



## REPORT OF THE 3RD SESSION OF THE IOTC WORKING PARTY ON SOCIO-ECONOMICS

Online, 1–2 April 2026

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## ACRONYMS

AFAD	Anchored fish aggregating device
“BIOT”	“British Indian Ocean Territory”
BMSY	Biomass which produces MSY
CMM	Conservation and Management Measure (of the IOTC; Resolutions and Recommendations)
CNCP	Cooperating Non-Contracting Party, of the IOTC
CoC	Compliance Committee of the IOTC
CPs	Contracting Parties
CPCs	Contracting Parties and Cooperating non-Contracting Parties
DFAD	Drifting fish aggregating device
EEZ	Exclusive Economic Zone
FAD	Fish aggregating device
FAO	Food and Agriculture Organization of the United Nations
FMSY	Fishing mortality at MSY
GEF	Global Environment Facility
HCR	Harvest control rule
ICRU	Improved Cost Recovery Uplift
IOC	Indian Ocean Commission
IOTC	Indian Ocean Tuna Commission
IPNLF	International Pole and Line Foundation
ISSF	International Seafood Sustainability Foundation
IUU	Illegal, unreported and unregulated
LRP	Limit reference point
LSTLV	Large-scale tuna longline vessel
MPF	Meeting participation fund, of the IOTC
MSC	Marine Stewardship Council
MSE	Management Strategy Evaluation
NGO	Non-Governmental Organisation
OFCF	Overseas Fishery Cooperation Foundation of Japan
OIG	Office of the Inspector General
OPRT	Organisation for the Promotion of Responsible Tuna Fisheries
OT	Overseas Territories
PEW	PEW Charitable Trust
RFMO	Regional Fisheries Management Organisation
SC	Scientific Committee of the IOTC
SCAF	Standing Committee on Administration and Finance of the IOTC
SIOFA	Southern Indian Ocean Fisheries Agreement
SBMSY	Spawning or ‘adult’ equilibrium biomass at MSY
SWIOFC	Southwest Indian Ocean Fisheries Commission
TCAC	Technical Committee on Allocation Criteria of the IOTC
TCMP	Technical Committee on Management Procedures
TCPR	Technical Committee on Performance Review
TRP	Target referent point
UNCLOS	United Nations Convention on the Law of the Sea
VMS	Vessel Monitoring System
WPEB	Working Party on Ecosystems and Bycatch of the IOTC
WPICMM	Working party on the Implementation of Conservation and Management Measures
WPM	Working Party on Methods of the IOTC
WPTmT	Working Party on Temperate tunas of the IOTC
WPTT	Working Party on Tropical Tunas of the IOTC
WWF	World Wide Fund for Nature (a.k.a World Wildlife Fund)

## STANDARDISATION OF IOTC WORKING PARTY AND SCIENTIFIC COMMITTEE REPORT TERMINOLOGY

SC16.07 (para. 23) The SC **ADOPTED** the reporting terminology contained in Appendix IV and **RECOMMENDED** that the Commission considers adopting the standardised IOTC Report terminology, to further improve the clarity of information sharing from, and among its subsidiary bodies.

### How to interpret terminology contained in this report

#### **Level 1: From a subsidiary body of the Commission to the next level in the structure of the Commission:**

**RECOMMENDED, RECOMMENDATION:** Any conclusion or request for an action to be undertaken, from a subsidiary body of the Commission (Committee or Working Party), which is to be formally provided to the next level in the structure of the Commission for its consideration/endorsement (e.g. from a Working Party to the Scientific Committee; from a Committee to the Commission). The intention is that the higher body will consider the recommended action for endorsement under its own mandate if the subsidiary body does not already have the required mandate. Ideally this should be task specific and contain a timeframe for completion.

#### **Level 2: From a subsidiary body of the Commission to a CPC, the Secretariat, or other body (not the Commission) to carry out a specified task:**

**REQUESTED:** This term should only be used by a subsidiary body of the Commission if it does not wish to have the request formally adopted/endorsed by the next level in the structure of the Commission. For example, if a committee wishes to seek additional input from a CPC on a particular topic but does not wish to formalise the request beyond the mandate of the Committee, it may request that a set action be undertaken. Ideally this should be task specific and contain a timeframe for the completion.

#### **Level 3: General terms to be used for consistency:**

**AGREED:** Any point of discussion from a meeting which the IOTC body considers to be an agreed course of action covered by its mandate, which has not already been dealt with under Level 1 or level 2 above; a general point of agreement among delegations/participants of a meeting which does not need to be considered/adopted by the next level in the Commission's structure.

**NOTED/NOTING:** Any point of discussion from a meeting which the IOTC body considers to be important enough to record in a meeting report for future reference.

**Any other term:** Any other term may be used in addition to the Level 3 terms to highlight to the readers of IOTC reports the importance of the relevant paragraph. However, other terms used are considered for explanatory/informational purposes only and shall have no higher rating within the reporting terminology hierarchy than Level 3, described above (e.g. **CONSIDERED; URGED; ACKNOWLEDGED**).

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## EXECUTIVE SUMMARY

The 3<sup>rd</sup> Session of the Indian Ocean Tuna Commission’s (IOTC) Working Party on Socio-Economics (WPSE) was held online on the 1–2 April 2026. A total of 62 participants attended the Session (50 in 2025, 69 in 2024). The list of participants is provided in [Appendix I](#). The meeting was opened by the Chair of the WPSE. The following are the recommendations from the WPSE03 to the Commission, which are provided in Appendix V.

[Para 30] The WPSE therefore **REQUESTED** that percentage-based socio-economic indicators be used to complement indicators based on absolute values.

[Para 32] The WPSE **NOTED** the importance of fish processing activities in coastal countries, and that both the International Seafood Sustainability Foundation (ISSF) and the IOTC monitor data from processing factories that may not be captured by the identified indicators. The WPSE therefore **REQUESTED** that fish processing activities be included in the indicator framework.

[Para 91] The WPSE **RECOMMENDED** that the Commission consider and endorse the WPSE Programme of Work (2027–2031), as provided in Appendix IV.

[Para 100] The WPSE **RECOMMENDED** that the Commission consider the consolidated set of recommendations arising from WPSE03, provided in Appendix V.

