Sharing Knowledge and Experiences on Small-Scale Marine Fisheries Data Collection and Management for Sustainable Development in the APEC Region

APEC Ocean and Fisheries Working Group

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Note:
Various terms referenced in this report do not imply the political status of any APEC economy.

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Acronym List

APEC	Asia-Pacific Economic Cooperation
CCRF	Code of conduct for Responsible Fisheries
EAM	Ecosystem Approach to Management
EAFM	Ecosystem Approach to Fisheries Management
EBM	Ecosystem-Based Management
EBFM	Ecosystem-Based Fisheries Management
EEZ	Exclusive Economic Zone
FAO	Food and Agriculture Organization
FMAs	Fisheries Management Areas
GPS	Global Positioning System
GSO	General Statistics Office
I-EAFM	Integrated Ecosystem Approach to Fisheries Management
IHH	Illuminating Hidden Harvests
IM	Integrated Management
ISSF	Information System on Small-Scale Fisheries
IUU	Illegal, Unreported and Unregulated
LGUs	Local Government Units
MARD	Ministry of Agriculture and Rural Development
OFWG	Ocean and Fisheries Working Group
SDGs	Sustainable Development Goals
SSF	Small-Scale Fisheries
TBTI	Too Big To Ignore

Executive Summary

The sustainable management of small-scale marine capture fisheries is crucial for economic prosperity, food security, and environmental health in the Asia-Pacific Economic Cooperation (APEC) region. Despite their significance, these fisheries face numerous challenges, including unsustainable practices, resource degradation, economic marginalization, and climate change. While the root cause of the problems is multi-faceted, data efficiency has been identified as one of the compounding factors. In effect, inadequate data hampers informed decision-making, hindering efforts to ensure their sustainability. Recognizing this, the project titled *"Sharing knowledge and experiences on small-scale marine capture fisheries data collection and management for sustainable development in the APEC region"* (OFWG 01 2022) was implemented to help enhance data collection and management for small-scale marine capture fisheries in the APEC region. By filling existing data gaps and fostering knowledge exchange among APEC member economies, the project seeks to support the conservation of marine resources and the well-being of coastal communities, as well as to promote sustainable development.

The project aligns with global sustainability initiatives such as the Sustainable Development Goals (SDGs) and the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries (SSF Guidelines). Initially, a desk study review of published and non-published literature, including web-based resources, was conducted, to examine the existing practices in small-scale marine capture fisheries data collection and management. It also drew on frameworks developed by organizations like the Food and Agriculture Organization (FAO) and the Too Big To Ignore Information System on Small-Scale Fisheries (TBTI ISSF) in the understanding of existing challenges and best practices in small-scale fisheries data system.

Subsequently, a survey questionnaire was developed and distributed to the contact points of the Ocean and Fisheries Working Group (OFWG) of APEC, as well as relevant government agencies, researchers, and practitioners from the APEC economies. The questionnaire contains four main sections, capturing information about the respondents, data collection and management system, characteristics of small-scale marine capture fisheries, and management and governance. Seventeen surveys were completed by eleven economies. The survey results revealed growing interest in improving data systems and technological integration. Challenges such as limited resources and technological constraints underscored the need for increased

support and capacity-building initiatives. The survey results were synthesized, and used as the basis for the development of the “best practice guidelines,” tailored to the characteristics of small-scale marine capture fisheries and the data system in the APEC region.

An in-person workshop was held in Bangkok, Thailand, on 31 January to 2 February 2024 as the as the final step in the project. Twenty-six people from 11 APEC economies, and three resource persons, participated in the workshop. Presentations during the workshop emphasized the importance of comprehensive data collection, spanning ecological, economic, and social dimensions for effective fisheries management and governance. Economy presentations provided insights into the status and challenges of small-scale fisheries across APEC economies, highlighting common issues such as environmental degradation and regulatory compliance. Discussions centered on the integration of small-scale fisheries within the framework of ecosystem-based management (EBM) and the broader blue transformation agenda. Participants emphasized the interconnectedness of social-ecological systems and the need for collaborative governance structures to achieve SDGs. Further, aligning small-scale marine capture fisheries management and governance with the FAO's SSF Guidelines and the SDGs was identified as a way to foster productive knowledge exchange, and drive improvements in data collection and management practices.

Through presentations and discussions, participants shared experiences, exchanged knowledge, discussed best practices in data collection, and identified collaborative opportunities. Key policy recommendations include establishing clear definitions within the legal frameworks to recognize the socioeconomic importance of small-scale marine capture fisheries, investing in user-friendly technology for data collection, promoting inclusive decision-making and enhancing trust among stakeholders, focusing on capacity building initiatives that empower local communities and ensure long-term viability, and developing tailored strategies addressing regional challenges and promoting regional cooperation, in alignment with global sustainability initiatives.

1. Introduction

The Asia-Pacific Economic Cooperation (APEC) is a regional economic group comprising 21 member economies from the Asia-Pacific region. APEC members include both developed and developing economies, cooperating on a wide range of economic and trade issues to promote prosperity and sustainable development of the region. Marine fisheries are important globally, contributing about 63% of the global marine catch in 2019. In the APEC region, catches from small-scale marine capture fisheries account for approximately 37% of global catches, based on the estimates from the Sea Around Us project (Fig. 1).

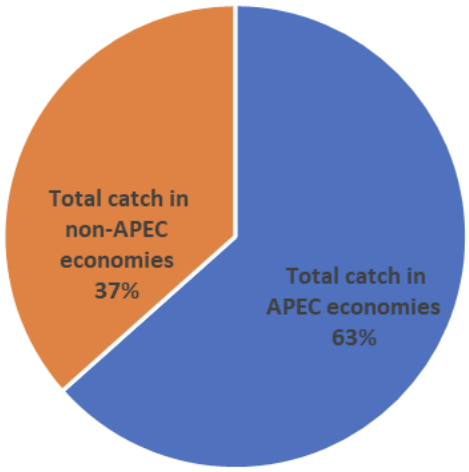

Figure 1. Contribution of marine catch from the APEC economies in the global marine fish production. Source: www.seaaroundus.org

These data demonstrate the importance of small-scale fisheries to the economies and livelihoods of many APEC member economies, especially those with extensive coastlines and important marine resources (Fig. 2). Because small-scale fisheries are rooted in communities, it is essential for food security, income generation, employment opportunities, and cultural heritage in the region.

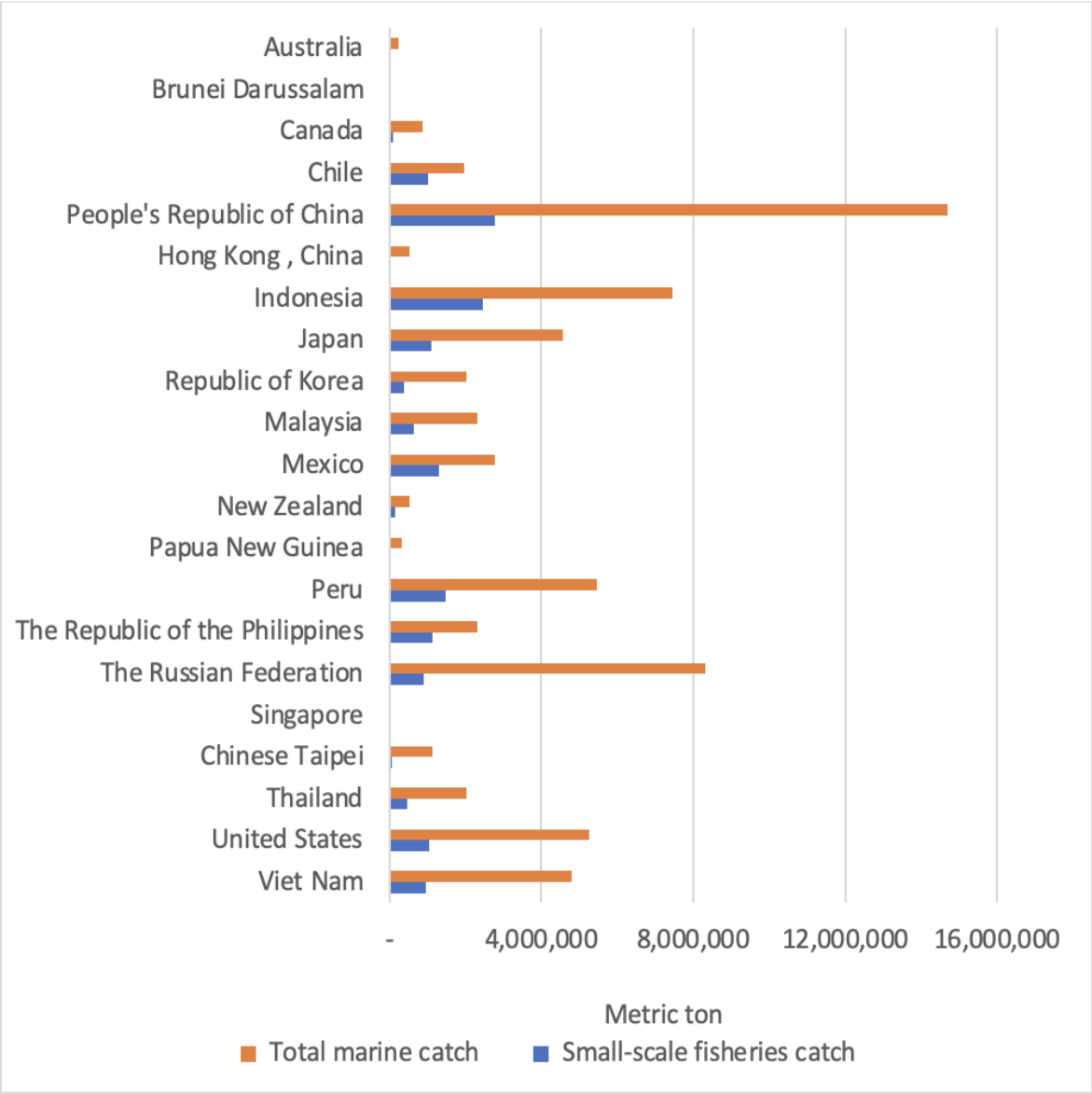

Figure 2. Small-scale fisheries catch in comparison with total marine catches. Source: www.seaaroundus.org

2. Literature review about small-scale marine capture fisheries and data collection

2.1 Characteristics of small-scale marine capture fisheries

Globally, small-scale fisheries play a vital role in providing livelihoods for over 90% of the 120 million people involved in capture fisheries. However, many small-scale fishing communities face economic and political marginalization, are highly susceptible to change, and have historically been overlooked in policy discussions (Dias et al., 2023). Even in

developed economies like Japan, they are at risk of marginalization, especially with the growing influence of the global ocean development (Li, 2022). Having good estimates and up-to-date information about small-scale fisheries will enable decision-makers, fisheries managers, and stakeholders to make informed decisions about resource management, conservation efforts, and sustainable development.

Small-scale marine capture fisheries are essential in the APEC region, embodying local traditions, livelihoods, and social cohesion within communities and oceans. These fisheries are integral to the local economy, supporting food security and preserving cultural heritage for generations (Jentoft & Chuenpagdee, 2022). Small-scale marine capture fisheries use various traditional and artisanal fishing techniques, often adapted to the unique local marine ecosystems that reflect generations of local and traditional knowledge and home-grown expertise. Many coastal communities rely heavily on small-scale marine capture fishing for income and employment. These fisheries provide livelihoods for fishers, also engaging local people in downstream activities such as processing and trading (Belton et al., 2022). Women play a key role in the fisheries particularly in processing and marketing of fish and other fishery products (Lentisco & Lee, 2015). Fishing practices and traditions are closely associated with the cultural identity of many APEC member economies. Indigenous knowledge, customs, and rituals shape how these fisheries are managed and maintained. Unlike large-scale, industrial fisheries, small-scale marine capture fisheries tend to be community-based, promoting a sense of local marine resource management, and leading to more sustainable harvesting practices.

There is no one definition to describe small-scale marine capture fisheries due to their diversity, complexity, dynamics and scale. Some aspects of small-scale marine capture fisheries may seem similar across certain regions, there are likely certain aspects that are unique. Generally, small-scale marine capture fisheries are ‘characterized’, rather than ‘defined’, to distinguish them from the large-scale counterpart and to differentiate them for the management purpose. In Viet Nam, where the marine fishing industry is mainly small-scale, the official categorization is based on the proximity to shore, i.e. coastal, inshore and offshore. Factors like engine size, hull length, distance from shore, depth of fishing, and equipment are often used to classify small-scale marine capture fisheries. There is no unified or precise definition of small-scale fisheries in China, but it is mainly based on small fishing vessels, which can be classified as small, medium, or large, in which small vessel is less than 12 m long (Zhao & Jia, 2020). Similarly, there is no legal definition of small-scale fishing in Japan. Yet, for the purpose of

fisheries production statistics, fishing boats that are smaller than 10 gross tons are recognized as coastal fishing vessels (Delaney & Yagi, 2017) . In some cases, small-scale fisheries are legally defined by law. Thailand, for instance, defines small-scale fisheries as fishing operations taking place in coastal seas in which a fishing vessel is used or in which a fishing gear is used without a fishing vessel, but in any case, it does not include commercial fishing (Royal Gazette, 2015).

Like elsewhere, small-scale fishers in the APEC region have close tie to the local marine environment and ecosystems. This is because of the use of traditional and artisanal fishing techniques, passed down from generation to generation, reflecting a deep cultural heritage connection (Weeratunge et al., 2014). Small-scale marine capture fisheries typically use smaller boats, lower catch volumes, and are less mechanized, compared to large-scale fisheries sector. They also have a relatively low environmental impact, although certain fishing gears are deemed highly destructive (Suebpala et al., 2017). Because small-scale marine capture fisheries often involve local communities, there is a strong sense of ownership of the resources, and along with customary practices, beliefs and values, their local and traditional knowledge contribute significantly to promote conservation and sustainability of fisheries resources and marine ecosystems.

2.2 Data collection and management system

For the small-scale marine capture fisheries in the APEC economies to contribute to the region's food security, livelihoods, and economic development, comprehensive data collection and appropriate management systems are required (Chuenpagdee & Jentoft, 2018). Data collection and management is the basis of sustainable fisheries management, with well-informed decision-making, resource assessment, and policy formulation, particularly in small-scale marine capture fisheries. Effective data management supports the implementation of sustainable practices and ensures the long-term viability of these fisheries.

Data collected on small-scale marine capture fisheries in the APEC region generally includes catch and effort data, environmental data, socioeconomic data, gear and vessel information, and market data. Catch and effort data are used for stock assessment and for determining sustainable catch limits. Ecosystem-related data enables an assessment of marine ecosystems' overall health, identifying habitat condition trends, and understanding ecological changes that

impact fish populations. Now that climate change is already altering fish stock distribution and abundance patterns, these changes has to be considered in order to facilitate fishery planning and adaptive management efforts (Fujita, 2021). Regulatory compliance data supports monitoring and enforcement efforts by verifying catch data and efforts against established regulations. Community livelihood data are used to assess the socioeconomic contributions of small-scale marine capture fisheries to local communities, helping to design policies that improve livelihoods and ensure food security. Socioeconomic data are also needed in order for small-scale fishing communities to adapt to climate change (Hanich et al., 2018). Market and trade data help improve transparency in seafood supply chains, ensuring traceability, safety, and product quality, which are increasingly important, especially in the global market. To achieve sustainable development, knowledge about how management decisions impact human wellbeing and how to maximize the societal benefits of fisheries is required and this can only be achieved by integrating social, economic, and ecological goals (Arias Schreiber & Gillette, 2021).

Fisheries Departments and related governance agencies are responsible for the data collection, overseeing collecting catch and effort data and other relevant statistics from small-scale marine fisheries. These departments strive to harmonize data collection methods, establish reporting requirements, and ensure regulatory compliance. Ensuring accurate, consistent, and reliable data collection remains challenging due to different methods, variances in reporting, and technical capacity. Common challenges include limited resources, data variability, seasonal and informal fishing, technical capability, communication barriers, data privacy and ownership, and fragmented governance. Many fisheries policies fail to address and support small-scale fisheries due to constraints like bureaucracy, funding, and politics (Bundy et al., 2008). Supporting local governance is key to maintaining sustainable use of marine and coastal resources and ensures the sustainability of the local economy (Satumanatpan et al., 2017). Small-scale marine capture fisheries often operate with limited financial and technological resources, affecting their ability to invest in data collection tools, technology, and training. Lack of funding can lead to a lack of monitoring equipment and limited access to information and training. Especially among small-scale fisheries and less tech-savvy fishing zones, using high technology in data collection and management systems requires training for them to gain the necessary skill sets in addition to using the proper tools, procedures, and interfaces (Lukambagire et al., 2023).

As small-scale marine capture fisheries are characterized by diverse fishing methods, species, and areas, leading to variability in the data, collecting data can be challenging and requires adaptive and innovative approaches. Further, many small-scale marine capture fishers engage in seasonal or informal fishing, making consistent data collection difficult. These activities may not be recorded in official data systems, leading to underrepresenting catches and fishing efforts.

3. Method

The project began with a desk study review of small-scale fisheries in the APEC economies and the existing information about data collection and management methods. In addition, pertinent documents were reviewed such as the Food and Agriculture Organization (FAO) Illuminating Hidden Harvest (FAO et al., 2023) and the Too Big To Ignore Information System on Small-Scale Fisheries (TBTI ISSF; Chuenpagdee et al., 2017). The project built on frameworks developed by these initiatives to determine current practices in data collection and management.

The Illuminating Hidden Harvest study is developed with a set of indicators to reveal contributions of small-scale fisheries to sustainable development and the challenges faced in maintaining those contributions (FAO et al., 2023). The indicators focused on the environmental, economic, gender, food security and nutrition, and governance dimensions of small-scale fisheries. Meanwhile, the TBTI ISSF is a global repository providing information on small-scale fisheries characteristics, importance, contributions and potentials (Chuenpagdee et al., 2017). The goal of ISSF is to capture key characteristics of small-scale fisheries across the 'fish chain' including the nature and type of fisheries and fishing activities, fishers' relationships with end users and governance. Through the interactive visualization, ISSF generates new knowledge on small-scale fisheries for effective communication with end-users and provides a solid foundation for multilevel analysis of small-scale fisheries that will enable appropriate policy development and decision-making.

Building on the Illuminating Hidden Harvest and ISSF, a survey questionnaire was developed, which contains a combination of questions in checkbox format and open-ended questions (Annex 1). This mix of questions allows gathering insights into the data collection and management practices related to small-scale marine capture fisheries in the APEC region, and

how it is being used for management and sustainable development. The draft survey was sent to be reviewed by a selected group of experts, including those from FAO, governments, and universities. Comments and feedback received from these experts were incorporated in the finalization of the survey. The survey was distributed by email to the APEC OFWG focal points for circulation to relevant government agencies. It was also sent to researchers, practitioners and academics working in the APEC economies. By completing and returning the survey, the participants grant permission for the project team to utilize the data for the study, identifying and presenting it with the name of the APEC economy associated with it and ensuring the confidentiality of personal identity.

The surveys were completed by 17 individuals, from 11 economies (Table 1). The results from the survey were synthesized, and used as the basis for the development of the best practice guidebook (see details in Annex 2). This document was circulated to those who participated and completed the survey for feedback. Further discussion to finalize the best practices took place at an in-person workshop on 31 January to 2 February 2024, held in Bangkok, hosted by the Department of Fisheries Thailand.

Table 1. Number of completed surveys by APEC economies.

APEC economies	OFWG Focal Point	Independent researchers
Chile	2	
Japan		3
Republic of Korea		1
Malaysia	1	1
Mexico		1
Papua New Guinea	1	
Peru	1	
The Republic of the Philippines	1	1
Chinese Taipei	1	
Thailand	2	
Viet Nam	1	
Total	10	7

4. Overview of the workshop

Twenty-six people from 11 APEC economies, and three resource persons, participated in the workshop. The workshop participants included fisheries officers and relevant personnel nominated by the OFWG Focal Points, as well as independent researchers who participated in the survey. Resource persons were from Canada, Sweden and Thailand (see List of Participants, Annex 3). Three 3-day workshop consisted of presentations by resource persons, economy presentations by the participants, and interactive discussion about the best practices for data collection (see Workshop Agenda, Annex 4).

The Deputy Director-General of the Department of Fisheries, Thailand, Dr. Taworn Thunjai, delivered the opening remarks. He emphasized Thailand's warm welcome as the host economy and highlighted the importance of sharing knowledge and practices in addressing global challenges in small-scale marine fisheries data collection and management, especially in the APEC economies. Dr. Kungwan Juntarashote, Chair of TBTI Global, followed by expressing his gratitude to all attendees for their participation in responding to the survey and underscored the importance of small-scale fisheries.

4. Summary of presentations (see also Annex 5)

4.1 Resource person presentations

4.1.1 The importance of data and information for small-scale fisheries management and governance

The first presentation was about the importance of data and information for small-scale fisheries management and governance by Milena Arias Schreiber, School of Global Studies, University of Gothenburg, Sweden. Her presentation underscored the societal importance of small-scale fisheries, but noting that they are facing challenges despite their historical significance dating back thousands of years. Collecting data for small-scale fisheries is crucial for understanding their definition, value, and challenges. The presentation categorized data collection for small-scale fisheries into ecological/environmental, economic, and social dimensions, recognizing small-scale fisheries as complex social-ecological systems. The inclusion of qualitative and quantitative data was emphasized to provide a comprehensive understanding of small-scale fisheries dynamics. Additionally, co-management and

participation were highlighted as essential for inclusive governance structures that empower marginalized voices and foster equitable management. The presentation concluded with an emphasis on the importance of evidence-based management strategies, inclusive governance structures, and collaborative decision-making processes to address multifaceted goals and challenges of small-scale fisheries.

4.1.2 Current efforts in improving small-scale marine capture fisheries data

Ratana Chuenpagdee made this presentation, in place of Dr. Silvia Salas who could not participate in the workshop. Her presentation focused on ongoing efforts to improve data on small-scale marine capture fisheries. Central to these endeavors is the Code of conduct for Responsible Fisheries (CCRF), a voluntary instrument developed by the FAO to ensure the sustainable management and development of aquatic resources. The presentation also focused on the SSF Guidelines, which prioritize human rights, gender equality, and economic sustainability. Efforts to enhance data collection draw on the Illuminating Hidden Harvests (IHH) global study, which aims to uncover the contributions and impacts of small-scale fisheries on food security and ecosystems. Finally, the presentation introduced the Information System on Small-Scale Fisheries (ISSF), an open, web-based platform designed to facilitate knowledge exchange and collaboration within the small-scale fisheries community.

4.1.3 Small-scale fisheries in the context of Ecosystem-Based Management

Alida Bundy, Fisheries and Oceans Canada, presented Ecosystem-Based Management (EBM) framework, and the relevance for small-scale fisheries, emphasizing the need for a holistic and integrated approach to fisheries and oceans management. This approach recognizes the interconnectedness of social-ecological systems and aims to achieve sustainable development by balancing diverse societal objectives. EBM considers the complexities of ecosystems, including biotic, abiotic, and human components, and applying an integrated approach within ecologically meaningful boundaries. EBM is one of the key guiding principles in the SSF Guidelines. The implementation of EBM involves various levels of management, including integrated management (IM), ecosystem approach to management (EAM), and ecosystem-based fisheries management (EBFM). Benefits of EBM include optimizing benefits across societal goals, identifying trade-offs and benefits among ecosystem activities, and ensuring transparent decision-making processes based on scientific evidence. However, challenges in

implementing EBM for small-scale fisheries include data collection difficulties due to factors such as dispersed nature of fishing activities, limited resources, and cultural barriers.

4.1.4 Small-scale fisheries and Blue Transformation

Angela Lentisco's presentation highlighted the importance of aquatic food systems, and emphasized the role of small-scale fisheries in providing nutrition globally. Statistics indicated significant growth and changes in the global blue sector, with increasing aquaculture production. The employment opportunities provided by the fisheries and aquaculture sector, particularly in Asia, where small-scale fisheries support livelihoods of over 600 million people, including women. The FAO's Blue Transformation roadmap, focused on sustainable aquaculture expansion, effective fisheries management, and improved value chains. The significance of small-scale fisheries is emphasized in contributing to food security, poverty alleviation, and nutrition, especially in developing economies. The SSF Guidelines was also introduced stressing their importance in guiding sustainable practices and promoting inclusivity. The presentation concluded by highlighting the need for collaborative implementation efforts and the support provided by FAO through various tools and initiatives.

4.2 Summary of conomy presentations

4.2.1 Small-scale fisheries in Chile: characterization, governance and challenges

The presentation delivered by Esteban Donoso Abarca and Lisette Montesi of the National Fisheries and Aquaculture Service offered a thorough examination of the Chilean fishing and aquaculture sector. It provided a detailed characterization of the fisheries industry, highlighting the significant presence of various entities, including industrial fishing vessels, small and middle vessels, divers, and areas of management. Moreover, it offered insightful statistics on exportation, transportation, and domestic consumption of fishery products, indicating the sector's economic importance. The governance structure within the sector, and related institutions responsible for enforcement, compliance, facilitation, and compliance as essential aspects of governance were also highlighted. The presentation hinted at the challenges facing the sector, including the need to balance economic interests with environmental conservation, enforce regulations effectively, and promote sustainable practices across all levels of the

industry. The importance of responsible management practices and regulatory compliance was emphasized as important in securing the long-term viability of Chile's small-scale fisheries.

4.2.2 Small-scale fisheries in China: current status and future prospects

Qinqin Lin from Shanghai Ocean University delivered a presentation on small-scale fisheries in China, outlining the current status, management policies, challenges, and future prospects of this sector. Small-scale fisheries in China are primarily defined by the size of fishing vessels, with the majority being less than 12 meters in length. They play a role in employment, economy, and livelihoods. Management policies for fisheries in China operate under unified leadership with decentralized administration, covering small-scale fisheries within broader guidelines. However, specific policies tailored to small-scale fisheries are lacking. Governance has evolved to focus on sustainability, biodiversity conservation, and ecosystem protection, with measures such as fishing bans and vessel decommissioning. Significant reduction in the number of marine fishing vessels have been successful and China's consistent ranking as the world's top producer of aquatic products are mainly from aquaculture. Better classification and management mechanisms for small-scale fisheries remain a challenge. Besides a call to re-evaluate China's fisheries management system to better accommodate the needs of the small-scale fisheries, capacity-building and improved data collection are essential, considering the large and diverse nature of small-scale fisheries in China. In conclusion, while China's small-scale fisheries face challenges, opportunities arise for sustainable development through improved management and international cooperation.

4.2.3 Small-scale marine fisheries in the Philippines

The presentation by Alice Joan Ferrer from the University of the Philippines Visayas highlighted the significance of small-scale marine fisheries in the Philippines, focusing on their values, challenges, and management. Small-scale marine fisheries, also known as municipal fishing, encompasses both boat-based and non-boat-based fishing activities. Despite individual catches being small, collectively, small-scale marine fisheries contribute to the total fish production. However, fishers in this sector face various challenges, including climate change vulnerabilities, displacement due to tourism and marine protected areas, and encroachment by commercial fishers. These threats are exacerbated by the lack of full implementation of legal protections for small-scale fishers, leading to poverty and inequality within coastal

communities. The socioeconomic and cultural importance of small-scale fisheries with fishers often considered themselves as providers for their families and communities is emphasized despite being considered among the poorest. Efforts to address the challenges faced by this sector challenges include establishment of Fisheries Management Areas (FMAs) and the promotion of sustainable resource management practices. however, the effectiveness of these measures is hindered by discrepancies in the capacity of Local Government Units (LGUs) to manage coastal resources effectively. Ultimately, the need for robust governance frameworks and equitable policies is needed to support the sustainability and livelihoods of small-scale fishers in the Philippines.

4.2.4 Small-scale fisheries in Thailand

An overview of the small-scale fisheries in Thailand was presented by the Sichon Hoimuk, Department of Fisheries, who highlighted an overview of small-sale fisheries, emphasizing their economic, social, cultural, and heritage values. The presentation outlined the management and governance structures, including the implementation of the Royal Ordinance on Fisheries, B.E. 2558 (2015), administered by various departments such as the Department of Fisheries, Marine Department, and Department of Marine and Coastal Resources. Data on the number of fishing boats and gear registered in 2023 were presented, illustrating the distribution of fishing activity across different gear types and tonnage groups. Delineation of fishing areas, focusing on the Andaman Sea and the Gulf of Thailand were described, highlighting the economic significance of fisheries through catch value statistics from 2017 to 2023. Overall, challenges and issues facing the sector is evident emphasizing the importance of collaboration and knowledge-sharing for sustainable development in the small-scale fisheries sector.

4.2.5 Marine fisheries in Viet Nam

The presentation about small-scale fisheries in Viet Nam was presented by Thi Kim Cuc Nguyen, from Department of Fisheries. The presentation began with the issue around the lack of legal definition on small-scale fisheries, although it could be argued that the entire fishery is small-scale, with more than 75% are small boats under 15 meters. Viet Nam has a coastline of 3,260 kilometers and an Exclusive Economic Zone (EEZ) spanning 1,000,000 km^2, it has 28 marine catching provinces. In 2023, marine catching production reached 3.66 million tons, with over 83,000 fishing vessels and approximately 550,000 fishers contributing to this

production. Around 1.5 million people in various roles are engaged in the fisheries. Despite stable production in recent years, challenges persist, including Illegal, Unreported and Unregulated (IUU) fishing concerns, labor shortages, inadequate infrastructure, limited investment, and low technological adoption, leading to high post-harvest losses and low labor productivity. The legal framework for management includes the Fisheries Law of 2017 and related decrees and circulars. National Statistics on Marine Capture rely on laws, regulations, and the efforts of governmental organizations like the General Statistics Office (GSO) and the Department of Fisheries (MARD) and other programs.

4.2.6 Small-scale fisheries in Japan

Yinji Li, from Tokai University, outlined the various aspects of small-scale fisheries in Japan, emphasizing marine capture fisheries conducted along coastal regions. These operations involve vessels under 10 tons, mainly managed by family enterprises. Nearly 2,800 fishing ports and 6,300 villages engage in small-scale fisheries, utilizing diverse fishing methods. The importance of small-scale fisheries extends beyond economic sustenance, encompassing resource management, marine conservation, and societal roles. The management of small-scale fisheries relies on fishing rights and licenses issued by prefectural authorities in Japan, with involvement of fisheries cooperatives. Challenges include environmental concerns, regulatory frameworks, and the need for sustainable practices. Notably, with Japan's New Fishery Act of 2018, it aimed at revitalizing the industry and accommodating newcomers while addressing long-standing issues. New initiatives like 'Umigyo' which focused on community viability and resource cooperation, reflects the efforts to enhance small-scale fisheries sustainability. Ongoing challenges persist despite new efforts, necessitating continued attention to ensure the vitality of Japan's small-scale fisheries sector.

4.2.7 Current status and challenges of small-scale fisheries in the Republic of Korea

HoGeun Jang from the Department of Marine and Fisheries Business and Economics College of Fisheries Science, Pokyung National University, presented the current status and challenges of small-scale fisheries in the Republic of Korea. The number of fisheries households and population declined, with a significant portion being over 65 years old. The definition of small-scale fisheries in South Korea is complex, considering both vessel size and income criteria. Small-scale fisheries is important and is emphasized through the conservation of local

knowledge and ecosystems, prevention of local extinction, and contribution to local ecotourism. Challenges identified include demographics changes, limited investments, and low policy acceptability due to reliance on local knowledge and skepticism towards government policies. Proposed solutions include promoting community-based management and incorporating market principles to incentivize sustainable practices. Management strategies including regulations and innovations proposed for 2023, aim to address challenges like the 'tragedy of the commons,' and demographic shifts.

4.2.8 Small-scale fisheries in Malaysia

Bahrinah Binti Bahrim and Mohd Faizrus Anwar Bin Roslan of the Department of Fisheries, Malaysia, discussed various aspects of small-scale marine fisheries management. The presentation covered the description, values, and importance of small-scale fisheries, emphasizing its economic, social, cultural, and heritage significance. It outlined the challenges and issues faced, including fish stock assessment, environmental degradation, IUU fishing, climate change and market measures. Additionally, details on the small-scale fishing zones were highlighted including the objectives and conditions of community-based fisheries management. Challenges in data collection, such as dispersed landing sites, limited budgets, and data security, were some of the issues faced in Malaysia. Proper management practices and improved data collection are needed for economically viable and sustainable small-scale fisheries in Malaysia.

4.2.9 Small-scale fisheries in Chinese Taipei

The presentation on Chinese Taipei's fisheries sector highlights key statistics, management strategies, and challenges. The economy's geographical landscape covers approximately 36,190 km^2 with a population of around 23 million. Fisheries play a significant role, with about 21,696 fishing vessels, including 1,200 operating in high seas. Various fishing methods are employed, with gillnets and longline fishing being the most common. In 2022, coastal and offshore fisheries production reached 135,188 metric tons, providing substantial employment opportunities to its people. The Ministry of Agriculture and its autonomous body, the Fisheries Agency, oversee fisheries policy and governance, supported by local fisheries divisions. Data collection methods include paper-based logbooks, fish collection at landing sites, and landing declarations, with increasing reliance on digital platforms. Vast number of landing sites,

remoteness of locations, limited budgets, and insufficiently trained personnel, leading to issues of data collection accuracy and trust in authorities remain a challenge.

4.2.10 Small-scale capture fisheries in Brunei Darussalam

The presentation by Desimawati Haji Metali and Siti Nur Nisrina Matali, of the Department of Fisheries in Brunei Darusalam, discussed the efforts to bolster the small-scale capture fisheries in their economy through a multifaceted approach. They emphasized the importance of delineating fishing zones and understanding the different categories of small-scale fisheries, including full-time, part-time, and small-scale commercial operators. To support the fishers, several initiatives are proposed. Firstly, capacity building programs such as briefings and short courses are suggested to enhance skills in boat engine diagnosis and maintenance, thus improving capabilities and reducing costs. Secondly, the distribution of necessities like GPS devices, cool boxes, and safety equipment aims to elevate the socioeconomic status of fishers while ensuring their safety and maintaining the quality of catches. Thirdly, a resource enrichment program involving the construction and development of artificial reefs is advocated to sustainably manage marine ecosystems and facilitate the long-term recovery of fisheries resources. Other proposed measures include conducting socioeconomic surveys to identify emerging issues, upgrading landing sites to enhance operational efficiency, and organizing discussion sessions (Muzkarah) to foster stakeholder collaboration. Furthermore, they aim to streamline data collection by transitioning to a mobile application in 2024, promising a more efficient and effective approach compared to existing methods.

5. Summary of discussions

In order to frame the discussion about the best practices in small-scale marine capture fisheries data collection and management for sustainable development in the APEC region, a presentation of the survey results was made. On the whole, the results revealed that while marine fisheries in the APEC region significantly contribute to the global catch, there are considerable data gaps that hinder decision-making and sustainable development efforts. It also highlighted a growing interest among APEC economies in improving data collection systems and management practices. A gradual shift towards digital data collection methods and technological integration, was observed, alongside a growing emphasis on advanced information management systems. Challenges such as limited resources and technological

constraints were identified, highlighting the need for increased support, training, and real-time monitoring to enhance data collection and management efforts. The importance of sharing experiences and best practices to promote sustainability in small-scale marine capture fisheries across the APEC region is clear. Finally, collaboration and ongoing discussions are important to inform future initiatives and improve the management of small-scale marine capture fisheries.

5.1 Importance of data to be integrated in small-scale fisheries data

Integrating different types of data for small-scale fisheries management is imperative to address complex challenges in fisheries and governance. The persistent issues such as environmental degradation, poverty, and conflicts, necessitating an interdisciplinary or transdisciplinary approach are highlighted. The followings are highlights from the discussion about data during the workshop, based on two considerations, i.e. the importance of the data and the ease of obtaining them.

Social data

Social data, including beliefs, aspirations, and working conditions, are considered crucial, yet challenging to obtain. Rather than treating social data as supplementary, it is important to advocate for their integration into fisheries datasets, to inform policymaking and effectively raise awareness. The interpretation of social data involves various methods like adjusting research lenses and engaging in action-based research. Despite the significance of social perspectives in fisheries, the marginalization of social scientists in fisheries is noted. The presentations call for collaboration, creativity, and inclusivity to address fisheries and coastal governance challenges.

Ecological data

In terms of ecological and biophysical factors, and based on their importance and ease of acquisition, factors like landing data, species caught, and fishing location information are considered “must-have,” but are challenging to obtain due to data collection complexities but varies in each economy. Similarly, certain data such as discard rates, marine debris, and local knowledge are considered “good to have” but are difficult to acquire. Conversely, landing data, species caught, landings by species, harvesting information, catch information, landing amount, catch species, and biological data are relatively easier to obtain, likely due to

standardized data collection methods. Finally, local knowledge, while valuable, falls under the category of "good to have" and is relatively easy to get through active stakeholder engagement. Overall, these categorization highlights the importance of comprehensive data collection in fisheries management while considering practical constraints.

Economic data

Economic data that are difficult to obtain but crucial for informed decision making are information on household debt, access to financial support, income, processing costs, and value chain segments. Understanding processing details, market dynamics, and catch distribution is vital yet difficult to collect. On the other hand, easily accessible data includes income breakdowns, various costs components, investment details, employment statistics, and e-commerce data. Bridging the gap in accessing challenges in data collection and deciding which data to collect is crucial for sustainable fisheries management and informed decision-making.

