

# PROCEEDINGS BOOK OF TUNA TALKS SEMINAR

Interfacing Science and Management for  
Sustainable and Regenerative Tuna Fishery

Padma Resort Legian, Bali, May 23th, 2023



TUNA  
CONSORTIUM

IPB University  
— Bogor, Indonesia —

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## PREFACE

The Tuna Talks 2023 entitled ‘Interfacing Science and Management for sustainable and regenerative Tuna Fishery’. It is a scientific publication delivered from various assessments and researches, containing 3 aspects of Lessons, i.e.: Fishery Resources, Socio-economic and Governance related to tuna fisheries. Those have been discussed in this proceeding.

The scientific knowledge is crucial for understanding fish stocks, their population dynamics, and the impacts of fishing activities. Robust data collection, monitoring, and research are essential to support management decisions accurately. The proceeding considers applying effective implementation for Ecosystem Approach of Fisheries Management, based on the appropriate data analysis combined with management, especially in developing Harvest Strategy.

A lesson of using citizen science for fish data collection, then give back to information to the data providers will give awareness on the resources condition. While Crowd Data Crawling manuscript, may is a future practice for data collection and management and business intelligence. Big data and AI have the potential to revolutionize the fisheries sector by providing more comprehensive, real-time, and accurate data that can inform better decision-making and management practices.

In the aspect of Socio-economic, the fisheries management and management of conservation areas should lead to an impact on socio-economic conditions, especially related to the resilience of fishermen. In this case, a Fisheries Sustainability Model (Sustainable Livelihood Assessment – SLA) needs to be developed to measure the resilience of fishing communities and at the same time measure the impact of the Harvest Strategy Implementation.

To sustain tuna fishing future, it is necessary to improve capacities of governments and stakeholders to develop and strengthen regulatory and policy frameworks for the successful implementation of Tuna Harvest Strategy.

The issues that is still apparent in Indonesia is the lack of governance structure in place for tuna fisheries labor and worker governance. Therefore, improvement of governance and regulation for fishery worker need to be strengthened. The studies explore the social structures and power relations resulting in the gender differentiated access to, and control over, livelihood assets. This has important implications that affect the ability of men and women to participate in governance and policy, achieve social-ecological resilience to change in global processes and the environment and livelihood sustainability.

Illegal, unreported, and unregulated (IUU) fishing is a transnational organized crime in fisheries, has significantly affects Indonesia's national losses of fisheries resources and socio-economic problems. There is an opportunity to combat IUU fishing. How to battle against IUU Fishing in Tuna and Governance regulation Initiatives. The important traceability, Fair Trade, MSC certification is how we can increase prosperity of fishers and investing self-reliance fishers in the future without any subsidies and incentive.

I hope that we can continue to work together in the future to sustain our tuna! Enjoy Reading.

Jakarta, July 1<sup>st</sup>, 2024.

Dr. Budy Wiryawan  
Chair of Tuna Talks Seminar



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The program for the Tuna Talks was developed in consultation with the committee (Dr. Toni Ruchimat, Prof. Dr. Ir. Luky Adrianto, Prof. Dr. Ir. Indra Jaya, Hari Christianto, MSc, Prof. Tri Wiji Nurani).

The Proceedings from the Tuna Talks would not have been possible without the enthusiastic participation of all participants from different institutions during the Event and the commitment of the authors to completing their sections of the Proceedings. The participants come from a diverse range of organisations and the Tuna Talks have highlighted the value of a collaborative approach between government, universities and nongovernment organisations for facing the many challenges of the implementation of Tuna Harvest Strategy and Fisheries Management in Indonesia.