## 1. Opening of the meeting

1. The 3<sup>rd</sup> Session of the Indian Ocean Tuna Commission’s (IOTC) Working Party on Socio-Economics (WPSE) was held online on the 1 – 2 April 2026. A total of 62 participants attended the Session (50 in 2025, 69 in 2024). The list of participants is provided in [Appendix I](#). The meeting was opened by the Chair of the WPSE.

## 2. Adoption of the agenda and arrangements for the session

2. The WPSE **ADOPTED** the Agenda provided at [Appendix II](#). The documents presented to the WPSE03 are listed in [Appendix III](#).

## 3. The IOTC Process: outcomes, updates, and progress

### 3.1. Outcomes of the 28th Session of the IOTC Scientific Committee

3. The WPSE **NOTED** paper [IOTC-2026-WPSE03-04](#) which summarizes the outcomes the report of the 28th Session of the Scientific Committee (SC28), particularly the comments specifically related to the work of the WPSE:

*(Para 43) The SC **NOTED** the report of the 2<sup>nd</sup> Session of the Working Party on Socio-Economics ([IOTC-2025-WPSE02-R](#)), including the consolidated list of recommendations provided as an appendix to the report. The meeting was held online and attended by 50 participants (cf. 69 in 2024).*

*(Para 44) The SC **THANKED** the chair for the comprehensive and clear presentation summarising the main outcomes of the WPSE meeting.*

*(Para 45) The SC **NOTED** that the consultant provided the WPSE with useful and relevant information on socio-economic data pertinent to tuna fisheries, including a proposed set of socio-economic indicators for monitoring these fisheries, several of which were identified through the scoping study conducted for the Commission in 2019 ([IOTC-2024-WPSE01-INF03](#)).*

*(Para 46) The SC **NOTED** the WPSE Chair’s summary of socio-economic information available from FAO, including production, employment, fleet, trade and market intelligence, while recognising that many datasets are available only at regional or global scales.*

*(Para 47) The SC **NOTED** the persistent gaps in socio-economic data, largely due to incomplete or under-reported national statistics, especially for employment in support industries and fisheries-related services.*

*(Para 48) The SC **NOTED** the wide variation in socio-economic indicators collected by coastal States, with many reported only at aggregated primary-sector levels and limited fisheries-specific or species-specific information, although some countries report employment by gender and income level.*

*(Para 49) The SC **NOTED** the outcomes from paper [IOTC-2025-WPSE02-06](#) presented at the WPSE on the economics of tuna gillnet fisheries in Pakistan which indicated that these fisheries are profitable, with incomes for crew and captains higher than in other fisheries, but that they incur initial important investments and have high fuel and operating costs. The WPSE further **NOTED** that the need to enhance the collection of fisheries data in Pakistan to better understand the dynamics of the fisheries sector.*

*(Para 50) The SC **NOTED** that the data used in this study were provided by WWF-Pakistan, and that they may not reflect accurately the economic status of the tuna gillnet fisheries of Pakistan. The SC further **NOTED** that some major improvements have been recently made with fisheries data collection and management in Pakistan, including the use of digital solutions, and that some economic data are now available and could be provided to support the work of the WPSE.*

*(Para 51) The SC **NOTED** the statement by the invited expert that firstly, supplementary analyses (not presented to the SC) were conducted to assess the impacts of a wire-leader ban on the large-scale longline fisheries from Taiwan, China, and secondly that the analyses confirmed that the expected strong negative*

*repercussions on the fishery, initially estimated at more than \$40 million USD in total losses, as well as major impacts on Donggang processing families and tourism workers.*

### **3.2. Outcomes of the 29<sup>th</sup> Session of the Commission**

4. The WPSE **NOTED** paper [IOTC-2026-WPSE03-03](#) which summarizes the outcomes of the 29th Session of the Commission. The WPSE **RECALLED** the Commission adopted Resolution 23/10 in 2023, which established the terms of reference for the Working Party on Socio-Economics.
5. The WPSE **NOTED** that the Commission discussed the report of the TCAC meeting in 2025, which mentioned the Socio-economic indicators discussed at WPSE should be updated in the App.
6. (para 36) The Commission **REQUESTED** that the consideration of operational, economic and social impacts of mitigation approaches be confined to the WPSE, not the WPEB (which considers scientific matters).

## **4. Information on socio-economic data for IOTC CPCs and fisheries**

### **4.1. Review of socio-economic data available at the Secretariat and other fishery management organisations**

7. The WPSE **NOTED** presentation [IOTC-2026-WPSE03-10](#) from FAO, which provided an update on minimum socio-economic data collection from countries, and highlighted several weaknesses in current data reporting.
8. The WPSE **NOTED** that some socio-economic datasets have been recently expanded using newly collected data, including more detailed trade data, nutritional data, and a disaggregated Fish Price Index (FPI), which now includes tuna prices.
9. The WPSE **ACKNOWLEDGED** that the data received by FAO are constrained by several challenges at the national level, particularly the lack of detailed data collection; inconsistent monitoring; reduced policy visibility in terms of poverty reduction due to the resilience of fishery sector; and the extensive nature of small-scale fisheries, which are difficult to monitor effectively.
10. The WPSE **NOTED** that FAO plans to develop standardised approaches for data collection through capacity-building initiatives, which will incorporate socio-economic indicators. It was also **NOTED** that FAO will collaborate with the World Bank to develop survey modules to support country-level data collection.
11. The WPSE **NOTED** that, in cases of non-reporting, the FAO uses alternative data sources such as Regional Fisheries Management Organizations (RFMOs), and that interval fishery census data are available in some countries. However, FAO **NOTED** that it does not currently have specific methodologies to estimate missing data.
12. The WPSE also **ACKNOWLEDGED** the complexity of collecting detailed information, such as employment by occupation, and **NOTED** FAO's plans to review and improve historical datasets.
13. The WPSE **NOTED** that FAO has released an R package and a new API Developer Portal to improve public access to fisheries data (see [FAO Data Portal](#)).
14. The WPSE **NOTED** presentation [IOTC-2026-WPSE03-07](#) which presented the European Union (EU) data collection framework (DCF) and economic indicators available through EU legislation. The presentation outlined the structure, purpose, and application of the DCF, emphasising its central role in supporting evidence-based fisheries management under the Common Fisheries Policy (CFP).
15. The WPSE **NOTED** that the DCF, established in 2000 and governed by EU regulation, enables Member States to systematically collect biological, environmental, economic, and social data. These data are gathered through national workplans, coordinated regionally, and submitted to centralised databases for analysis. A key institutional actor is the Scientific, Technical and Economic Committee for Fisheries (STECF), which processes

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aggregated data and provides scientific advice to inform policy decisions. The workflow reflects a cyclical system linking national data collection, expert analysis, and policy formulation.