Governance data

In fisheries, data and data collection in governance are crucial for sustainable management. Must have data but challenging to obtain include information on injustices, governance effectiveness, compliance, and policies. These data are essential for evaluating regulatory frameworks and addressing social and environmental concerns. Data accessibility is often an issue due to transparency and accountability challenges within governance structures. Conversely, important data that can be easily obtained, like women's participation in management and permit/licenses numbers, provide foundational insights into governance effectiveness and regulatory compliance. "Good to have" but difficult to obtain data, such as staff participation and current policies, require more robust data collection mechanisms. Organizational information and post-harvest methods, contribute to understanding governance structures and operational effectiveness. Ultimately, data accessibility varies based on contextual and economic factors. Data categories span institutions, policies, structures, processes, and compliance, addressing aspects like participation, injustices, and gender. Strengthening governance frameworks and data collection and data collection mechanisms is vital for sustainable development of the small-scale marine capture fisheries and fostering trust in regulatory frameworks.

5.2 Complexities in data collection

The complexities in data collection were discussed during the workshop, suggesting a spectrum of data proficiency and the multifaceted nature of data collection challenges. Economies shared their experience in small-scale marine capture fisheries data, highlighting strengths and limitations (Table 2). The importance of stakeholder engagement and the complexities of data collection in fisheries management is evident in the discussions.

Table 2. An overview of the different economies' capabilities and limitations regarding their fisheries data collection system.

APEC economy	**Data collection capabilities and limitations**
Brunei Darussalam	Proficient in collecting data on fisheries, but lack information on species, weight of fish caught, and gear used, which are crucial for ecosystem management and securing budgets.
Chile	Good at capturing formal data on catches and operations but lack pre- and post-harvest, fish landing data, which are important for understanding gender dynamics in fishing activities.
People's Republic of China	Collect data on fishing vessels and total production but struggle to differentiate between small-scale and large-scale fisheries, leading to aggregated catch data.
Japan	Excel in gathering catch data and fishery statistics but lacks social and environmental data, essential for understanding the socioeconomic aspects of fishing communities.
Republic of Korea	Aggregate data on various categories but face challenges in obtaining consistent census data and relies on voluntary surveys, impacting the representativeness of the sample.
Malaysia	Able to capture landing data by zone and type of fishery but face challenges in conducting census due to cost, preferring microdata collection instead.
The Republic of the Philippines	Collect comprehensive data on fishers and fisheries profiles but struggle with the analysis and utilization of socioeconomic indicators for effective management.

Thailand	Have a robust data collection system but face limitations in coverage, especially in conflict areas, impacting the comprehensiveness of the data.
Viet Nam	Implement catch production data collection but seeks to expand data collection to include processing and socioeconomic indicators for more efficient resource management.

Additionally, a significant portion of the discussion centered around the challenges associated with data collection for small-scale marine capture fisheries. Participants exchanged views on the availability and utilization of data, with some expressing concerns about the underutilization of governance data despite its accessibility. There were discussions on the need for more descriptive data that can capture the dynamic nature of small-scale fisheries' activities. The importance of complaints from fisheries as valuable source of information was highlighted, emphasizing the need for efficient grievance mechanisms to address issues promptly.

5.3 The management and policy realities

The discussions surrounding fisheries management, policies and practices, offers invaluable insights into the complexities in sustaining fisheries resources, particularly on small-scale fisheries. The topics spanned a multitude of key themes including the efficacy of existing policies, challenges in data collection, governance structures, terminology refinement, application of frameworks, collaborative efforts, licensing regulations, and challenges encountered in gathering data.

Participants raised questions regarding the impact of policies such as vessel reduction on small-scale fisheries communities. There was a substantial concern regarding the need for policies that align with the realities of small-scale fisheries' livelihoods, with some participants hinting at a shift towards promoting aquaculture as a potential solution. This underlines the necessity for policies that are tailored to the unique needs and circumstances of small-scale marine capture fisheries, acknowledging their significance in the broader context of sustainable fisheries management.

Governance structures emerged as another crucial aspect of the discussion, with participants scrutinizing the appropriateness of current management systems for small-scale fisheries. Differences between small-sale fisheries and large-scale fisheries were underscored, thus the need for governance structures that cater specifically to the unique characteristics of small-scale fisheries.

Terminology refinement emerged as a key area of consideration, with participants advocating for the re-evaluation of certain terms to ensure the inclusivity and accuracy in representing the small-scale fisheries. There were discussions on the need to recognize and highlight the roles of women within small-scale fisheries communities, reflecting a broader effort to promote gender inclusivity and equity in fisheries management discussions.

The application of frameworks such as Ecosystem-Based Management (EBM) to small-scale fisheries was another focal point of the discussions. Participants deliberated on the feasibility of applying such frameworks to small-sale fisheries contexts, therefore needing incremental steps and collaborative efforts to navigate the complexities involved. This underscored the holistic approaches that consider both environmental and socio-economic factors in fisheries management.

6. Summary of policy interventions developed in the workshops

The workshop highlighted several important policy interventions, aiming at addressing challenges in data collection, and in promoting sustainability in small-scale marine capture fisheries. During the breakout activity, participants were divided into groups based on different categories: biological, social, economic, and governance. The discussions within each group focused on two central questions: firstly, the purpose behind acquiring data, and secondly, how to effectively utilize the collected data. By addressing these questions, policy interventions are drawn, aiming mostly to gain deeper understanding of the importance of data collection, and its practical implications across different aspects of fisheries management.

The interconnectedness of ecological and economic factors was emphasized and participants recognized the vital importance of stock assessment and the need to include small-scale fisheries data for comprehensive evaluations. Regarding climate change, discussions focused on necessary data types to assess vulnerability. Overall, *interdisciplinary collaboration and*

data-sharing initiatives were emphasized to enhance fisheries ecosystem resilience and sustainability. Further, the discussion highlighted challenges in obtaining compatible data, the significance of economic data in policy formulation, and concerns about reliability. *Gender-disaggregated data* and its relevance is assessing equity and employment dynamics were highlighted. *Creativity and innovation* in supporting small-scale fisheries through economic initiatives is emphasized.

The importance of social data in fisheries in decision making processes cannot be overstated. While challenges related to data interpretation and subjectivity are acknowledged, they are compensated by the value of social data in guiding policy and understanding community perspectives. *Comprehensive data-driven approaches*, taking into consideration qualitative data, including stories and oral history, are proposed to help capture the complexity of managing small-scale marine capture fisheries. Finally, participants emphasized the need to promote *evidence-based decision-making*. *Legal and policy analysis* is proposed as a way to examine alignment in the different set of laws and the legislative frameworks that are directly and indirectly related to small-scale marine capture fisheries. Priorities should also be given to enhance governance principles such as transparency and accountability.

7. The APEC best practices on data collection and management of small-scale marine capture fisheries

The best practices on data collection and management of small-scale marine capture fisheries were thoroughly discussed. Inputs obtained during the workshop on the five main areas to improve data collection system and fishery management in the APEC economies are summarized below.

Best practice # 1: Defining small-scale fisheries and their importance

Small-scale marine capture fisheries in the APEC region play a crucial role in local economies, food security, and marine ecosystem preservation. Recognizing their socioeconomic value is vital for promoting community wellbeing and inclusive policies, aligning with regional sustainability goals. These fisheries also hold cultural significance, transcending mere economic contributions. However, accurately assessing their total value requires innovative approaches. Improved data collection begins with clear definitions within legal frameworks,

acknowledging the diversity and contributions of small-scale fisheries, even within informal sectors. Achieving consensus on definitions and protections across diverse economies remains challenging due to varying legal frameworks. Legal recognition is essential to protect small-scale fisheries, ensuring compensation in case of incidents. Storytelling emerges as a valuable tool for understanding their complexities and injustices. Clear zoning and better management practices are necessary for their sustainability. Overall, legal recognition, storytelling, and improved management are crucial for safeguarding the significance of small-scale fisheries and their sustainable contribution to local economies and ecosystems.

Best practice # 2: Improving effectiveness of the data collection system

Maximizing the potential of data is crucial for informed decision-making in small-scale fisheries. Efficient data use supports sustainable practices, resource management, and addresses sectoral challenges. Leveraging collected data empowers stakeholders, fosters transparency, and enhances management effectiveness. Small-scale fisheries can adapt and contribute to sustainability goals through data-driven navigation of complexities. User-friendly technology for data access is essential for increased effectiveness and widespread usage. Local community involvement and traditional knowledge integration are prioritized, requiring training for improved data collection. Regular review ensures alignment with evolving needs. Sharing best practices and fostering collaboration enhance data quality, supported by technical mechanisms and quality data collection tools. Effective data collection keys include comprehensive training, standardization, appropriate strategies, ethical considerations, clear objectives, and technology utilization, vital for sustainable development goals and informed decision-making.

Comprehensive training ensures stakeholders are proficient in data collection methods. Strategies must align with defined objectives, starting with an assessment of existing data. Ethical practices are vital, including secure data storage and access controls. Leveraging technology, such as IoT and AI, along with user-friendly mobile applications, enhances data collection efficiency. These components collectively support decision-making processes and sustainable development goals, emphasizing the importance of accessible technology and training for effective implementation.

Best practice # 3: Employing collaborative approach for data collection

The engagement of small-scale fishers in data collection and management fosters collaborative decision-making, improving comprehension, compliance, and the success of sustainability initiatives. This inclusive approach instills a sense of ownership and responsibility, ensuring that collected data reflects diverse perspectives and knowledge of the marine environment. Collaborative efforts enhance adaptability, refine strategies, and align management practices with socioeconomic and environmental contexts, promoting effective and sustainable practices. Partnerships among stakeholders facilitate resource pooling, knowledge exchange, and evidence-based decision-making. Open communication and mutual understanding are crucial for implementing cohesive management strategies. A comprehensive strategy addressing regional challenges fosters knowledge integration, harmonizes governance, and promotes continual improvement in data collection and management. Overall, the collaborative approach emphasizes stakeholder engagement, clear communication, and the integration of scientific and local knowledge to address complex challenges and achieve sustainable outcomes. Funding for meetings ensures sustained participation, while integrating local knowledge enhances decision-making, benefiting all involved stakeholders.

Best practice # 4: Improving governance and action

The governance of small-scale marine capture fisheries demands multifaceted approaches that acknowledge the sector's complexity and dynamics. Governments wield significant influence in management, entailing capacity building for collaborative and adaptive strategies, empowering local communities, providing financial backing, and periodically evaluating effectiveness to adapt to evolving conditions and local feedback. Transparent governance structures bolster fisheries policies' robustness and garner legal support, advocating for policy change and prioritization. Regular communication and knowledge sharing are vital for building trust, fostering collective efforts, and advocating policy reforms and governance transformation for sustainable small-scale fisheries. Transparency fosters stakeholder trust, addressing conflicts and recognizing customary rights, while robust policies incentivize small-scale fisheries participation in data provision. Governance and action in small-scale fisheries necessitate financial support. Financial support enables effective governance implementation and tailored policy development. Overall, transparent governance, underpinned by strong

policies and adequate financial backing, is essential for fostering sustainable SSF management, ensuring long-term viability.

Best practice # 5: Moving forward together

Moving forward together in improving data about small-scale marine capture fisheries requires tailored strategies, capacity building, and trust-building measures. Strategies must consider local contexts, language, and culture, prioritizing capacity building in developing economies. Trust is essential, cultivated through transparent data practices, inclusive engagement, and technology utilization. Regular review and adaptation of data collection practices enhance quality and responsiveness to evolving needs. Looking ahead, the sustainability of small-scale fisheries depends on customization, empowerment, collaboration, and best practices implementation. Customizing strategies acknowledges regional challenges, while empowering local communities through capacity building is vital, especially in data management. Collaboration among stakeholders and political support are crucial for addressing threats like climate change and seizing opportunities. Proactive planning and access to reliable data are essential for preparing for challenges and capitalizing on potential benefits. Implementing best practices ensures sustainability, resilience, and equitable outcomes. Prioritizing these strategies ensures the long-term viability of small-scale fisheries, benefiting both the environment and the livelihoods of dependent communities. Innovative models for capacity building, governance, and funding are imperative for success in APEC economies and beyond.

8. Policy recommendations to improve data collection and management of small-scale marine capture fisheries in the APEC region

Policy interventions for enhancing small-scale marine capture fisheries data collection and management in the APEC region include establishing clear definitions within legal frameworks to recognize their socioeconomic importance. Improving data collection effectiveness involves investing in user-friendly technology and involving local communities. Collaborative approaches promote inclusive decision-making and trust among stakeholders. Transparent governance structures and capacity building initiatives empower local communities and ensure long-term viability. Tailored strategies address regional challenges, while regional cooperation facilitates knowledge exchange and policy alignment with global sustainability initiatives. Technology integration and innovation enhance data collection accuracy and efficiency.

Sustainable resource management practices minimize ecological impact and support coastal communities. By adopting these recommendations, APEC economies can promote the sustainability and resilience of small-scale fisheries, contributing to regional prosperity and sustainable development goals.

One of the policy priorities should be on enhancing data collection methods to ensure reliability and transparency, including the exploration of innovative solutions such as mobile applications for data gathering. Moreover, deliberative efforts is needed to integrate social data into management strategies, recognizing the subjective nature of such data and the need for innovative approaches to collect and integrate it effectively. Meaningful engagement with fishing communities is another crucial policy area, which can be fostered through effective collaborative tools and trust building exercises between stakeholders and policymakers. Capacity building is also stressed as essential to empower fishers, government agencies, and other stakeholders, with training programs and knowledge-sharing initiatives proposed to enable active participation in decision-making processes and the adoption of sustainable fishing practices. Furthermore, the adoption of the Ecosystem Approach to Fisheries Management (EAFM) principles is underscored as a comprehensive approach to small-scale marine capture fisheries management, with the Integrated EAFM (I-EAFM) model promoting collaboration among stakeholders and the integration of human, governance, and ecological dimensions in fisheries management to enhance sustainability and resilience. These policy recommendations aim to tackle key challenges in small-scale marine fisheries data collection, governance and management, while supporting the long-term viability of small-scale fisheries, and safeguarding marine ecosystems and livelihoods.

9. Conclusion

On a whole, the project has achieved its goal in obtaining better understanding about the existing methods and tools used in data collection and governance of small-scale marine capture fisheries in the APEC region. Participants of the survey and the workshop shared knowledge and experience in data collection and management, leading to concrete best practices that the economies can use to guide their data collection effort. Several policy recommendations have also been provided. The importance of inclusive, evidence-based approaches to sustainably manage small-scale marine capture fisheries has been emphasized throughout the discussions. Key interventions include defining fisheries, improving data

collection effectiveness, fostering collaboration, enhancing governance, and tailoring strategies to regional contexts. By prioritizing capacity building, transparency, and stakeholder engagement, policymakers can work towards ensuring the long-term sustainability and equitable outcomes of small-scale fisheries in the APEC region. These efforts not only benefit local economies and livelihoods but also contribute to the conservation of marine resources and the achievement of global sustainability goals. Collaboration among APEC member economies is essential for implementing these recommendations and promoting the resilience of small-scale marine capture fisheries in the face of evolving challenges.

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Annex 1 - Survey

Survey questions on

"Small-scale marine capture fisheries data collection and management for sustainable development in the APEC region"

Background and invitation to participate in the survey

The Asia-Pacific Economic Cooperation (APEC) region has rich marine ecosystems that play an important role in supporting the livelihoods of millions of people. Small-scale marine fisheries are essential for the economy and wellbeing of coastal communities, providing income, jobs, and cultural heritage for generations. However, in many APEC economies, small-scale fisheries face multiple challenges, such as declining resources due to overfishing, habitat loss, resource degradation, climate change effects, weak infrastructure, poor governance, and inadequate data collection and management practices.

Comprehensive information on key characteristics of small-scale fisheries is often lacking. This is partly due to the lack of best practices in data collection and management systems. The purpose of this survey is to learn about what information about small-scale marine capture fisheries is being collected in the APEC region, and how it is being used for management and sustainable development. The results from the survey will be compiled and presented as part of the best practice guidebook, and circulated to everyone completing the survey for feedback. Further discussion will be held at a workshop that the Thailand Department of Fisheries will host in Thailand in February next year.

We would appreciate it if you could complete all the questions in the survey to the best of your knowledge, and return the completed survey to us - TBTI Global by **15 October 2023**.

The survey contains many questions but they are mostly check-boxes. Please complete all questions (without skipping) to the best of your knowledge. Note that by completing and returning the survey to us, you are given us permission to use the data for the study. The data will be identified and presented using the name of the APEC economy that you are associated with, not by your identity.

We thank you in advance for your kind cooperation. Please don't hesitate to let us know if you have any questions or comments about the survey and the study.

I. Information about the survey respondent

(All questions are required.)

(1) Name:

(2) Gender:

- O Man or male
- O Woman or female
- O Non-binary
- O [I/They] use a different term (please specify)
- O Prefer not to answer

(3) Affiliation/Organization:

(4) Type of organization:

- O Government
- O Non-government
- O Inter-government
- O Civil society/community groups
- O Academics/research institution
- O Others (please specify):

(5) Level of operation of the organization:

- O Local
- O Sub-regional
- O Domestic/Economy-wide
- O Regional
- O International

(6) Position of the respondent within the organization:

(7) Name of the APEC Economy:

(8) Email address of the respondent:

II. Marine fishery data collection and management system

1. Do you, or your organization, collect data about …? (Select ALL that apply)
   - O Industrial/large-scale fisheries
   - O Commercial small-scale fisheries
   - O Subsistence (non-commercial) fisheries
   - O Indigenous fisheries
   - O Large-scale aquaculture
   - O Small-scale aquaculture
   - O Others (please specify):

2. What method(s) are used to collect and/or record the data identified above? (Select ALL that apply to any of the data type)
    - O Paper-based logbooks
    - O Digital logbooks or applications
    - O Mobile phone applications
    - O Interviews with fishers
    - O Field observation
    - O Fish collection at landing sites
    - O Onboard fisheries observation
    - O GPS tracking devices
    - O Remote sensing and satellite technology
    - O Others (please specify):

3. What is the main government agency (or agencies) responsible for collecting marine capture fisheries data in your APEC Economy?

4. Is there a specific unit/division responsible for collecting SMALL-SCALE MARINE CAPTURE FISHERIES data?

5. What other institution(s) or organization(s) (e.g., NGOs), or intergovernmental bodies, are also collecting similar data in your APEC Economy?

6. How do you store and manage the collected data? (Select ALL that apply)
    - O Paper records
    - O Spreadsheet software (e.g., Excel)
    - O Relational database
    - O Website or online portal
    - O Specialized fisheries management software
    - O Cloud-based systems
    - O Others (please specify):

7. In collecting SMALL-SCALE MARINE CAPTURE FISHERIES data, what challenges do you face (or may face, if the data is not currently collected)? (Select ALL that apply)
    - O Too many fishers, too many vessels
    - O Too dispersed/too remote geographically
    - O Too many landing sites
    - O Lack of well-trained personnel for data collection
    - O Limited budget
    - O Language/cultural barriers

- O Data security concerns
- O Lack of trust in authorities
- O Others (please specify):

8. What resources or support would you like to have if you were to improve your SMALL-SCALE MARINE CAPTURE FISHERIES data collection and management practices? (Select ALL that apply)
    - O Training on effective data collection methods
    - O Increased budget
    - O Increased monitors/recorders at landing sites
    - O Increased technical support
    - O Improved availability of data collection tools
    - O Enhanced quality of data collection tools
    - O Improved communication among agencies collecting related data
    - O Employing user-friendly data technology
    - O Others (please specify):

9. What do you/your organization do with the data that is collected about SMALL- SCALE MARINE CAPTURE FISHERIES? (Select ALL that apply)
    - O Compile into reports (e.g. Fisheries Statistics)
    - O Provide data/recommendations for development of fisheries policy
    - O Provide data/recommendations for fisheries management
    - O Provide data to other government units
    - O Provide data to fishers/fishers' organizations
    - O Provide data to non-governmental organizations
    - O Provide data to general public
    - O Provide data to inter-governmental organizations (Please specify):

    - O Others (please specify):

III. Characteristics of small-scale marine capture fisheries

1. Are small-scale fisheries "officially" defined? (Select ONE only). Note that this could be from the legal and/or management perspective.
    - O Yes
    - O No
    - O Not explicitly

Provide definition, if applicable:

2. In the following, specify what data is currently collected about SMALL-SCALE MARINE CAPTURE FISHERIES in your economy, how frequent and at what level. Check box in the last column if the data is not currently collected, but it should be collected.

Value chain segment	What types of data is currently collected? (Select ALL that apply)	How frequently do you collect data? (Select ALL that apply)	What level is the data collected? (Select ALL that apply)	Data is not currently collected, but it should be collected.
Harvesting information				
(a) Catch information	O Landing amount	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O
	O Catch species	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O
	O Biological data (e.g. length, weight, sex, diet, etc.)	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O
	O Fishing location	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O
	O Fishing trips	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O

	O Fishing permits	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O
	O Type of gears	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O
	O Fishing methods	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O
(b) Vessel information	O Types of vessels	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O
	O Number of vessels	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O
	O Size of vessels	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O
	O Engine size	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O
	O Gross Register Tonnage (GRT)	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O
(c) Crew information	O Number of small-scale marine capture	O Annually O Monthly	O Economy-wide O State/Provincial	O

	fishers (including gatherers if applicable)	O Daily O Occasionally	O Local	
	O Number of crew members	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O
	O Nature of employment (i.e. full-time vs. part-time)	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O
(d) Economic information	O Landing prices	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O
	O Fuel consumption	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O
	O By-catch/discards	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O
	O Vessel/gear ownership	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O
	O Fisher income	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O

	O Household debt	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O
	O Access to financial support	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O
(e) Social information	O No. of households involved in small-scale marine capture fishing	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O
	O Number of women involved in fishing	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O
	O Number of children involved in fishing	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O
	O Other employment (non-fishing occupations)	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O
	O Age of fishers	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O
	O Education of fishers	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O

	O Health conditions of fishers	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O
	O Safety conditions of fishers	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O
	O Access to healthcare	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O
	O Level of job satisfaction	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O
(f) Other information	O Marine debris (plastic pollution)	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O
	O Weather conditions	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O
	O Climate variability	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O
	O Ecosystem impact of fishing gear	O Annually O Monthly	O Economy-wide O State/Provincial	O

	O Others (please specify):	O Daily O Occasionally	O Local	
Value chain segment	What types of data is currently collected? (Select ALL that apply)	How frequently do you collect data? (Select ALL that apply)	What level is the data collected? (Select ALL that apply)	Data is not currently collected, but it should be collected.
Processing information	O Amount processed	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O
	O Percentage of catch processed by the small-scale fishing household	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O
	O Sources of raw materials	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O
	O Species processed	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O
	O Types of processed products	O Annually O Monthly	O Economy-wide O State/Provincial O Local	O

		O Daily O Occasionally		
	O Processing methods	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O
	O Number of women involved in processing	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O
	O Number of children involved in processing	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O
	O Quality control standards	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O
	O Number of employees	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O
	O Employees' work hours	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O
	O Income from processing	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O

	O Nutritional value of processed products O Storage and refrigeration O Waste and byproducts O Others (please specify):	O Annually O Monthly O Daily O Occasionally O Annually O Monthly O Daily O Occasionally O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local O Economy-wide O State/Provincial O Local O Economy-wide O State/Provincial O Local	O O O
Value chain segment	What types of data is currently collected? (Select ALL that apply)	How frequently do you collect data? (Select ALL that apply)	What level is the data collected? (Select ALL that apply)	Data is not currently collected, but it should be collected.
Marketing/ trading information	O Marine catch retained for household consumption O Marine catch going to fish oil/fish meal O Marine catch going to other non-food uses or unknown uses	O Annually O Monthly O Daily O Occasionally O Annually O Monthly O Daily O Occasionally O Annually O Monthly O Daily	O Economy-wide O State/Provincial O Local O Economy-wide O State/Provincial O Local O Economy-wide O State/Provincial O Local	O O O

		O Occasionally		
	O Marine catch going to export market	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O
	O Number of women involved in marketing/trading	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O
	O Number of children involved in marketing/trading	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O
	O Number of employees	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O
	O Employees' work hours	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O
	O Market structures/distributi on channel	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O
	O Market prices	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O
	O Marketing organization (e.g. cooperatives)	O Annually O Monthly O Daily	O Economy-wide O State/Provincial O Local	O

		O Occasionally		
	O Use of ices	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O
	O Storage and refrigeration	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O
	O Transportation and logistics	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O
	O Sales and revenue data	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O
	O E-commerce	O Annually O Monthly O Daily O Occasionally	O Economy-wide O State/Provincial O Local	O
	O Others (please specify):			

IV. Fisheries management and governance

1. At what level(s) are SMALL-SCALE MARINE CAPTURE FISHERIES regulated? (Select ALL that apply)
   - O Economy-wide
   - O State
   - O Provincial
   - O Regional
   - O Local
   - O Bilateral
   - O International

- O Small-scale fisheries are NOT REGULATED
- O Others (please specify):

2. What management/governance system is in place for SMALL-SCALE MARINE CAPTURE FISHERIES? (Select ALL that apply)
    - O Top-down, centralized governance
    - O Decentralized governance
    - O Co-management
    - O Community-based management
    - O Self-governance
    - O Indigenous governance
    - O Others (please specify):
    - O Not applicable

3. Is the effectiveness of the management/governance of SMALL-SCALE MARINE CAPTURE FISHERIES assessed/evaluated (by the responsible government authority)? (Select ONE only)
    - O Yes
    - O No
    - O Not sure
    - O Don't know
    - O Not applicable

4. What measures, rules and regulations are applied to manage SMALL-SCALE MARINE CAPTURE FISHERIES? Select ALL that apply.
    a. Catch/Fishing
        - O Catch quota
        - O Mesh size regulations
        - O Species regulations
        - O Fishing gear restrictions
        - O Fishing effort restriction

    b. Vessel
        - O Vessel monitoring
        - O Port state measures
        - O Vessel restrictions

    c. Closures
        - O Seasonal closures
        - O Fisheries closures (temporary)
        - O Marine protected areas

d. Access/Rights
   - O Licensing/permits
   - O Traditional/customary rights
   - O Community-based fishing rights
   - O Formal tenure systems
   - O Informal rules and norms
   - O Territorial user rights
   - O Property and access rights

e. Others (please specify):

5. What are the key principles, main purposes, or mandates, for the management of SMALL-SCALE MARINE CAPTURE FISHERIES? Select ALL that apply
   - O Precautionary principle
   - O Ecosystem-based management (EBM
   - O Ecosystem approach to fisheries management (EAFM)
   - O Co-management/participatory management
   - O Integrated Management (IM)/Integrated Coastal Zone Management (ICZM)
   - O Human rights-based management
   - O Others (specify):

6. What are the key issues/challenges facing SMALL-SCALE MARINE CAPTURE FISHERIES in your APEC Economy? (Select ALL that apply)
   - O Food security
   - O Poverty
   - O Social justice
   - O Gender equality and equity
   - O Access to resources
   - O Access to markets
   - O Fisheries/gear conflicts
   - O IUU fishing
   - O Conflicting management measures
   - O Enforcement and compliance
   - O Stakeholder engagement
   - O Subsidies
   - O Vulnerability of fishing communities
   - O Ecosystem health/environmental conditions
   - O Climate change/variability
   - O Social organization and cohesion
   - O Education and literacy levels

- O Safety and working conditions
- O Access to services and technology
- O Lack of employment/income options
- O Others (please specify):

V. Additional comments

Please share any additional comments, suggestions, or experiences related to data collection and management in small-scale marine capture fisheries.

You may provide scientific or grey literature of interest for the description of the small-scale marine capture fisheries. (Please upload data in a zip file. Supported formats are .zip and .rar.)

Thank you for filling this survey!

Please return the completed questionnaire to TBTI Global by **15 October 2023**.

If you have any questions on any of this questionnaire, please feel free to contact TBTI Global.

Annex 2 – Survey results

A summary report from the survey on

“Sharing knowledge and experiences on small-scale marine capture fisheries data collection and management for sustainable development in the APEC region”

APEC Project – OFWG 01 2022

Prepared by TBTI Global

January 2024

A summary report from the survey on "Sharing knowledge and experiences on small-scale marine capture fisheries data collection and management for sustainable development in the APEC region" (APEC Project - OFWG 01 2022)

10 January 2024

Prepared by TBTI Global

Background and rationale

The Asia-Pacific Economic Cooperation (APEC) is a regional economic group comprising 21 member economies from the Asia-Pacific region. APEC members include both developed and developing economies, cooperating on a wide range of economic and trade issues to promote prosperity and sustainable development of the region. Marine fisheries are important globally, especially in the APEC economies, contributing about 63% of the global marine catch in 2019. Additionally, catches from small-scale marine capture fisheries in the APEC economies account for approximately 37% of global catches based on the estimates from the Sea Around Us project (Fig. 1).

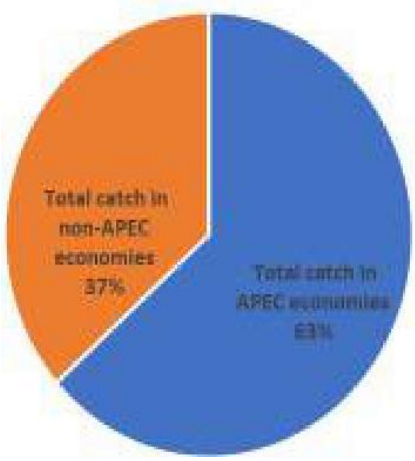


Figure 1. Contribution of marine catch from the APEC economies in the global marine fish production. Source: www.seaaroundus.org

These data demonstrate the importance of small-scale fisheries to the economies and livelihoods of many APEC member economies, especially those with extensive coastlines and important marine resources (Fig. 2). Because small-scale fisheries are rooted in communities, it is essential for food security, income generation, employment opportunities, and cultural heritage in the region.

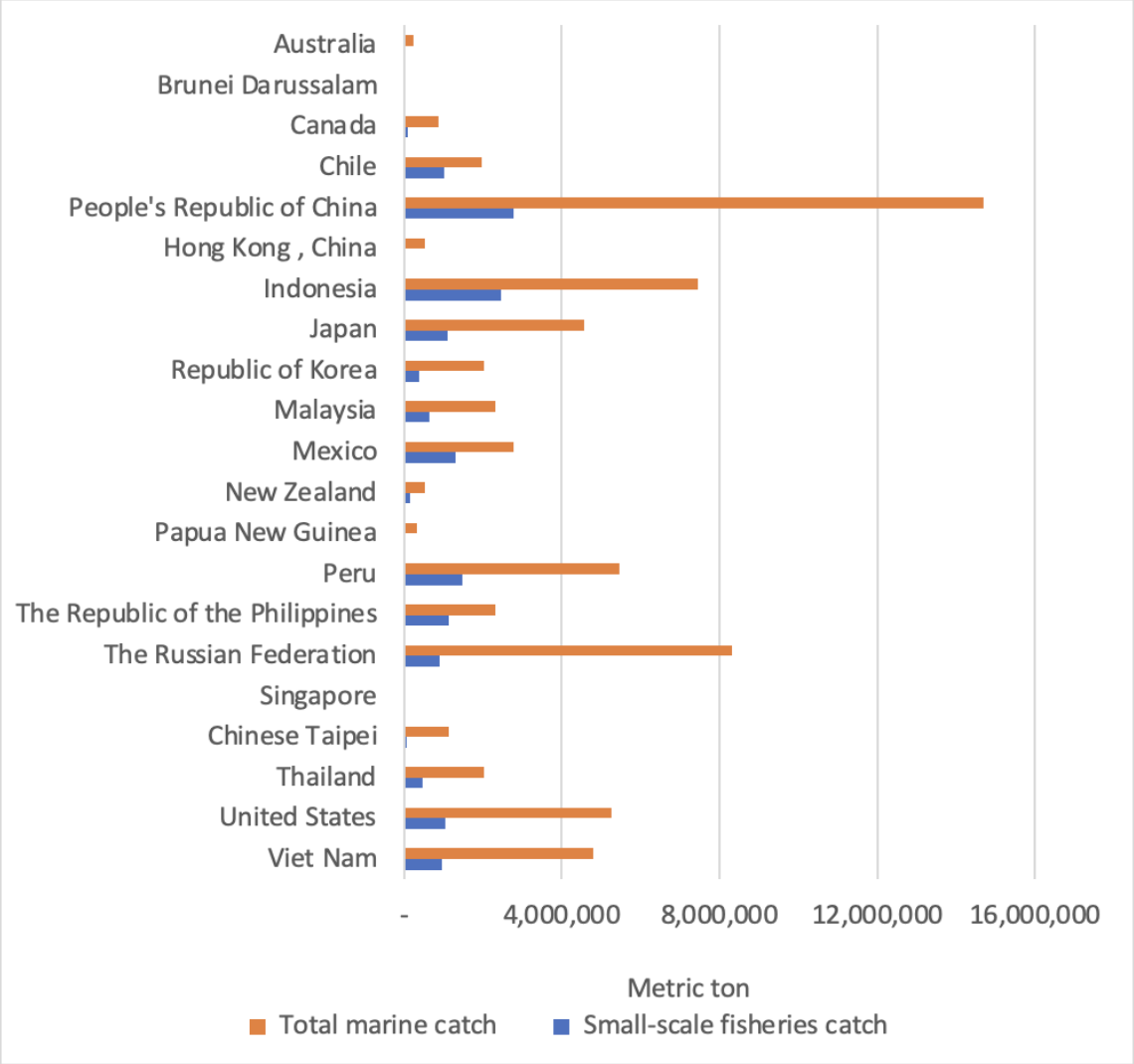


Figure 2. Small-scale fisheries catch in comparison with total marine catches. Source: www.seaaroundus.org

Globally, small-scale fisheries play a vital role in providing livelihoods for over 90% of the 120 million people involved in capture fisheries. However, many small-scale fishing communities face economic and political marginalization, are highly susceptible to change, and have historically been overlooked in policy discussions (Dias et al., 2023). Even in developed economies like Japan, they are at risk of marginalization especially with the growing influence of the global ocean development (Li, 2022). Having good estimates and up-to-date information about small-scale fisheries will enable decision-makers, fisheries managers, and stakeholders to make informed decisions about resource management, conservation efforts, and sustainable development.

A comprehensive data on key characteristics of the small-scale marine capture fisheries, and on existing data collection and management systems, is currently lacking. Thus, the project aims to fill data gaps in small-scale fisheries, in order to support informed decision-making and ecosystem-based management to achieve fisheries management objectives in the APEC economies, as well as global goals like the Sustainable Development Goals (SDGs). It also aims to enhance the understanding of small-scale fisheries data collection and management, addressing challenges like overfishing and climate change, with a focus on fostering knowledge exchange and developing context-appropriate strategies for sustainable resource management among APEC member economies.

Through this, a culture of lesson sharing and collaboration can be fostered, also to support effective implementation of the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the context of Food Security and Poverty Eradication (SSF Guidelines; FAO 2015). As such, the project actively involves stakeholders in the understanding about small-scale fisheries data and the data collection system in the APEC economies, and helps to steer the discussion to motivate an adoption of sustainable practices and contribute to global sustainability goals. Moreover, the project aligns with key initiatives and frameworks supporting the APEC Roadmap on Combatting Illegal, Unreported, and Unregulated (IUU) Fishing, the APEC's Oceans and Fisheries Working Group (OFWG) strategic plan 2021-2023, and the Policy Partnership on Food Security (PPFS) Strategic Framework on Rural-Urban Development, promoting sustainable development both on land and sea.

Method

The project begins with a desk study review of small-scale fisheries in the APEC economies and the existing information about data collection and management methods. In addition, pertinent documents were reviewed such as the Food and Agriculture Organization (FAO) Illuminating Hidden Harvest (FAO et al., 2023) and the Too Big To Ignore Information System on Small-Scale Fisheries (TBTI ISSF; Chuenpagdee et al., 2017). The project builds on frameworks developed by these initiatives to determine current practices in data collection and management. The Illuminating Hidden Harvest study is developed with a set of indicators to reveal contributions of small-scale fisheries to sustainable development and the challenges faced in maintaining those contributions (FAO et al., 2023). The indicators focused on the

environmental, economic, gender, food security and nutrition, and governance dimensions of small-scale fisheries.

Meanwhile, the TBTI ISSF is a global repository providing information on small-scale fisheries characteristics, importance, contributions and potentials (Chuenpagdee et al., 2017). The goal of ISSF is to capture key characteristics of small-scale fisheries across the 'fish chain' including the nature and type of fisheries and fishing activities, fishers' relationships with end users and governance. Through the interactive visualization, ISSF generates new knowledge on small-scale fisheries for effective communication with end-users and provides a solid foundation for multi- level analysis of small-scale fisheries that will enable appropriate policy development and decision-making.

Building on the Illuminating Hidden Harvest and ISSF, a survey questionnaire was developed, which contains a combination of questions in checkbox format and open-ended questions (Appendix 1). This mix of questions allows gathering insights into the data collection and management practices related to small-scale marine capture fisheries in the APEC region, and how it is being used for management and sustainable development. The draft survey was sent to be reviewed by a selected group of experts, including those from FAO, governments, and universities. Comments and feedback received from these experts were incorporated in the finalization of the survey. The survey was distributed by email to the APEC Ocean and Fisheries Working Group (OFWG) focal points for circulation to relevant government agencies. It was also sent to researchers, practitioners and academics working in the APEC economies. By completing and returning the survey, the participants grant permission for the project team to utilize the data for the study, identifying and presenting it with the name of the APEC economy associated with it and ensuring the confidentiality of personal identity. The results from the survey were compiled and used to develop the best practice guidebook, which will be circulated to those who participated and completed the survey for feedback. It will then be discussed and finalized at an in-person workshop on 31 January to 2 February 2024, to be held in Bangkok, hosted by the Department of Fisheries Thailand.