## ABBREVIATIONS

ACE	: Annual Catch Entitlement
AI	: Artificial Intelligence
BET	: Bigeye Tuna
BKIPM	: Fish Quarantine and Inspection Agency
BLM	: Black Marlin
CDC	: Crowd Data Crawling
CODRS	: Crew-Operated Data Recording System
CPUE	: Catch per Unit Effort
DGMSM	: Directorate General of Marine Spatial Management
DOL	: Dolphinfish
FAD	: Fish Aggregating Device
FIP	: Fisheries Improvement Project
FMA / WPPNRI	: Fisheries Management Area
HS	: Harvest Strategy
IAW	: Indonesian Archipelagic Waters
IKAN	: Initiative of Fisheries Data Collaboration
ILO	: International Labor Organization
IOP	: Indonesian Ocean Policy
IOTC	: Indian Ocean Tuna Commission
IUU	: Illegal, Unreported, and Unregulated
MDPI	: Indonesian Fisheries and Society Foundation Indonesia
MMAF/KKP	: Ministry of Marine Affairs and Fisheries
MPA	: Marine Protected Areas
MSA	: Sustainability Analysis
MSC	: Monitoring Control and Surveillance
NGO	: Non-Governmental Organization
RFMO	: Regional Fisheries Management Organizations
SEEA	: System of Environmental and Economic Accounting
SKJ	: Skipjack Tuna
SST	: Sea Surface Temperature
SWO	: Sword Fish
TAC	: Total Allowable Catch
TCT	: Tuna, Skipjack, and Mackerel
USAID	: United States Agency for International Development
VMS	: Vessel Monitoring System
WCPFC	: Western and Central Pacific Fisheries Commission
YFT	: Yellowfin Tuna

## TUNA TALKS AGENDA

Activity/Topic	Detail	Speakers / Moderators
<b>Opening</b>	Welcoming	Thilma Komaling, M.Sc Lead of Indonesia Tuna Consortium
	Opening Remarks	Dr. Ridwan Mulyana Direktor of FRM MMAF (PSDI KKP)
Introduction to Tuna Talks	Science on Tuna Fishery as basis of Sustainability: Research Locally, Negotiate Globally	Prof. Budy Wiryawan IPB University, Advisor of Tuna Consortium
Thematic Presentation	The Role and Position of the IAW Tuna Fisheries in RFMO (IOTC & WCPFC)	Putuh Suadela, MESM
Tuna Talk Session #1  <b>Tuna Resources</b>	1) Genetic Connectivity Between Fish Larva and Adult Fish Caught Inside and Outside of MPAs	Dr. Victor Nikijuluw - KI
	2) A method to Involve Fishers in Voluntary Data Collection for Management of Tuna Fisheries in Indonesia	Dr. Peter Mous – YKAN
	3) Population Parameters Analysis of Skipjack Tuna ( <i>Katsuwonus pelamis</i> ) Landed on Kendari Oceanic Fishing Port	Dr. Naslina Alimina / UHO - Kendari
	4) The Biological Characteristics of Yellowfin Tuna ( <i>Thunnus albacares</i> ) in The Indian Ocean the South of Nusa Tenggara (WPP 573), Indonesia	Ayu A. Damayanti – UNRAM
	5) Fishing Ground and The Composition of Large Pelagic Fish Catching Using Tuna Handlines in The FAD Area of FMA 713 and 714	Arham Rumpa – POLTEK Bone
Tuna Talk Session #2  <b>Social Economy</b>	6) Fish Resource Account: An Instrument to Support Measurable Fishing Policy in Indonesia (Case Study on Little Eastern Tuna "Tongkol" in Indonesia)	Dr. Maulana Firdaus Socio-economic research.
	7) Gender Equity in Tuna Fisheries Indonesia	Dr. Ria Fitriana – Freelance Consultant

