REMARKS

Regional Technical Consultation on The Harmonization of Simple and Practical Indicators for Sustainable Pelagic Fisheries in Southeast Asia

22 – 24 October 2025
Subang, Malaysia

By Dr. Masahito Hirota, Deputy Chief of SEAFDEC/MFRDMD

Associate Prof. Rumeaida Mat Piah and Dr. Abdullah Mohamad from UMT, Mr. Abd. Haris Hilmi Ahmad Arshad, Chief of SEAFDEC/MFRDMD, all representatives from ASEAN member countries and DOF-FRI Malaysia and Ladies and Gentlemen, Good afternoon.

Thank you very much for joining to "The Regional Technical Consultation on the Harmonization of Simple and Practical Indicators for Sustainable Pelagic Fisheries in Southeast Asia (RTC)".

This activity is supported by the JAPAN ASEAN Integration Fund (JAIF), the objective of this fund is to support all ASEAN member countries by establishing the strong, dynamic and open system of ASEAN community. And this program is well expected to deepen the mutual understanding between Japan and ASEAN countries, in promotions of human resource communication, technology transferring, study and research activities, to have good relationships with ASEAN countries and Japan.

The JAIF project, for this next step, SEAFDEC JTF team and ASEAN have started discussion that how we can update the program to be better goal of JAIF. I think that this meeting is good timing and can get a meaningful result for member countries, especially for the sustainable use method of fish stock of ASEAN water.

On the other hand, I also expect that this project can support a better pelagic fisheries management strategy or fish stock management system for achieving sustainable use of pelagic fish stock system in ASEAN waters. I hope that this project's output can provide supportive information to member countries for the future planning of the reginal action for the management of fishing capacity.

I would like to say thank you again and I hope to work continuously together and keep in touch with all.

Now, I would like to declare the meeting closed. Thank you very much.

APPENDIX

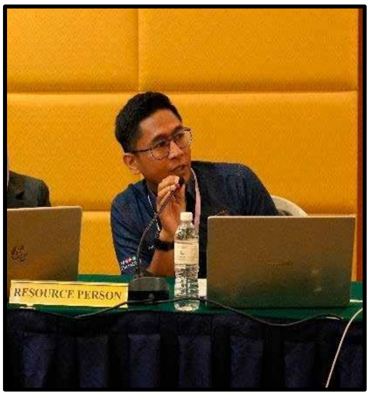
Meeting images photographed by Mr. Noredzuan Hakimi bin Ghani

Mr. Abd Haris Hilmi Ahmad Arshad, *Chief of MFRDMD*
x

Dr. Masahito Hirota
Deputy Chief of MFRDMD

Ms. Mazalina Ali
Special Departmental Coordinator of MFRDMD

Assoc. Prof. Dr. Rumeaida Mat Piah, *Resource Person from UMT*



Dr. Abdullah Mohamad
Resource Person from UMT

Ms. Desimawati Haji Metali
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Ms. Siti Nur Nisrina Matali
Brunei Darussalam

Mr. Leng Syvann
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Dr. Chea Tharith
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Ms. Marlinda Anim Marham
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Mr. Jackson Clive Jusak
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Mr. Zaw Khaing
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Ms. Nuengruetai Yoknoi
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Mrs. Nguyen Thi Hong Nhung
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Dr. Vu Viet Ha
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Mr. Muhammad Amirullah Al-Amin Ayob, *MFRDMD*

Ms. Hamizah Nadia binti Alias @ Yusof, *MFRDMD*

Ms. Khairiah Jaafar *MDRDMD*

Ms. Che Nurfatihah Che Li @ Che Ali, *MFRDMD*

Mr. Rosdi Mohd Nor *MFRDMD*

Mr. Muhammad Khairul Nizam Man, *MFRDMD*

Mr. Azmeer Mohd Yusof, *MFRDMD*

Mr. Ahmad Akid Ajwad Yamani, *Internship student*

Southeast Asian Fisheries Development Center (SEAFDEC)

What is SEAFDEC?

SEAFDEC is an autonomous intergovernmental body established as a regional treaty organization in 1967 to promote sustainable fisheries development in Southeast Asia. SEAFDEC currently comprises 11 Member Countries: Brunei Darussalam, Cambodia, Indonesia, Japan, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Viet Nam.

Vision

Sustainable management and development of fisheries and aquaculture to contribute to food security, poverty alleviation and livelihood of people in the Southeast Asian region

Mission

To promote and facilitate concerted actions among the Member Countries to ensure the sustainability of fisheries and aquaculture in Southeast Asia through:

i. Research and development in fisheries, aquaculture, post-harvest, processing, and marketing of fish and fisheries products, socio-economy and ecosystem to provide reliable scientific data and information.
ii. Formulation and provision of policy guidelines based on the available scientific data and information, local knowledge, regional consultations and prevailing international measures.
iii. Technology transfer and capacity building to enhance the capacity of Member Countries in the application of technologies, and implementation of fisheries policies and management tools for the sustainable utilization of fishery resources and aquaculture.
iv. Monitoring and evaluation of the implementation of the regional fisheries policies and management frameworks adopted under the ASEAN-SEAFDEC collaborative mechanism, and the emerging international fisheries-related issues including their impacts on fisheries, food security and socio-economics of the region.


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MARINE FISHERY RESOURCES DEVELOPMENT AND MANAGEMENT DEPARTMENT **(MFRDMD)**

9 786297 629179