Results and discussion

The analysis below is based on seventeen surveys, which were completed and returned to TBTI Global by early January. Ten of them were from the OFWG focal points associated with the following APEC economies: Chile; Malaysia; Papua New Guinea; Peru; The Republic of the Philippines; Chinese Taipei; Thailand; and Viet Nam (see Table 1). Additional surveys were completed and returned by independent researchers from Japan; Republic of Korea; Malaysia; Mexico; and The Republic of the Philippines. Altogether, the analysis is based on twelve responses from eight developing economies and five responses from three developed economies.

Table 1 Number of completed surveys by APEC economies

APEC economies	OFWG Focal Point	Independent researchers
Chile	2	
Japan		3
Republic of Korea		1
Malaysia	1	1
Mexico		1
Papua New Guinea	1	
Peru	1	
The Republic of the Philippines	1	1
Chinese Taipei	1	
Thailand	2	
Viet Nam	1	
Total	10	7

Below is the summary of the responses from the survey, organized by the categories presented in the questionnaire. While the responses are presented in comparative term between developed and developing economies, it should be noted that the results are based on a small sample size, and thus should not be treated as representative of the APEC Region.

a. Data Collection tools, methods and techniques

The data is segmented into categories such as logbook types, data collection techniques, and technological tools used in small-scale marine capture fisheries data collection (Fig. 3). Paper-based logbooks remain common in both developed and developing economies, but there is a noticeable shift towards digital logbooks and applications, particularly in developing economies. Mobile phone applications and remote sensing and satellite technology are more prevalent in developing economies, suggesting a higher level of technological integration for data collection. The higher utilization of interviews with fishers, field observation, data collection at landings sites, and onboard fisheries observation in both economies may indicate a more hands-on and participatory approach to data collection.

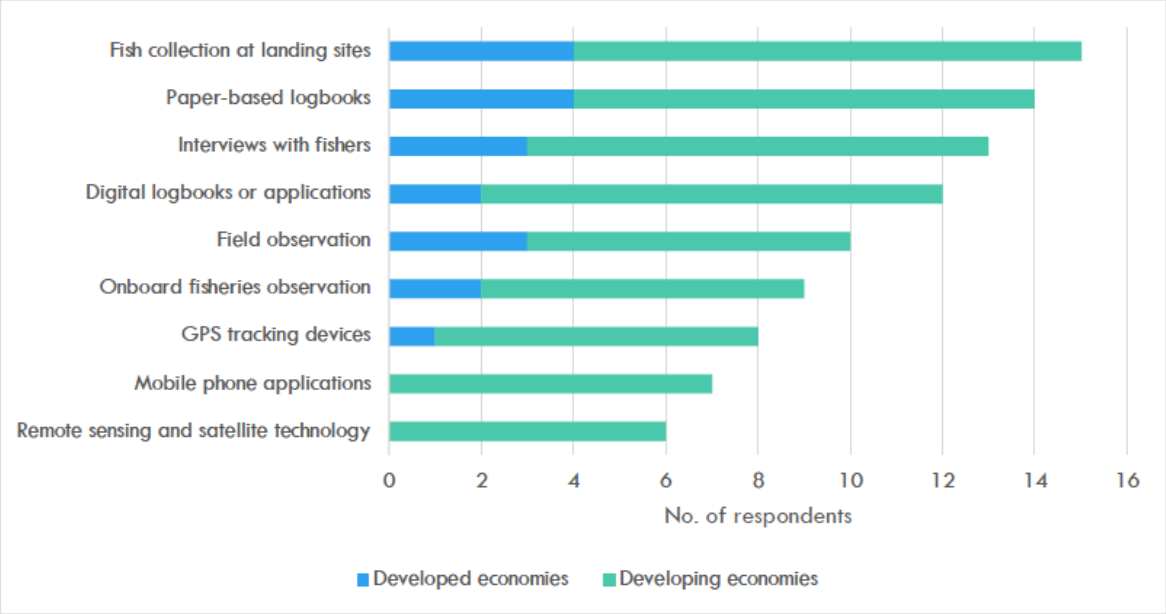


Figure 3. Methods of data collection

The use of GPS tracking devices that is more widespread in developing economies, reflects a greater emphasis on location-based data collection. Developing economies exhibit a more diverse array of data collection techniques and a higher adoption of technological tools, indicating a multifaceted and technologically advanced approach to fisheries data collection compared to the developed counterparts.

b. Data storage and management system

Paper records, and spreadsheet software (e.g., Excel) are commonly used across both developed and developing economies, but their prevalence is notably higher in developing economies (Fig. 4). This might indicate a reliance on traditional and basic tools for information management in these economies. Both developed and developing economies demonstrate a higher adoption of various information management systems, including relational database, and website or online portals. Although developed economies exhibit a diverse set of information management tools, there is a notable emphasis on using relational database, cloud-based systems, and website or online portals. This suggests a level of technological sophistication in information management. Developing economies show a higher inclination towards adopting specialized fisheries management software, suggesting a more tailored and advanced approach to fisheries information management.

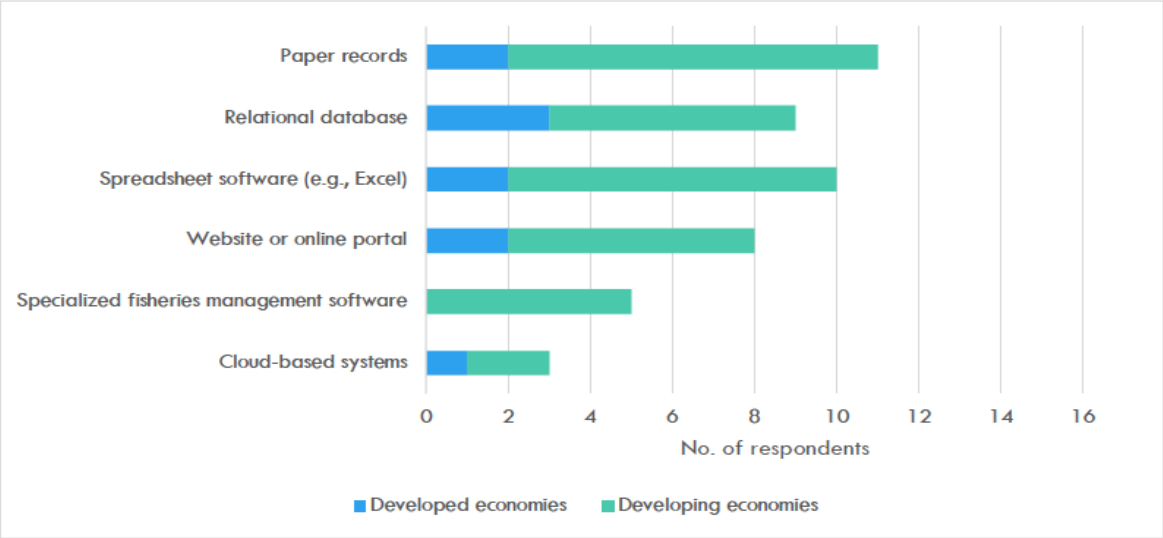


Figure 4. Data management system

Cloud-based systems are also more widely adopted in developing economies, indicating a trend towards scalable and remotely accessible solutions in fisheries data management. While basic tools like paper records and spreadsheet software are prevalent across economies, developing economies are actively embracing a broader range of digital information management systems. Similar with data collection, data management in small-scale marine capture fisheries have shifted towards more advanced and scalable solutions.

c. Data utilization

The analysis shows how small-scale fisheries data is utilized across developed and developing economies in the APEC region, focusing on its role in various sectors. Both developed and developing economies prioritize the compilation of fisheries data into reports indicating a recognition of the importance of summarizing information for easy dissemination (Fig. 5). Providing data and recommendations for the development of fisheries policy and fisheries management is a high priority in both economies, emphasizing the integral role of data in policymaking and management decisions. Developed economies exhibit a lower emphasis on providing data directly to the public, intergovernmental organizations (e.g., FAO, SEAFDEC, IOTC, UN, OECD), and non-governmental organizations compared to developing economies. These economies also place a higher priority on disseminating data to various stakeholders, including fisher/fisher's organizations. Developed economies also put emphasis on the importance of providing data for research about fisheries businesses and economies. It was noted in the responses that the small-scale fisheries data can also be used by other government agencies such as the Department of Agriculture or Office of Civil Defense for providing assistance in case of calamities.

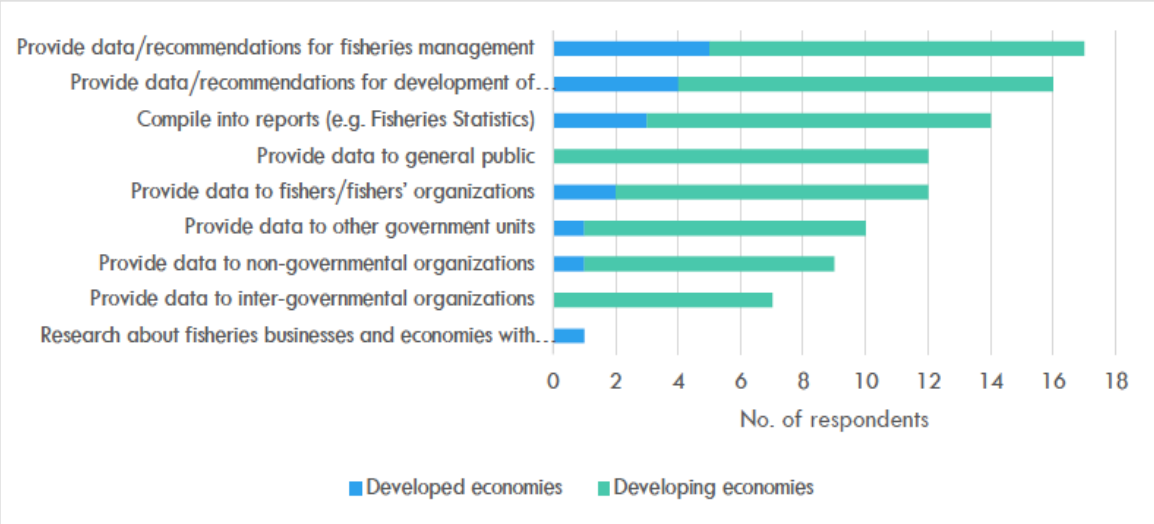


Figure 5. Data utilization

d. Resources or support needed to improve small-scale marine capture fisheries data collection and management

The responses from both the developed and developing economies indicate key priorities and

areas that require attention to improve small-scale fisheries data collection and management. Increased budget, employing user-friendly data collection and management technology, and technical support are indicated as key priorities for both developed and developing economies, along with the recognition on the importance of training and capacity building in effective data collection (Fig. 6). Adequate funding is crucial for implementing effective and sustainable fisheries data collection and management strategies. Increased monitors/recorders at landing sites and enhanced technical support are seen as crucial in both developed and developing economies, emphasizing the importance of real-time monitoring and support infrastructure. Improved availability and quality of data collection tools are priorities in both economies, with higher emphasis on developing economies. This suggests a recognition of the need for reliable and advanced tools for data collection. Moreover, improved communication among agencies and user-friendly data technology are needed in both economies, indicating the importance of seamless collaboration and technology accessibility. Finally, incentivizing fishers for reporting their own data is suggested in developed economies, whereas developing economies may need to focus on strategies to encourage greater fisher participation. Developing economies also suggested the use of interoperability technology to collect data, enabling collaboration, efficiency, and accessibility while ensuring improved quality of data exchange and adaptability to evolving technologies for informed decision-making. Effective fisheries data collection and management require a combination of financial support, training, technological infrastructure, and community engagement.

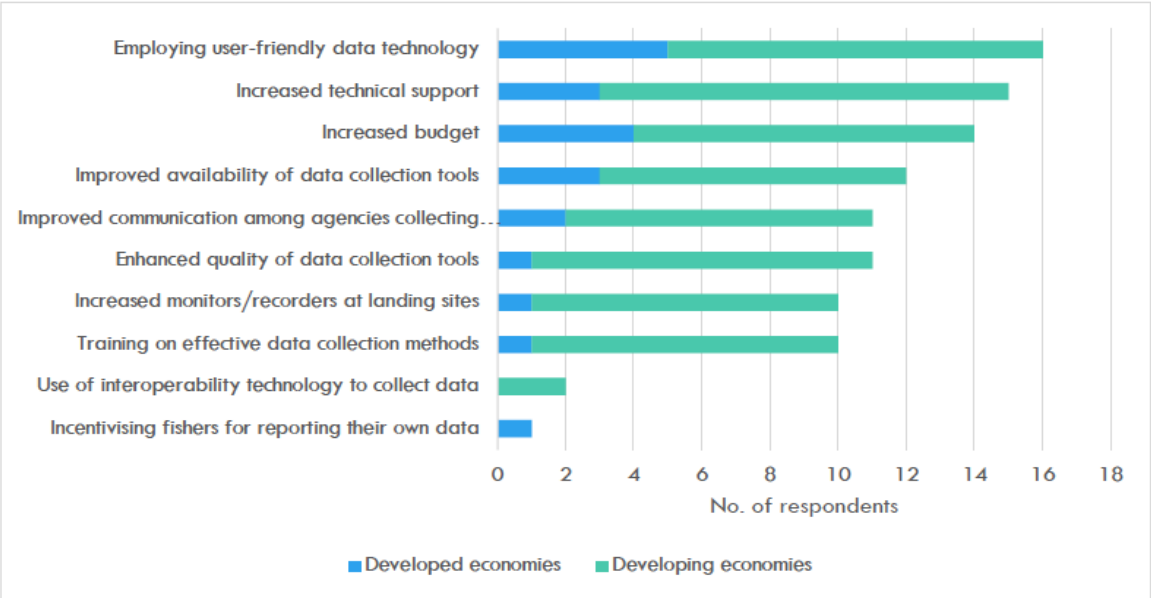


Figure 6. Resources or support required to improve data collection and management.

e. Agencies responsible for data collection

Effective data collection for small-scale marine capture fisheries in the APEC region requires cooperation among a range of entities, encompassing government fisheries departments, fisheries research institutions, fishers' organizations and cooperatives, non-governmental organizations (NGOs), academic institutions, and international organizations. Government fisheries agencies typically assume a pivotal role in data collection, disseminating this information to various organizations, including FAO. It is crucial for government institutions responsible for fisheries resource management to enforce and oversee existing regulations in fisheries data collection and management, promote and facilitate active community involvement to promote sustainable practices (Naranjo Madrigal & Salas Márquez, 2014). In addition, these departments strive to unify data collection and ensure adherence to regulatory requirements. It is important to note that different APEC economies each have different government agencies responsible for marine capture fisheries data collection. Many economies involve multiple institutions, including NGOs and international organizations, in fisheries data collection indicating a collaborative effort to ensure comprehensive and accurate data. Some economies have specific units or divisions dedicated to collecting data on small-scale fisheries, emphasizing the importance of understanding and managing this sector exclusively. Local government units, cooperatives, and international organizations play a role in fisheries data collection, recognizing the need for multi-level and cross- border approach to fisheries data collection and management. In few instances, specific details about responsible units or agencies are not provided, reflecting potential gaps in transparency or communication about fisheries data collection and management or simply just the lack of awareness or knowledge regarding the specifics of fisheries data collection within certain economies.

f. Defining small-scale fisheries

Small-scale fisheries are challenging to define due to their diversity, complexity, dynamics, and scale, making them better characterized than strictly defined (Chuenpagdee et al. 2017). Distinguishing them from large-scale counterparts is crucial, however, for management purpose, as illustrated in the Illuminating Hidden Harvest report (FAO et al., 2023). Different economies employ varying criteria for categorizing small-scale fisheries. Often, small-scale fisheries exhibit a close connection with their local marine environment and employ traditional

fishing techniques, reflecting cultural heritage. They typically use smaller, less mechanized boats or some have no boats, have lower catch volumes, and generally have lower environmental impact.

There is a diverse perspective regarding the definition of small-scale fisheries for each of the APEC economy responding to the survey. On a whole, 47% of the respondents indicated that small-scale fisheries in their own economies are defined, while 41% suggested that they are not explicitly defined, and 12% stated no definition for their small-scale fisheries. This diversity of responses could be due to differences in legal frameworks, management approaches, and contextual considerations. Defining small-scale fisheries is crucial either legally or in terms of management criteria, as lack of clear or official definition could hinder the ability to design and implement targeted policies and regulations for the sustainable management of these fisheries.

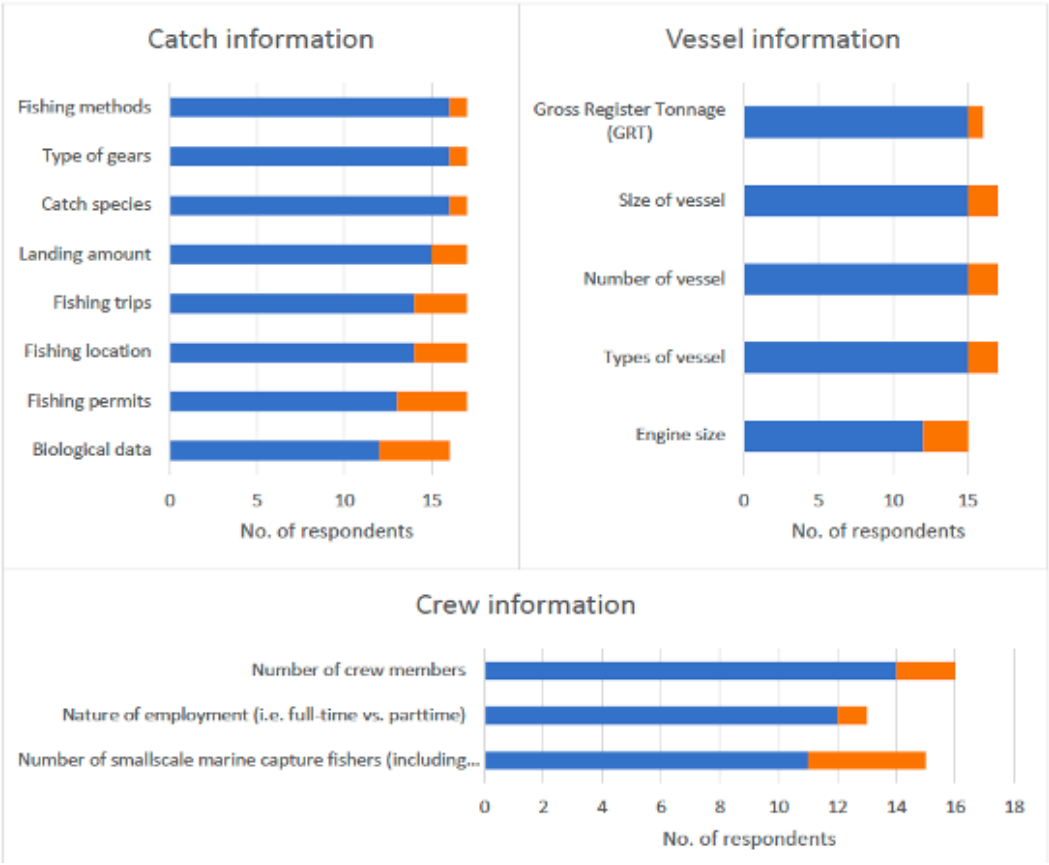
g. Information on the fisheries value chain

Harvesting information

The data collection on harvesting includes information on the techniques employed in small-scale fisheries, considering the social background, cultural practices, and their environmental impact. This data collection encompasses details on catches, vessels, crew, economic, social, and other aspects including marine debris, weather, climate, and ecosystem impact of fishing gear. Due to the significant human involvement in small-scale fisheries and the various societal concerns associated with them (Chuenpagdee & Jentoft, 2018), it is crucial to collect information on the social aspects of small-scale fisheries for comprehensive understanding of this sector. Catch/fishing information is common data collected in small-scale marine capture fisheries (Fig. 7). Based on the survey, fishing permits, fishing location, fishing trips, landing amount, catch species, type of gears, and fishing methods are widely collected. This indicates a level of uniformity in data collection in terms of catch/fishing practices among economies. However, there is a need for improvement in collecting biological data. In terms of vessel information, there is a high consistency in the data collection. However, data collection on engine size is slightly lower among economies. While the crew information such as the number of crew members and the nature of employment are collected by the majority of respondents (88% and 75%, respectively), data collection on the number of small-scale marine capture

fishers needs to be improved to address potential gaps in understanding the workforce size in small-scale marine capture fisheries.

In terms of economic information, landing prices, fisher income, and vessel/gear ownership are generally well-collected, however data collection on household debt, access to financial support, and fuel consumption needs improvement. Data collection on the social information of small-scale marine capture fisheries reveals that while certain aspects like the number of households involved in fishing, other non-fishing employment information, involvement of women and the age of fishers are well-documented, other variables such as the health conditions of fishers, access to healthcare, and the level of job satisfaction needs to be improved. This is important because fisher's engagement is shaped by their job satisfaction and diverse motivations that extends beyond income considerations and an understanding of these aspects would enhance fisheries management (Arias Schreiber & Gillette, 2021). Other information such as marine debris, weather conditions, climate variability and ecosystem impact should also be collected regularly to address the information gaps in understanding these environmental and ecological aspects related to small- scale marine capture fisheries.



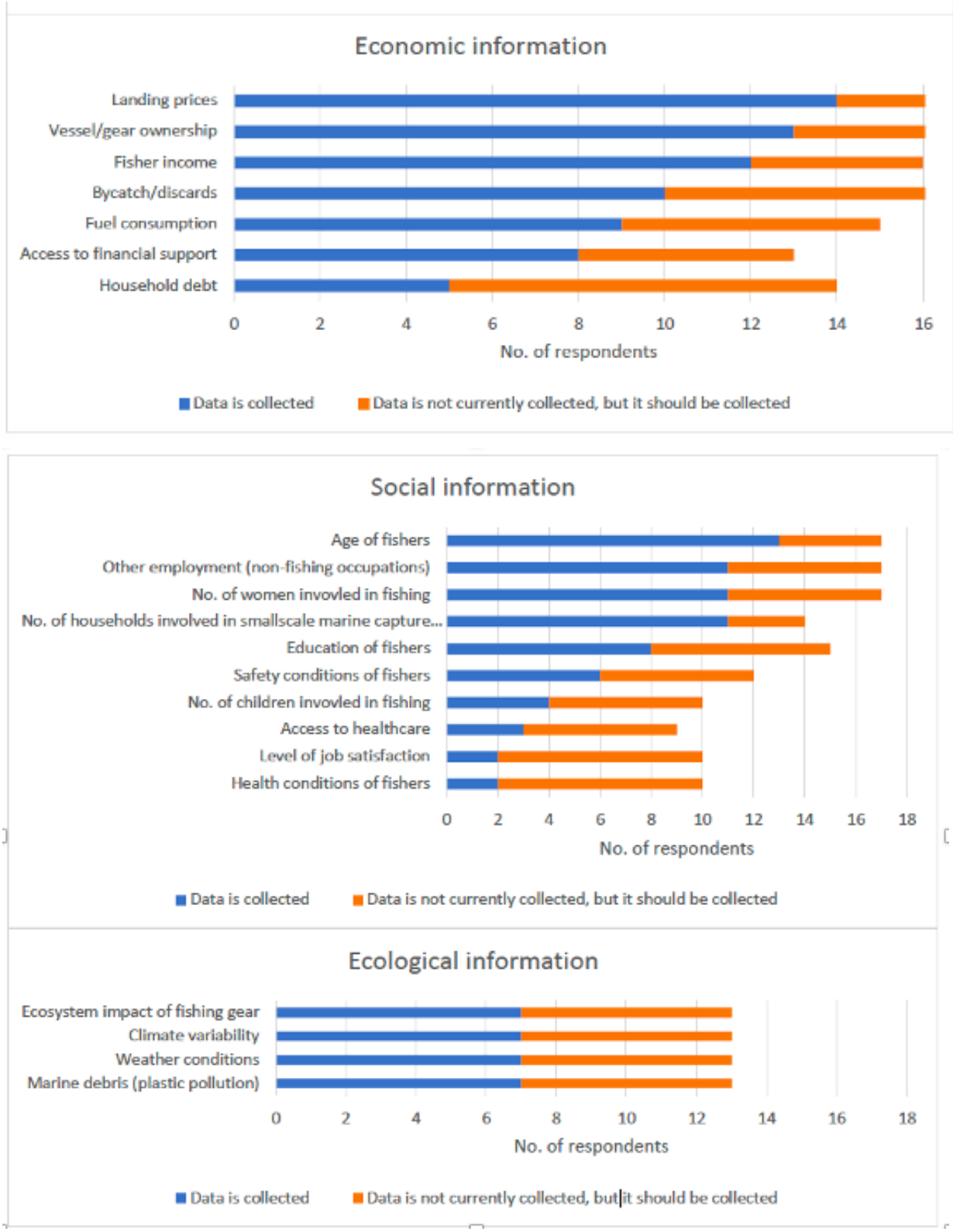


Figure 7. Catch/fishing information

Processing information

Fish processing in small-scale marine capture fisheries extends and enhances product quality and economic opportunities, often rooted in traditional techniques. The collection of processing information includes details on the sources, amount, and types of species and processing methods (Fig. 8). It also includes information on social and economic aspects of processing, nutritional values, quality, and byproducts. Information about these aspects of processing is crucial as the lack of it may limit the comprehensive understanding of the processing sector which is an important segment of the value chain.

There are notable gaps in collecting data in the processing sector such as information on the involvement of children in processing, employees' work hours, the nutritional value of processed products, and waste and byproducts. The high percentage of data collection on processing methods, types and amounts of processed products informs efficient processing methods, enhances product types, and optimizes production volumes fostering sustainability and economic viability. Collecting data on quality control standards indicates a recognition of the importance of ensuring the quality of processed products. This information can contribute to the sector's credibility and leading to consumer trust. Moreover, data collection on storage and refrigeration is recognized in both economies indicating a positive response on ensuring the quality and safety of processed products which is essential for market competitiveness.

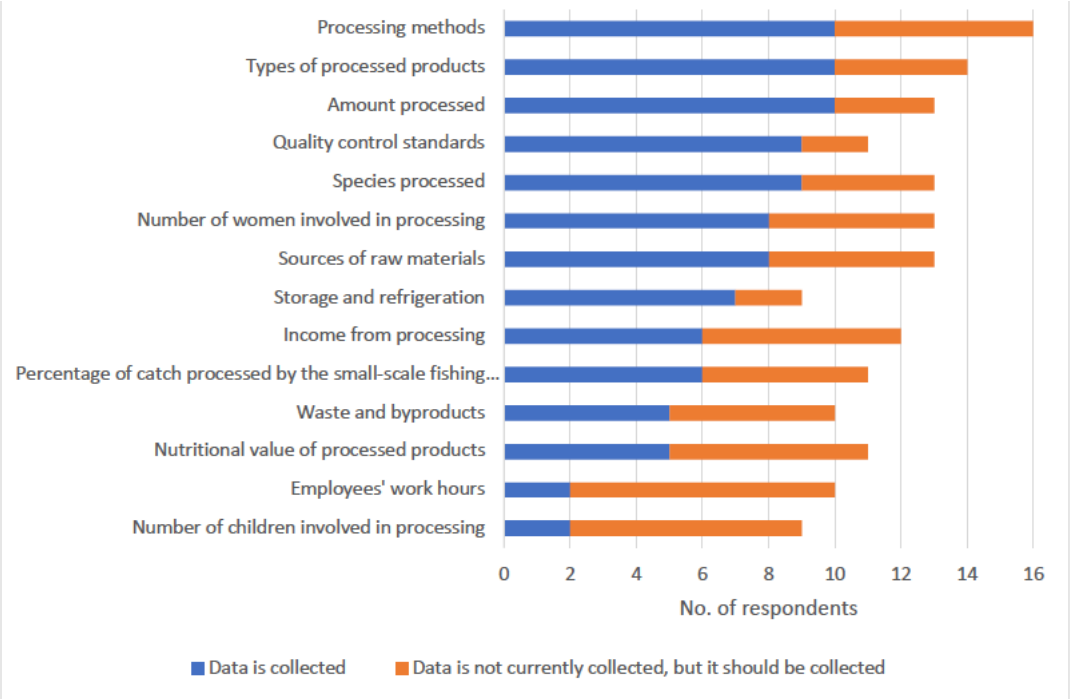


Figure 8. Processing information

Marketing/trading information

Marketing and trading in small-scale marine capture fisheries play a crucial role in connecting fishers with consumers, boosting local economies, and enhancing food security. Traditional markets remain vital for cultural exchange and economic activity. The collection of data on marketing and trading includes information on fish utilization, export markets, e-commerce, sales and revenue, among others. It also includes information on the social aspects and logistics in marketing and trading.

Based on the survey results, there is a need for increased data collection related to marketing and trading in small-scale marine capture fisheries in the APEC region. Respondents believe that data should be collected to bridge the gap in information and enhance the comprehensive understanding of the market dynamics in the small-scale marine capture fisheries. The majority of respondents see the need for improved data collection on marine catch going to export markets, transportation and logistics, market prices, storage and refrigeration, sales and revenue information, and market structures and organization (Fig. 9). In addition, data collection on the involvement of women and children, employees and their work hours in marketing and trading is an area that needs improvement.

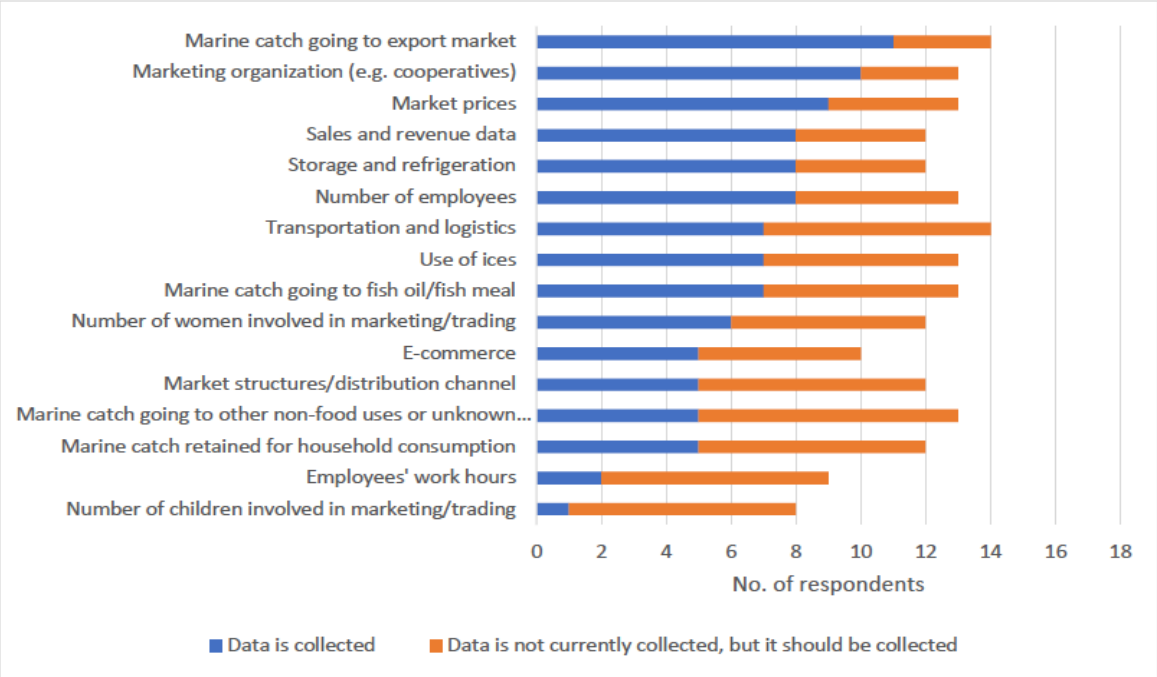


Figure 9. Marketing/trading information

Recognizing and addressing this gap is crucial for understanding the human dynamics within the sector. The importance of e-commerce is also acknowledged, and efforts should be made to have adequate information, and to integrate technology-related data collection methods to adapt to evolving market trends. E-commerce and online platforms for selling fish and fishery products has become a coping strategy for numerous fishers during COVID-19 pandemic (Ferrer et al., 2021). Ultimately, the availability of comprehensive information on marketing and trading can lead to supporting better-informed decision making and sustainable practices in the small-scale marine capture fisheries.

h. Governance information

Efficient management and governance of small-scale marine capture fisheries are pressing issues in the APEC region. The management of marine resources directly impacts the attainment of development objectives, including food security, employment opportunities, and income. The collection of governance information includes details on regulations, governance systems and mandates, the issues and challenges in the small-scale marine capture fisheries, among others. Comprehensive data, effective communication and sharing of information significantly contribute to improved small-scale fisheries governance (Satumanatpan et al., 2017), as well as for the implementation of the SSF Guidelines (Jentoft, 2014), hence the importance of this section of the survey. The analysis provides an overview of the regulation of small-scale marine capture fisheries at different levels in the APEC to enhance the effectiveness of regulatory frameworks.

Levels of regulations in small-scale marine capture fisheries

Based on the survey results, both developed and developing economies reported that their small- scale marine capture fisheries is regulated locally, with slightly higher instances in developing economies (Fig. 10). Provincial regulation, on the other hand, is more common in developed economies compared to developing economies. In addition, developing economies show a higher tendency to regulate their small-scale marine capture fisheries at the economy-wide level. State regulation is notably more prevalent in developing economies, with no instances reported in developed economies. However, developed economies indicate some level of international and regional regulation. Developing economies tend to have a more comprehensive approach to regulation, particularly at the state and economy-wide levels. Tailoring to the specific needs and contexts of each economic category is noted as crucial.

Finally, collaboration between developed and developing economies is deemed beneficial to enhance regulatory frameworks for small-scale marine capture fisheries on the APEC region and globally.

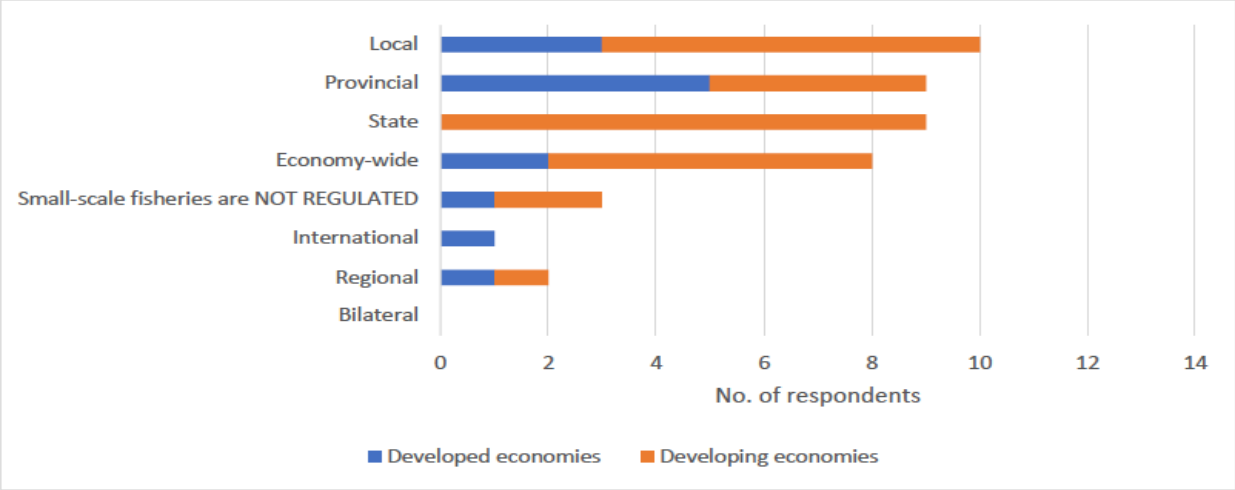


Figure 10. Are small-scale marine capture fisheries regulated?

What management/governance system is in place for small-scale marine capture fisheries?

Both developed and developing economies reported instances of self-governance in small-scale marine capture fisheries (Fig. 11). However, some developing economies highlighted a higher adoption of decentralized governance, including fishing licenses and general fisheries management. Co-management and community-based management, although employed in both developed and developing economies, the community-based management is notably common in developing economies. Meanwhile, indigenous governance is more prevalent in developed economies. It is also noted that two respondents in the developing economies find that management/governance are not applicable to small-scale marine capture fisheries. Finally, both developed and developing economies acknowledge the implementation of an ecosystem approach to fisheries management.

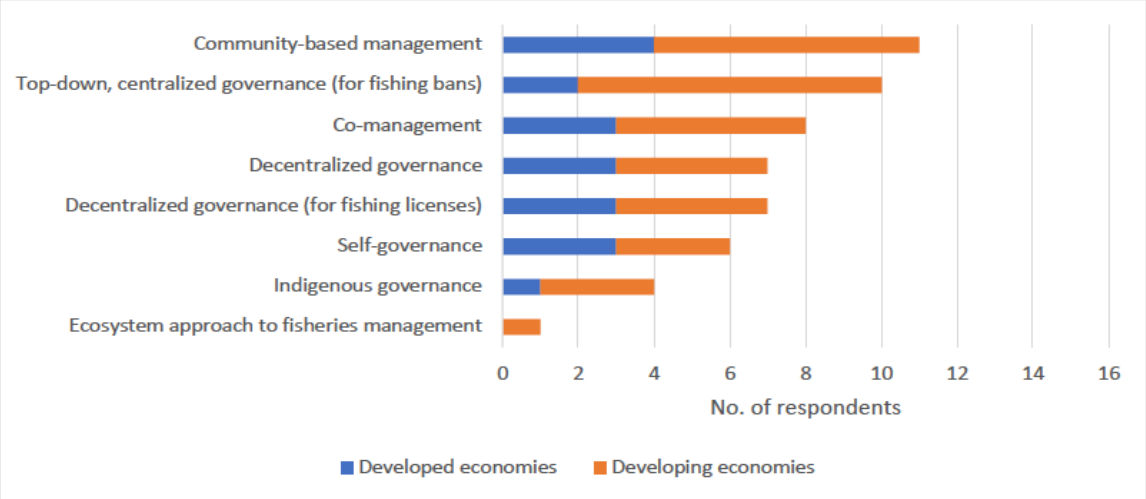


Figure 11. Types of management/governance in small-scale marine capture fisheries.