Activity/Topic	Detail	Speakers / Moderators
<b>Opening</b>	Welcoming	Thilma Komaling, M.Sc Lead of Indonesia Tuna Consortium
	Opening Remarks	Dr. Ridwan Mulyana Direktor of FRM MMAF (PSDI KKP)
	8) Small Scale Handline Tuna Fishery in Buru Island, Maluku Province, Indonesia, During the Covid-19 Pandemic	Dr. Jufri Laituppa - Univ. Iqra Buru
	9) Multiaspect Sustainability Analysis of Small-Scale Tuna Fisheries Management in the Ombai Strait Waters: A Participatory Assessment	Beatrix M. Rehatta - UKAW
	10) Abstract: MDPI's Community Development Work	Nilam & Sri Jalil / MDPI
	11) Socio-economic in Small Scale Tuna Fishermen in Kawa, West Seram, Maluku	Maskur Tamanyira – IPNLF
<b>Thematic Presentation</b>	Crowd Data Crawling as an Alternative Tuna Data Sources: How Big Data Supports Fisheries Business Intelligence and Policy Recommendation	Dr. Irfan Julianto – IPB FRCI
<b>Tuna Talk Session #3</b>  <b>Governance</b>	12) Understanding the Intricacies of Governance in Fishing Vessel Crews and Seafood Workers in Indonesia: An exploratory study	Felicia Nugroho - DFW Indonesia
	13) Decades of FADs Regulation in Tuna Fisheries: Moving Forward or Going Nowhere?	M. Natsir, Ph.D - BRIN
	14) Transnational Organised Crime in Fisheries Threaten the Sustainability of Future Tuna Commodities in Indonesia	Dr. Alexander Khan / UNPAD
	15) Indonesia Archipelagic Tuna Industry Rapid Assessment	Roderic Hodges / Marine Change
	16) Traceability & Certification	Mr. Sven Blankenhorn / Fair Trade

Activity/Topic	Detail	Speakers / Moderators
Opening	Welcoming	Thilma Komaling, M.Sc Lead of Indonesia Tuna Consortium
	Opening Remarks	Dr. Ridwan Mulyana Direktor of FRM MMAF (PSDI KKP)
	17) MCS System for Tuna Fisheries at the Indonesian Fisheries Management Area	Sahono Budianto - KKP
Tuna Talk Session #4	18) Diversity, Abundance and Distribution of Tunas Larvae and Their Relationship with Oceanographical Parameters in Banda Sea, The Indonesian Fisheries Management Area (WPP) 714	Karsono Wagiyono - BRIN
	19) Utilization of Multisensor Satellite Data for Estimating the Dynamics of Large Pelagic Fisheries in North Maluku	Prihatin Ika Wahyuningrum, M.Sc – IPB University
	20) Approach of Feedback Harvest Control Rule (FHCR) Application and Schaefer 1954 Method to Yellowfin Tuna ( <i>Thunnus albacares</i> ) Fishery Production in Bena Harbor, Bali	Tri Djoko Lelono - UNIBRAW
	21) Economic Analysis of Tuna Fisheries in Morotai Island, North Maluku	Tri Laela Wulandari, M.Sc - UNKHAIR

## OPENING WELCOMING

**Thilma Komaling, SE, MPP (Strategic Lead of Indonesia Tuna Consortium Phase 2)**

Selamat Pagi!

Just yesterday, and today in a different part of the world, nations are celebrating the UN Biodiversity Day – on the 22<sup>nd</sup> May 2023. It is not by coincidence that we are having this talk responding to the theme for this year, “From Agreement to Action: Build Back Biodiversity.” As conjunction to the International Tuna Conference tomorrow, the Indonesia Tuna Consortium is fully committed to deliver one single objective: “By 2024, supporting the Indonesian government in finalizing and initiating the implementation of Harvest Strategy for tuna fisheries in the Indonesian Archipelagic Waters (WPP 713, 714,715) based on sound science with effective co-management and coordination mechanisms in place, while strengthening adaptive fisheries management and community livelihoods.”

Every single detail of elements in this objective are happening today, tomorrow and the day after tomorrow. Today in Tuna Talks, we will discuss the ‘sound science’ as the foundation of fishery management; right next door – the co-management and coordination is in place led by one of the Tuna Consortium members.