16. The WPSE **NOTED** that the DCF covers four main data domains: biological data, ecosystem impacts, fishing activity, and economic/social indicators. Economic data collection aims to assess fleet performance, support bio-economic modelling, track employment trends, and contribute to ecosystem-based fisheries management. Economic indicators include income, costs, investments, employment, and fleet characteristics. These data are collected at vessel level and aggregated into fleet segments defined by fishing technique, vessel size, and region.
17. The WPSE **NOTED** that data availability varies in resolution and source, combining administrative records, monitoring systems, and survey-based economic data, further **NOTING** that limitations remain, particularly for smaller vessels.
18. The WPSE **NOTED** that key outputs include the Annual Economic Report and capacity balance indicators produced by STECF, which are widely used for policy evaluation and sector analysis. At the international level, ICES WGECOM contributes by advancing economic analysis and integrating socio-economic considerations into fisheries science and management advice. UK-specific indicators and reporting tools demonstrate how such data are applied nationally to monitor fleet performance and economic health. Dissemination tools used within the EU and UK to make the economic indicators available are reports, Tableau and other interactive online tools. The WPSE further **NOTED** that the methodology calculating the indicator is published in order to maintain some transparency.
19. The WPSE **ACKNOWLEDGED** that fisheries management integrates environmental, economic, and policy dimensions, with the DCF providing a critical framework for informed decision-making.
20. The WPSE **NOTED** the limited number of submissions received from CPCs. In light of this, the Secretariat and Chairs invited contributions from experts representing RFMOs, academia and regional organisations to inform the discussion on indicators. It was generally considered preferable to draw on these expert inputs, even in the absence of formal papers, rather than proceed without substantive contributions.
21. The WPSE **NOTED** the UK experience regarding indicator development and accessibility, including the availability of indicators and supporting tools, **QUERYING** whether comparable mechanisms exist at EU level.
22. The WPSE **AGREED** on importance of ensuring that data and indicators are readily accessible through simple and user-friendly means. The need for greater standardisation of indicators across EU and ICES frameworks was also highlighted, alongside the practical challenges that arise where relevant data are not systematically collected.
23. The WPSE **QUERIED** the author on the best way of incentivising industry to provide operational and commercial data. It was **NOTED** that, in the UK, data collection is largely voluntary and underpinned by trust-based relationships between researchers and fishers, often facilitated through direct engagement with companies. Demonstrating clearly how such data are used, particularly in informing policy, was seen as key to encouraging participation. The provision of benchmark reports, enabling individual operators to compare performance against the wider sector, was identified as a further incentive. At EU level, more formal approaches are being explored, including the potential linkage of reporting requirements to fishing licences.
24. Finally, the WPSE **DISCUSSED** the role of economic indicators in policy-making. In the UK context, such indicators are not generally linked directly to policy objectives, with the exception of measures relating to stability. While broader national benefit objectives could in principle be associated with economic indicators, these are liable to shift in response to wider geopolitical developments. Economic indicators are, however, used by stakeholders to assess the performance of management measures, including in marine protected areas. Notwithstanding this, the WPSE **ACKNOWLEDGED** that there remains a clear preference for maintaining management frameworks based on biological targets and thresholds, rather than introducing explicit economic objectives.

## 4.2. Socio-economic data assessment relevant to tuna fishing nations and fisheries

25. The WPSE **NOTED** paper [IOTC-2026-WPSE03-11](#) which provides an overview of the socio-economic indicators from coastal countries in Indian Ocean, emphasising on indicators relevant to the Technical Committee on Allocation Criteria (TCAC), together with their associated data collection methodologies and availability.

The WPSE **NOTED** that limited data on socio-economic indicators are available at the Secretariat, particularly with respect to the economic development of CPCs. It further **NOTED** the proposed set of indicators from TCAC, which are considered in the present paper, including:

- High per capita fish consumption
- High proportion of fish workers employed in small-scale and artisanal fisheries
- High proportion of workers employed in fish processing
- Vulnerability as assessed by the Commonwealth Universal Vulnerability Index
- High contribution to GDP from tuna fisheries
- High proportion of total export value comprised of fisheries exports
- Low Human Development Index (HDI) status

26. The WPSE **NOTED** the various methodologies used by the Secretariat to compile the TCAC-proposed socio-economic indicators, drawing on globally available data sources such as the World Bank, International Labour Organization (ILO), Organisation for Economic Co-operation and Development (OECD), FAOSTAT, UN Comtrade, and the United Nations Development Programme (UNDP). The WPSE further **NOTED** that the Secretariat is automating the retrieval of these data using R scripts, and that these scripts will be made available through the IOTC website for transparency and reproducibility.

27. Considering the risks associated with highly uncertain data, the WPSE **NOTED** the high risk of using such data for management purposes and emphasised that they should instead serve as guidance on how to support fishers.

28. The WPSE further **NOTED** that incorporating these indicators into a framework would require clearly defined criteria. The WPSE **RECALLED** that a consultant developed a framework for some of these indicators, including a clearer articulation of their objectives. Furthermore, the WPSE **NOTED** that additional indicators, such as export of tuna, should be considered in quota allocation discussions.

29. The WPSE **NOTED** that several indicators are computed on a per capita basis, which may understate the importance of fisheries in some coastal regions of countries with large populations, such as India. In these countries, coastal fisheries may play key social and economic role in specific regions, including Andaman, Nicobar, and Lakshadweep islands. The WPSE **AGREED** on the importance of computing regional indicators in such cases.

30. The WPSE therefore **REQUESTED** that percentage-based socio-economic indicators be used to complement indicators based on absolute values.

31. The WPSE **ACKNOWLEDGED** the interest of conducting surveys to better evaluate the different components of tuna consumption in IOTC coastal countries, **NOTING** that national consumption may also be derived from international trade statistics (i.e., imports and exports) although estimates may be uncertain due to conversion factors and accuracy of such statistics in some countries.