Assessment of management/governance effectiveness

A majority of the respondents (47%) affirm their uncertainty that the effectiveness of the management/governance of small-scale marine capture fisheries is assessed by the responsible government authorities. However, a notable portion (35%) is certain that assessments are being conducted while 24% of the respondents explicitly state that no assessment is carried out. Regular assessment and systematic reporting mechanisms should be established for assessing the effectiveness of small-scale marine capture fisheries management. This could include periodic reviews, evaluation, and the use of performance indicators. It is also important to ensure transparency and accountability, stakeholder involvement throughout the process, knowledge sharing, as well as the use of adaptive management. Finally, by adopting these strategies, governments can work towards a more effective, transparent, and sustainable management of small-scale marine capture fisheries, ensuring the well-being of both ecosystems and communities dependent on these resources.

Measures, rules, and regulation applicable to manage small-scale marine capture fisheries

a. Catch/fishing regulations

Fishing gear and fishing effort restrictions, mesh size and species regulations, and catch quota are commonly applied in both developed and developing economies (Fig. 12). However, developed economies emphasize the importance of fishing gear restrictions and catch quotas while developing economies focus more on fishing effort restrictions, species regulations,

mesh size regulations, and fishing gear restrictions. Developed economies prioritizing fishing gear restrictions and catch quotas signals a commitment to sustainable exploitation and habitat protection and a concern on targeted resources, with potential implications for market-targeted factors. Meanwhile, developing economies emphasize comprehensive measures reflecting the overall ecosystem sustainability and resource management for local livelihoods. This also means balancing economic benefits with resource sustainability is critical, given the reliance of local communities on these fisheries. Developed economies' capacity for enforcing specific gear restrictions may also reflect on their higher technological and infrastructural capacity. On the other hand, the broader measures emphasized by the developing economies acknowledge contextual suitability, considering technological and infrastructure constraints and geographical remoteness and species diversity. In navigating these implications, a collaborative approach is key.

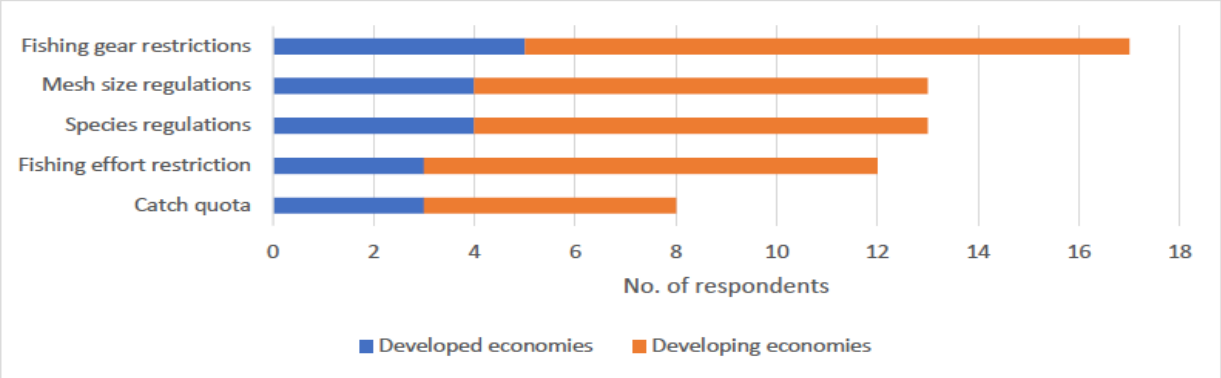


Figure 12. Measures, rules and regulations applied to catching/fishing.

Both economies can learn from each other. Developed economies can share experiences in implementing effective regulations, while developing economies can contribute insights into community-based, ecosystem-focused strategies. Ultimately, a balanced and adaptive approach, tailored to the specific socio-economic and ecological contexts, is crucial for the sustainable management of small-scale marine capture fisheries in the APEC region.

b. Vessel regulations

Vessel restrictions, vessel monitoring, and port state measures are both applied in developed and developing economies (Fig. 13). However, vessel monitoring, and vessel restrictions are commonly applied in developing economies, indicating a stronger focus on regulating vessel activities in these economies. Port state measures although adopted in both economies, is not emphasized in developing economies. The adoption of port state measures is helpful for addressing issues related to illegal, unreported, and unregulated (IUU) fishing. The equal

adoption by both developed and developing economies underscores a shared responsibility in the region to contribute to global efforts in promoting sustainable fisheries. While the adoption is a positive sign of global commitment, it also highlights potential differences in resources and capabilities. This implies for ongoing capacity building, technical assistance, and knowledge sharing.

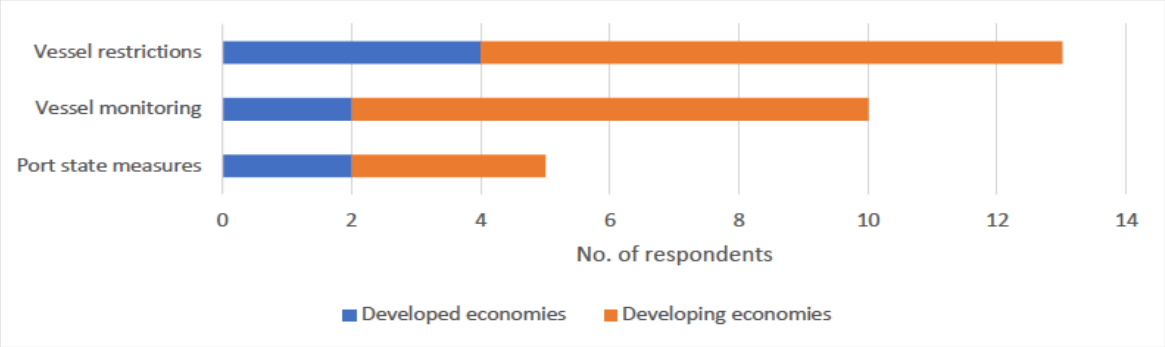


Figure 13. Measures, rules and regulations applied to fishing vessels.

c. Closure measures

Seasonal closures, temporary fisheries closures, and marine protected areas are widely applied in both developed and developing economies (Fig. 14). The adoption of seasonal closures and temporary fisheries closures across both developed and developing economies indicates a global consensus on the effectiveness of time-bound restrictions in managing marine resources. The acknowledgement of the adaptability of these measures to diverse ecological and socio-economic contexts, allow for tailored approaches in different economies and in different fisheries, such as variations in marine life cycles. In some instances, including when scientific information is available, the fisheries experience crisis because of failure in adopting a comprehensive ecosystem perspective (Bundy et al., 2008). For marine protected areas (MPAs), which are commonly utilized in developing economies, appropriate integration of scientific and local knowledge can contribute to global marine biodiversity conservation, addressing social and economic challenges. However, implementing MPAs requires careful consideration in terms of funding, enforcement, and stakeholder engagement, in short, collaboration. Balancing conservation goals with the needs of local communities will be crucial for effective implementation of MPAs.

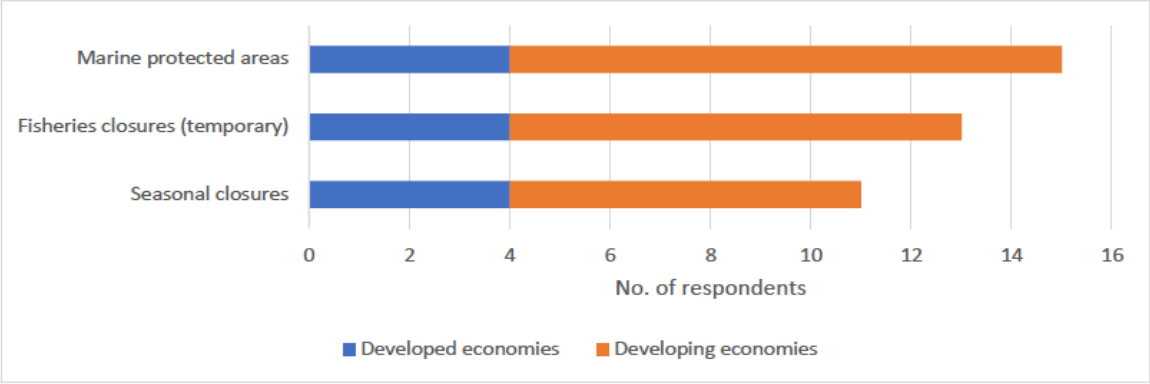


Figure 14. Types of closures applied to manage small-scale marine capture fisheries.

d. Access/Rights

The survey results reflect a diversity of approaches to rights management in small-scale marine capture fisheries (Fig. 15). Different economies apply a mix of formal, traditional, community-based, and informal systems to regulate access. Licensing/permits are more commonly used in both developed and developing economies, indicating a strong reliance on formal regulatory mechanisms to control access and promote sustainable fishing practices. The higher prevalence of traditional/customary rights in developing economies suggests a recognition of the importance of local cultural practices in shaping access and resource utilization. Meanwhile, community-based fishing rights and community involvement in general, although more common in developed economies, are recognized as important aspects of sustainable fisheries in both contexts.

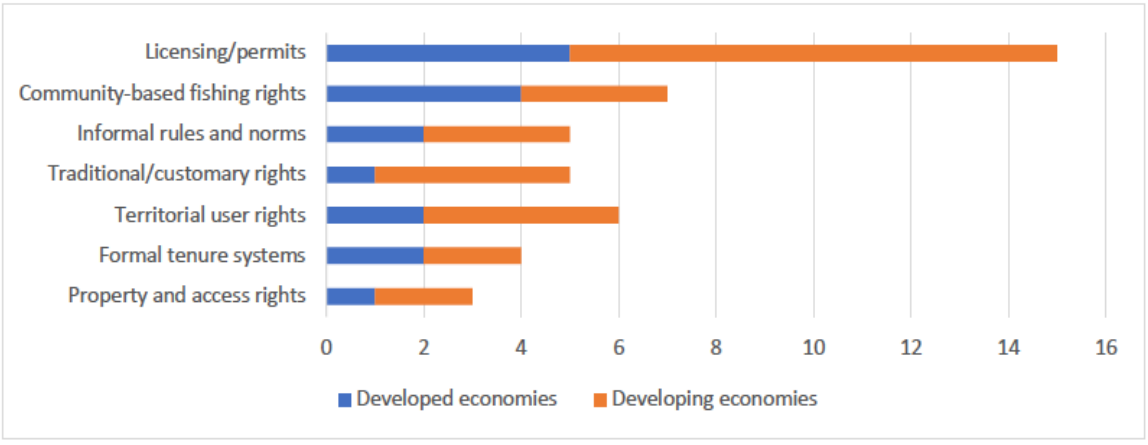


Figure 15. Measures, rules and regulations related to access/rights.

Key principles, main purposes, or mandates, for the management of small-scale marine capture fisheries

The survey results indicate a diversity of management approaches, with different economies placing emphasis on different principles, reflecting complexity of small-scale marine capture fisheries management and governance (Fig. 16). The strong emphasis on the Precautionary Principle and the Ecosystem Approach to Fisheries Management in developing economies suggests an overall recognition of the need for caution in resource management and the importance of considering the broader ecosystem. Integrated management (IM)/Integrated Coastal Zone Management (ICZM) is more commonly applied in developing economies, possibly reflecting the comprehensive approach needed for managing coastal zones with diverse activities. Additionally, co-management/participatory management is equally emphasized in both developed and developing economies, promoting a shared understanding of the importance of involving local communities in decision-making processes.

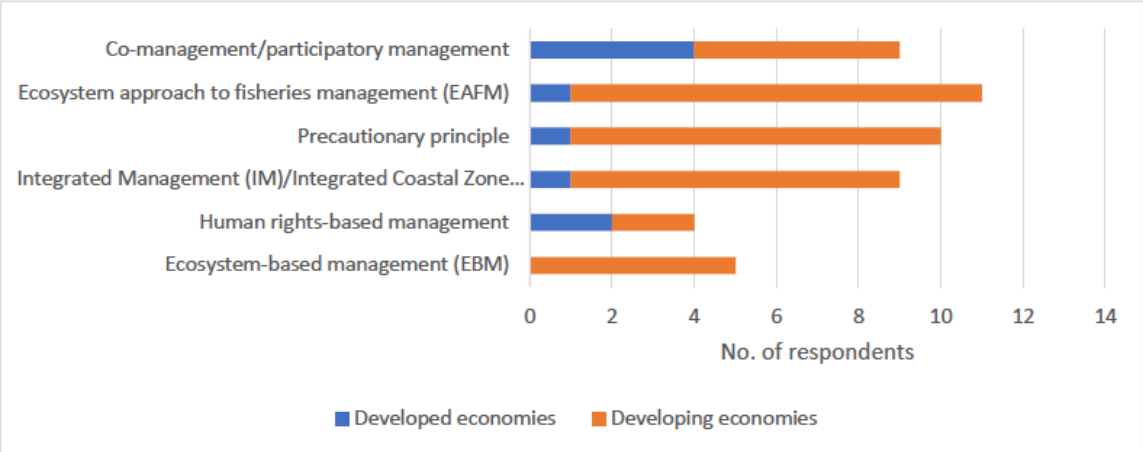


Figure 16. Key principles, main purposes, or mandates for the management of small-scale marine capture fisheries.

Key issues and challenges facing small-scale marine capture fisheries in the APEC region

The survey reveals a complex web of challenges facing small-scale marine capture fisheries in the APEC region, with issues spanning economic, social, environmental, and governance dimensions (Fig. 17). Climate change and variability are significant challenges globally, emphasizing the impact of environmental changes on small-scale marine capture fisheries. In many coastal communities in the Pacific region, local people have strong relationships and dependence with their marine environment making them highly vulnerable to profound

impacts in their coastal surroundings (Hanich et al., 2018). In addition, the importance of ensuring the safety and working conditions of those engaged in small-scale fisheries is crucial in ensuring their wellbeing at work. Developing economies face heightened challenges, including higher levels of poverty, IUU fishing, and climate change impacts. Addressing these issues and challenges requires targeted interventions and collaboration among various economies and stakeholders.

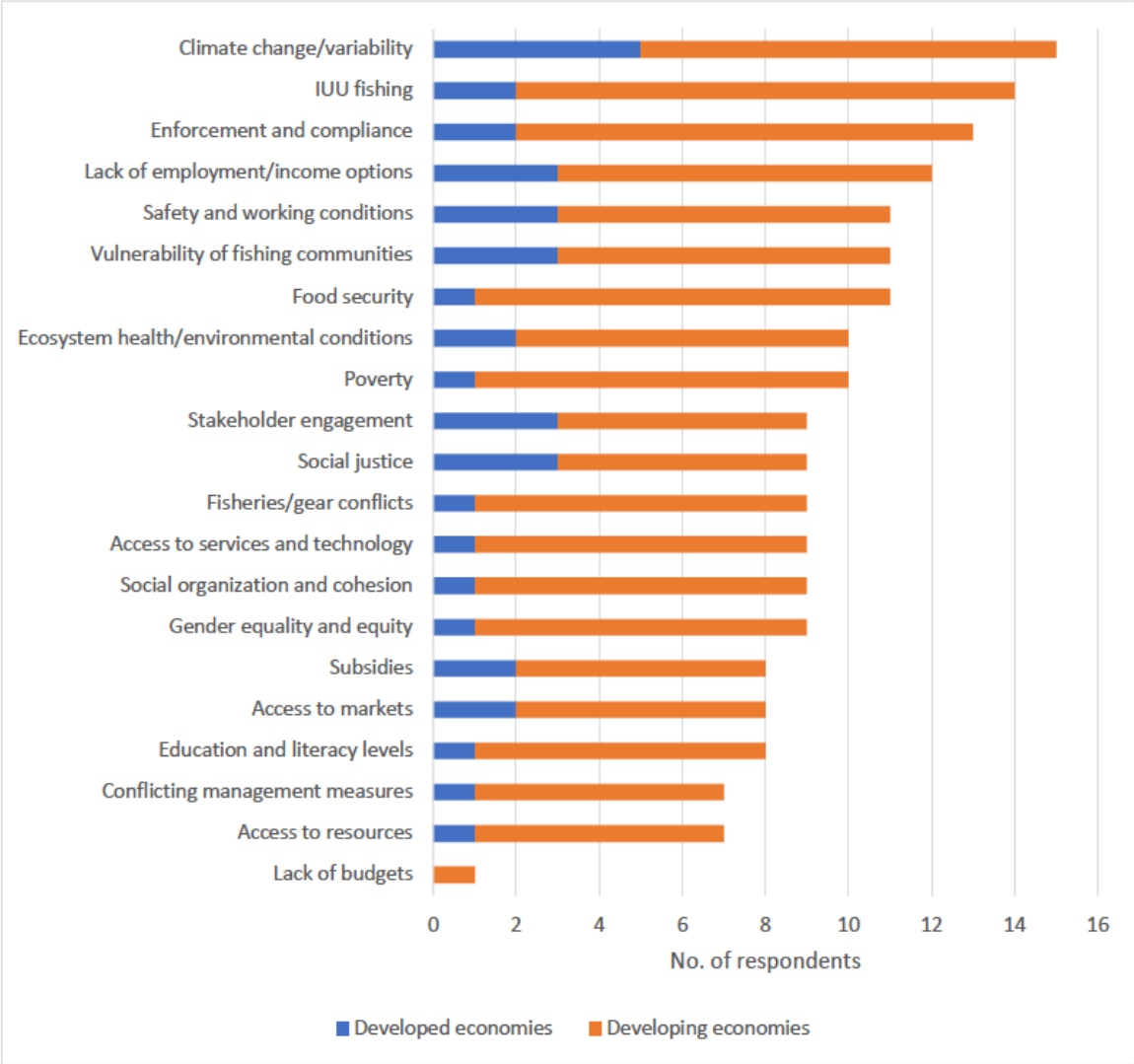


Figure 17. Common issues and challenges in small-scale marine capture fisheries.

The emphasis on food security underscores the crucial role of small-scale fisheries in providing a reliable source of food, especially in developing economies. Moreover, the recognition of gender equality and equity as a challenge emphasizes the need for inclusive policies that

address the specific vulnerabilities faced by women in the sector. Social injustice is also a concern in both economies, emphasizing the need for equitable distribution of benefits and opportunities within the fisheries sector.

i. Challenges in data collection

Both developed and developing economies face challenges in data collection and management. These challenges span various aspects, including the scale of fisheries operations, geographical considerations, human resources, budget constraints, cultural factors, and trust issues with the authorities (Fig. 18). With more fishing vessels and a high number of fishers, collecting small-scale marine capture fisheries data is challenging. Developing economies, in particular, struggle with geographical challenges due to dispersion and remoteness of fisher locations. Limited budget is a predominant challenge in both economies suggesting a common financial constraint affecting fisheries data collection and thus, management. Lack of well-trained personnel for data collection is more pronounced in developing economies, indicating a need for capacity building. Language and cultural barriers are relatively low in developed economies but emerge as a concern in developing economies. This highlights the importance of understanding local contexts for effective data collection and management. Lack of trust in authorities is a challenge in both developed and developing economies, though it is more pronounced in the latter. Building trust is crucial for successful fisheries management initiatives. Additionally, data security concerns are primarily an issue in developing economies, suggesting a need for robust data protection measures. In summary, the survey result underscores the multifaceted challenges faced in fisheries management, with commonalities and distinctions between developed and developing economies. Effective solutions require a tailored approach that considers both operational and sociocultural factors in data collection.

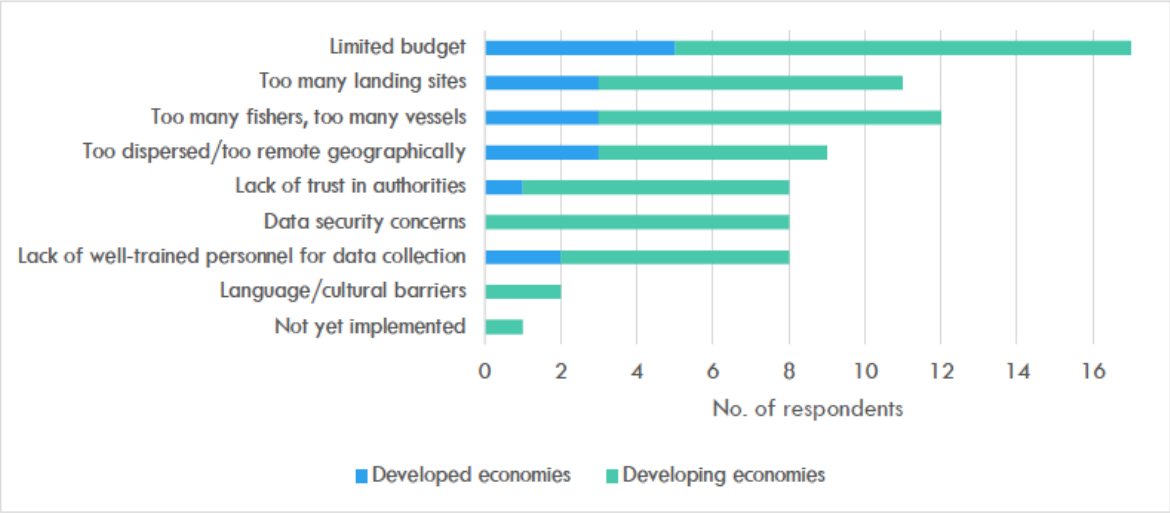


Figure 18. Challenges in collecting small-scale marine capture fisheries data.

Conclusion

Despite the small number of completed surveys, the results reveal a strong interest, and the need, for better information and improved data collection system in small-scale marine capture fisheries in the APEC region. Small-scale fisheries are well recognized for their importance in both developed and developing economies that target them in their data collection effort, even though the information is far from complete and the methods are not perfect. Key lessons can be drawn from the emphasis of the economies in certain aspects of the data. They also highlight areas where data are deemed necessary but data collection is challenging. The connection between data and management is clear, leading to improved management and sustainability of small-scale marine capture fisheries. Experience sharing and discussion at the workshop in Thailand can help inform the best practices for data collection and data collection system for sustainable small-scale marine capture fisheries in the region.

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Annex 3 - List of Participants

A Workshop on "Sharing Knowledge and Experiences on Small-Scale Marine Fisheries Data Collection and Management for Sustainable Development in the APEC Region" (OFWG 01 2022)

31 January – 2 February, 2024
Jasmine City Hotel, Bangkok, Thailand

LIST OF PARTICIPANTS

OFWG Focal Points Nomination	
Brunei Darussalam Desimawati BINTI HAJI METALI Department of Fisheries, Ministry of Primary Resources and Tourism Siti Nur Nisrina BINTI MATALI Department of Fisheries, Ministry of Primary Resources and Tourism	Chile Esteban DONOSO SERNAPESCA Lisette Montesi SERNAPESCA
People's Republic of China Jipeng WEI Shanghai Ocean University Qingin LIN Shanghai Ocean University	Malaysia Bahrinah BINTI BAHRIM Department of Fisheries Malaysia Mohd Faizrus Anwar BIN ROSLAN Department of Fisheries Malaysia
The Republic of the Philippines Remia APARRI Bureau of Fisheries and Aquatic Resources Alice Joan FERRER University of the Philippines, Visayas	Chinese Taipei Sih-Hua CHEN Fisheries Agency, Ministry of Agriculture Yi-Ping LIU Fisheries Agency, Ministry of Agriculture
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Republic of Korea Ho Geun JANG Pukyong National University	Malaysia Gazi Md Nurul ISLAM Universiti Tun Abdul Razak
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Milena ARIAS SCHREIBER University of Gothenburg Sweden	

Local Teams	
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Annex 4 – Workshop Agenda

A Workshop on "Sharing Knowledge and Experiences on Small-Scale Marine Fisheries Data Collection and Management for Sustainable Development in the APEC Region"
(OFWG 01 2022)

31 January -2 February, 2024
Jasmine City Hotel, Bangkok, Thailand

Workshop Objectives

The overall project goal is to improve data and data collection system about small-scale fisheries in the APEC Economies in order to enhance understanding about the value and contribution of this sector to food and nutrition security and economic development. Such knowledge will ultimately help improve fisheries management, making it possible to achieve sustainable development goals.

The workshop is a three-day event led by expert consultants who will facilitate discussion about the best practices on small-scale fisheries marine fisheries data collection and management. The workshop will include several sessions, with varying dynamics such as presentations by resource persons and by APEC Economies participants, breakout groups, and plenary discussion. The workshop is an opportunity to discuss and finalize the 'Best Practices' document on "Small-Scale Marine Capture Fisheries Data Collection and Management", developed based on the results from the survey, "Sharing Knowledge and Experiences on Small-Scale Marine Fisheries Data Collection and Management for Sustainable Development in the APEC Region".

Workshop Agenda

Day 1: 31 January 2024

TIME	
08:30	Registration
09:00	Welcome and opening statements
09:30	Group photo & tea/coffee break
10:00	Participant self-introductions Introduction of the workshop (objectives, context, modus operandi and expected outcomes)
11:00	Resource person presentation (1): The importance of data and information for small-scale fisheries management and governance
11:30	Resource person presentation (2): Current efforts in improving small-scale fisheries data
12:00	Q & A on the presentations
12:30	***Lunch break***
14:00	Presentations by participating APEC Economies + Q & A on the presentations
15:30	***Tea/coffee break***
16:00	Presentations by participating APEC Economies + Q & A on the presentations

17:30	***End of day 1***
18:30	***Reception*** (hosted by Department of Fisheries, Thailand)

Day 2: 1 February 2024

TIME	
09:00	Recap of Day 1 / Introduction of Day 2
09:15	Resource person presentation (3): Small-scale fisheries in the context of ecosystem-based management
09:45	Resource person presentation (4): Small-scale fisheries in the context of Blue Economy
10:15	Q & A on the presentations
10:45	***Tea/coffee break***
11:15	Expert consultation presentation (5): Best practices in data collection system for small-scale fisheries
11:45	Q & A on the presentations
12:30	***Lunch break***
14:00	Breakout groups (1): Key limitations, challenges and opportunities in small-scale fisheries data collection
15:30	***Tea/coffee break***
16:00	Report back and discussion Revision of the 'Best Practices' document
17:30	***End of day 2***

Day 3: 2 February 2024

TIME	
09:00	Recap of Day 2 / Introduction of Day 3
09:15	Breakout groups (2): Enabling frameworks to improve small-scale fisheries data collection system
10:45	***Tea/coffee break***
11:15	Report back and discussion Revision of the 'Best Practices' document
12:30	***Lunch break***
14:00	Plenary discussion: Multi-level collaboration to support sustainable small-scale fisheries
15:30	***Tea/coffee break***
16:00	Finalization of the 'Best Practices' document
17:30	***End of day 3***

"Small Scale Fisheries in Chile"

- **Characterization**
- **Governance**
- **Challenges**

ESTEBAN DONOSO ABARCA & LISETTE MONTESI
National Fisheries and Aquaculture Service

Chilean fishing and aquaculture sector

Small Scale Fishing Sub Sector

1141 registered Vessels.
946 with fishing landings in 2023, for 729 thousand tons

Middle scale vessels
More than 12 meters in lenght

12 273 registered Vessels.
7 541 with fishing landings in 2023, for 464 thousand tons

Middle scale vessels
Less than 12 meters in lenght

Fishing divers
Shellfish divers.

11 033 registered divers.
3 597 with registered operation in 2023, as fishing crew, from shore or in BRMA

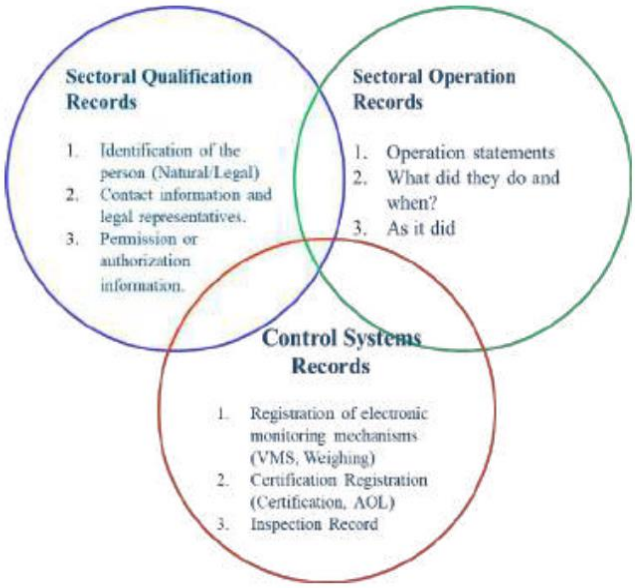
830 registered Areas.
300 with harvest in 2023, 28 thousand tons

Benthic resource management areas (BRMA)

74 678 registered gather collector.
10 882 with fishing landings in 2023, for 128 thousand tons

Small scale gather collectors

Small Scale Fishing Sub Sector, information records and characterization.



All types of information on sectoral activities are contained in some electronic information system.

Governance

Ministry of Economy, Development and Tourism

- Fisheries and aquaculture undersecretary.
- National institute for sustainable development of artisanal fishing and small-scale aquaculture
- National Fisheries and aquaculture service.

IFOP Fisherie Development Institute

Related institutions in enforcement and compliance

1. Chilean Police:
   - Carabineros
   - PDI.
2. Chilean Navy
3. Customs Service.
4. Health Public Service
5. Enviromental superintendence

Related institutions in territorial development

1. CORFO
2. SERCOTEC
3. Local Goverments

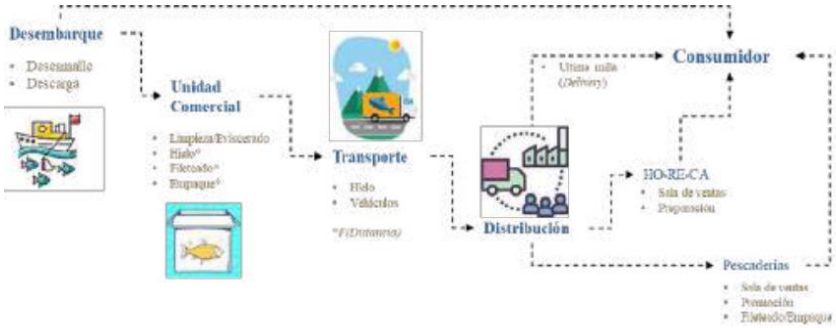
Challenges

Complete territorial actors such related activities for fishing operation.

Create infrastructure, like digital connectivity.

Economic modeling for fishing activities.

Challenges



Standards

Interoperability

Facilitation

Compliance

About Sernapesca

sernapesca
Servicio Nacional de Pesca y Acuicultura

1200 personas

52 oficinas

Mission

Contribute to the sustainability of the sector and the protection of hydrobiological resources and its environment, through comprehensive inspection and health management that influences sectoral behavior by promoting compliance with standards.

Vission

To be a leading, innovative and articulating Service in the achievement of a sustainable fishing and aquaculture activity, with competent, motivated and committed teams.

Small-scale Fisheries in China: Current Status and Future Prospects

Qinqin Lin

Shanghai Ocean University

CONTENTS

01 Definition

- In China, while there is **currently no unified or clear definition** of small-scale fisheries (SSFs), most relevant studies define SSFs based on small fishing vessels.
- The **small fishing vessel** is defined in the Regulations on the Management of Fishing Licenses issued by the Ministry of Agriculture and Rural Affairs (MARA) as a fishing vessel **with a length of no more than 12 meters**. The proportion of small fishing vessels is more than 50% in China.
- The majority of marine fishermen in China live on SSFs, and it is **closely related to** China's employment, economy, and livelihoods.

Some researchers have defined SSF as livelihood fisheries that operate in inland, coastal, or nearshore areas with fishing vessels up to 12 meters in length.

02 Related management policies

- In terms of management, China's superintendence of fisheries operates under the principle of "unified leadership and decentralized administration", which **does not distinguish between SSFs and other fisheries**.
- Although China does not have a policy specifically for SSFs, it is **covered by the basic guidelines for fisheries production** under the Fisheries Law of the People's Republic of China
- In fishery production, China adopts a policy that calls for **simultaneous development** of aquaculture, fishing and processing, with **special emphasis on aquaculture** and with priority given to different pursuits in accordance with local condition

The CPC Central Committee and the State Council attach great importance to the work of the fisheries industry, and General Secretary Xi Jinping has always been concerned about the development of fisheries.

Fisheries governance's focus has extended from at-sea fishing operations to transshipments, ports & landing, markets, and consumers, and its objectives are no longer limited to the sustainable use of fisheries resources but have been **expanded to conservation of biodiversity and the protection and preservation of the ecosystem**.

Conservation measures for coastal fishery resources

Law-based governance for fisheries

- The system of fishery laws and regulations, with the Fisheries Law at its core, is becoming increasingly sound;
- Chinese Fisheries Administration has organized and carried out the "Sword-showing" law-enforcement operation.

Put a cap on fishing intensity

- Impose Ten-year Fishing Ban in the Yangtze River;
- Fully implement the total output control system for marine fisheries resources;
- Encourage fishermen shift from fishing to aquaculture;
- Decommission in the number of fishing vessels.

Conservation measures for coastal fishery resources

Widely promote conservation and restoration actions

- Delineate aquatic germplasm resource protection zones;
- Create national-level marine ranching demonstration areas;
- Carry out enhancement and releasing;
- Promote Fisheries in the Great Lakes, such as Qiandao Lake and Chagan Lake, to purify and nourish water by fishing.



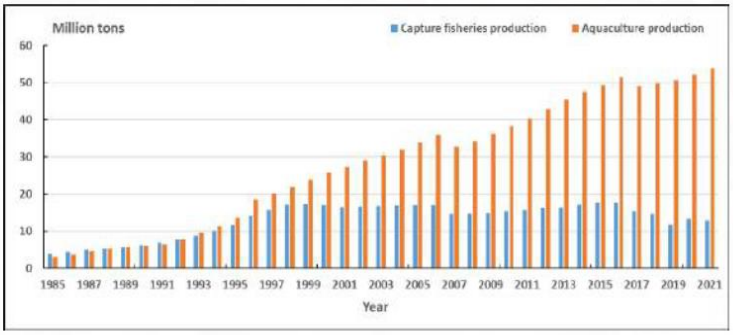
Comprehensively improve the quality, efficiency and competitiveness of fisheries

- Facilitate the quality of aquaculture production, reinforce the foundation of fisheries development, mandated to secure the supply of aquatic products;
- Ask for food from the rivers, lakes and seas, actively developing large surface fisheries, and expanding the “new space” for fisheries development;
- Optimize policies on resource conservation and refine specific measures to promote "sustainable" utilization of fisheries resources;
- Strengthen fisheries supervision and enhance the level of governance, firmly guarding the “safety line” of fisheries development



Important achievements——All of these policies provide SSFs with access to resources and markets

- ✓ The total number of marine fishing vessels :
  222,390 in 2002,
  136,800 in 2020,
  126,500 in 2022,
  decreased by 43% within 10 years.
- ✓ In 2022, China's total output of aquatic products reached 68.66 million tons, ranking first in the world for 33 consecutive years, of which **aquaculture products accounted for 82%** of China's total output of aquatic products, and more than 60% of the world's aquaculture output.



03 Challenges and future prospects

1. Encourage researchers to conduct studies on the **classification of SSFs**, in particular the distinction between SSFs in developed and developing economies.
2. Encourage the **development of management mechanisms for SSFs** and guidelines for their assessment, which cannot be based exclusively on commercial fisheries management.
3. SSF management principles cannot be defined in terms of developed economies, but **in accordance with the realities of developing economies**.(According to FAO report in 2022, nearly 80 percent of the 37.9 million fishers were from Asia, followed by Africa with 13 percent.)

03 Challenges and future prospects

4. **Capacity-building for developing economies** is necessary to protect the rights and interests of SSFs fishermens and promote their sustainable development.

5. Due to the large, widely distributed, and difficult-to-count group of small-scale fishermen, the degree of **improvement of data** related to China's SSF fisheries needs to be further improved.

6. The fisheries management system in China may no longer be applicable to the current situation of SSF, and the **differentiated management of SSFs** is more in line with the needs of China's fisheries and national conditions, but its **feasibility** has yet to be verified.

THANKS!

Qinqin Lin

qqlin@shou.edu.cn

OUTLINE

- Marine capture small-scale fisheries in the Philippines
- Values and importance
- Management and governance
- Challenges and issues

2

Marine Capture SSF in the Philippines

Definition

MUNICIPAL FISHING

Fishing within municipal waters using small vessels (≤3 GT) or vessel-free methods
(RA 8550, as amended by RA 10654)

MUNICIPAL FISHERFOLK

Engaged directly or indirectly in municipal fishing and related activities
(RA 8550, as amended by RA 10654)

In the Philippines, municipal fishing is commonly referred to as small-scale fishing (SSF).