Tomorrow, we will witness the commitment of the government of Indonesia in the highly anticipated launching of the Tuna Harvest Strategy, which historically emerged as the premise of national sovereignty based on the national mandate of The 1945 Constitution of The Republic of Indonesia Article 33 Section 3: The land and waters and the natural wealth contained in it shall be controlled by the state and utilized for the optimal welfare of the people.

The day after tomorrow, the dialogue of sustainable business practices and responsibilities will be detailed in the business forums – as the realization of policy and commitments made based in accordance to scientific developments.

It is about sustainable consumption methods; we can all have a real impact on our ecosystems through our consumption practices and choices. So, from nature to table, let us rethink the relationship between our food and the sea, reconnecting human to the ocean.

With great honor, I welcome you researchers, academia and policy makers to the very first Tuna Talks: Interfacing Science and Management for Sustainable and Regenerative Tuna Fisheries.

We need a whole-of-government, whole-of society approach.

Everyone must be engaged. Everyone must be involve

## OPENING

### Opening Remarks

#### **Dr. Ridwan Mulyana (Director of Fisheries Resources Management, MMAF)**

Guests of honor, members of the Indonesian Tuna Consortium from the Yayasan Konservasi Alam Nusantara, MDPI, ladies and gentlemen who were selected as speakers and all the participants whose names I may not be able to name.

Assalamualaikum.wr.wb

Om swastiastu

Salam budaya

Salam kebajikan

Good morning to all of you,

First of all, let all of us express our gratitude to Allah and our mighty creator for giving us the opportunity together in person in this comfortable room as well as virtually to join me in increasing our system and knowledge in understanding tuna fisheries in "tuna talk". For this blessing, allow me to congratulate participants who submitted their scientific writings and or will directly present the ideas within the tuna talk agenda.

Guests of honor, ladies and gentlemen, I am very aware of the importance of some scientific knowledge in supporting decision-making, and that is why, within the invitation that we extend to you, I confide that. Excellent scientific information background is an important part of the effort and process to achieve the sustainability of tuna resources. Therefore, as rationally as it is called, sufficient scientific knowledge will lead to a better direction following their conditions. Management of tuna fisheries in the current information aim has its challenges, including the variety of information that must be available and the speed at which this information is provided to solve various problems in tuna management. In this field, tuna talk can be an excellent start to re-establish a more robust network of research experts spread throughout Indonesia and overseas, especially in channeling and forwarding scientific information to support fisheries management.

Ladies and gentleman, The formation that looks above is becoming increasingly important because the management of tuna fisheries will enter a new phase with the presence of the harvest strategy of fish utilization strategy. With this strategy, a framework has been determined that includes management action for tropical tuna fisheries in RFMO 713, 714, and 715 needed to achieve management objectives as consequences of the results monitoring and best simulation that has been carried out. Insha Allah, the minister of marine affairs and fisheries will launch the strategic framework for tropical tuna in Indonesia's Archipelagic Waters tomorrow.



Guests of honor, Ladies and gentleman

The tuna talk confided the preferred time of connecting science and management for sustainable and regenerative tuna fisheries. I believe that the result of the tuna talk will contribute to the achievement of tuna fisheries, such as Indonesia's effort to achieve sustainable development goal number 14 to conserve and use oceans, seas, and marine resources sustainably for sustainable development. And to the success of the quota and zone-based fishing policy on which implementation is being initiated

my deep appreciation for the team collaboration from the director of fish resources and the Indonesia tuna consortium initiatives members for their action appreciation and hard work. Finally, I hope you have a productive discussion and be helpful to our Indonesian Fisheries.

Thank you

## INTRODUCTION TO TUNA TALKS

Science on Tuna Fishery as basis of Sustainability: Research Locally, Negotiate Globally

Prof. Dr. Budy Wiryawan (Chair of Tuna Talks, Advisor of Tuna Consortium)

Assalamualaikum warahmatullahi wa barakatuh.