32. The WPSE **NOTED** the importance of fish processing activities in coastal countries, and that both the International Seafood Sustainability Foundation (ISSF) and the IOTC monitor data from processing factories that

may not be captured by the identified indicators. The WPSE therefore **REQUESTED** that fish processing activities be included in the indicator framework.

### 4.3. Presentation from CPCs

33. The WPSE **NOTED** paper [IOTC-2026-WPSE03-09](#) on a study of the dynamics of price fluctuation of the prime tuna species in determining operational strategies of tuna gillnet vessels in Pakistan, with the following abstract provided by the authors:

*“Gillnet fishing operations are the only method of exploitation of tuna and tuna-like species in the coastal and offshore waters of Pakistan. Pakistan has a fleet of about 700 tuna gillnet vessels, which are primarily based in two major landing centres (Karachi and Gwadar) along the coast of Pakistan. The main target species of these vessels are yellowfin tuna, skipjack tuna, longtail tuna, narrow-barred Spanish mackerel (kingfish), marlins (black, blue, and striped), and sailfish, whereas queenfish, dolphinfish, and coastal tunas (kawakawa, frigate, and bullet tunas) are mainly caught as opportunistic species. Tuna species are not locally consumed and mainly transported to neighbouring countries. Prevailing prices in Karachi Fish Harbour is usually about 30 to 50 % less than prices in Gwadar. Despite low prevailing tuna prices, Karachi Fish Harbour appears to be attractive to tuna gillnet vessels because of facilities for repair and maintenance, transportation, proximity to important fishing grounds on the vast continental shelf, and the supply of inputs; however, fuel prices are much higher. It was common practice for smuggled fuel to be readily available at sea aboard other fishing vessels and dedicated supply vessels. Gwadar, located near the neighbouring country, is also an attractive and important operational base because of the availability of cheap fuel prices, as well as usually high but fluctuating prices for tuna and tuna-like products.”*

34. The WPSE **NOTED** that Karachi Fish Harbour had historically served as a major operational base for tuna gillnet vessels due to the availability of supporting facilities. However, over the past six years, a significant shift has occurred, with the tuna gillnet fleet relocating to Gwadar, driven primarily by higher market prices for tuna species in that port.
35. The WPSE **NOTED** that this relocation has also resulted in a shift in fishing grounds, with a substantial proportion of the fleet now operating in deeper offshore waters along the Balochistan coast. It was further **NOTED** that the movement of the fleet since 2021 is attributed mainly to prevailing price structures and fish grading systems in Karachi Fish Harbour, and to a lesser extent the availability of comparatively cheaper fuel in Gwadar.
36. The WPSE **NOTED** that comments were invited from delegates of Pakistan regarding the presentation, which had been delivered by WWF Pakistan rather than a government representative. No comments were provided, as no delegates from Pakistan were present at the time.
37. The WPSE **DISCUSSED** the extent to which international market prices influence the domestic tuna sector, including the proportion of landings entering export markets. It was **NOTED** that a significant share of catches, particularly from gillnet vessels, does not meet the quality standards required for international export markets.
38. The WPSE **NOTED** that these vessels frequently undertake extended fishing trips relying solely on ice-based preservation methods, which constrains product quality. As a result, most landings are exported only to neighbouring countries, with Iran identified as a primary destination.
39. The WPSE further **NOTED** that the current conflict situation has adversely affected these operations, making offloading in Iran increasingly difficult. Rising fuel costs and heightened risks to crew safety associated with the conflict were highlighted as key concerns impacting the fishery.

40. The WPSE **NOTED** paper [IOTC-2026-WPSE03-12 Rev1](#) on a comparative analysis of the semi-industrial longline fleet efficiency in Seychelles, with the following summary provided by the authors:
- “This comprehensive analysis of Seychelles' semi-industrial longline (SILL) fishery was commissioned to address critical recommendations from a 2022 baseline assessment. The study examines fleet performance, efficiency, and sustainability over a seven-year period (2017-2023), moving beyond traditional catch-and-effort metrics to provide a holistic understanding of the fishery's dynamics.”*
41. The WPSE **CONGRATULATED** the authors for their presentation, which detailed the economic performance of the fleet and the impact of various environmental variables on the fishery and provided detailed information on the economics of the Seychelles semi-industrial fishery. The WPSE **ENCOURAGED** other CPCs to conduct similar studies and present the results at the next sessions of the WPSE.
42. The WPSE **NOTED** that the fleet is experiencing significant growth, although concerns remain regarding operational efficiency.
43. The WPSE further **NOTED** the declining CPUE of the fishery, which may indicate that increasing levels of effort and resources are required to sustain operations.
44. The WPSE **NOTED** that, since 2016, the main target species has shifted to yellowfin tuna, compared to swordfish in previous years. The WPSE further **NOTED** alongside the changes in fishing operations and an increase in the number of vessels operating from 2016 onwards, as well as a rise in the number of foreign workers in the sector.
45. The WPSE **NOTED** the revenue structure and variability of the fishery, as well as a declining trend in operating profit. It was further **NOTED** that some vessels are operating at a loss, despite the provision of government fuel subsidies. Additionally, productivity trends at the fleet level indicate a declining technical frontier.
46. The WPSE **NOTED** that 15 environmental variables were analysed to assess oceanographic conditions, which were found to explain only 15-18% of fleet performance.
47. The WPSE also **NOTED** the project's recommendations, which suggest that fisheries authorities should incorporate more socio-economic factors into the management framework, and promote diversification and innovation.
48. The WPSE **NOTED** that there were no follow-up activities to assess the impact of the recent Middle East conflict on the cost of fishing operations. The WPSE **ACKNOWLEDGED** the measures taken by the Seychelles government, including the maintenance of fuel reserves sufficient for several months.
49. The WPSE **NOTED** that exports of fishery products have been adversely affected by the cancellation of Emirates flights, resulting in the destruction of several consignments. This is of particular concern given that the fleet primarily targets export markets for higher-value products.
50. The WPSE **NOTED** paper [IOTC-2026-WPSE03-13](#), which presented the socio-economic dependency and limited adaptive capacity in Indonesian tuna fishing households, based on case studies from Kendari and Ternate.
51. The WPSE **THANKED** the authors for the detailed presentation on the importance of tuna fisheries in these regions, **NOTING** that Indonesia was the leading tuna fishing nation in 2018, accounting for approximately 17-22% of global production.
52. The WPSE **NOTED** the weak integration of socio-economic indicators into fisheries management, which coincides with the vulnerability of fishing households. The results highlighted the strong link between tuna fisheries and small-scale livelihoods in Indonesia, as well as the high dependence on these fisheries for food security.