Marine Capture SSF in the Philippines

2023 TBTI Philippines' Book, *Portrait of Small-Scale Fishers in the Philippines*, published by TBTI Global

Marine Capture SSF in the Philippines

Small-scale fishing with the use of boat

Marine Capture SSF in the Philippines

Small-scale fishing without using boat

Marine Capture SSF in the Philippines

Fishing Gears

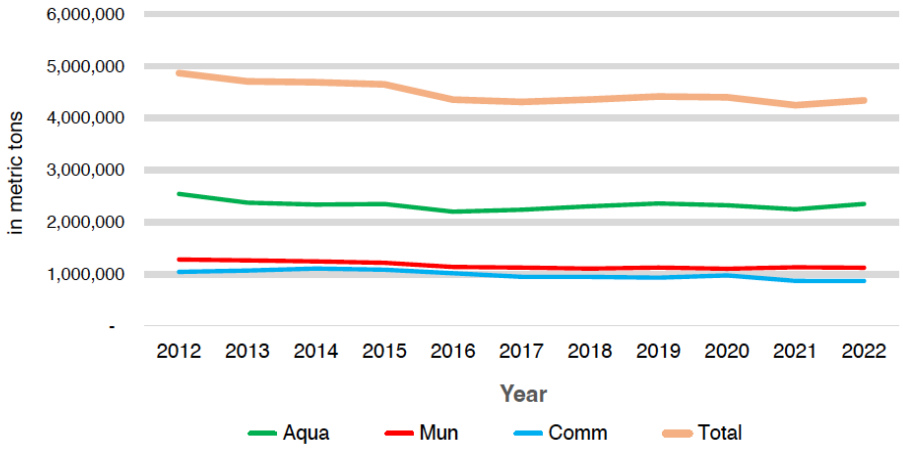
Marine Capture SSF in the Philippines

Fishery Resource

Values and Importance

Municipal vs Commercial Fisheries Production

Volume of Production

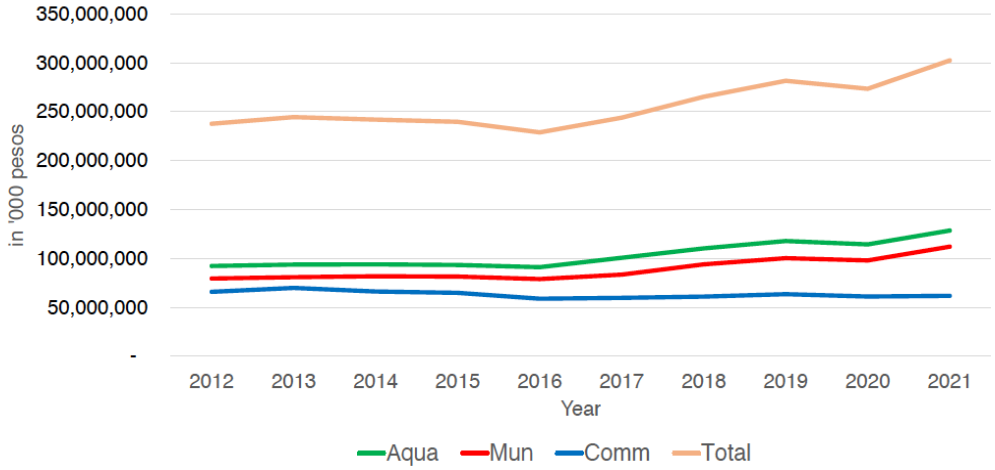


Source: PSA, various years. Fisheries Statistics of the Philippines, various years

Values and Importance

Municipal vs Commercial Fisheries Production

Value of Production



Source: PSA, various years. Fisheries Statistics of the Philippines, various years

Values and Importance

People dependent on SSF

Sector	No. of Registered Fisherfolk
Capture Fishing	1,095,774
Gleaning	253,825
Aquaculture	247,164
Fish Vending	147,038
Fish Processing	42,524
Others	404,113
TOTAL	2,190,438

Source: Fish R (BFAR, 2021)

Year data was collected	Persons engaged in SSF
2002	1,371,676
2011	1,229,516
2012	1,148,794
2013	1 ,211,672
2014	1,221,019
2015	1,148,794
2016	1,027,287
2017	1,023,889
2018	944,017
2019	1,117,610
2018	1,167,095
2021	2,190,438

Source: Philippine Statistics Authority. Annual Labor and Employment Estimates for 2013; Retrieved from: https://psa.gov.ph/statistics/survey/labor-and-employment/labor-force-survey; 2018, 2021: BFAR FishR

Table 5.5 Ten countries with the largest national estimates of part- and full-time small-scale fisheries employment and engagement in subsistence activities in 2016 , based on household-based surveys

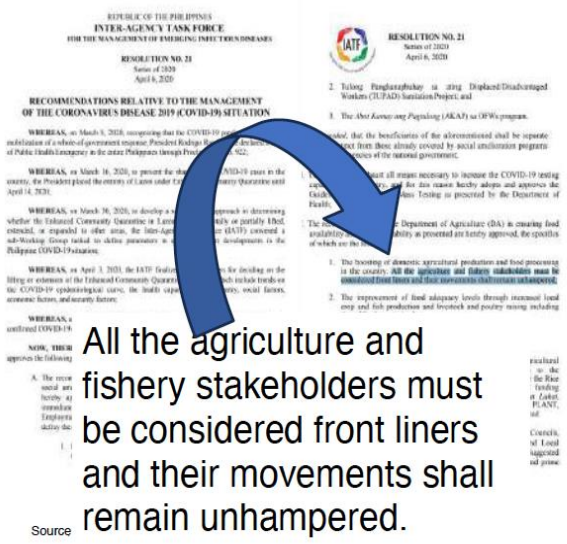
Country	Employment (part- and full-time)	Subsistence activities	Total small-scale fisheries participation
China	18 068 356	17 453 780	35 522 136
India	9 580 693	3 541 877	13 122 570
Indonesia	3 317 355	1 406 037	4 723 392
Bangladesh	3 189 814	9 704 662	12 894 476
Nigeria	2 552 434	765 636	3 318 070
Philippines	2 283 761	1 322 175	3 605 937
Pakistan	1 429 764	2 992 800	4 422 564
Myanmar	1 287 058	1 988 939	3 275 997
Japan	1 022 986	187 109	1 210 095
Viet Nam	930 463	416 875	1 347 338
Total	43 662 684	39 779 891	83 442 575

Note: Household-based surveys include labour force surveys and household income and expenditure surveys.

FAO, Duke University, WoldFish 2023

Values and Importance

SSF as Food Front-liners



REPUBLIC OF THE PHILIPPINES
INTER-AGENCY TASK FORCE
FOR THE MANAGEMENT OF EMERGING INFECTIOUS DISEASES

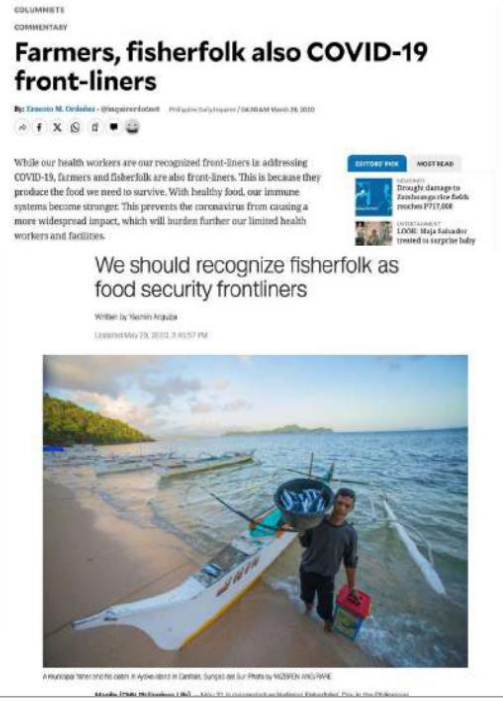
RESOLUTION NO. 21
Series of 2020
April 6, 2020

RECOMMENDATIONS RELATIVE TO THE MANAGEMENT OF THE CORONAVIRUS DISEASE 2019 (COVID-19) SITUATION

RESOLUTION NO. 21
Series of 2020
April 6, 2020

All the agriculture and fishery stakeholders must be considered front liners and their movements shall remain unhampered.

Source



COLUMNISTS
COMMENTARY

Farmers, fisherfolk also COVID-19 front-liners

While our health workers are our recognized front-liners is addressing COVID-19, farmers and fisherfolk are also front-liners. This is because they produce the food we need to survive. With healthy food, our immune systems become stronger. This prevents the coronavirus from causing a more widespread impact, which will burden further our limited health workers and facilities.

We should recognize fisherfolk as food security frontliners

Values and Importance

Socio-economics and cultural aspects of SSF

Mr. Fernan Q. Abragan (MSU-Naawan),October 2023 webinar: In the coastal community of Lapinigan Island, Surigao del Norte, **the involvement of parents at the start of their children's fishing careers is not just passing influence but a profound tradition deeply rooted in the sea**. The findings highlighted a robust generational connection within the community, signifying the transmission of fishing expertise and knowledge from one generation to the next.

Dr. Raul G. Bradecina (ParSU), August 2023 webinar of **TBTI** Philippines, **presented economic, economic anthropology, and institutional economics viewpoints and called for the promotion of island communities' customs of food fish sharing to strengthen their participation in resource governance for the sustainable management of the abalone fishery in the area**.

Source: TBTI Philippines, August and October 2023 webinar.

Values and Importance

Socio-economics and cultural aspects of SSF

A word cloud from the answers of the fishers to the question of "what is a small-scale fisher?" to them.

In the book, *Portrait of Small-Scale Fishers in the Philippines: SSF* describe themselves as

- **poor and marginalized with a small income**
- **happy, satisfied, grateful, and fulfilled with their work.**
- **fishing tradition that is handed down to the next generation.**

Despite the challenges and hardships, small-scale fishers see themselves as **providers for their families and the community.**

Management and Governance

Article VII Section 7 of the 1987 PH Constitution

- **Guarantees protection of subsistence fisher's rights.**
- Prioritizes communal marine and fishing resources for use by local communities.
- Promises support through appropriate technology, research, financial aid, production assistance, marketing support, and other services

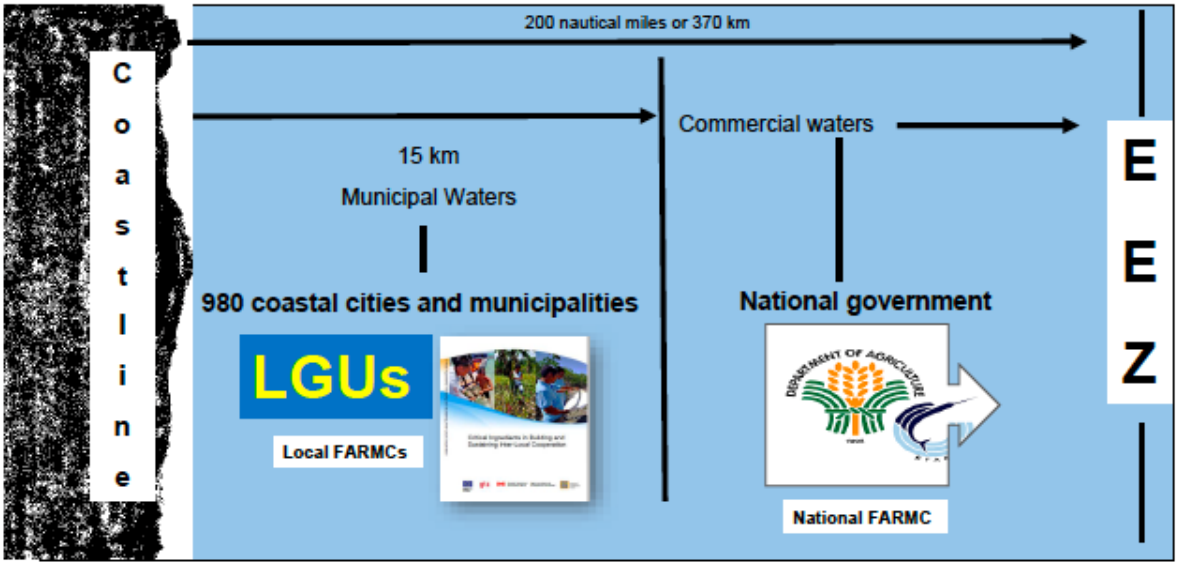
PH Fisheries Code (RA8550, As amended by RA10654)

- Declares a policy to protect the rights of the fisherfolk, particularly local communities, with a focus on municipal fisherfolk.
- Emphasizes preferential use of municipal waters for fishing.
- Commits to providing support to the fishery sector, especially municipal fisherfolk, women, and youth.
- Support includes technology, research, financial aid, production assistance, construction of post-harvest facilities, marketing assistance, and other services.

Fisheries Management

- Equitable use of tuna resources (e.g., Economy-wide Tuna Management Plan /Sardines Management Plan
- Fisheries Management Area (FMA) and mainstreaming Ecosystem Approach to Fisheries Management (EAFM)

Management and Governance



Management and Governance

Source: https://ph.oceana.org/our-campaigns/fisheries-management-areas/

2019: Fisheries Administrative Order 263

- 12 Fishery Management Areas (FMAs)
- provide a **science-based, participatory**, and **transparent governance framework and mechanism** to sustainably manage fisheries.

- FMA is a "*bay, gulf, lake or any other fishery area which may be delineated for fishery resource management purposes*" (Fisheries Code, Sections 4-34).

2024 Book Release

Implementation of the Small-Scale Fisheries Guidelines: A Legal and Policy Scan

Editors: Julia Nakamura, Ratana Chuenpagdee, and Svein Jentoft

Mare Series, Springer

CHAPTER IV

Securing the Rights of Small-Scale Fishers and Their Communities in the Context of Fisheries Management Areas in the Philippines

Alice Joan G. Ferrer, Rose-Liza Eisma-Osorio, Dennis Calvan, and Marlito Guidote

Management and Governance

THE LOCAL GOVERNMENT CODE OF THE PHILIPPINES
BOOK I
GENERAL PROVISIONS
TITLE ONE. - BASIC PRINCIPLES
CHAPTER 1. - THE CODE, POLICY AND APPLICATION

SECTION 1. Title. - This Act shall be known and cited as the "Local Government Code of 1991".

SECTION 2. Declaration of Policy. - **(a)** It is hereby declared the policy of the State that the territorial and political subdivisions of the State shall enjoy genuine and meaningful local autonomy to enable them to attain their fullest development as self-reliant communities and make them more effective partners in the attainment of national goals. Toward this end, the State shall provide for a more responsive and accountable local government structure instituted through a system of decentralization whereby local government units shall be given more powers, authority, responsibilities, and resources. The process of decentralization shall proceed from the national government to the local government units.

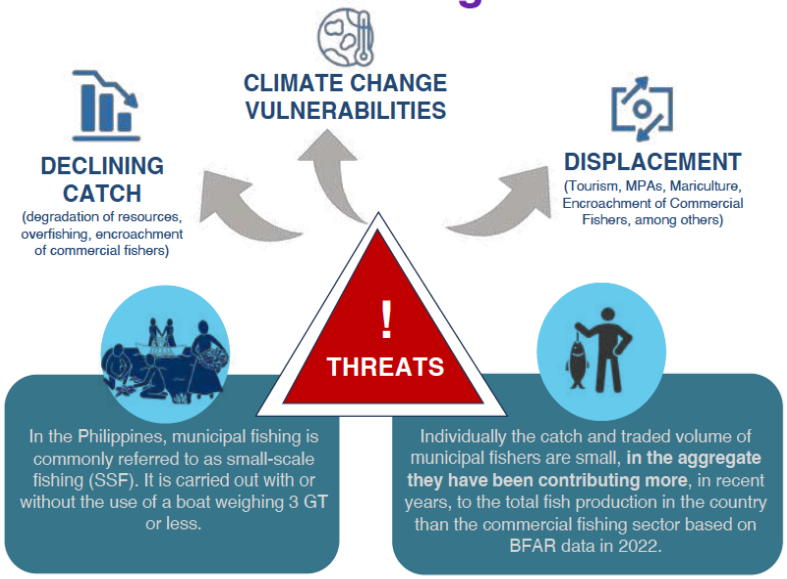
(b) It is also the policy of the State to ensure the accountability of local government units through the institution of effective mechanisms of recall, initiative and referendum.

- In 1991, R.A. No. 7160 was enacted: LGUs were given the mandate to use and manage their own municipal waters.
- After 3 decades of devolution, LGUs demonstrated different levels of capacity in coastal resource management.
- ***Hence, municipal fishers are often disadvantaged by various socio-economic implications.***

19

Image Source: https://www.officialgazette.gov.ph/downloads/1991/10oct/19911010-RA-7160-CCA.pdf

Challenges and Issues



It appears that the **preferential right given by the laws to the small-scale fishers are in papers only or are not fully implemented on the ground.**

These threats contribute to **poverty, inequality, and demise of SSF**, on which millions of Filipinos depend on food, nutrition, and livelihood.

Poverty data consistently show that fishers in the country are the **poorest of the poor** (PSA, 2023).

Sources:
Bennet 2014; Cabral and Alino, 2011; CNFIDP 2021-2025; Fabinyi 2010; Ferrer et al 2015, Ferrer et al 2017; Gomez 2021; Macusi et al., 2021; Mascia and Claus 2009; Miller 2022; Muallil et al., 2014a; Muallil et al 2014b; Muallil et al., 2015b; Oracion 2005

Challenges and Issues

Sharing Knowledge and Experiences on Small-Scale Marine Fisheries Data Collection and Management for Sustainable Development in the APEC Region

Present by Thailand

31 January 2024

Bangkok, Thailand

Outline

The presentation can include the following topics:

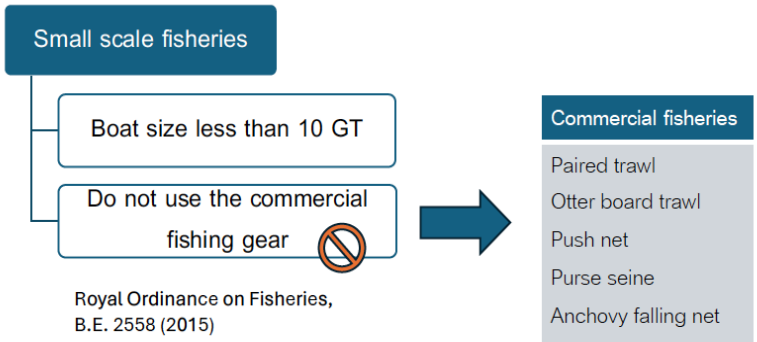
(1) Description of **small-scale fisheries** - tell us what they look like

(2) **Values and importance** - not only economic, but also social, cultural, heritage, and other values

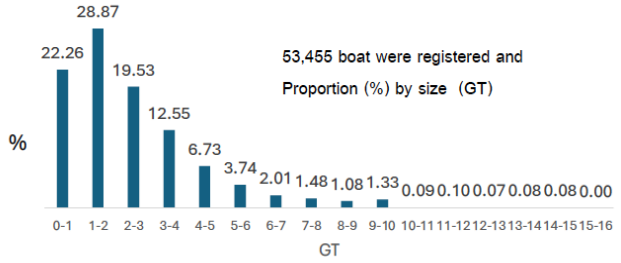
(3) **Management and governance** - how are they managed, by who?

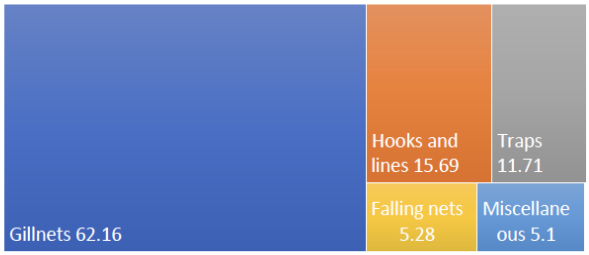
(4) **Challenges and issues** - what are some of the major concerns/problems facing the sector?

Small Scale Fisheries



Small Scale Fisheries



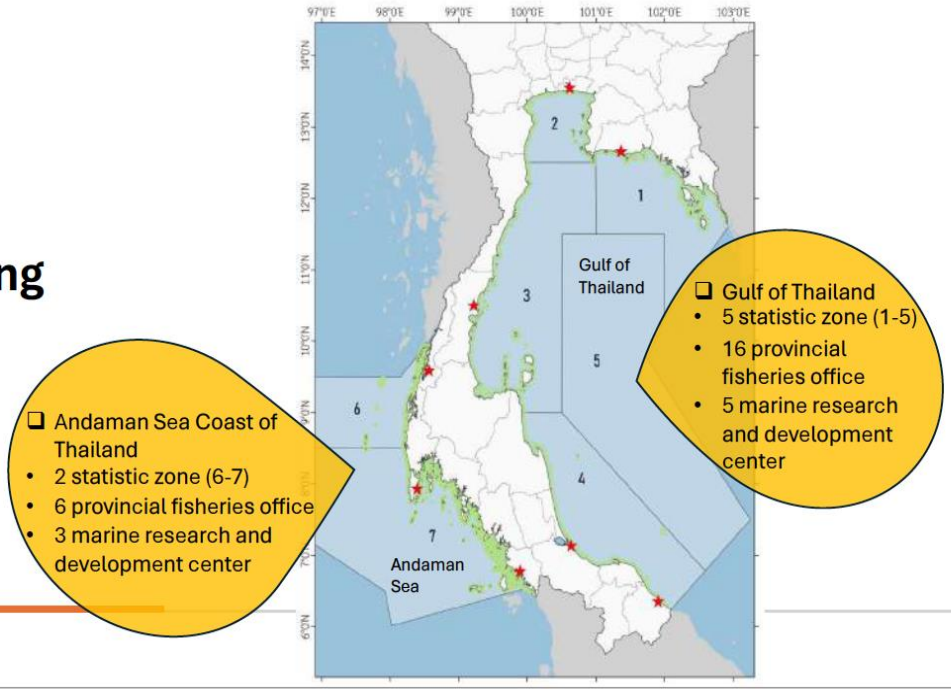


Small Scale Fisheries

Number of fishing boat and fishing gear registered in 2023

group (tongr	Gillnets	Hooks and lines	Traps	Falling nets	Miscellaneous	Surrounding nets	Grand Total	%
0-1	5920	2718	2527	89	634	7	11895	22.25
1-2	11132	2377	1194	364	470	12	15549	29.09
2-3	7442	1035	838	742	444	3	10504	19.65
3-4	4420	1015	633	398	251	3	6720	12.57
4-5	1829	593	388	287	467	3	3567	6.67
5-6	1025	236	367	198	130	2	1958	3.66
6-7	509	128	86	276	57	1	1057	1.98
7-8	416	85	72	154	38		765	1.43
8-9	223	129	50	118	39	1	560	1.05
9-10	253	51	61	123	173	1	662	1.24
10-11	13	2	20	11	2		48	0.09
11-12	23	8	7	13	1		52	0.10
12-13	11	4	4	17	2		38	0.07
13-14	7	2	5	21	5		40	0.08
14-15	6	2	9	10	12		39	0.07
15-16	1						1	0.00
Grand Total	33230	8385	6261	2821	2725	33	53455	
%	62.16	15.69	11.71	5.28	5.1	0.06		100.00

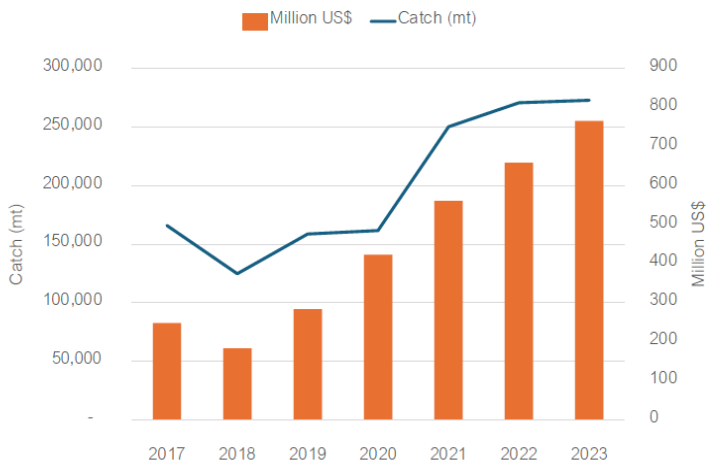
Fishing Area



❑ Andaman Sea Coast of Thailand
- 2 statistic zone (6-7)
- 6 provincial fisheries office
- 3 marine research and development center

❑ Gulf of Thailand
- 5 statistic zone (1-5)
- 16 provincial fisheries office
- 5 marine research and development center

Capture - Values and importance



Management and governance

Department of Fisheries

Marine Department

Department of Marine and Coastal Resources

Management		Response authorities
General Management	Register	MD, DOF
Conservation and Management Measure	MCS ▪ Monitor fisheries status ▪ Determine appropriate measures - Spatial and temporal measure (coastal zone, closure area) - Fishing gear (spec, quantity) ▪ Enforce the law	 DOF DOF DOF, DMCR
co-management and support	▪ Community hatchery ▪ Artificial reef ▪ Subsidy	DOF DOF Government

Challenges and issues

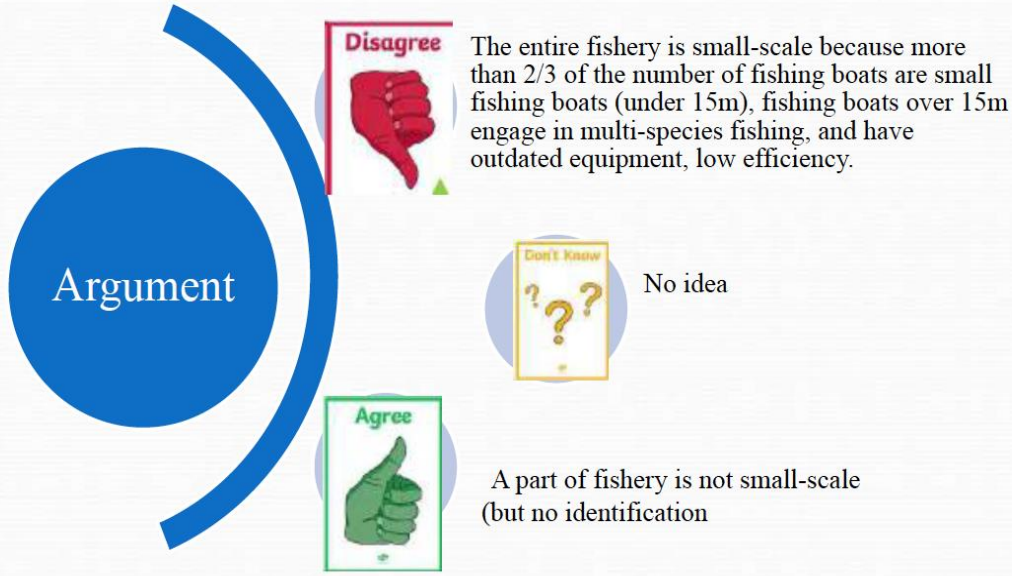
Issues	Challenges
Inaccurate in number of small scale fishing and its trend is increasing may cause overfishing and conflict	▪ Raise awareness on the importance of registration of fishing boat and fishing licence ▪ Co-management among fisheries groups via provincial fisheries committee and DOF to find appropriate solution management for sustain resources and reducing conflict
Insufficient time and effort (and funds) allocated to collect and analysis data and information required for fisheries management	▪ Fishing logbook requirement for SSF ▪ Government should make an application for fisherman and DOF can share data and information
Effect of climate change and human activities may cause negative situation	

Thank you for your attention

Marine fisheries in Viet Nam

Presentation for APEC – OFWG, 2024

Not yet legal definition on Small Scale Fisheries



Contents

- Geographical cover
- Marine Fishery
- Management and Governance
- Challenges and Issues
- National Statistics on Marine Capture

1. Geographical cover

Total land area: 329,560 sq km; Coast line: 3,260 km;
EEZ area: 1 million sq. km.

ECOLOGICAL REGIONS
1. Red River Delta
2. Northern midlands and mountain areas
3. North Central and Central coastal areas
4. Central Highlands
5. South East
6. Mekong River Delta

MARINE CATCHING PROVINCES: 28

MARINE CATCHING AREA

1, Coastal waters: limited by the sea water edge at the coast and inshore line

2, The inshore zone: the sea area limited by the inshore line and the offshore line

3, The high seas (offshore zone): the sea areas limited by the offshore line and the outer boundary of the exclusive economic zone of Viet Nam's waters (not yet official map available).

2. Marine Fishery in 2023

- Marine catching output: 3,66 million tons
- Number of Fishing vessels: 83.430 ships, of which:
  from 6-12m is 37,770;
  from 12-15m are 16,000;
  from 15-24m are 26,500 units;
  over 24m are 2,510 ships.
- Labor force: about 550,000 people are fishers; about 1.5 million people involved in marine fisheries as service workers, logistics, etc.
- Production teams at sea: 4,227 teams (29,588 fishing vessels and 179,601 fishers participated).
- Export turnover: about 3,6 billion USD.
- 28/28 coastal provinces and cities issued Total Allowable Catch (TAC). Total quotas determined and announced was 95,703 permits (high seas 31,297 permits; offshore 21,555 permits; coastal areas 42,851 permits).

Marine capture fisheries in 5 years

- Marine capture production remained stable in 5 years, at 3,6 -3,7 million tons, trend down in recent years;
- Number of fishing boards and vessels discreasing
- Fish catch accounts for 75% of total marine catch

Contents	Unit	2019	2020	2021	2022	2023
Catching Production	1000 tons	3,633.1	3,700.3	3,740.2	3,670.8	3,643.9
Export turnover	Million USD	3,088.9	2,278.5	3,238.5	4,037.1	3,604.3
Number of fishing boats	unit		94,572	92,422	89,722	83,430
6 -< 12m	unit		45,950	44,500	43,000	37,770
12 -< 15m	unit		18,425	18,000	17,000	16,520
15 -< 24m	unit		27,575	27,300	27,100	26,630
>24m	unit		2,622	2,622	2,622	2,510

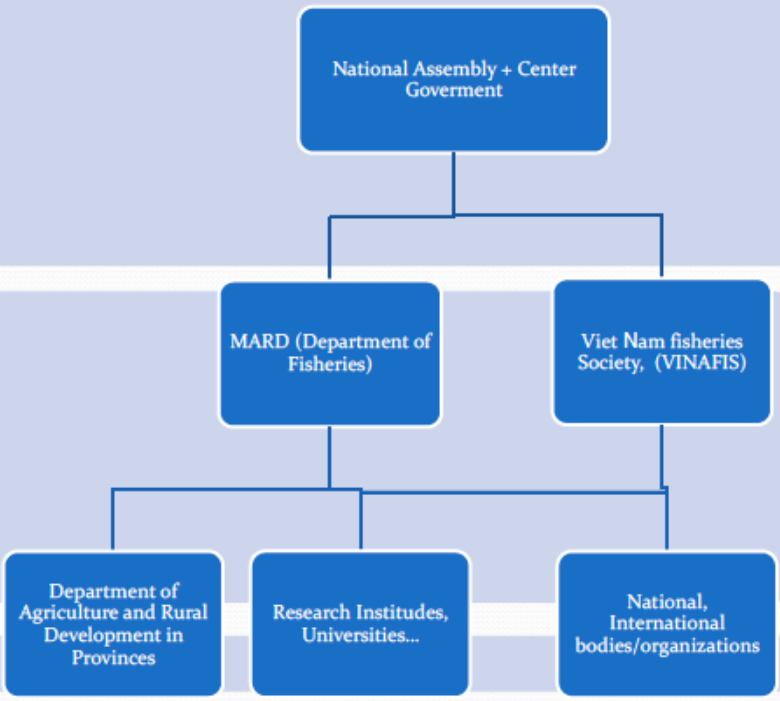
3. Management and Governance

Fisheries Law 2017

Decree No. 26/2019/ND-CP: Detailing a number of articles and measures to implement the Fisheries Law: (i) Regulations on co-management in protecting aquatic resources ; (ii) Legislate content related to combating (IUU) fishing; (iii) national fishing data system

Circular No. 21/2018 / TT-BNNPTNT dated 15/11/2018 (Circular 21) on the regulations on recording and submitting reports and fishing logbooks; publish a designated fishing ports to certify the origin of aquatic products from fishing; lists of illegal fishing vessels; certification of raw materials and certification of the origin of the fishing aquatic products.

Decisions, projects…



4. Challenges and Issues

- Yellow card from EU, IUU fishing
- Shortage of high-quality labor
- Infrastructure does not met the requirements of the industry development, maintenance work has not been paid much attention by the locality
- Limited investment resources
- Low application of scientific and technological advances
- Low labor productivity of fishermen
- High post-harvest losses

5. National Statistics on Marine Capture

- **Legal basic**
  - **The Law on Statistics**, 2003 (Law on Statistics No. 4/2003/QH11).
  - **The National Statistical Indicator System** (*Decision 43/2010/QD-TTg dated June 2nd, 2010*).
  - **Fisheries Law**, 2017: (Law on Fisheries No. 18/2017/QH14).
  - **The system of indicators for agriculture and rural development** (Circular 16/2020/TT-BNNPTNT and Circular 17/2020TT-BNNPTNT)
- **Organizations:**
  - **GSO:**
    - Harvesting area, production, boats (with >90 CV)…(annually) by survey.
    - Price of selected spicies (monthly) by survey
    - Value of Fishery industry (quarterly)
  - **MARD (D-FISH)**: ***National Data base on Fisheries*** (mainly includes Fishing boads inormation) and its component database: (1) Catching document traceability (ECDT); (2) Database on seafood processing and markets; (3) Database of marine protected areas based on GIS maps (4) Fishing Vessel Monitoring System (Coordination); (5) Database on sanctions for administrative violations in the field of fisheries exploitation;

Other software: Database on pangasius farming; (7) VietGAP management software; (8) Database for investigating biodiversity, resources, oceanography and marine fisheries; (9) Database Management of plans, investigations, and planning of the fisheries sector; (10) Database for management system and feedback on aquatic environmental monitoring results; (11) Database of aquatic breeds, aquatic feed, aquaculture environmental treatment products;

THANK YOU

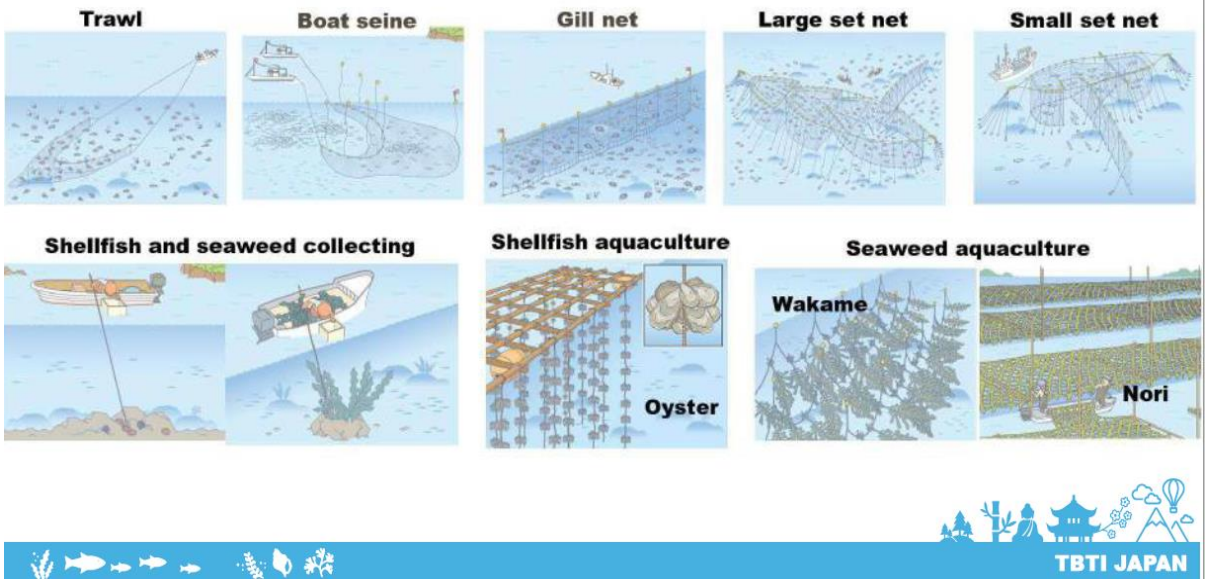
FOR YOUR LISTENING!


小規模漁業
Small-Scale Fisheries in Japan
Workshop on "Sharing Knowledge and Experiences on Small-Scale Marine Fisheries Data Collection and Management for Sustainable Development in the APEC Region"
31 January -2 February 2024, Bangkok, Thailand


1. Marine capture small-scale fisheries

- More known as coastal fisheries.
- Vessels of less than ten tons, mostly daytime operations.
- Diverse species are caught using diverse fishing methods.
- Based on family operations.
- Nearly 2,800 fishing ports.
- About 6,300 fishing villages.

★Diverse fishing methods



TBTI JAPAN

2. Values and importance

Coastal fishery accounts for 20% of Japan's fishery production.