Good morning

Ladies and gentlemen, I am honored to become a host and speaker of this important event, and I welcome you all to this tuna talk on the topic of science on tuna fisheries as a basis of sustainability research locally and globally. As we know, tuna is also a leading fisheries product for Indonesia. Tuna fisheries have generated economic activity in this fisheries sector and also generated the well-being of fishers, the coastal community, and the industry. Talking fisheries management, we come to the mandate of the Code of Conduct of Responsibility Fisheries 1995, which is a set of principles and international standards of behavior for responsible practice concerning the ecosystem, biodiversity recognition, the network nutritional economy, social environment, and cultural important of fisheries and interest of all those continental fisheries sectors.

Indonesia's tuna fisheries are amongst the most important, diverse, and complex fisheries in the world. More than 130,000 vessels from 3 m in length to more than 100 m are operated with a total catch of more than 1 million tons of tuna per year. Tuna is one of the most valuable species in Indonesia, with an export value of US\$677.9 million in 2017, increase to be US\$ 865.7 in 2022. Hence, tuna is an important generator of wealth across all fleets, making it the most important seafood category for the country. The species of tuna caught in Indonesian waters mostly yellowfin (*Thunnus albacares*) and Skipjack (*Katsuwonus pelamis*).

Tuna fishing has grown significantly in the waters of the Indonesian archipelago so that in 2016, Indonesia was the top country globally for tuna landings. In the last 10 years, Indonesia has become involved in several regional fisheries management organizations.

The Government of Indonesia has shown its commitment to sustainable tuna fisheries by issuing a Tuna Fisheries Management Plan in 2015. One of the most important components of this plan is the collection of data to improve decision support systems for tuna fisheries management.

From a researcher's perspective, the policy-making and management environments may seem distant or daunting. The fisheries and resource management decision interface is extremely complex and multifaceted, and organizational structures and cultures have been identified as hurdles for implementing new information and approaches to management. Often, scientific evidence only occupies **a small part** of the "decision space" of managers or policy makers, and other factors including values, judgment, pragmatics, competing interests, and path dependency also influence decision-making

We do respect to cultural Divide. In the science-policy literature, issues related to the paradoxical relationship between science and politics as well as the influence of governance structures are additional challenges to using science in decision-making. These factors widen the gap between knowledge and action, which undermines the effective flow of information across knowledge and practice.

Sometimes, uptake of new knowledge into fisheries management can be influenced by government models, political regimes, the geographic region, the organizational culture on information management, and personal and institutional interests and values of different stakeholders. The decision-making process in fisheries management is also complex and must often consider multiple objectives, disciplines, perspectives, and constituencies and respect economic and political realities

Fisheries management is a complex process aimed at maintaining sustainable fish populations while balancing the economic, social, and environmental aspects of fishing. Here are some general considerations for effective fisheries management:

1. **Scientific Data and Research on Resource consideration:** Sound scientific knowledge is crucial for understanding fish stocks, their population dynamics, and the impacts of fishing activities. Robust data collection, monitoring, and research are essential to inform management decisions accurately.
2. **Sustainable Harvest:** Fisheries management should aim to maintain fish populations at levels that can support sustainable harvests. Setting appropriate catch limits, such as total allowable catches (TACs) or quotas, based on scientific advice and stock assessments, helps prevent overfishing and depletion of fish stocks.
3. **Biodiversity & Ecological. Ecosystem-Based Approach:** Fisheries management should consider the broader ecosystem dynamics and interactions. It's important to account for the relationships between target species, their predators, prey, and habitat, as well as the impacts of fishing gear on the ecosystem.
4. **Stakeholder Engagement:** Inclusive and participatory processes involving fishermen, fishing communities, scientists, NGOs, policymakers, and other relevant stakeholders lead to better decision-making. Engaging stakeholders in the management process helps promote transparency, legitimacy, and ownership of the measures implemented.
5. **Institutional function on Compliance and Enforcement:** Effective fisheries management requires strong monitoring, control, and surveillance systems to ensure compliance with regulations. Monitoring fishing activities, enforcing regulations, and addressing illegal, unreported, and unregulated (IUU) fishing practices are crucial for sustainable fisheries management.
6. **Adaptive Management for fleet capacity:** Recognizing the dynamic nature of fisheries, adaptive management approaches allow for flexibility and adjustments based on new information or changing circumstances. Regular review and evaluation of management measures enable iterative improvements over time.
7. **Protection of Habitat and Biodiversity:** Preserving critical habitats, such as coral reefs, seagrass beds, and spawning grounds, is vital for the long-term sustainability of fish populations. Implementing measures to minimize habitat degradation, protect vulnerable species, and reduce bycatch are essential components of fisheries management.
8. **Integrated Fisheries Management:** Recognizing that fisheries are just one aspect of broader marine resource management, it is important to integrate fisheries management with other sectors such as coastal zone management, marine spatial planning, and marine conservation initiatives.