53. The WPSE further **NOTED** the importance of income derived from tuna fisheries for traders and vessel-owner households in the studied regions. In some cases, tuna fisheries represent the sole source of income, with limited diversification of economic activities. Additionally, the WPSE **NOTED** the high consumption of tuna species within local diets.
54. The WPSE also **NOTED** the authors' comments emphasizing the need to integrate socio-economic dependency and adaptive capacity indicators into fisheries management frameworks.
55. The WPSE **NOTED** that certain provinces in Indonesia experience food insecurity. Furthermore, the WPSE **ACKNOWLEDGED** that income distribution within the sector is uneven.
56. The WPSE **NOTED** that the study focuses on the socio-economics of tuna fisheries, and that it did not consider other fish species.

#### 4.4. Selection of Key Indicators

57. The indicators defined by the consultants during WPSE02 were **DISCUSSED** under Agenda Item 4.2 and formed part of the material presented in paper IOTC-2026-WPSE03-11.
58. The WPSE **NOTED** the fisheries and contextual indicators from the proposed list and **SUGGESTED** that additional relevant indicators be included. Furthermore, the WPSE **EMPHASISED** the need for clear definitions of each indicator, including a description of what each entail.

#### 4.5. Mapping value chains and market organisation in Indian Ocean coastal countries

59. The WPSE **NOTED** the paper [IOTC-2026-WPSE03-06](#) on Reducing drifting Fish Aggregating Devices number and impacts through cooperation, with the following abstract provided by the authors:

*“Drifting fish aggregating devices (FADs), equipped with echosounder buoys, are highly effective tools that significantly enhance tuna catchability for purse seine vessels. FADs are also responsible for various externalities, highlighting the need to develop strategies aimed at reducing FAD numbers. In this study, we explore the potential of knowledge sharing among vessels as a means to reduce FAD numbers while maintaining purse seine fleets profitability. By developing an Agent-Based Model, built upon a pelagic species behavioral model, we demonstrate that a four-fold reduction not only improves vessel profitability by cutting private costs and increasing revenue, but it also strongly decreases social costs, such as carbon emissions and FAD stranding. However, this approach also highlights trade-offs, as it leads to a slight increase in silky shark bycatch. Therefore, careful consideration will be required to balance these outcomes and guide future FAD management strategies.”*

60. The WPSE **DISCUSSED** how the sharing of fish aggregating devices (FADs) might operate in practice. It was **NOTED** that some degree of sharing already occurs within companies, including the rotational use of FADs and the exchange of associated information. Extending such arrangements across an entire fleet was considered theoretically beneficial, but operationally complex.
61. The WPSE **NOTED** that suppliers could facilitate electronic systems to support information sharing, potentially coordinated at an intergovernmental or regional level.
62. The WPSE **NOTED** that the study presented focused specifically on information sharing beyond the company level, exploring broader system-wide approaches.
63. The WPSE **DISCUSSED** governance arrangements for shared or “common” FADs. Several options were outlined, including company-led initiatives, the establishment of cooperatives or producer organisations, and management by coastal States or regional groupings on behalf of fleets.

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64. The WPSE **NOTED** that the high cost of recovering FADs drifting beyond fishing zones represents a significant constraint, particularly for individual companies. Shared responsibility for deployment, maintenance and recovery was identified as a potential means of reducing abandoned FADs, while noting that issues such as end-of-life management and recovery costs fall outside the scope of the study. These considerations were linked to broader discussions on circular economy approaches.
  65. The WPSE **NOTED** that the reception among fishers to proposals aimed at reducing FAD numbers and increasing information sharing has been mixed. While some increase in information sharing within companies has occurred, particularly following limits on buoy numbers, there remains reluctance to extend such practices further due to concerns over disclosing long-developed fishing strategies. More broadly, industry feedback has tended to view such proposals as largely theoretical and not readily applicable in practice.
  66. The WPSE **ACKNOWLEDGED**, however, that industry behaviour has evolved in response to external pressures, including technological developments. It was **SUGGESTED** that future economic or operational pressures could incentivise greater cooperation, particularly where increased profitability offsets the costs associated with reduced competition.
  67. The WPSE **NOTED** that any transition towards more cooperative approaches would likely require some degree of fleet consolidation.
  68. The WPSE **DISCUSSED** the relationship between DFAD use and fish abundance, particularly in the context of spatial differences across the Indian Ocean. It was **NOTED** that purse seine activity is concentrated predominantly in the western Indian Ocean, except under specific oceanographic conditions, such as strong ENSO events (e.g., in 1997-1998), which may alter catchability in the eastern region.
  69. The WPSE **RECALLED** existing Commission measures concerning FAD-related fishing mortality, including efforts to determine optimal numbers of DFADs and associated buoys. It was **NOTED** that the relationship between the number of DFADs or buoys and fishing effort is not linear, but depends on vessel strategies, fishing opportunities and the availability of free-school fish. Ongoing research aims to better understand these dynamics and identify economically optimal ranges for FAD deployment, taking into account spatial distribution and potential clustering at sea.
  70. Finally, the WPSE **DISCUSSED** the practicalities of cost-sharing arrangements between companies. It was emphasised that inter-company dialogue would be necessary to determine acceptable levels of information sharing and cost allocation, while accommodating differing operational strategies. The WPSE **FURTHER NOTED** the important role of equipment suppliers in supporting any transition towards shared systems, particularly through the provision of appropriate technologies

## 5. Incorporating fisheries socio-economics into IOTC science and management

### 5.1. *Applied fisheries economic and social science research relevant to IOTC fisheries (e.g., climate change)*

71. The WPSE **NOTED** the presentation [IOTC-2026-WPSE03-08](#) by Pr William Cheung (UBC), an invited expert to the WPSE, on research into extreme and compound climate events and their implications for fisheries. The WPSE thanked Professor Cheung for sharing his research experience with the IOTC WPSE.
72. The WPSE **NOTED** that extreme marine weather events, such as heatwaves, have affected many fisheries worldwide and have contributed to collapses in some fish populations and stocks. Temperature changes during these events can exceed fish biological tolerance limits, which can affect survival and shift distribution, in turn changing where species occur.