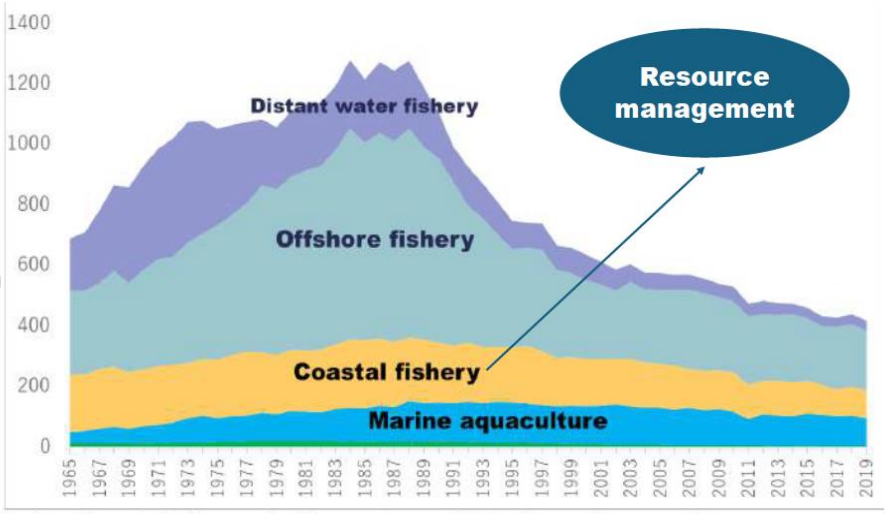
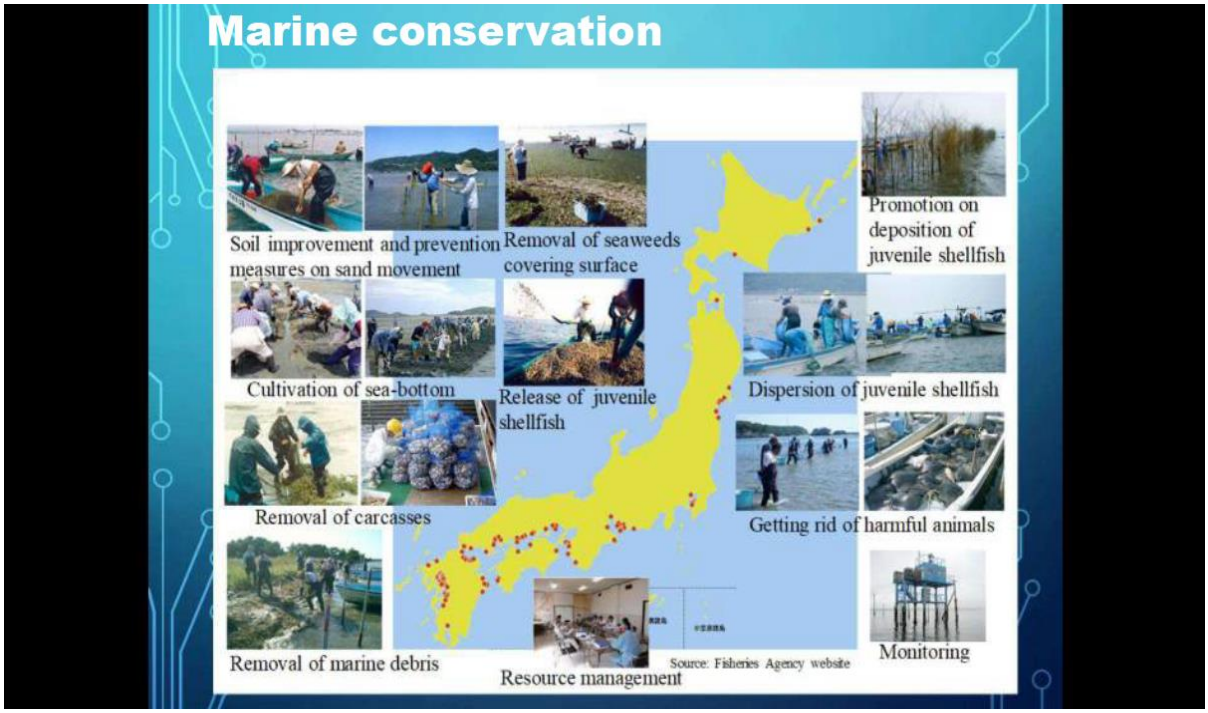


Fig. Trends in the production volume of fisheries and aquaculture
Source: Fisheries and Aquaculture Production Statistics


「獲るだけでなく増やして行くのも
漁師の仕事です！」
Voluntary resource management

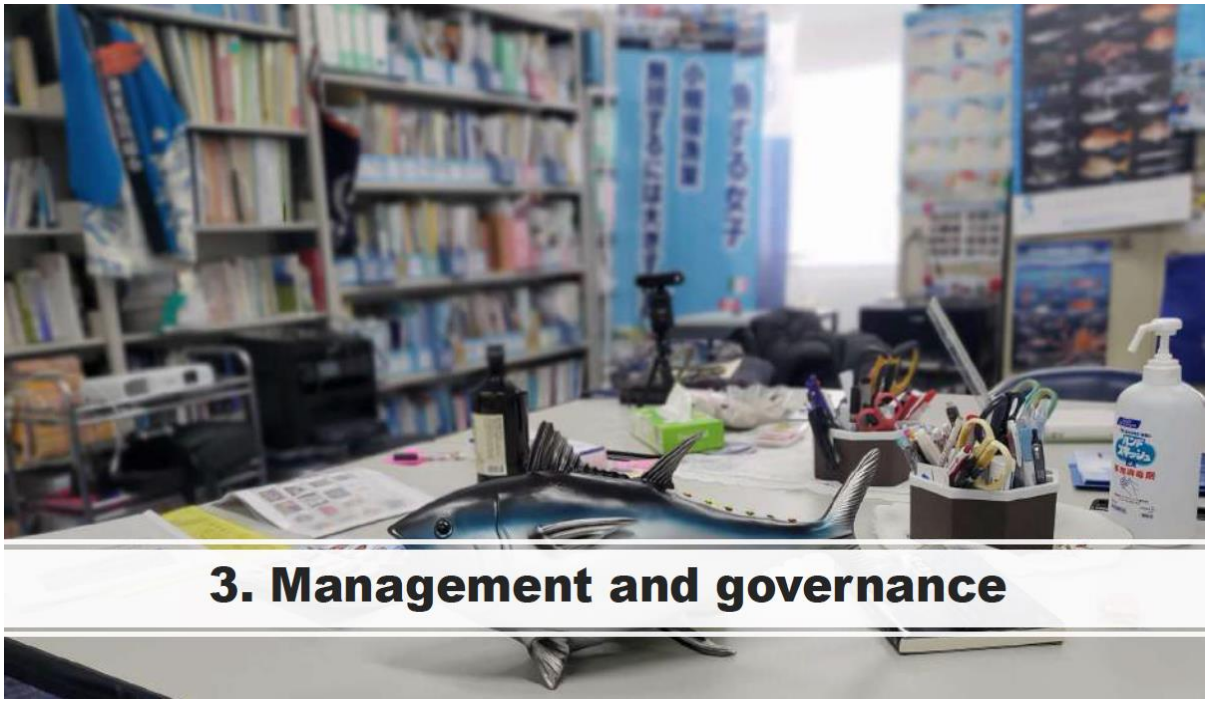

Marine conservation
Soil improvement and prevention measures on sand movement
Removal of seaweeds covering surface
Promotion on deposition of juvenile shellfish
Cultivation of sea-bottom
Release of juvenile shellfish
Dispersion of juvenile shellfish
Removal of carcasses
Getting rid of harmful animals
Removal of marine debris
Resource management
Monitoring
Source: Fisheries Agency website


Environmental education


The New Era of Support for Marine Conservation (Nov 22, 2023)
Never Underestimate the Power of Small: Stories of Marine Conservation in Japan
Yinji Li
(Tokai University & TBTI Japan)


Fish as food


Gender, women



3. Management and governance

How are SSF governed?

There is the Fishery Basic Act as a philosophy law, the Fishery Act as the substantive law, and the Fishery Cooperative Act as a law related to fishers' organization.

Fisheries legislation

- Fishery Act (1949)
- Fishery Cooperative Act (1948)

- Amendment of Fishery Act from 2018

National fisheries policy

- **Fisheries Basic Act (2001).** [There used to be a policy called the 'Coastal Fisheries Promotion Act' (1963-2001)]

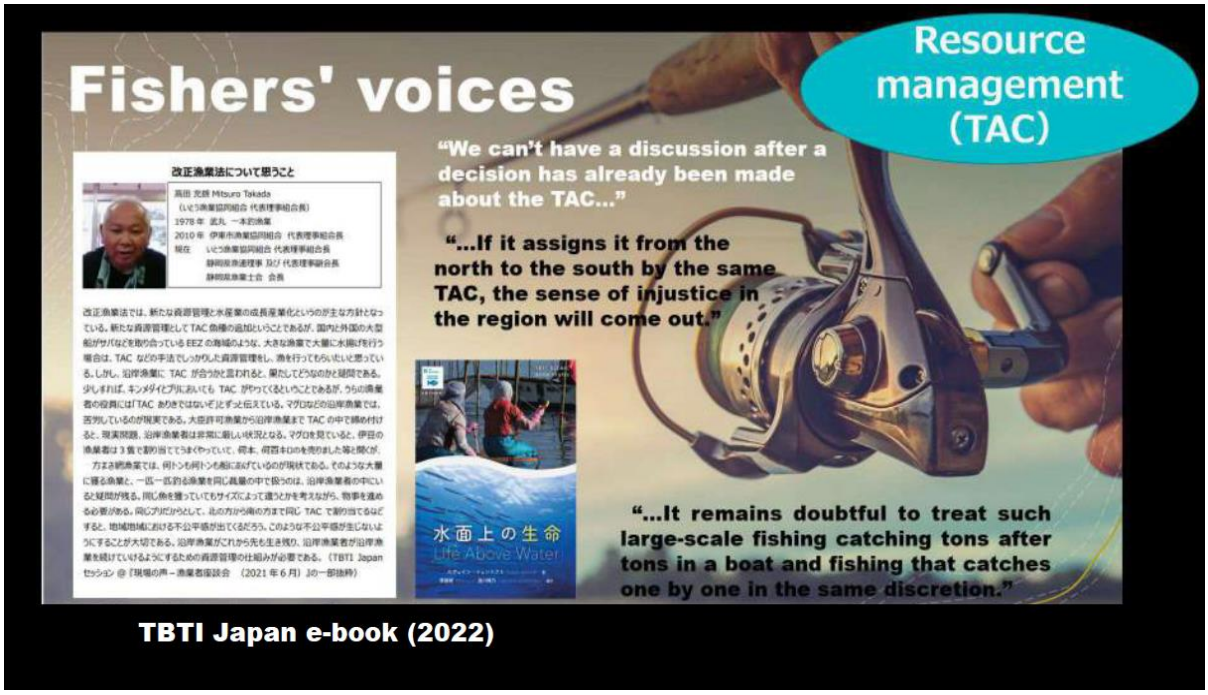
SSF fishers operate based on their fishery rights or fishing licenses (approval from the prefectural governor).


Fisheries cooperatives
由比港漁業協同組合
宮城県漁業協同組合
矢本支所
葉山町漁業協同組合
Coastal FCAs:
945 (2019)


Blue Justice
Small-Scale Fisheries in a
Sustainable Ocean Economy
4. Challenges and issues
東海大学　李銀雅


The meaning of small
in an era of big change
Structural
Changes
社会環境・
産業構造の変化
Global Change
in marine systems
海洋システムの
地球規模の変化
Policy Changes
水産政策の変化
THE MEANING OF SMALL IN THE ERA OF BIG CHANGE
TBTI GLOBAL BOOK SERIES
THE MEANING
OF SMALL
IN THE ERA
OF BIG CHANGE
ESSAYS ABOUT
JAPANESE SMALL-SCALE
FISHERIES
EDITED BY
YINJI LI
TAMANO NAMIKAWA
TBTI Japan e-book(2020)

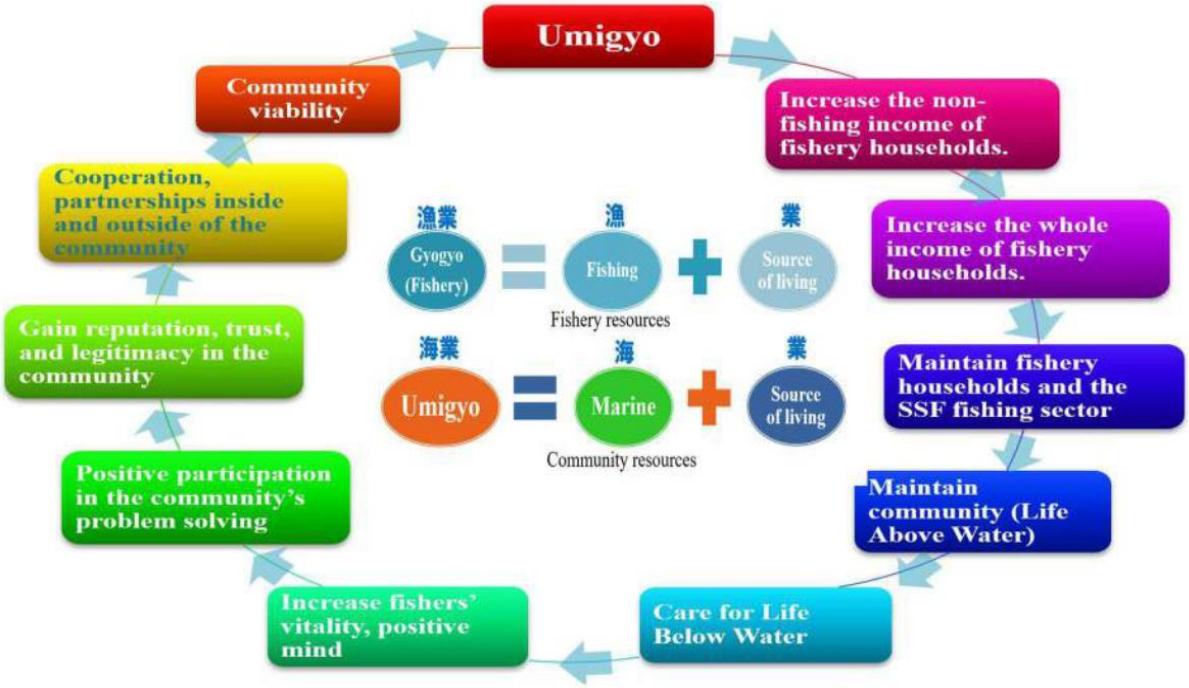

国際社会におけるブルーエコノミー関連政策と小規模漁業の関係の縮図？
日本では？
漁業の民主化の
重視から、効率
性重視へと改正。
漁業者の権利の
民間開放が促さ
れる。
◆What's happening in Japan?
日刊水産経済新聞
改正漁業法が成立
New Fishery Act was
enacted in December
2018 for the first time in
about 70 years.
'Open'
fishery
rights
Growth industry
成長産業化
Sei cho san gyo ka


Fishers' voices
Resource management (TAC)
改正漁業法について思うこと
高田 充勝 Mitsuru Takada
(いそう漁業協同組合 代表理事組合長)
1978年 底丸 一本釣漁業
2010年 伊東市漁業協同組合 代表理事組合長
現在 いそう漁業協同組合 代表理事組合長
静岡県漁業調整事 及び 代表理事副会長
静岡県漁業士会 会長
改正漁業法では、新たな資源管理と水産業の成長産業化というのが主な方針となっている。新たな資源管理として TAC 魚種の追加ということであるが、国内と外国の大型船がサバなどを取り合っている EEZ の海域のような、大きな漁業で大量に水揚げを行う場合は、TAC などの手法でしっかりした資源管理をし、漁を行ってもらいたいと思っている。しかし、沿岸漁業に TAC が合うかと言われると、果たしてどうなのかと疑問である。少しずれば、キンメダイ1つ例においても TAC がやってくるということであるが、うちの漁業者の役員には「TAC ありきではないぞ」とずっと伝えている。マグロなどの沿岸漁業では、苦労しているのが現実である。大臣許可漁業から沿岸漁業まで TAC の中で縛り付けると、現実問題、沿岸漁業者は非常に厳しい状況となる。マグロを見ていると、伊豆の漁業者は3隻で割り当てでうまくやっていて、何本、何百キロの魚を売りました等と聞くが、
方また網漁業では、何トンも何トンも漁にあがっているのが現状である。そのような大量に獲る漁業と、一匹一匹釣る漁業を同じ基準の中で扱うのは、沿岸漁業者の中にいると疑問が残る。同じ魚を獲っていてもサイズによって違うとかを考えながら、物事を進める必要がある。同じブリだからとして、北の方から南の方まで同じ TAC で割り当てるなどすると、地域地域における不公平感が出てくるだろう。このような不公平感が生じないようにすることが大切である。沿岸漁業がこれから先も生き残り、沿岸漁業者が沿岸漁業を続けていけるようにするための資源管理の仕組みが必要である。(TBTI Japan セッション @「現場の声 – 漁業者座談会 (2021年6月) Jの一部抜粋)
"We can't have a discussion after a decision has already been made about the TAC..."
"...If it assigns it from the north to the south by the same TAC, the sense of injustice in the region will come out."
水面上の生命
Life Above Water
"...It remains doubtful to treat such large-scale fishing catching tons after tons in a boat and fishing that catches one by one in the same discretion."
TBTI Japan e-book (2022)


Blue Justice
A concept to critically examine the political, economic and ecological processes of blue economy development initiatives.
47. Blue Justice
2020
Blue Justice
Small-Scale Fisheries in a Sustainable Ocean Economy
2022
BLUE JUSTICE SPECIAL SESSION
SPEAKERS
Alice Joan Ferrer
SPEAKER
Tek Bahadur Gurung
SPEAKER
Dilanthi Koralagama
SPEAKER
Yinji Li
SPEAKER
Rafayat Fakoya
SPEAKER
2021
Adopting a Blue Justice lens for Japanese small-scale fisheries
2021
Blue Justice
Important insights from the case of Inatori Kinme fishery
Yinji Li (Tokai University)
WORLD OCEAN Summit Asia-Pacific
Panel discussion: Protecting small-scale fisheries
December 7th 2021
2021
Paola Alvarez
Assistant secretary, department of finance
Philippines
Jack Kittinger
Vice president, blue production (global fisheries & aquaculture), Conservation International
Sangram Sawant
Founder
Pescafresh
Yinji Li
Associate professor, Tokai University, Japan and coordinator
TBTI Japan Research Network
Moderated by
Dominic Ziegler
Senior Asia correspondent
The Economist


5. New initiatives


Umigyo: exploring the way of securing life above water and below the water
海業-水面上の生命と水面下の生命を守るための道のり
Yinji Li(Tokai University)
4WSFC Asia-Pacific 11 May 2022（第4回世界小規模会議・アジアパシフィック）


Umigyo
Increase the non-fishing income of fishery households.
Increase the whole income of fishery households.
Maintain fishery households and the SSF fishing sector
Maintain community (Life Above Water)
Care for Life Below Water
Increase fishers' vitality, positive mind
Positive participation in the community's problem solving
Gain reputation, trust, and legitimacy in the community
Cooperation, partnerships inside and outside of the community
Community viability
漁業
Gyogyo (Fishery)
漁
Fishing
業
Source of living
Fishery resources
海業
Umigyo
海
Marine
業
Source of living
Community resources

Arigato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TBTI JAPAN
TOKAI UNIVERSITY
OAK FOUNDATION
Dried Fish Matters
TBTI GLOBAL

Current Status and Challenges of Small-Scale Fisheries (SSF) in the Republic of Korea

APEC Workshop
31.01.2024

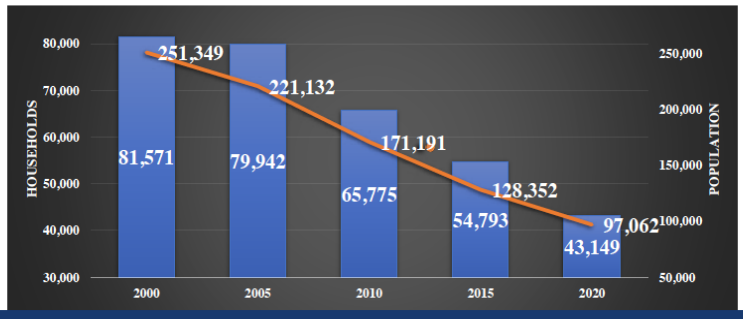
HoGeun Jang
Dept. of Marine & Fisheries Business and Economics
College of Fisheries Science, PKNU

Contents

Introduction

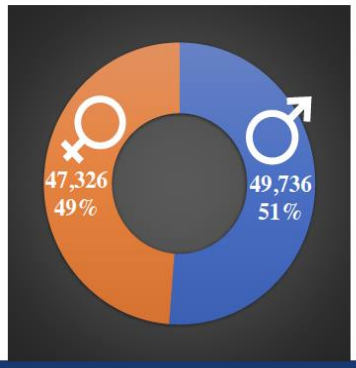
1. Introduction

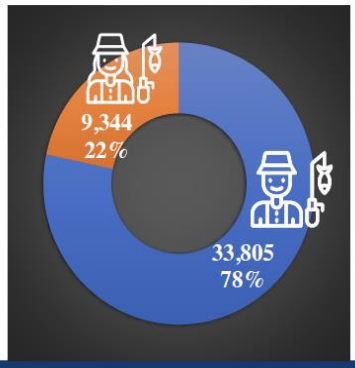
- **Fisheries households**
  - Data source: Census of Fishery (5Y; 2020)
  - Total households: 43,149 (-21.3% of 2015)
  - Total households population: 97,062 (-24.4% of 2015)



1. Introduction

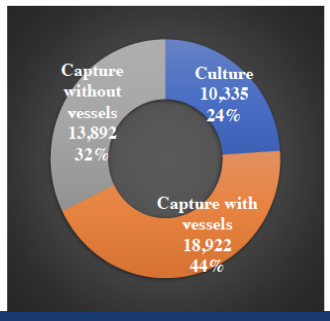
- **Fisheries households (cont.)**
  - Total households population: 97,062 (F 49% vs M 51%)
  - Households by female owner: 9,344 (22% of 43,149)

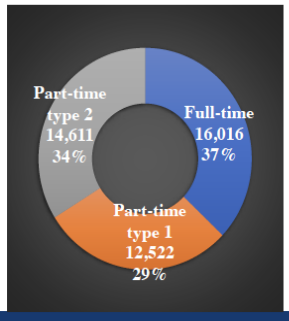


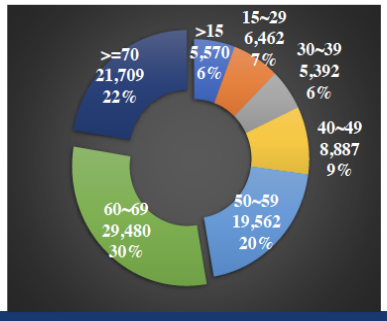


1. Introduction

- **Fisheries households (cont.)**
  - Households for capture fishery: 32,814 (76% of total)
  - Households for part-time fishery: 27,133 (63% of total)
  - Households Population over 65 years old: 34,978 (36% of total)





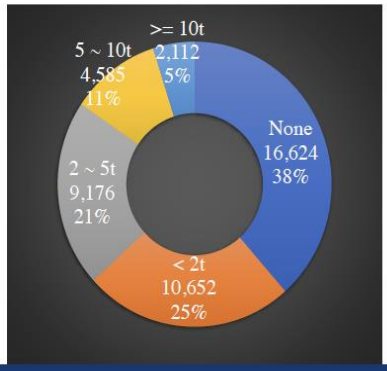


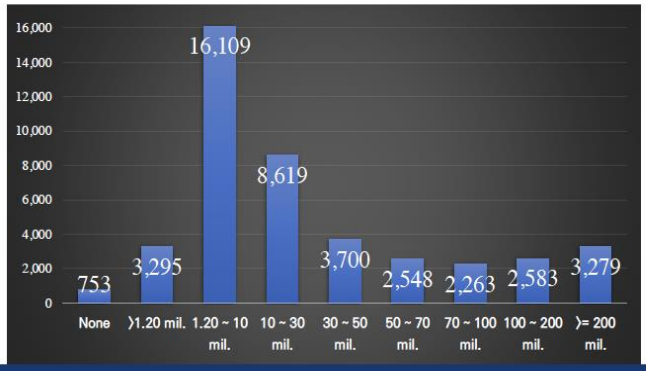
1. Introduction

- **Small-scale fisheries**
  - **Global**: fishery household with fishing boat <12m | <10t
  - **ROK**: complicated definition considering its economy
    - ☞ boats: < 5 tonnes
    - ☞ income: fish product sales < 50% of median incomes
      - ☜ Based on the 「**Act on the operation of direct payment program for promoting public functions of fisheries and fishing villages**」

1. Introduction

- **Small-scale fisheries (cont.)**
  - Households in vessel criteria: 36,452 (84% of total)
  - Households income criteria: 25,903 (60% of total)





Importance

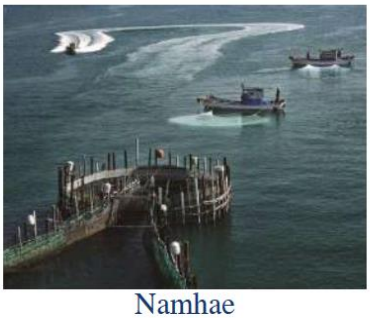
2. Importance

2. Importance

- **Importance of small-scale fisheries**
  - Conservation of local knowledge on traditional fisheries

Jeju
Haenyeo fishery

Sinan, Jindo
Intertidal sea mustard harvesting fishery



Namhae
Jukbangnyeom (Set net) fishery

2. Importance

- **Importance of small-scale fisheries (cont.)**
  - Prevention of local extinction as providing eco-tourism

Traditional fishing experience

Wetland and shellfish fishing camp

Traditional saltern experience

2. Importance

- **Importance of small-scale fisheries (cont.)**
  - Protection of coastal nursery and fishing grounds

Release of fish seedlings

Creation of artificial reefs

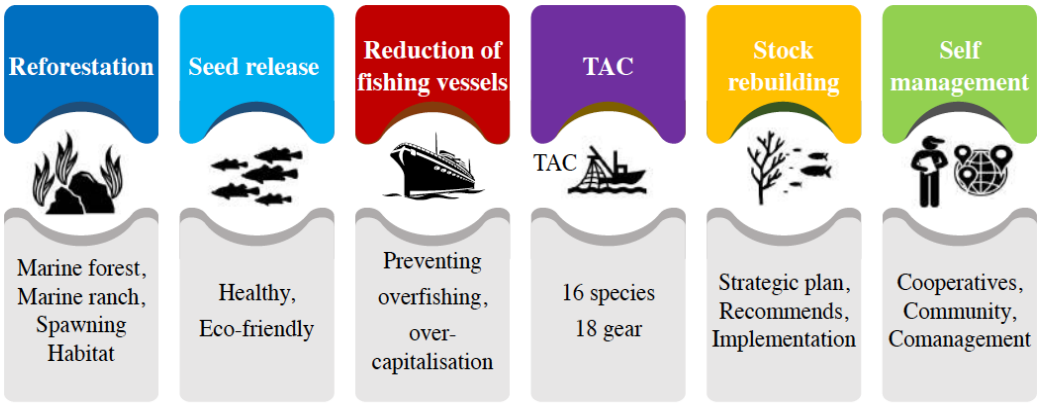
Collection of abandoned fishing gears

3. Management

Management

3. Management

- **Management of small-scale fisheries**
  - 「Fishery Resources Management Act」



3. Management

- **Innovations in fisheries 2030** – backgrounds
  - **Fishery advancement plan**
    - Managed manly through regulations (fishing limits, size restriction, etc.) based on the Fisheries Act enacted 115 years ago
    - Tragedy of Commons continues to occur
  - **A major revolution in 115 years**

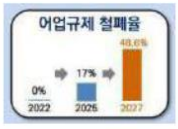
3. Management

- **Innovations in fisheries 2030** – main concepts
  - **Innovation in existing fishing regulation**
    - ☞ Improving and minimising regulations / Enhancing Autonomy
  - **TAC-centred, market-friendly fishery management**
    - ☞ Enhancing resource management / Employing market principles
  - **Establishment of an global-level monitoring system**
    - ☞ Real-time monitoring system / Landing management / Value-chain management

3. Management

- **Innovations in fisheries 2030** – 3 main targets

3 main performance indicators



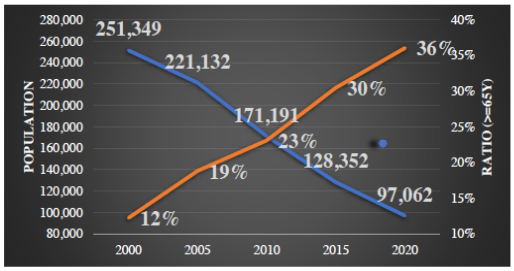
Deregulation rate

TAC management rate

The number of vessels complied on landing management

Challenges

- **Demographic challenges**
  - Decreasing labour forces
  - Ageing



- **Limitations in investment**
  - Easily excluded from policy and investment target
- **Low policy acceptability**
  - Strong belief on local knowledge
  - Low reliability on government policies (stock assessment, etc.)

4. Challenges

- **Possible solutions on the challenges**
  - **Promoting community-based management**
    - ☞ Strong identification of community (groups) / Share goals
    - ☞ Autonomous management for resource allocation
    - ☞ Inclusive decision-making
  - **Internalisation of externalities (mistrust, quota, etc.)**
    - ☞ Market principles (incentivising people to take action)
    - ☞ Gradual sanctions for inappropriate behaviours
    - ☞ Monitoring agreed-upon behaviours

Q & A

There is no reason to believe that bureaucrats and politicians are better at solving problems than the people on the spot, who have the strong incentive to get the solution right.

- Elinor Ostrom -

"Sharing Knowledge and Experiences on Small-Scale Marine Fisheries Data Collection and Management for Sustainable Development in the APEC Region"

BAHRINAH BINTI BAHRIM
MOHD FAIZRUS ANWAR BIN ROSLAN

DEPARTMENT OF FISHERIES
MALAYSIA

CONTENT

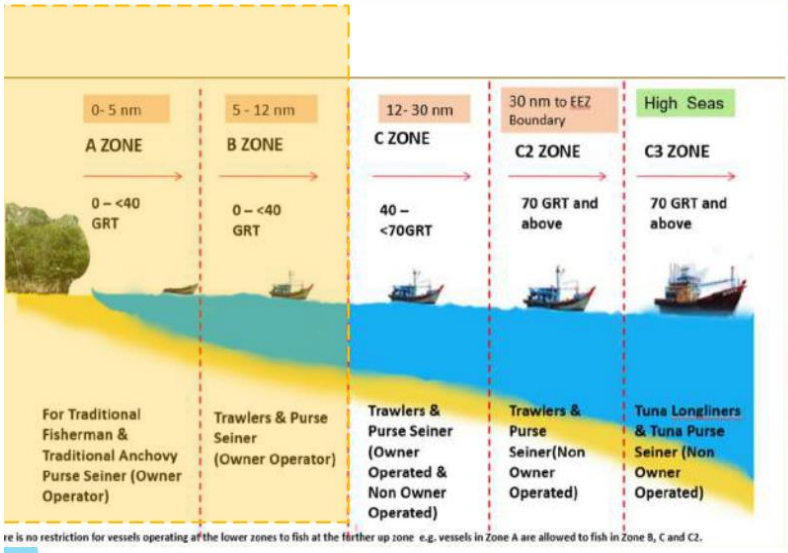
(1) Description of marine capture small-scale fisheries

(2) Values and importance - not only economic, but also social, cultural, heritage, and other values

(3) Management and governance

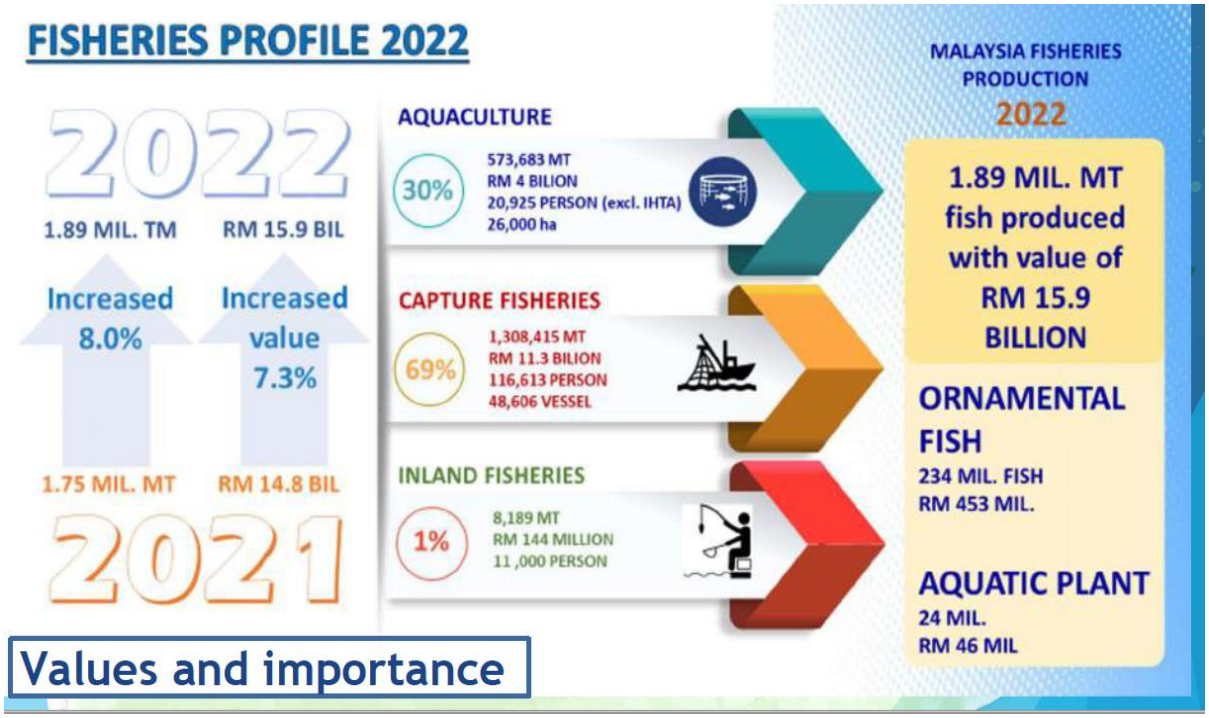
(4) Challenges and issues

SMALL -SCALE FISHING ZONING AREA



- Coastlines - 4,490 km
- Extension of Malaysian fisheries waters from 47,9000 sq. nm to 160,000 sq. nm after EEZ declaration in 1980
- 4,53,186 km² EEZ waters comprises part of the Andaman Sea, the Straits of Malacca, the South China Sea, the Sulu Sea and the Celebes Sea

FISHERIES PROFILE 2022



Values and importance

SMALL-SCALE CAPTURE FISHERIES 2022

Year	Quantity (MT)	Value (RM B)
2021	800,804	6.0
2022	777,648	6.4

SMALL-SCALE COASTAL

59 %

ZON A,B

In 2022, there is a -2.9% decline in quantity and a +6.7% increase in value in comparison to 2021.