9. Robust & Precautionary Principle: The precautionary approach involves taking preventive measures when scientific knowledge is uncertain or incomplete. It suggests that if there are concerns about the health or sustainability of fish populations, conservative management actions should be implemented to avoid irreversible damage.

By considering these factors, fisheries management can work towards sustainable fishing practices, protect marine ecosystems, and ensure the long-term viability of fish populations for both current and future generations.

The fisheries management process is an iterative and ongoing cycle, where feedback and lessons learned inform future management actions. It aims to balance the ecological, economic, and social aspects of fisheries to ensure the long-term sustainability of fish populations and the well-being of fishing communities.

Make sure we have fish in the sea so we do Stock Assessment: The process begins with the assessment of fish stocks to determine their status, abundance, and health. This involves data collection through surveys, sampling, and scientific research to estimate population size, age structure, reproductive potential, and other relevant factors.

During the HS process from 2014–2023, we do science matchmaking event series through Workshops! Thank you very much for MMAF and TC Members. Science is only one input into policy making process. Many other factor such as economic, budgetary, tradeoffs, and public opinion must and will factored into final policy decision; science is not policy – prescriptive; policy matters need to be inform scientifically; Respect each other Science and Policy-making process.

Example of Implementation of Tuna Management Plan: Information of TCT, Integrated data, reduce destructive fishing, no by catch, catch effort information, HS formulation, implementation of HCR, TAC and Catch Limit (Measurable fisheries)

### **Conclusion and Management Recommendation**

There is a need to strengthen the science-policy interface in support Tuna Harvest Strategy implementation, so that policy reform can lead to increased integration of sustainable resource management with social and economic development. To sustain tuna fishing future, it is necessary to improve capacities of governments and stakeholders to develop and strengthen regulatory and policy frameworks for the success implementation of Tuna Harvest Strategy. Evidence has shown that results of scientific research may not always be in a format that is accessible or directly applicable to the needs of decision makers or resource managers due to timing, methods and uncertainty issues. Improved data and knowledge can support implementation of the SSF Guidelines for Tuna Fisheries Business in Indonesia.

I hope you all have a productive discussion and be benefiting to our Indonesian Tuna Fisheries.

Thank you

Assalamualaikum wahmatullahi wa barakatuh.

## THEMATIC PRESENTATION

### The Role and Position of the IAW Tuna Fisheries in RFMO (IOTC & WCFC)

Putu Suadela, MESM (Directorate of Fisheries Resources Management, MMAF)

First of all, I would like to say thank you having this great events. This is the first time we have this tuna talks. I think that a lot topics are going to discuss present today's. and the first time at the station is about the role and positions of the Indonesian archipelagic waters tuna fisheries RFMO for an IOTC and the WCFC. So, this first thematic presentations for me is will be in regional level and what is the role and positions of our archipelagic waters is involves or needed.

Illegals bussiness is ofcourse from the Indonesians Nations Convention on the Law of the Sea and also the Nations Fish Stocks Agreement. But where is arctic water is mention?