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73. The WPSE **NOTED** that, using a risk-based framework and examining over 7,000 fisheries, the study showed that large and persistent extreme events can significantly increase the odds of extremely low catches in specific fisheries, leading to economic and employment losses that can exceed those expected from long term climate change alone.
74. The WPSE **NOTED** a question to the author on whether the impacts projected under climate change resemble the effects of ENSO events. The question referenced the strong 1998 El Niño impacts in Seychelles, when tuna shifted eastward, reducing local catches and landings for about a quarter and causing major economic losses (estimated at roughly 4 to 5 GDP points). It was asked whether a worst-case climate scenario (e.g., RCP 8.5) would produce similar disruptions, or whether climate change impacts differ from periodic ENSO shocks.
75. The WPSE also **NOTED** that a participant shared observations from the Arabian Sea illustrating how extreme ocean conditions can disrupt tuna fisheries and livelihoods. The participant described a 2019 marine heatwave (supported by satellite thermal data) that led to very poor catches and forced an earlier seasonal closure, reducing the fishing season to about eight months and lowering revenues. He added that the following year, even without a heatwave, a massive jellyfish bloom (possibly linked to temperature anomalies) spread across a wide region (from India through Pakistan, Iran, Oman, and into parts of the Persian Gulf), again forcing fishers to stop operations earlier than planned. He also recalled extreme low temperature events around 2011 that caused similar closures. The participant pointed out that these climate and variability driven extremes have broad socioeconomic and ecological implications, and that his team is continuing analyses and plans to share results with IOTC.
76. The WPSE **NOTED** that Professor Cheung responded by linking both interventions. He explained that many historical extreme conditions are partly driven by ENSO, consistent with the examples raised. He said their team extended historical models forward using projected ocean conditions, and found that extreme conditions are expected to become more frequent and more intense. Using statistical models, they estimated how often fisheries may experience low catch conditions over the next 50 years, and found a steadily increasing trend from now to mid-century across all climate scenarios. He emphasized that increases in the near to mid-term occur regardless of scenario due to committed change from past and current emissions. He added that ENSO like events may also become more frequent and may change in character, and that some traditional indices used to define these events are being reconsidered because historical baselines are becoming less relevant. He concluded that climate change is likely to amplify and compound ENSO related variability, increasing the odds of low catch conditions and increasing economic impacts through reduced revenues and livelihood losses. He noted that these results can support planning and the development of response options to prepare fisheries for future extremes.
77. The WPSE **NOTED** the question on how shifts in species distribution can be incorporated into this modelling framework. It was noted that spatial shifts in fish distribution can affect availability to fisheries and vulnerability to fishing pressure, and that impacts differ across species. Migratory species such as tuna may be affected more strongly. In some cases, distribution shifts may also create opportunities to develop new fisheries for some coastal communities. Models can help predict how fish populations may respond to changing environmental and ocean conditions.
78. The WPSE **NOTED** the presentation [IOTC-2026-WPSE03-14](#) by Pr Rashid Sumaila (UBC), an invited expert to the WPSE, on the implications of fishing on climate change and vice versa. The WPSE thanked Professor Sumaila for sharing his research experience with the IOTC WPSE.
79. The WPSE **NOTED** that the study emphasized how climate change affects the productivity and distribution of fish biomass in the global ocean, with major socioeconomic consequences for catches, food security, and the costs of fishing. The WPSE **NOTED** that the interactions between climate change and fishing are two ways, in that fisheries also contribute to climate change.
80. The WPSE **NOTED** a question on how climate change specifically affects the Indian Ocean, given its proximity to northern waters and the importance of tuna stocks there. The WPSE **NOTED** that the author indicated that,
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while his presentation showed general patterns, region specific studies also exist (including for the Indian Ocean). The author offered to identify and share relevant papers through the chair. He added that tuna are highly migratory and will shift their range as ocean conditions change because they track preferred temperature zones. Citing research by his students, the author noted that tuna can cross many EEZs and that recent work suggests more fish, especially tuna and other highly migratory stocks, are moving into the high seas. He concluded that displacement and movement effects are likely to be particularly strong for tuna in the Indian Ocean.

81. The WPSE **NOTED** a question on whether there are studies (or plans for further studies) that look beyond fish distribution shifts to impacts along the value chain, especially “secondary production” such as processing and employment. It was emphasized that, for example, in Mauritius the processing sector is a major employer, and that multiple Indian Ocean Island states have processing industries that are affected by climate driven variability (e.g., the Indian Ocean Dipole). The author indicated that his group has been working with the World Bank on studies across a number of African countries and that they do examine impacts along the fish value chain. He agreed that post-harvest employment is very important and noted that it often involves more women, making the gender dimension significant. He acknowledged that when fish move, the processing sector can be affected because it depends on raw material supply. The author also indicated that he would review what his team is doing in the region, assess how much of the downstream or food service sector is currently covered, and seek to strengthen their approach accordingly.

## 6. WPSE Programme of work

### 6.1. WPSE Programme of Work (2027–2031) and research priorities

82. The WPSE **NOTED** paper IOTC-2026-WPSE03-05 presenting the draft WPSE Programme of Work (2027–2031). The WPSE **NOTED** that a full programme of work will be developed over time and that the current workplan is a living document.
83. The WPSE **REVIEWED** the draft WPSE programme of work and agreed the immediate priority (2026) is to finalise a recommended set of social and economic indicators that are relevant, feasible to collect, and useful for long term monitoring, with indicators mapped to current and future work and relevant Commission resolutions (including impacts of CMMs).
84. The WPSE **AGREED** on moving from a broad list to something structured, including SMART goals that link indicators to specific work program objectives, and drawing from the previous report where indicator tables already exist.
85. The WPSE **DISCUSSED** data collection and implementation planning and **ACKNOWLEDGED** a suggestion of piloting indicator data collection in about five countries, with a need for support from economists and researchers to develop standards, procedures, questionnaires, and reporting processes.
86. The Secretariat **RECALLED** that a prior consultant review already exists (from last year) and suggested the Secretariat can manage access to public repositories and potentially automate computation of some indicators, publish them on the IOTC website, and share scripts, but that fishery level indicator priorities must be set by the WP.
87. The WPSE **AGREED** that “modelling” be made more explicit in the work plan (not just “research”), especially bioeconomic or socioecological modelling to assess how management measures affect jobs, profits, fishing rent, and potentially climate related impacts, alongside biological outcomes.
88. The WPSE **ACKNOWLEDGED** that modelling (and indicators) should have clear objectives and questions to answer (for example, thresholds, trend analysis, management scenario evaluation), not be done “for the sake

of modelling”; capacity building or training on generic bioeconomic models was suggested as a practical starting point.