COASTAL , DEEP SEA & HIGH SEA

41 %

ZON C,C2,C3

Landing (TM)	777,648
Value (RM)	6.4 bilion

-2.9% Declined in quantity

+6.7% Increased in value

Management & governance

Management and governance

Fisheries Act 1985 (Act 317) & Fisheries Regulations
Fisheries (Inland Fisheries Aquaculture) (Federal Territory of Kuala Lumpur and Federal Territory Of Labuan) Rules 2017
National Agriculture Policy 2.0
DOF Strategic Plan of Action 2021-2030

Other related Acts:

Feed Act 2009 (Act 698)
International Trade In Endangered Species Act 2008 (Act 686)
Food Act 1983 (Act 281) & Food Regulations 1985
Malaysian Quarantine and Inspection Services Act 2011 (Act 728)
Lembaga Kemajuan Ikan Malaysia Act 1971 (Act 49)

OBJECTIVES

Community based fisheries management concept and activities

Consultation with communities for fisheries resources management

Enhance economic activities

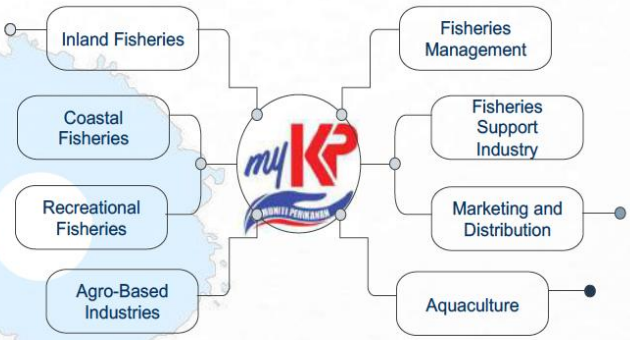
A smart partnership between community – department on ground

CONDITIONS

Fishermen community

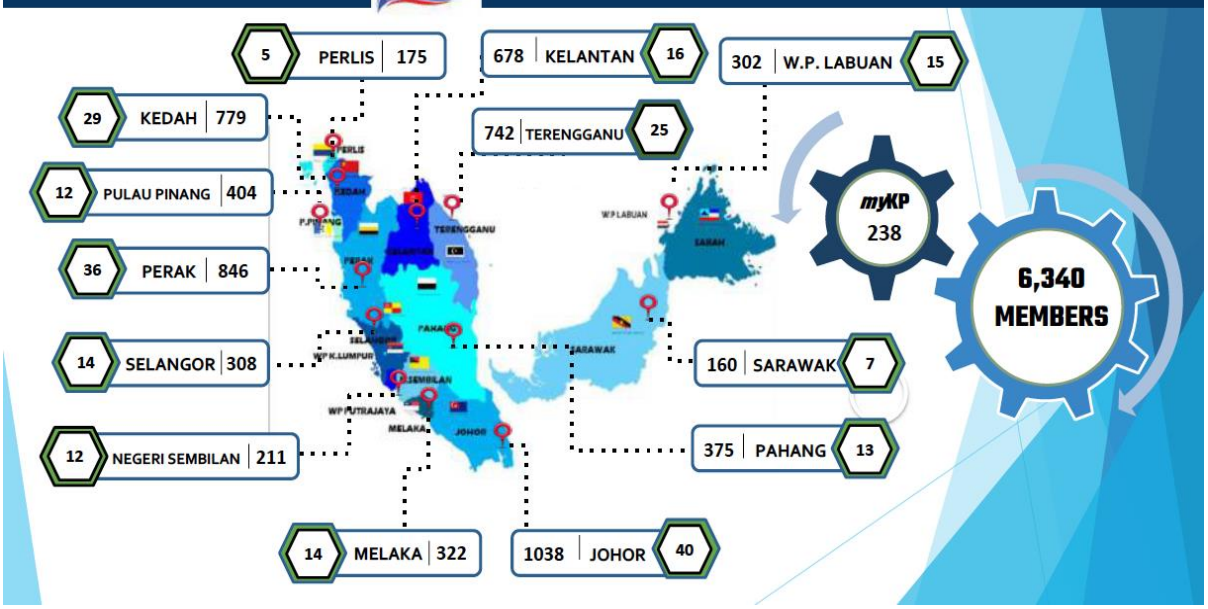
Members: 5 or more

3 person or more/ activities

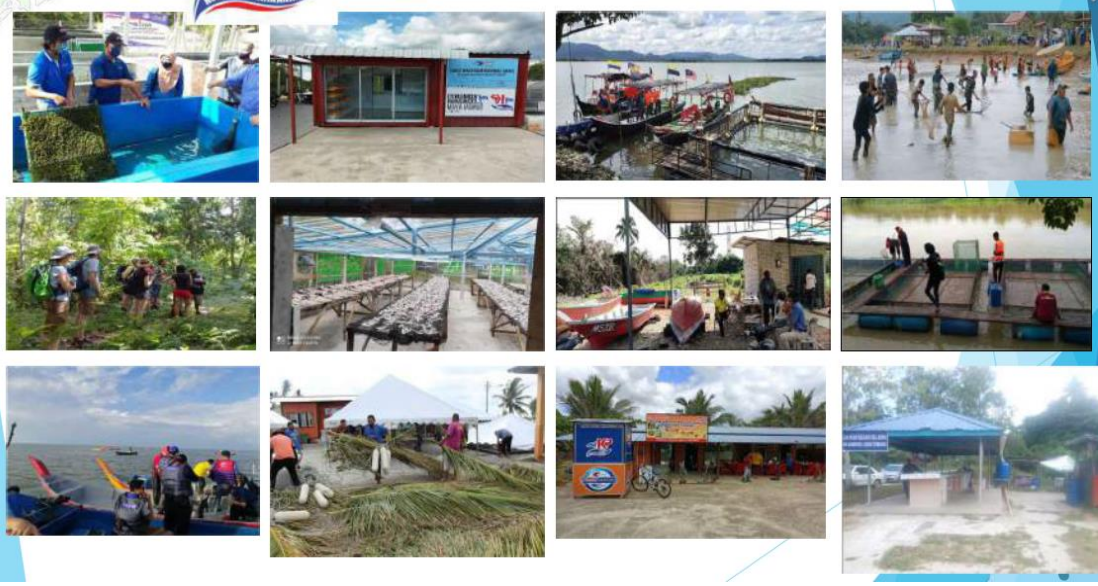


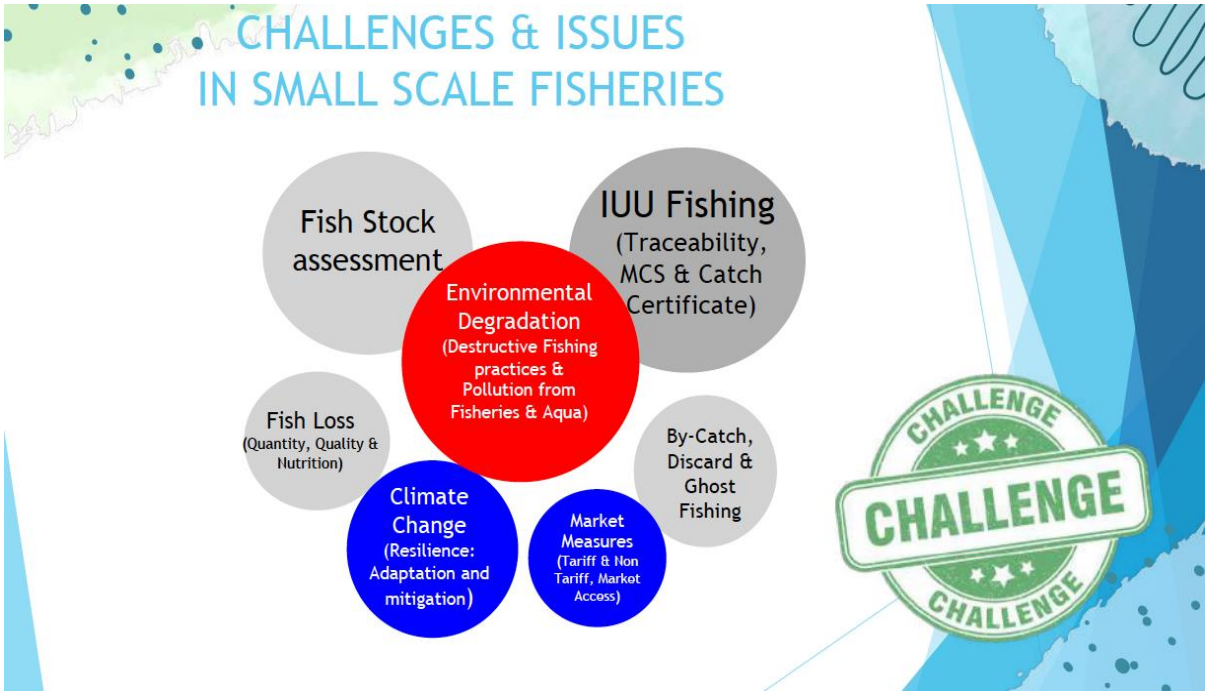
Management and governance

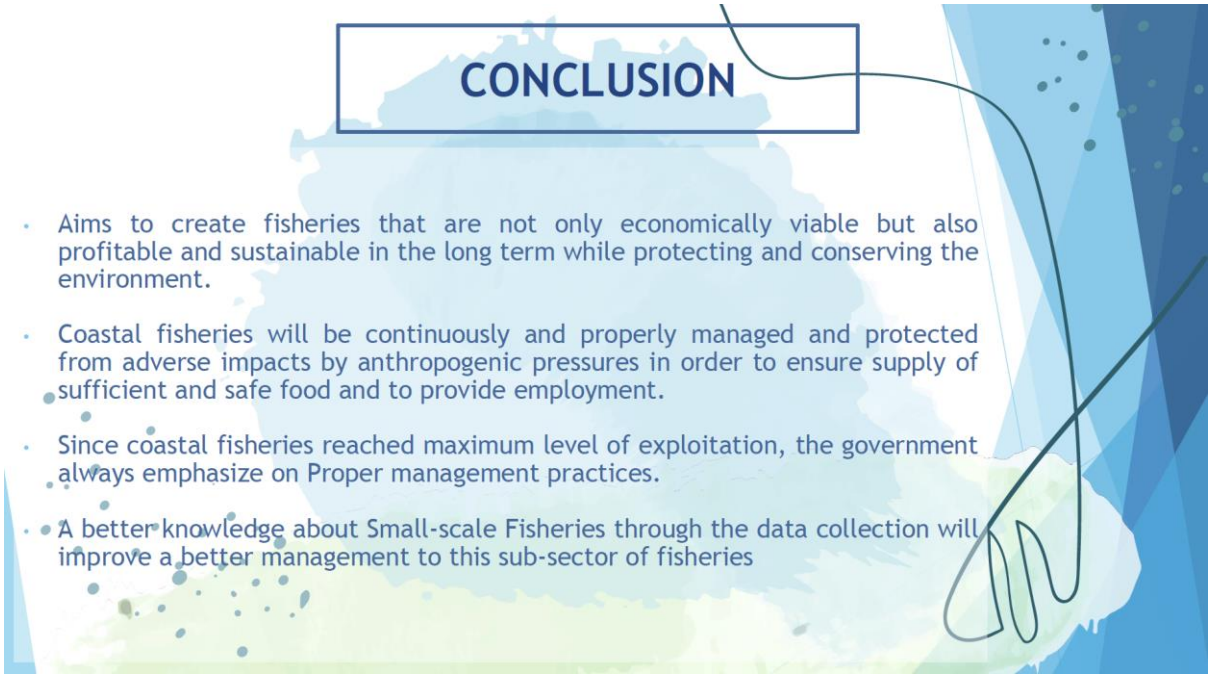
ESTABLISHMENT OF myKP



myKP IS EVERYWHERE




CHALLENGES & ISSUES
IN SMALL SCALE FISHERIES
Fish Stock assessment
IUU Fishing (Traceability, MCS & Catch Certificate)
Environmental Degradation (Destructive Fishing practices & Pollution from Fisheries & Aqua)
Fish Loss (Quantity, Quality & Nutrition)
By-Catch, Discard & Ghost Fishing
Climate Change (Resilience: Adaptation and mitigation)
Market Measures (Tariff & Non Tariff, Market Access)
CHALLENGE
CHALLENGE
CHALLENGE


CONCLUSION
Aims to create fisheries that are not only economically viable but also profitable and sustainable in the long term while protecting and conserving the environment.
Coastal fisheries will be continuously and properly managed and protected from adverse impacts by anthropogenic pressures in order to ensure supply of sufficient and safe food and to provide employment.
Since coastal fisheries reached maximum level of exploitation, the government always emphasize on Proper management practices.
A better knowledge about Small-scale Fisheries through the data collection will improve a better management to this sub-sector of fisheries


GIVE A MAN A FISH, HE EATS FOR A DAY. TEACH A MAN TO FISH, HE EATS FOR A LIFETIME.
OVERFISH AND SOON NO ONE EATS.
www.caglecartoons.com

THANK YOU

14

Chinese Taipei Presentation

Chinese Taipei has total area of approximately 36,190 square kilometers.
The population is about 23 million people. Just only Nantou is landlocked and doesn't border the sea.

According to fisheries statistics of 2022, there are about 21,696 fishing vessels and rafts in Chinese Taipei, including about 1,200 fishing vessels operate in high sea. (Those are not SSF).
The abundant fisheries resources in coastal and offshore areas of Chinese Taipei have resulted in diversity of fishing methods.
Including 6,889 gillnet fishing vessels , 5,870 longline fishing vessels, 1,315 trawlers and etc.
Among which the fishing vessels less 20 gross tonnage accounts for 85%.

About Values and Importance
In 2022, the production of coastal and offshore fisheries is 135,188 metric tons.
It provides full-time employment for about 170,000 people and part-time employment for about 16,000 people.

About management and governance
The Ministry of Agriculture is the fisheries policy decision-making agency of central.
The Fisheries Agency, which is an autonomous body under the Ministry of Agricultural.
In different levels of local governments, fisheries divisions or sections are established for fisheries administration and outreach work.

About data collection including

1.Paper-based logbooks
According to law and scientific investigation need, in the event any tuna longline fishing vessels and larval anchovy fishing vessels leaves a port, its captain shall daily, completely, and accurately fill in the logbooks.

2. Fish collection at landing sites
Chinese Taipei has 220 fishing ports, and 64 ports have port inspection. Port Inspection includes vessel name, fishing gear and methods,species and actual weight.

3. Landing declarations
We collected landing declarations on specific fisheries and vessels over 10 tons. Fishmen can submit Landing declarations by paper and Web app. Currently, there are 80% of the total declarations send by Web App.

Challenges in Chinese Taipei
Too many landing sites: Chinese Taipei has 220 landing ports. Too remote geographically.
Lack of well trained personnel for data collection.
Budget is limited.
Lack of trust in authorities.

These are the challenges when we want to collected fisheries data

جابتن ڤرايكنن
DEPARTMENT OF FISHERIES
MINISTRY OF PRIMARY RESOURCES AND TOURISM
NEGARA BRUNEI DARUSSALAM

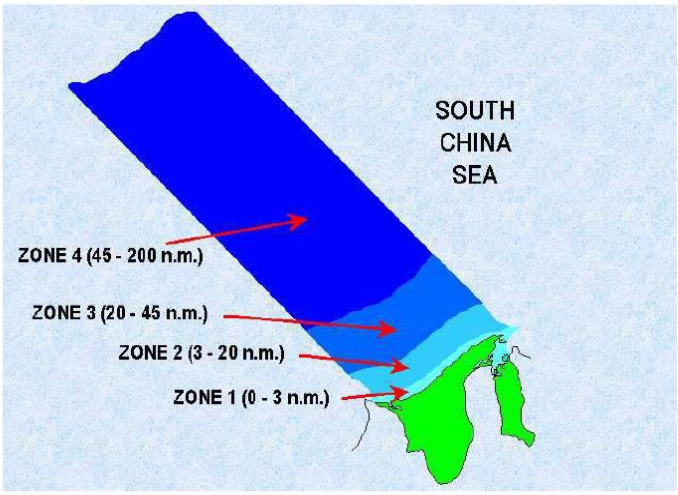
SMALL SCALE CAPTURE FISHERIES INDUSTRY IN BRUNEI DARUSSALAM

Desimawati Haji Metali
Siti Nur Nisrina Matali

FISHING ZONATION

جبتن ڤرايكنن
DEPARTMENT OF FISHERIES

Brunei Darussalam marine area covers a total of 38,600km^2 of the Exclusive Economic Zone (EEZ) within 200nm and divided into 4 major fishing Zones.



RE-DELINEATION OF FISHING ZONES 1 & 2

	NEW FISHING ZONATION 1.1.2024
Zone 1	**Zone 1A:** Area between 0 to 3 nautical miles (nm) from shore Designated for Full Time and Part Time small-scale fishermen
	Zone 1B: Area between 3.1 to 7 nm from shore permitted for small scale fishermen registered as companies.
Zone 2	Area between 7.1 to 20 nm from shore that are allowed for fishing activities by commercial fishing vessels (specification: less than 60 GT, less than 350 HP)
Zone 3	Area between 20.1 to 45 nm from shore permitted for fishing activities by larger commercial fishing vessels (specification: 60-150 GT, 351-600 HP)
Zone 4	Area between 45.1 to 200 nm from shore that are designated for fishing activities by larger commercial fishing vessels (specification: 150.1-230 GT, 600-800 HP)

CAPTURE FISHERIES INDUSTRY IN BRUNEI DARUSSALAM

CAPTURE FISHERIES INDUSTRY BRUNEI DARUSSALAM

Commercial Fisheries Industry

Small-Scale Fisheries Industry

SMALL SCALE FISHERIES IN BRUNEI DARUSSALAM

WHO ARE THE SMALL SCALE FISHERMEN?

- **Fishing gears: nets, hooks and lines, pots.**
- Type of boat: fiberglass fishing boats propelled by one or two units of outboard engines
- Fishing Ground: Zone 1 (0-7nm from shore) and above

SMALL SCALE FISHERIES IN BRUNEI DARUSSALAM

WHO ARE THE SMALL SCALE FISHERMEN?

FULL TIME SMALL SCALE FISHERMEN

- Livelihood of the fishermen depends entirely on fishing activities
- For commercial purposes and own consumption

PART TIME SMALL SCALE FISHERMEN

- Fishing activities carried out on a part-time basis (free time/ weekend)

SMALL SCALE COMMERCIAL FISHERMEN

- Fishing activities by small-scale companies
- For commercial purposes

CAPTURE FISHERIES INDUSTRY IN BRUNEI DARUSSALAM

CAPTURE FISHERIES INDUSTRY BRUNEI DARUSSALAM

Commercial Fisheries Industry

- Fishing Gears: **Purse Seine, Trawlers and Longline**
- Vessel type depends on the registered gear
- Fishing Ground: Zone 2 (7.1 - 40nm from shore) and above

Small-Scale Fisheries Industry

- Fishing gears such as **nets, hooks and lines, pots.**
- fiberglass fishing boats propelled by one or two units of outboard engines
- Fishing Ground: Zone 1 (0-7nm from shore) and above

EFFECTIVE PRACTICE FOR SUPPORTING AND IMPROVING SMALL-SCALE FISHERIES INDUSTRY IN BRUNEI DARUSSALAM

CAPACITY BUILDING

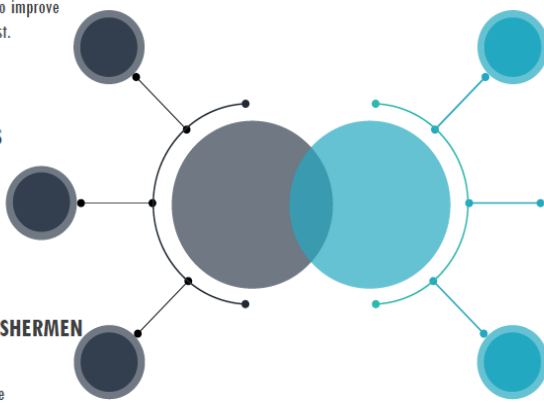
Briefing and short courses such as boat engine diagnosis and maintenance which aims to improve their skills and capabilities and reduce cost.

DISTRIBUTION OF NECESSITIES

such as GPS, cool box and safety equipment for boat which aims to improve the socio-economic status of the fisherman, their safety and maintaining the quality of catches to retrieve higher price.

UPGRADING OF SMALL-SCALE FISHERMEN LANDING SITES

Upgrading works in certain area of small-scale fisherman landing sites, to ease their operation.



RESOURCE ENRICHMENT PROGRAMME THROUGH CONSTRUCTION AND DEPLOYMENT OF ARTIFICIAL REEFS

to ensure the sustainability and stability of marine ecosystems and to ensure that fisheries resources could recover for the long term.

SOCIOECONOMIC SURVEY

to get update on any problem arise and support needed by the Small scale fishers

"MUZAKARAH"

Discussion Session for the xchange of opinions or thoughts

EXISTING METHOD OF DATA COLLECTION (CATCH DATA)

Data is collected monthly from Fishermen through two methods:

Manual – Form Provided by DOF distributed manually to the fishermen

Through Whatsapp

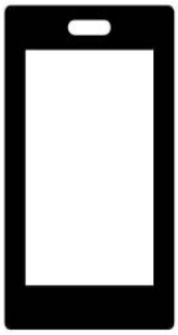
Fishing Operation

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

Market

- Price per Kg
- Sales Revenue
- Expenses

PROPOSED METHOD OF DATA COLLECTION 2024



Mobile Application

Profile set up:

- Individual details (Name, Age, Address)
- List of employees (helpers for full-time & part-time fishermen or foreign workers for companies)
- Fisher category (Company, full-time & part-time fishermen)
- Fishing license no.
- Type of fishing gear
- Fishing boat registration no.

Daily Data Input by Fishermen

- Type of fishing gear used
- Fish species caught
- Weight of catches
- Fishing operation location
- ("Location Sharing" feature)
- Departure and Landing Date and Time

"Sharing knowledge and experiences on small-scale marine capture fisheries data collection and management for sustainable development in the APEC region"

31 January - 2 February 2024, Bangkok, Thailand

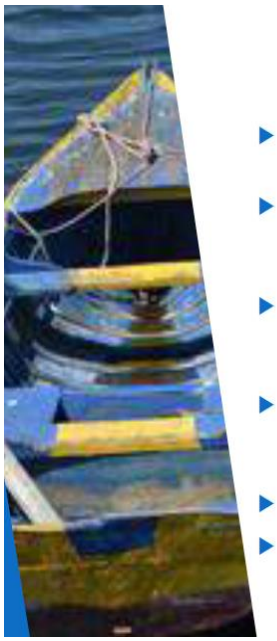
The importance of data and information for small-scale fisheries management and governance

Milena Arias Schreiber
School of Global Studies
University of Gothenburg, Sweden

Outline

- SSF overview
- Why data for SSF?
- Which data for SSF?
  - Ecological data
  - Economic data
  - Social and governance data
- Management and governance
- Data-informed management
- Co-management and participation
- Governance and challenges

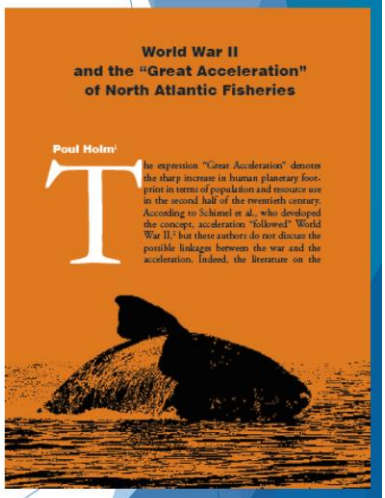
SSF as base for many activities



Small-scale fisheries (SSF)

- Date back to 10k years BC but still widespread activity and occupation (LSF after IIWW)
- No single definition (FAO 2012 "household activity", embedded in culture providing security, sense of belonging with social control)
- Food, nutrition and livelihoods (employment/gender) where it is more needed and food where it is more wanted
- Diversity and adaptability (examples of EBM), reduced bycatches, low-impact gears, local dependence as incentive for conservation
- Less profitable, fuel consumption? Too many?
- Vulnerability, poverty, marginalization? lack of property rights

Old but too relevant (not only for developing economies)



Why collect data for SSF?

- to know what they are - definition and difference from SSF
- to understand their value, contributions, strengths and challenges
- for evidence-informed decision making
- To promote collaboration, compliance and learning from each other (social learning)
- Be prepared for adaptation and resilience
- To achieve ecosystem -based management, combat IUU fishing
- To "walk the talk" to economy-wide and international targets and commitments (FAO Voluntary Guidelines, SDGs).

Data on SSF

- SSF as interacting social-ecological systems, complex, diverse
- Data collection adapted to three sustainability pillars:
  - ecological/environmental
  - social (social targets and governance)
  - economic

- Include the fisheries supply chain or "fishing chain"

Ecological/environmental data (based on ecosystems)

- Extraction of species (e.g. EU ecosystems overviews)
  - Landings
  - State of commercial stocks
  - Discards
  - Impacts in food webs
  - Threatened species
  - Seabirds and marine mammals
  - Hunting
- Contamination (substrate and water quality, productivity)
- Invasive species
- Climate change

Social (based on fishing communities)

- For monitoring social goals of fisheries (social indicators)
  - Employment (gender, age, education level, nationality)
  - Working conditions (safety) and social protection coverage
  - Job satisfaction and attractiveness of profession
  - Social identity, sense of place, cultural values)
- For analysing management and governance
  - Fisheries organizations
  - Participation in management
  - Regulatory framework (management)
  - Type of governances

Evidence: Qualitative or quantitative data?

- In the natural sciences
  - Taxonomy
  - Geology
- In the social sciences
  - Gender statistics
  - Data (not only perceptions)

Fisheries management

Fisheries management = the translation of data to actions to reach the set goal for sustainable development

Fisheries management = government actors in different institutional frameworks.

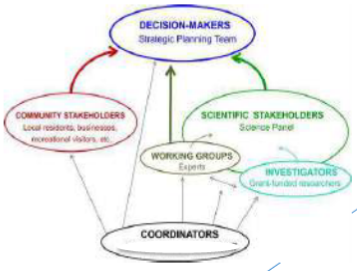
Fisheries management = rules and regulations in "Management Plans" for a fixed time.

Data-informed (evidence-based) management

- Who can fish? (fishing licenses, quota, communities, customary rules, etc).
- When, where and how? (fishing seasons, fishing grounds, MPAs, fishing gears)
- How much? (total allowable quotas, market and fishers decisions, etc)

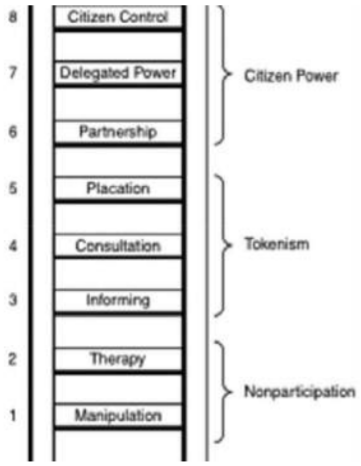
CO-MANAGEMENT

Not without, for, despite but WITH small-scale fishers participation



Arnstein's ladder of citizen participation

(Arnstein, 1969, 217)



- Recognition and respect of different types of knowledge
- Empowerment of marginalized groups
- Transdiciplinarity and co-production
- Transaction arenas
- Trust
- Time and funds

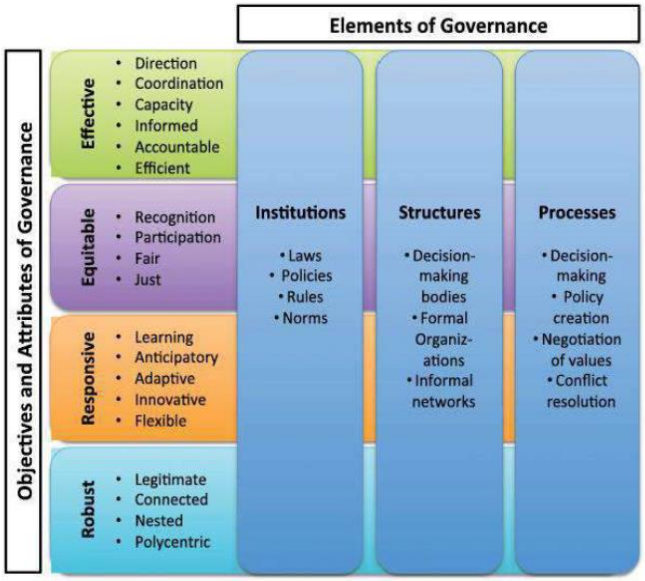
Fisheries governance

Governance = to steer, the manner of steering a group of people or a state.

Governance = government actors + other social actors (public sector + private sector + NGOs + CSOs + academia + media)

Fisheries governance = understanding how decisions related to fisheries are made and whether resultant policies and processes lead to sustainable outcomes.

Governance



Challenges

- SSF management challenges
  - large number of people, distributed over large and isolated areas
  - governments limited personnel and funding constrains
  - output controls (TACs) difficult because of expensive assessments and many species and landing sites
- SSF governance with multiple goals
  - Food and nutrition security
  - Employment and livelihoods
  - Social and environmental justice
  - Community wellbeing
  - Ecosystem health and economic viability

Current efforts in improving small-scale marine capture fisheries data

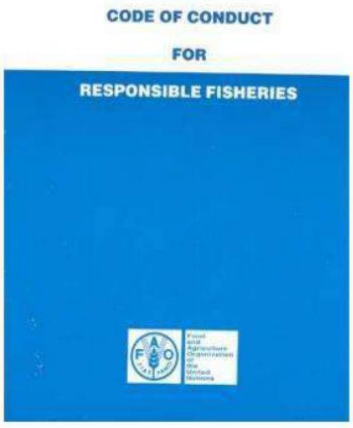
Ratana Chuenpagdee

Science Director, TBTI Global Foundation, Thailand

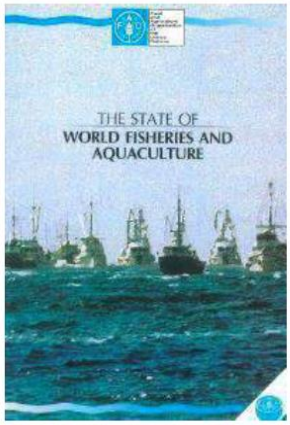
University Research Professor, Memorial University, Canada

A Workshop on "Sharing Knowledge and Experiences on Small-Scale Marine Fisheries Data Collection and Management for Sustainable Development in the APEC Region" (OFWG 01 2022)
31 January -2 February, 2024 | Bangkok, Thailand

CCRF is a voluntary instrument, developed and endorsed by FAO Member States in 1995, with principles and standards to ensure effective conservation, management, and development of aquatic resources.



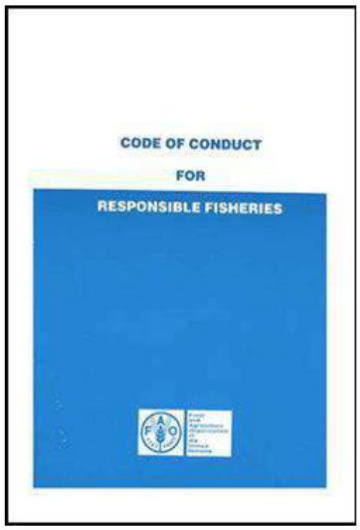
https://www.fao.org/3/v9878e/v9878e00.htm#7



(1994)

The idea of publishing **The State of World Fisheries and Aquaculture** (SOFIA) was conceived in 1995 in recognition of the growing demand for reliable information on the subject. Since there was no periodical providing a global and comprehensive view of the sector and covering policy issues, the FAO Fisheries Department decided to publish such a report every two years.

https://www.fao.org/fishery/en/sofia



FAO 1995

CCRF and Fisheries Management

- Collaborate with stakeholders to achieve sustainable and responsible fisheries
- Policy and legislative framework
- Precautionary approach and EAF
- Monitoring, surveillance, enforcement
- Data and information
- Fishing capacity and sustainable yeild

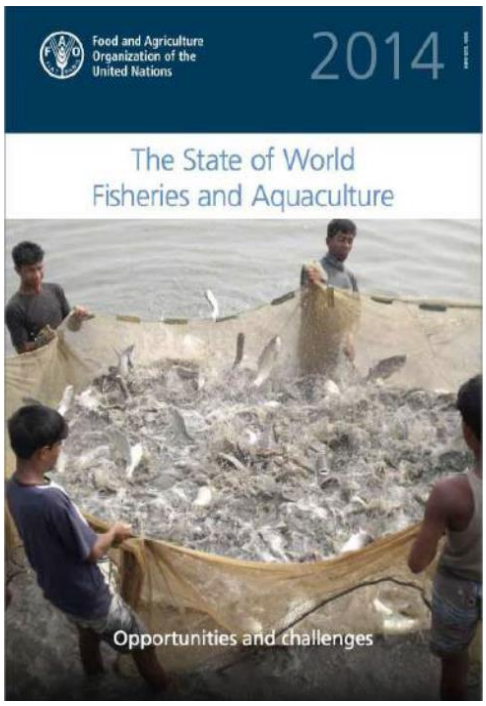
7.4 Data gathering and management advice

7.4.4 States should ensure that timely, complete and reliable statistics on catch and fishing effort are collected and maintained in accordance with applicable international standards and practices and in sufficient detail to allow sound statistical analysis. Such data should be updated regularly and verified through an appropriate system. States should compile and disseminate such data in a manner consistent with any applicable confidentiality requirements;

7.4.5 In order to ensure sustainable management of fisheries and to enable social and economic objectives to be achieved, sufficient knowledge of social, economic and institutional factors should be developed through data gathering, analysis and research;

7.4.6 States should compile fishery-related and other supporting scientific data relating to fish stocks covered by subregional or regional fisheries management organizations or arrangements in an internationally agreed format and provide them in a timely manner to the organization or arrangement. In cases of stocks which occur in the jurisdiction of more than one State and for which there is no such organization or arrangement, the States concerned should agree on a mechanism for cooperation to compile and exchange such data;

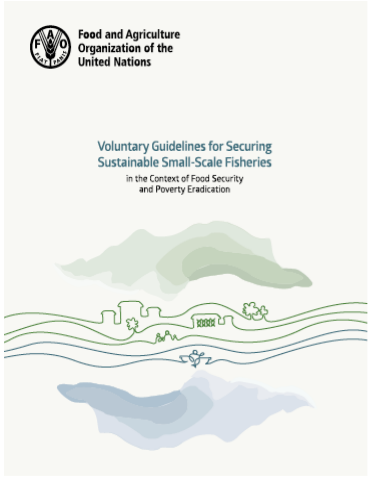
7.4.7 Subregional or regional fisheries management organizations or arrangements should compile data and make them available, in a manner consistent with any applicable confidentiality requirements, in a timely manner and in an agreed format to all members of these organizations and other interested parties in accordance with agreed procedures.



Key elements of the Voluntary Guidelines on the Governance of Tenure of Land, Forests and Fisheries in the Context of National Food Security for the fisheries sector

Introduction
Key issue 1: Understanding tenure
Key issue 2: Tenure rights in fisheries
Key issue 3: The benefits of responsible governance of tenure in fisheries
Key issue 4: Achieving responsible governance of tenure in fisheries
Conclusion

The Voluntary Guidelines for Securing Sustaianble Small-Scale Fisheries (SSF Guidelines)



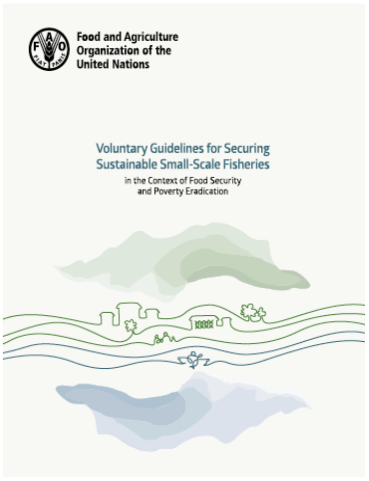
FAO (2015)

The Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication (SSF Guidelines) are the first international instrument dedicated entirely to the immensely important – but until now often neglected – small-scale fisheries sector.

The SSF Guidelines represent a global consensus on principles and guidance for small-scale fisheries governance and development. They were developed for small-scale fisheries in close collaboration with representatives of small-scale fisheries organizations in a process facilitated by FAO. They are directed at all those involved in the sector and intend to guide and encourage governments, fishing communities and other stakeholders to work together and ensure secure and sustainable small-scale fisheries for the benefit of small-scale fishers, fish workers and their communities as well as for society at large.

https://www.fao.org/voluntary-guidelines-small-scale-fisheries/en

SSF Guidelines



FAO (2015)

The Guiding Principles

- Human rights & dignity
- Respects of cultures
- Non-discrimination
- Gender equality & equity
- Equity & equality
- Consultation & participation
- Rule of law
- Transparency
- Accountability
- Economic, social & environmental sustainability
- Holistic & integrated approach
- Social responsibility
- Feasibility & social-economic viability

What do the SSF Guidelines cover?

Part I: Introduction

1. Objectives
2. Nature and scope
3. Guiding principles
4. Relationship with other international instruments

Part II: Responsible fisheries and sustainable development

5. Governance of tenure in SSF and resource management
6. Social development, employment and decent work
7. Value chain, post-harvest and trade
8. Gender equality
9. Disaster risks and climate change

Part III: Ensuring an enabling environment and supporting implementation

10. Policy coherence, institutional coordination and collaboration
11. Information, research and communication
12. Capacity development
13. Implementation support and monitoring

Section 11: Information, Research and Communication

11.1 States should establish systems of collecting fisheries data, including bioecological, social, cultural and economic data relevant for decision-making on sustainable management of small-scale fisheries with a view to ensuring sustainability of ecosystems, including fish stocks, in a transparent manner. Efforts should be made to also produce gender-disaggregated data in official statistics, as well as data allowing for an improved understanding and visibility of the importance of small-scale fisheries and its different components, including socio-economic aspects.

Section 11: Information, Research and Communication

11.6 All parties should ensure that the knowledge, culture, traditions and practices of small-scale fishing communities, including indigenous peoples, are recognized and, as appropriate, supported, and that they inform responsible local governance and sustainable development processes. The specific knowledge of women fishers and fish workers must be recognized and supported. States should investigate and document traditional fisheries knowledge and technologies in order to assess their application to sustainable fisheries conservation, management and development.

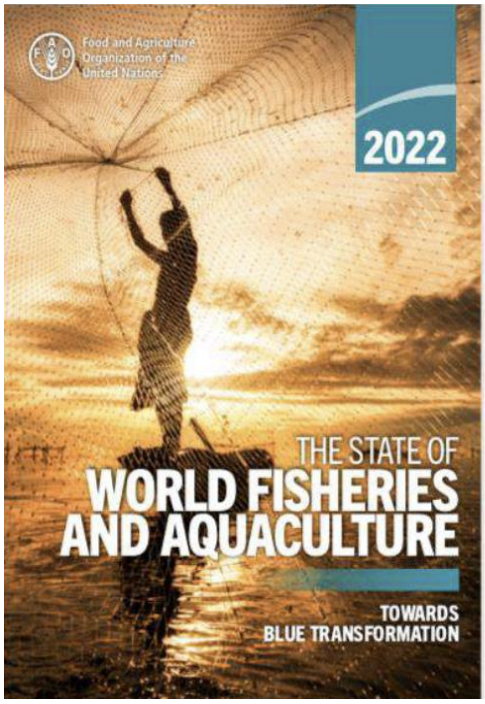
Section 11: Information, Research and Communication

11.8 All parties should promote the availability, flow and exchange of information, including on aquatic transboundary resources, through the establishment or use of appropriate existing platforms and networks at community, national, subregional and regional level, including both horizontal and vertical two-way information flows. Taking into account the social and cultural dimensions, appropriate approaches, tools and media should be used for communication with and capacity development for small-scale fishing communities.

Section 11: Information, Research and Communication

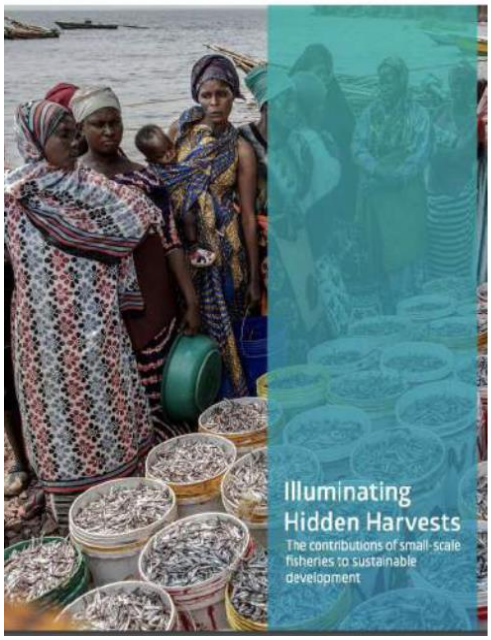
11.9 States and other parties should, to the extent possible, ensure that funds are available for small-scale fisheries research, and collaborative and participatory data collection, analyses and research should be encouraged. States and other parties should endeavour to integrate this research knowledge into their decision-making processes. Research organizations and institutions should support capacity development to allow small-scale fishing communities to participate in research and in the utilization of research findings. Research priorities should be agreed upon through a consultative process focusing on the role of small-scale fisheries in sustainable resource utilization, food security and nutrition, poverty eradication, and equitable development, including also DRM and CCA considerations.