First and if you see on part 4 on the UNCLOS arctic water is on the mentions about uses of terms, the baselines, etc. and there's no mentions about how we utilize the fish resources. There is no fish resources involved in that part. For highly migrations species which is tuna and the next species it is mentions at the part 5 inclusive economic zones. That the coastal state and other states is national peace and regions, shall cooperate directly or through appropriate for the national decisions and so on. That if you do take a look on UNFSA the second paragraft in the exercise of severn rights for the purpose of exploring and exploiting the serving and managing spreading to stock and highly migrated. Stock within areas under national jurisdictions the courses that shell apply without this within this the general principle in route in article 5. So, there's a basis where we practically need to manage our archipetic waters which is compatible with the regulation operations in regional basis

If you take a look on the IOTC agreement and if you see on the area competence in this is a little bit in the be discussions which is the applications of that agreement it sis said because the area competence of IOTC is FAO statical area 51 and 57 it doesn't mean since it is exclude there at international waters is not exclude arctic waters so it states all of those areas for this IOTC. On that basis in the resolutions adopted IOTC it always said IOTC area competence with no any further conditions. IOTC already have conservation major measure and this is some for of what we already adapted, but there are many other things. So we have the catch lmit to rebuilding the govern fish stock, we just adopted the catch limit for big eye tuna. we have this management flow for drifting paths and also anchor paths. We have this harvest strategy also is we already have this medium procedures status for the bigeye tuna and the rest will be conducted. WCFC and the second conventions is has this explicit provisions in its conventions that article 8 is says that compatibility of conservations and many measures where we are the CMM (Conservation and management measures) established for the high seas and those adopted for areas under national jurisdiction shall be compatible so that is the key is compatibility.

This is our archic waters for the IOTC we know that we have this area here what I have this yellow little round circles laut sawu and mentawai that is included in the area IOTC 57 and we have this area WPP 713, 715 included statistical area of the WCFC. The Big eye is actually the production of our archivic waters WPP 713, 714, 715 it consists of 59% from the total and this only for tuna catch. So a lot of productions came from arctic waters and you can see the tuna compositions most of its is from handlines and purse seine. This data we submit it to the RFMO through our National Report or Annual Report to IOTC end of WCFC. We are report

the annual catch estimates and we also report the operational data. So what's important for the stock assessment is those both exercise frequency also. Those data is going to be used to assess the stock assessment and the harvest strategy

The result from our data that is submit to RFMO. We have the status green, red and yellow based on the stock assessments.

In the arctic water we conducted 11 I line to improve our tuna data monitoring and reporting of course from logbook from sampling observer and also not just by the government but also already support by associations and we are willing to have full support from the academics university and also from the bussines compenies are very welcome. The highlight for our body waters fish management is the harvest strategy. The condition of tuna fisheries in the quarters because IOTC they already developing the harvest strategy and since there are a basis to have the compatibility of those provisions including strategy

This is compatibility base on what we have in the CCMM (compatibility of conservations and management measure) so they have Bigeye, skipjack, yellowfin but its not established yet up until now because they have this timeline or work plas are connected right now but we already have this strategy in place that was initiated in 2024. Interim framework harvest strategy is launch 2018. However, to the focus is not easy. We need a time series data or operational data, CPUE index, we needs data from the size distribution dan size frecueny. So, the technical team can incorporate those data into operating models. So its not about one year data ot two year data but it should be time series with the standardize data, so this is what we are trying to have collaborate with others data providers not just the government, not just logbook, but also data from associations or something data from NGOs assosiation and we combine. When we realise that we need more data integrate into operating models

Hopelly we/you can give a little bit hence what we need from the arctic waters and to be incorporated and how we mannage the fisheries arctic water. Data is important that not just the statistic data but operational data and the size data is very important, oceanography information also important because this is not just for us but also its for the whole regional aspect in the whole management fisheries.

That is from me

Thank you very much

Wassalamualaikum.wr.wb