89. Additional candidate work topics were raised for inclusion under impact evaluation, including evaluating the operational impacts of limiting wire leaders and shark lines, and linking to existing climate change and bioeconomic modelling work already presented in related forums.
90. It was confirmed the WP’s recommendations are intended to be presented directly to the Commission (with information also shared to the SC). It was **SUGGESTED** that WPSE should clarify with TCAC what TCAC expects from WPSE.
91. The WPSE **RECOMMENDED** that the Commission consider and endorse the WPSE Programme of Work (20276–2031), as provided in [Appendix IV](#).

## 7. Other business

### ***7.1. Election of a Chairperson and a Vice-Chairperson of the WPSE for the next biennium (IOTC Secretariat)***

92. The WPSE **NOTED** that the first term of the current Chairperson, Dr Umi Muawanah expired at the close of the WPSE03 meeting and, as per the IOTC Rules of Procedure (2014), participants are required to elect a new Chairperson of the WPSE for the next biennium.
93. **NOTING** the Rules of Procedure (2014), the WPSE **CALLED** for nominations for the position of Chairperson of the IOTC WPSE for the next biennium. Dr Muawanah was nominated, seconded and re-elected as Chairperson of the WPSE for the next biennium.
94. The WPSE **NOTED** that the first term of the current Vice Chairperson, Ms Sheriffa Morel expired at the close of the WPSE03 meeting and, as per the IOTC Rules of Procedure (2014), participants are required to elect a new Vice Chairperson of the WPSE for the next biennium.
95. **NOTING** the Rules of Procedure (2014), the WPSE **CALLED** for nominations for the position of Chairperson of the IOTC WPSE for the next biennium. Ms Morel was nominated, seconded and re-elected as Vice Chairperson of the WPSE for the next biennium.

### ***7.2. Date and place of the 4th and 5th Sessions of the WPSE (Chairperson and IOTC Secretariat)***

96. The WPSE **DISCUSSED** the dates for the next session of the WPSE. It was **NOTED** that it will be held virtually, for two days at the first week of April 2027.
97. The WPSE **NOTED** that some participants asked about whether a two-day meeting is necessary, given that few papers have been submitted by CPCs and the level of contribution from invited papers can vary from year to year. It was also **NOTED** that there was necessity of clarifying the appropriate application of rules of procedures to WPSE regarding the treatment of document submission and participants registration. The WPSE **NOTED** that the two-day duration (4 hours per day) was originally advised by the Commission and is not excessive given the agenda topics to be covered. The meeting may be shortened if the full time is not required to complete the agenda. The WPSE also **NOTED** that this WP was established relatively recently and will continue to evolve over time. It would be more practical to reassess the meeting duration after a few more sessions, once participation becomes more stable, and adjust it accordingly.

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**7.3. Development of priorities for Invited Expert(s) or consultant(s) at the next WPSE meeting (Chairperson)**

98. The WPSE **AGREED** to invite relevant experts from other RFMOs to provide their experience and guidance to the next session of the WPSE.
99. The WPSE **REQUESTED** that relevant experts from RFMOs that have experience in developing socio-economic indicators for RFMOs be invited to the next session of the WPSE.

**7.4. Review of the draft, and adoption of the Report of the 3rd Session of the WPSE (Chairperson)**

100. The WPSE **RECOMMENDED** that the Commission consider the consolidated set of recommendations arising from WPSE03, provided in [Appendix V](#).
101. The report of the 3rd Session of the Working Party on Socio-Economics (IOTC–2026–WPSE03–R) was **ADOPTED** by correspondence.

**APPENDIX I**  
**LIST OF PARTICIPANTS**

<b>Title</b>	<b>First name</b>	<b>Last name</b>	<b>Organisation</b>	<b>E-mail</b>	<b>CPC (Registered and Participated the meeting)</b>
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**APPENDIX II**  
**AGENDA FOR THE 3<sup>RD</sup> WORKING PARTY ON SOCIO-ECONOMICS (WPSE03)**

**Date:** 1–2 April 2026

**Location:** Virtual

**Time:** 11 am - 3 pm Seychelles

1. **OPENING OF THE MEETING** (Chairperson)
2. **ADOPTION OF THE AGENDA AND ARRANGEMENTS FOR THE SESSION** (Chairperson)
3. **THE IOTC PROCESS: OUTCOMES, UPDATES AND PROGRESS** (IOTC Secretariat)
  - 3.1. Outcomes of the 29<sup>th</sup> Session of the Commission
  - 3.2. Outcomes of the 28<sup>th</sup> Session of the Scientific Committee
4. **INFORMATION ON SOCIO-ECONOMIC DATA FOR IOTC CPCS AND FISHERIES**
  - 4.1. Review of socio-economic data available at the Secretariat and other fishery management organisations
  - 4.2. Socio-economic data assessment relevant to tuna fishing nations and fisheries
  - 4.3. Selection of Key Indicators
  - 4.4. Mapping value chains and market organisation in Indian Ocean coastal countries
5. **INCORPORATING FISHERIES SOCIO-ECONOMICS INTO IOTC SCIENCE AND MANAGEMENT**
  - 5.1. Assessment of the socio-economic significance of fisheries
  - 5.2. Analysis of socio-economic impacts of fisheries (e.g., catch limits)
  - 5.3. Applied fisheries economic and social science research relevant to fisheries (e.g., climate change)
6. **WPSE PROGRAM OF WORK** (Chairperson and IOTC Secretariat)
  - 6.1. WPSE Program of Work (2027–2031) and research priorities
  - 6.2. Regional cooperation and capacity building
7. **OTHER BUSINESS**
  - 7.1. Date and place of the 4<sup>th</sup> and 5<sup>th</sup> Sessions of the WPSE (Chairperson and IOTC Secretariat)
  - 7.2. Development of priorities for Invited Expert(s) or consultant(s) at the next WPSE meeting (Chairperson)
  - 7.3. Review of the draft, and adoption of the Report of the 3<sup>rd</sup> Session of the WPSE (Chairperson)

**APPENDIX III****LIST OF DOCUMENTS FOR THE 3<sup>RD</sup> WORKING PARTY ON SOCIO-ECONOMICS (WPSE03)**

<b>Document</b>	<b>Title</b>	<b>Authors</b>
IOTC-2026-WPSE03-01a	Agenda of the 3 <sup>rd</sup> WPSE	IOTC Secretariat
IOTC-2026-WPSE03-01b	Annotated agenda of the 3 <sup>rd</sup> WPSE	IOTC Secretariat
IOTC-2026-WPSE03-02	List of documents of the 3 <sup>rd</sup> WPSE	IOTC Secretariat
IOTC-2026-WPSE03-03	Outcomes of the 29 <sup>th</sup> Session of the Commission	IOTC Secretariat
IOTC-2026-WPSE03-04	Outcomes of the 28 <sup>th</sup> Session of the Scientific Committee	IOTC Secretariat
IOTC-2026-WPSE03-05	Revision of the WPSE program of work (2027–2031)	IOTC Secretariat
IOTC-2026-WPSE03-06	Reducing drifting Fish Aggregating Devices number and impacts through cooperation	Guillotreau et al
IOTC-2026-WPSE03-07	EU data collection framework and economic indicators available and collected through that EU legislation	ICES
IOTC-2026-WPSE03-08	Extreme and compound climate events and their implications for fisheries	Cheung et al
IOTC-2026-WPSE03-09	A study of the dynamics of price fluctuation of the prime tuna species in determining operational strategies of tuna gillnet vessels in Pakistan	MM Khan
IOTC-2026-WPSE03-10 presentation	Review of socio-economic data available at FAO	FAO
IOTC-2026-WPSE03-11	Update review of socio-economic indicators from coastal countries in Indian Ocean	IOTC Secretariat
IOTC-2026-WPSE03-12	A comparative analysis of the semi-industrial longline fleet efficiency in Seychelles	Antoine et al
IOTC-2026-WPSE03-13	Socio-Economic dependency and limited adaptive capacity in Indonesian tuna fishing households evidence from Kendari and Ternate	Muawanah et al
IOTC-2026-WPSE03-14	Climate change and the socioeconomics of fisheries	Sumaila et al

## APPENDIX IV

### WORKING PARTY ON SOCIO-ECONOMICS PROGRAMME OF WORK (2027–2031)

The Programme of Work consists of the following, noting that a timeline for implementation would be developed by the SC once it has agreed to the priority projects across all of its Working Parties:

- **Table 1:** Priority topics for obtaining the information necessary to develop Socio-Economic Indicators and advance Socio-Economic studies for IOTC (2027-2031)
- **Table 2:** Stock assessment schedule.

**Table 1.** Priority topics for obtaining the information necessary to develop Socio-Economic Indicators and advance Socio-Economic studies for IOTC (2027-2031)

Topic	Sub-topic and project	Priority	Timing				
			2027	2028	2029	2030	2031
1. Social and Economic Indicators	1.1. Conduct a review of existing social and economic indicators. Recommend indicators that are relevant to the aims of the IOTC and are achievable to collect and monitor long-term 1.2. Ensure that indicators are organised based on current or relevant future programmes of work and can be mapped to current resolutions e.g. allocation, impact of CMMs on socioeconomics, harvest strategies 1.3. Develop social and economic SMART goals (Specific, Measurable, Achievable, Realistic and Timely) that link to the indicators and relevant programmes of work	High, short term (1)					
2. Data collection and reporting	2.1. Development of a programme of work to review existing repositories of social and economic data of IOTC member countries 2.2. Undertake a gap analysis to identify the data gaps, based on the results from topic 1 (identification of relevant indicators required for IOTC), and topic 2.1 (review of existing data) 2.3. Identify major challenges in data collection and estimation or evaluation methodologies that are causing the data gaps; and provide practicable solutions to ensure good data collection into the future. 2.4. Develop and distribute reporting templates for social and economic data that inform the relevant indicators identified in topic 1	High, short to medium term (2)					

<p>3. External influences and impacts to social and economic impacts</p>	<p>3.1. Conduct (via invited academic experts) a systematic literature review of the potential climate change impacts on the social and economic aspects of tuna fisheries in the IOTC area of competence, including for example, the direct effects of positive dipole years on tuna fishing</p> <p>3.2. Review, research, and record the potential (or known, where appropriate) economic and social impact of CMM measures on social and economic indicators</p>	<p>Medium, longer term (3)</p>					
<p>4. Social-ecological and bioeconomic modelling</p>	<p>4.1. Estimate the impact of conservation measures on the fishing rent by fishing fleet or CPC</p> <p>4.2. Evaluate the potential impacts of limiting wire leader and shark lines on fleet operation and the potential social and economic impacts in the IO</p> <p>4.3. Assess the socio-economic impact of management procedures. Assess socio-economic impacts of climate change</p>						

## APPENDIX V Consolidated recommendations of the 3rd Session of the Working Party on Socio-Economics

[Para 30] The WPSE therefore **REQUESTED** that percentage-based socio-economic indicators be used to complement indicators based on absolute values.

[Para 32] The WPSE **NOTED** the importance of fish processing activities in coastal countries, and that both the International Seafood Sustainability Foundation (ISSF) and the IOTC monitor data from processing factories that may not be captured by the identified indicators. The WPSE therefore **REQUESTED** that fish processing activities be included in the indicator framework.

[Para 91] The WPSE **RECOMMENDED** that the Commission consider and endorse the WPSE Programme of Work (2027–2031), as provided in Appendix IV.

[Para 100] The WPSE **RECOMMENDED** that the Commission consider the consolidated set of recommendations arising from WPSE03, provided in Appendix V.