* DRM = Disaster Risk Management; CCA = Climate Change Adaptation



Millions of lives and livelihoods are supported by aquatic food systems. Yet, many small-scale producers, especially women, are vulnerable with precarious working conditions. Building their resilience is key to sustainability and equitable development.

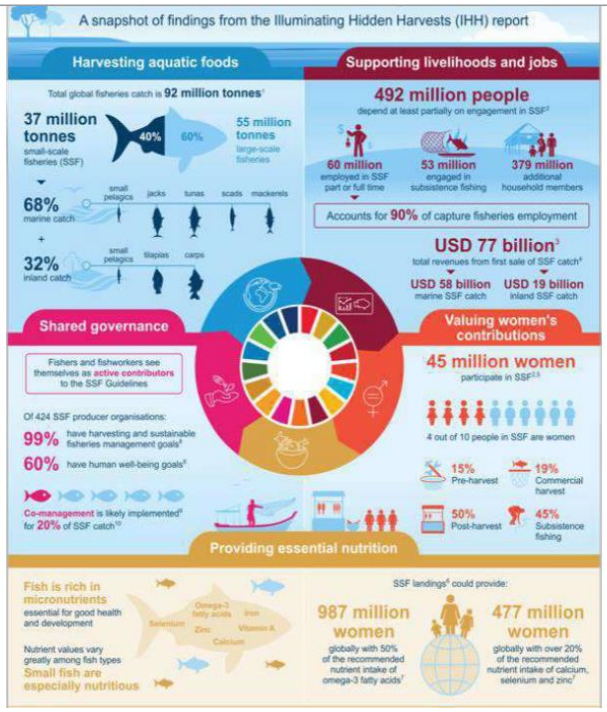
FIGURE 58 KEY MESSAGES OF IYAFA 2022



(2023)

Illuminating Hidden Harvests: the contributions of small-scale fisheries to sustainable development (IHH) is a global study uncovering the contributions and impacts of small-scale fisheries through a multidisciplinary approach to data collection and analysis. The study provides information that quantifies and improves understanding of the crucial role of small-scale fisheries in the areas of food security and nutrition, sustainable livelihoods, poverty eradication and healthy ecosystems. It also examines gender equality as well as the nature and scope of governance in small-scale fisheries.

https://doi.org/10.4060/cc4576en



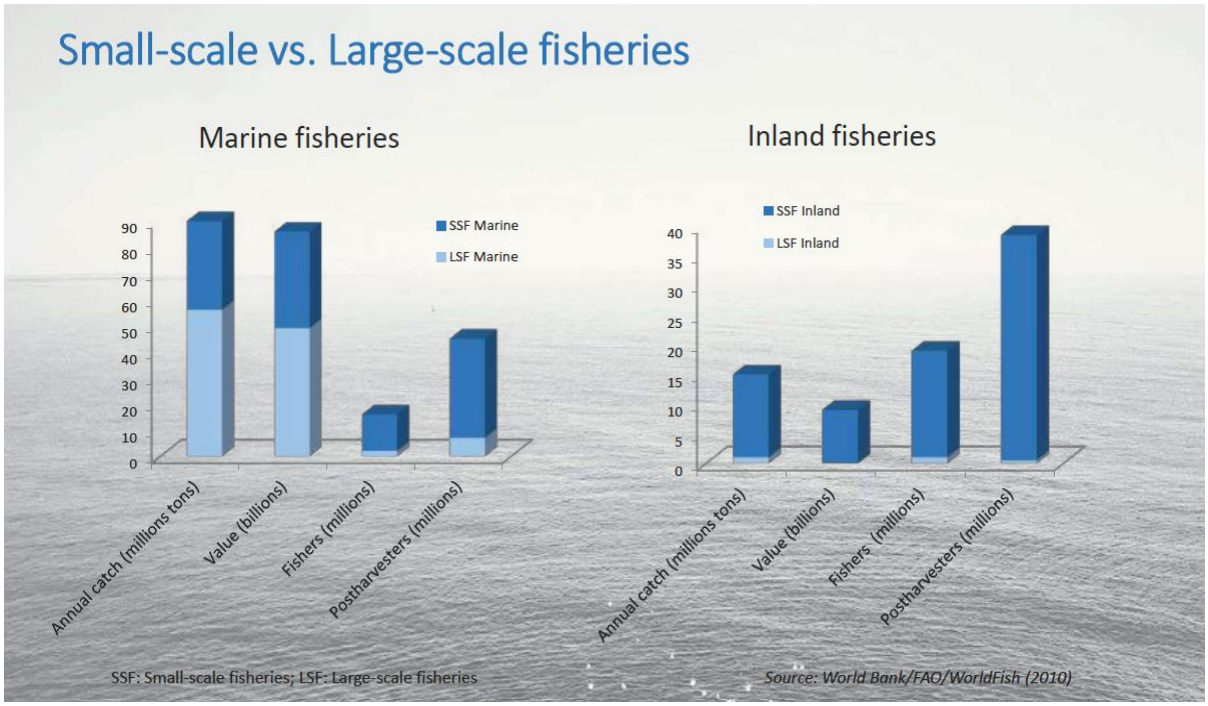
Asia was the region with the largest contribution of small-scale fisheries catch during 2013–2017, accounting for 64 percent (23.4 million tonnes) of the global total, while Oceania was the region with the least absolute contribution, at 0.4 million tonnes.

https://www.fao.org/documents/card/en/c/cc4576en

https://www.fao.org/3/cb8233en/cb8233en.pdf

Build on IHH study approaches and methods to improve data collection and analysis, moving beyond the limitations of "business as usual"

- Disaggregating data and information on both small- and large-scale fisheries to allow for governance and management decisions that are adapted to the multidimensional characteristics of small-scale fisheries;
- Applying participatory and innovative approaches, including drawing on traditional and local knowledge and expert insight;
- Applying multidisciplinary and multisource approaches, encompassing all interlinked dimensions of small- scale fisheries and their contributions, and creating integrated information systems;
- Making better use of surveys not specifically directed at fisheries, e.g. household-based surveys and those of the World Bank Living Standards Measurement Study, as well as integrating fisheries-specific modules with such surveys.



FISHERY *BENEFITS*	LARGE SCALE	SMALL SCALE
Number of fishers employed	about ½ million	over 12 millions
Annual catch of marine fish for human consumption	about 29 million tonnes	about 24 million tonnes
Capital cost of each job on fishing vessels	$30,000 - $300,000	$250 - $2,500
Annual catch of marine fish for industrial reduction to meal and oil, etc.	about 22 million tonnes	Almost none
Annual fuel oil consumption	14 – 19 million tonnes	1 – 3 million tonnes
Fish caught per tonne of fuel consumed	2 – 5 tonnes	10 – 20 tonnes
Fishers employed for each $1 million invested in fishing vessels	5 - 30	500 – 4,000
Fish and invertebrates discarded at sea	10-20 million tonnes	Little

Pauly (2007)

What other important questions about small-scale fisheries?

Who fish, where, how, why?

What happens to their catches? Who benefits? Are they viable? What makes them vulnerable?

What contribution are they making to the local community and the society at large?

What role do they play in conservation and stewardship?

How secured are their access/rights to resources?

How best to govern them?

Information System on Small-scale Fisheries (ISSF)

Open, web-based, interactive, crowd-sourced

Who's Who in SSF

State-of-the-Art

SSF Profile

SSF Organizations

SSF Blue Justice

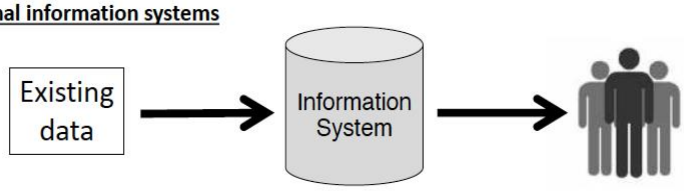
SSF Case studies

SSF Guidelines

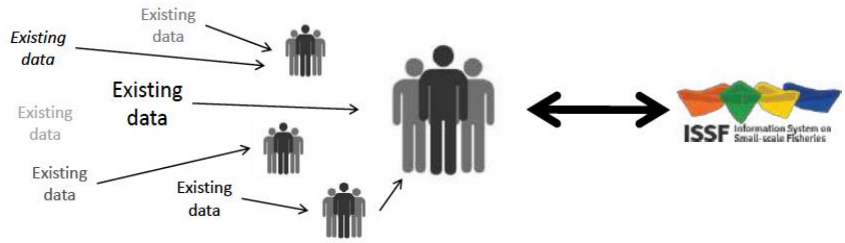
issfcloud.toobigtoignore.net

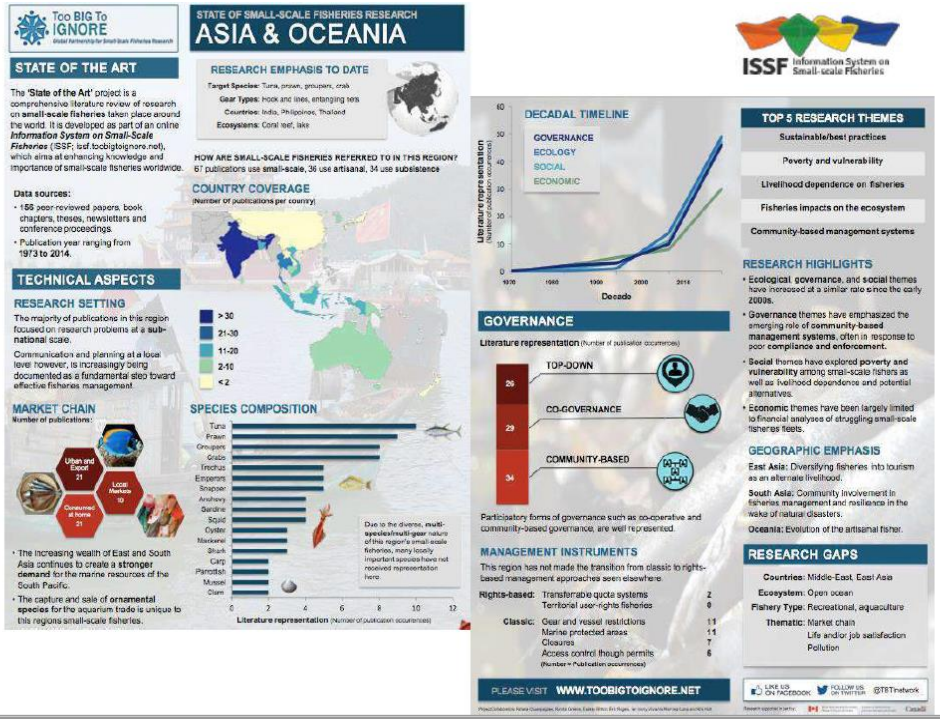
From traditional to unconventional

Traditional information systems



Crowdsourced information systems





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Small-scale fisheries in the context of Ecosystem-Based Management

Alida Bundy, Fisheries and Oceans Canada,

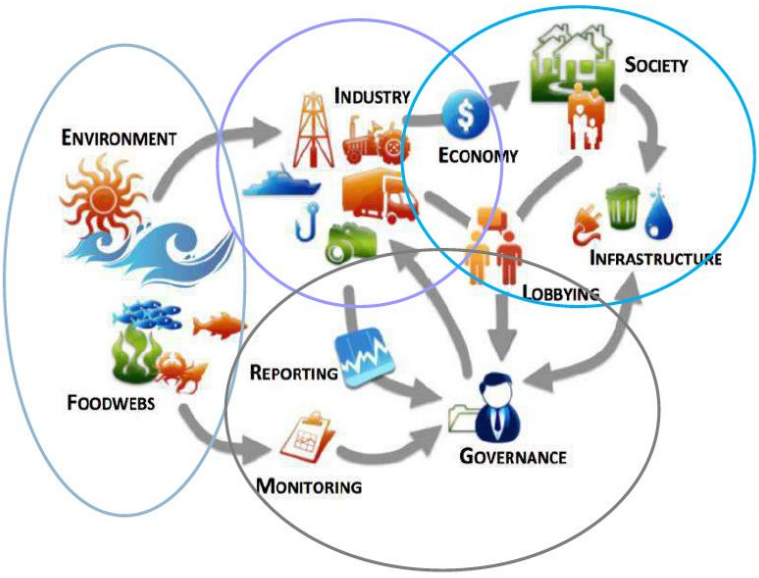
Presentation to APEC SSF workshop, 1 February 2024

Context for Ecosystem Based Management

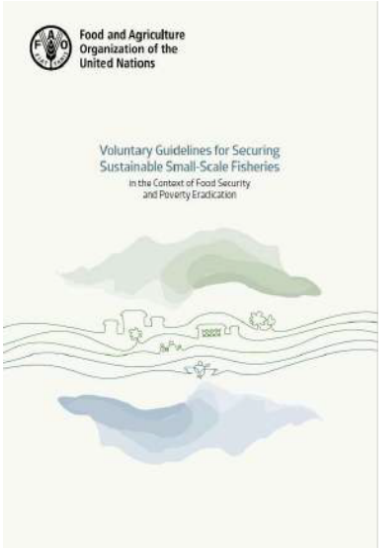
- Widespread recognition (internationally and economy-wide) of the need for more holistic or comprehensive approach to fisheries and oceans management
- We are managing social-ecological systems, and trying to achieve **sustainable development**
- An **ecosystem approach**, or ecosystem-based management approach has been widely proposed as the means to accomplish this

Social-ecological system

"Integrated complex systems that include social (human) and ecological (biophysical) subsystems in a two-way feedback relationship" (Berkes, 2011).



(Centre for Marine Socioecology/Beth Fulton)



SSF Guidelines

Guiding Principle # 11:

Holistic and integrated approaches: recognizing the ecosystem approach to fisheries (EAF) as an important guiding principle, embracing the notions of comprehensiveness and sustainability of all parts of ecosystems as well as the livelihoods of small-scale fishing communities, and ensuring cross-sectoral coordination as small-scale fisheries are closely linked

Definitions Abound: FAO 2003

- An **Ecosystem Approach to Fisheries** strives to balance diverse societal objectives, by taking into account the knowledge and uncertainties about biotic, abiotic and human components of ecosystems and their interactions, and applying an integrated approach to fisheries within ecologically meaningful boundaries (FAO 2003)

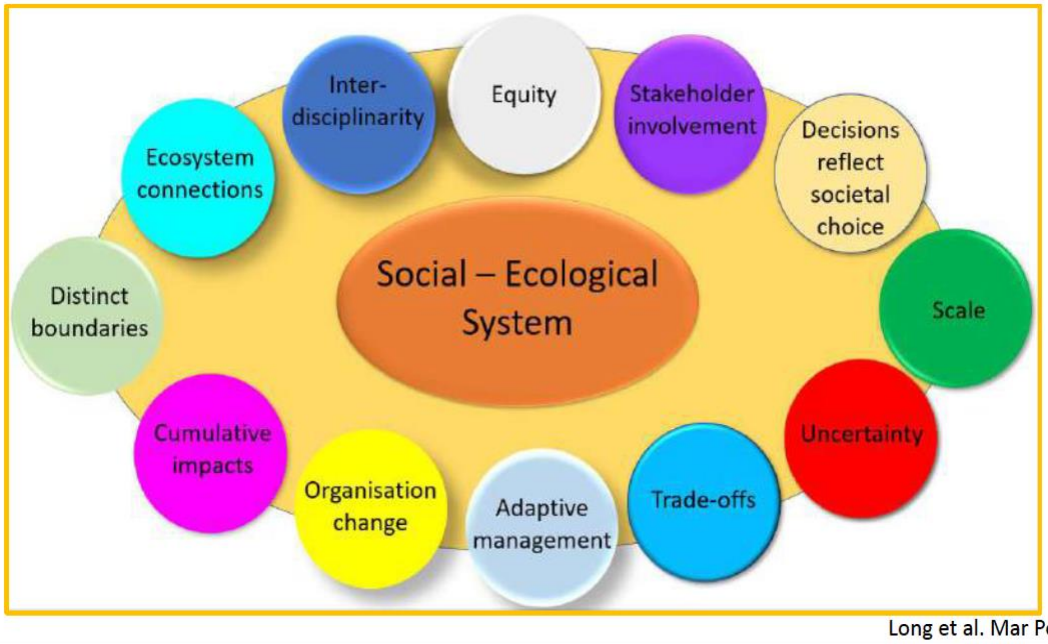
EBM Definitions

Ecosystem-based management is an interdisciplinary approach that balances ecological, social and governance principles at appropriate temporal and spatial scales in a distinct geographical area …….. EBM recognizes coupled social-ecological systems with stakeholders involved in an integrated and adaptive management process where decisions reflect societal choice.
Long et al. Marine Policy 2015

'balancing human activities and environmental stewardship in a multiple-use context'.

Smith et al. IJMS 2017

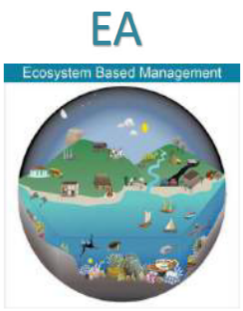
Principles of Ecosystem Base Management

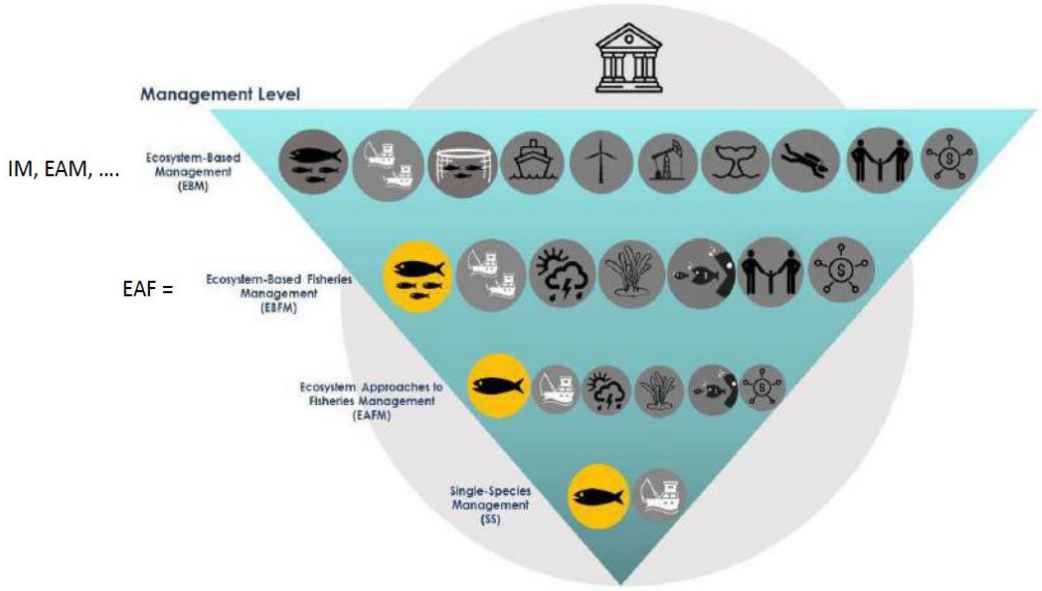


Long et al. Mar Pol (2015)

Alphabet Soup of Acronyms!

- **EA -** ecosystem approach
- **EAM** - ecosystem approach to management
- **EBM** - ecosystem-based management
- **EBFM -** ecosystem-based fisheries management
- **EAF -** ecosystem approach to fisheries
- **EAFM** – ecosystem approach to fisheries management
- **IM** – Integrated Management
  - **IOM** – Integrated Ocean Management
  - **ICZM** - Integrated Coastal Zone management





What are some of the benefits of EBM?

- optimize benefits among a diverse set of societal goals
- identify trade-offs and benefits among activities and resources within an ecosystem
- understand the cumulative impacts of a management action beyond just a single issue
- help communicate risks, uncertainties, and implications of management decisions
- ensure more transparent decision processes
- science-based EBM approach will enhance collaboration, leverage opportunities, and improve decision-making

AORA 2019.

"There are many **'right ways'** to move forward. EBM will be implemented differently in different historical, social, and ecological contexts."

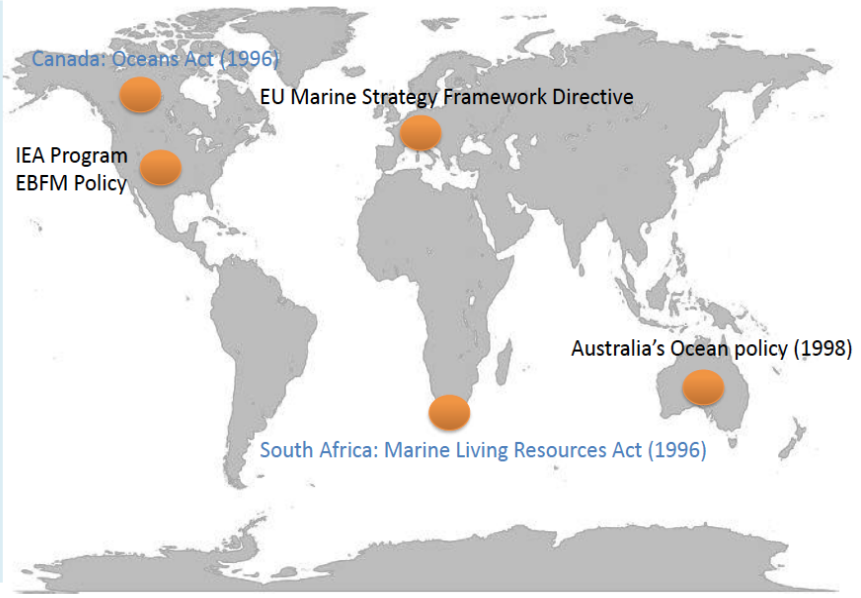
McLeod and Leslie, 2009, Ecosystem-Based Management for the Oceans

EBM related policy being widely developed

Rudd et al. 2019:
"there are adequate, existing mandates to authorize EBM"

BUT;
"the main impediments to implementation are governance and institutional frameworks rather than science" Tallis et al., 2010

"numerous impediments to effective EBM implementation arise, potentially relating to the lack of integration between agencies and departments, a lack of adequate policy" Rudd et al. 2019

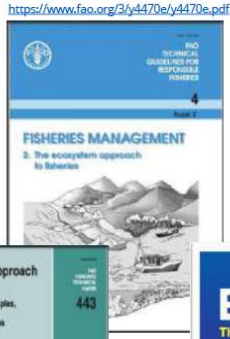


FAO Guidelines - Ecosystem Approach to Fisheries

The Ecosystem Approach to Fisheries strives to balance diverse societal objectives, by taking account the knowledge and uncertainties about biotic, abiotic and human components of ecosystems and their interactions.

KEY FEATURES OF THE EAF
- Holistic
- Participatory
- Based on the 3 pillars of sustainable development
- Best available knowledge
- Risk based approach
- Formal
- Adaptive

https://www.fao.org/3/y4470e/y4470e.pdf



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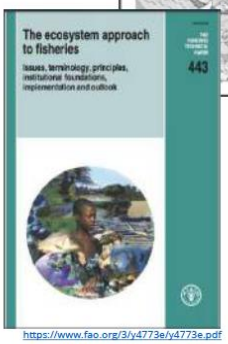

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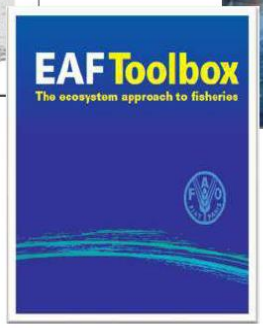


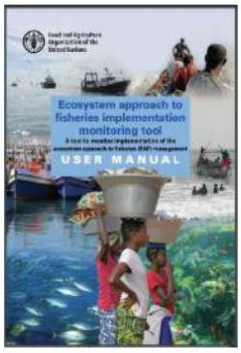
Fisheries and Aquaculture - Fisheries and Aquaculture - EAF Toolbox (fao.org)

Slide borrowed from presentation by Vera Agostini, FAO: PowerPoint Presentation (un.org)

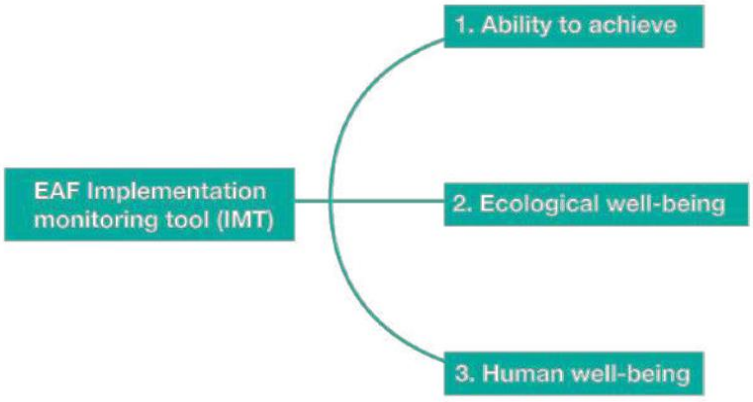
Implementation

EAF has "become a guiding approach for the practical implementation of sustainable development since its formal recognition in the past few decades" Vera Agostini (FAO, 2022)

UN EAF implementation review, May 2022; Report, Presentations



2021



FAO EAF implementation monitoring tool https://www.fao.org/documents/card/en/c/cb3669en

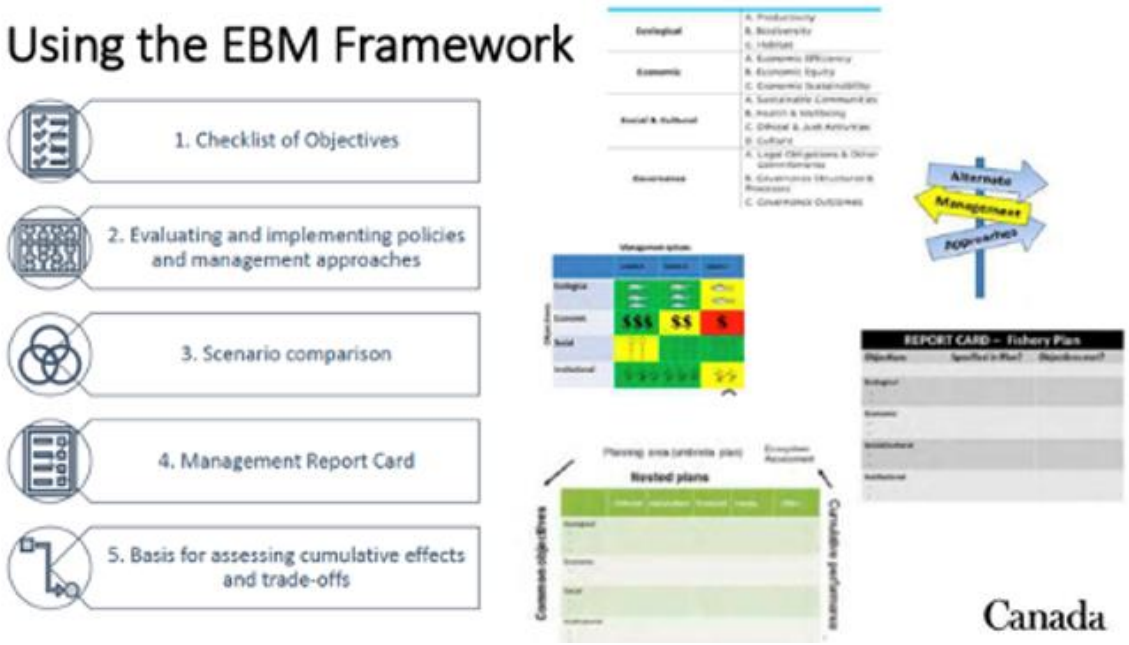
FAO - Legal reports on the Ecosystem Approach to Fisheries

These assessments analyse the extent to which 82 Ecosystem Approach to Fisheries legal requirements, considered the minimum standard, are reflected in the policies and legislation on fisheries; the environment; wildlife; and the maritime affairs of given economies

Angola	Guinea	Sao Tome and Principe
Bangladesh	Guinea_Bissau	Senegal
Cabo Verde	Kenya	Seychelles
Congo	Liberia	Sierra Leone
Cote d'Ivoire	Madagascar	South Africa
Gabon	Maldives	Sri Lanka
Gambia	Mozambique	Tanzania
Ghana	Namibia	Thailand
		Togo

EBM in Fisheries and Oceans , Canada

Pillars	Main Objectives
Ecological	A. Productivity B. Biodiversity C. Habitat
Economic	A. Economic Efficiency B. Economic Equity C. Economic Sustainability
Social & Cultural	A. Sustainable Communities B. Health & Wellbeing C. Ethical & Just Activities D. Culture
Governance	A. Legal Obligations & Other Commitments B. Governance Structures & Processes C. Governance Outcomes



Link to Small Scale Fisheries and Data

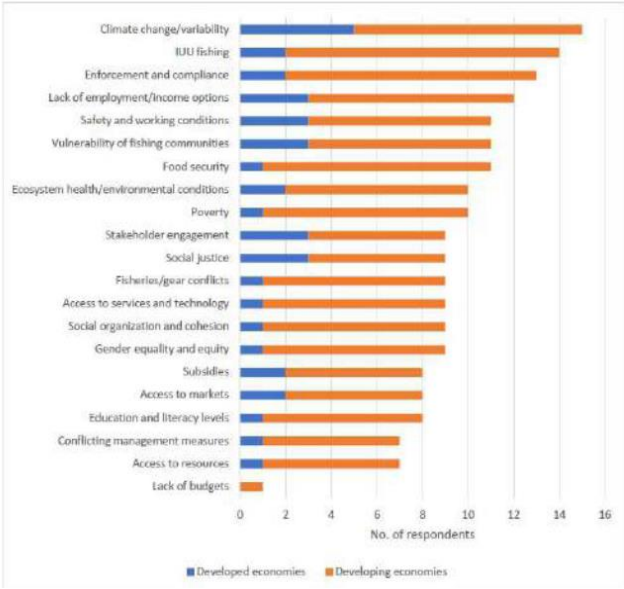
EAF	Ecological Well-being	Social Well-being		Ability to Achieve
EBM	Ecological	Economic	Social/Cultural	Governance
	Characteristics of small-scale marine capture fisheries: (a) Catch Information; (f) Other information	Characteristics of small-scale marine capture fisheries: (c) Crew Information; (d) Economic information	Characteristics of small-scale marine capture fisheries: (e) Social information	Characteristics of small-scale marine capture fisheries: (a) Catch Information; (b) Vessel Information
		Processing information	Processing information	Marine fishery data collection and management system
		Marketing/ trading information	Marketing/ trading information	Fisheries management and governance

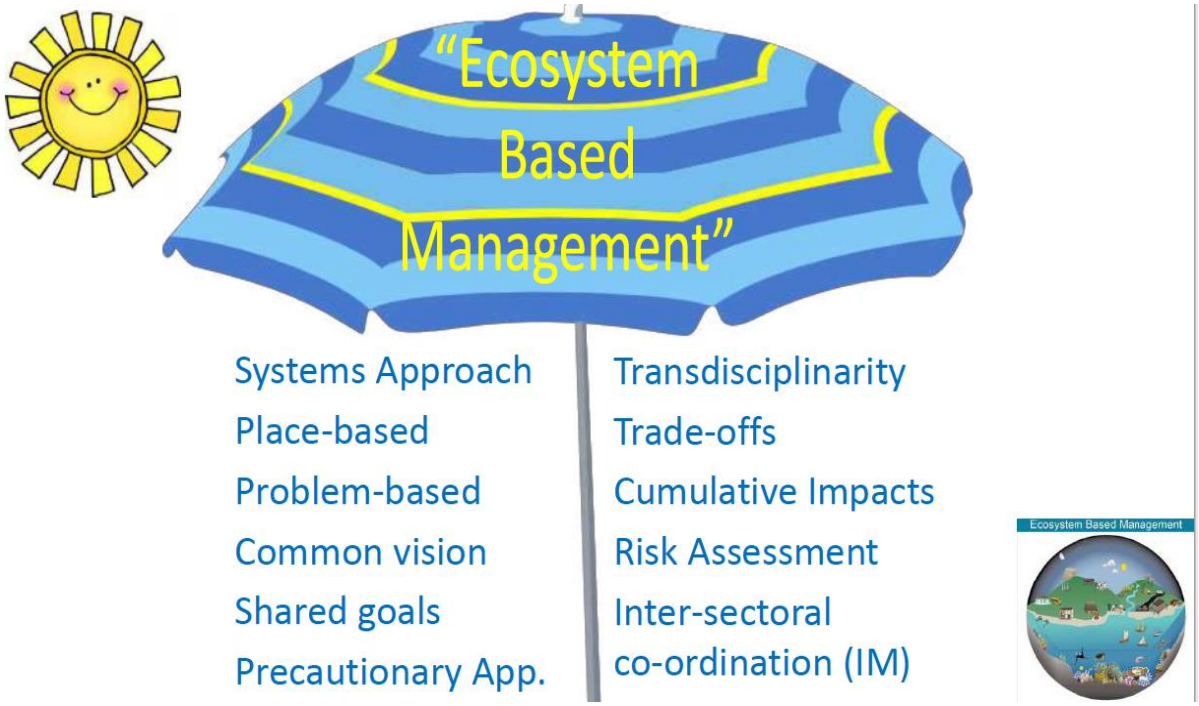
Challenges

APEC Survey

7. In collecting SMALL-SCALE MARINE CAPTURE FISHERIES data, what challenges do you face (or may face, if the data is not currently collected)? (Select ALL that apply)

- ❑ Too many fishers, too many vessels
- ❑ Too dispersed/too remote geographically
- ❑ Too many landing sites
- ❑ Lack of well-trained personnel for data collection
- ❑ Limited budget
- ❑ Language/cultural barriers
- ❑ Data security concerns
- ❑ Lack of trust in authorities
- ❑ Others (please specify):





Food and Agriculture Organization of the United Nations

Small-scale fisheries and Blue Transformation

Angela Lentisco
Fishery and Aquaculture Officer
Regional Office for Asia and the Pacific, FAO

Importance of aquatic food systems

There is growing recognition of importance of aquatic food systems to provide vital nutrition into the future

- Aquatic food systems provide 17% total global animal protein (>50% in several Asia and Pacific economies)
- Provider of key micronutrients and amino acids for better nutrition
- Lower Greenhouse Gas emissions and more efficient that land-based animal production systems
- Increasing demand for aquatic foods - driven by growth in populations, economies, urbanization and changing diets

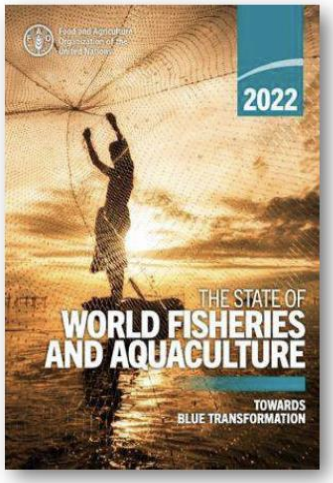
Global Blue Sector has changed over the past years

- Capture fisheries largely stable
- Aquaculture production 250% higher

-Fastest growing food production system for 50 years

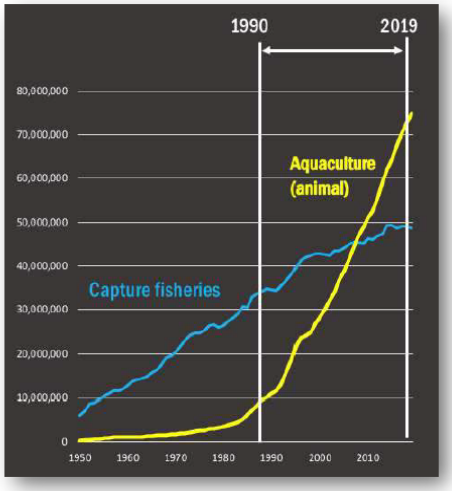
- Fish trade now >300% higher
- Per capita fish consumption 37% higher
- Volume of fish not used for food 30% lower

- FAO estimates 14% increase in global production of aquatic food by 2030
- Projected that per capita consumption will grow by 5% by 2030 (7% in Asia)



Total Asia-Pacific supply > 100 million tonnes

- The rising demand for aquatic food is clear
- **Capture fishery** landings (marine and inland) in 2021 was 46 Mt of animals (50 % of global)- 5/10 top producers are from the region
- Limited prospects for increasing capture fisheries except through management improvements.
- **Aquaculture** continues to increase - Asia producing 88% of globally farmed aquatic animals (80 Mt) and 99% of algae (35 Mt) in 2021.
- Aquaculture expected to grow by 22% by 2030



Employment in Fisheries and Aquaculture

- In 2020, an estimated 49.4 million people were involved in the primary sector as fishers and fish farmers in Asia
- This represents 84 %of global direct employment in fisheries and aquaculture
  - Capture fisheries – 30 million
  - Aquaculture – 19.3 million
- Adding dependants, subsistence and value change employees the sector supports the livelihoods of over 600 million people
- The majority of them in **small-scale fishers and fish-farmers,** and in **Asia**.
- **Women** represent about half of the people employed in the sector

What are small-scale fisheries?

What are small-scale fisheries?

What small-scale fisheries look like varies from one place or culture to another.

There is therefore no universal definition for what type of fisheries are 'small-scale', but as the name suggests, they are typically done on a smaller, non-industrial scale.

What are small-scale fisheries?

Generally, small-scale fisheries refer to both the act of catching fish, and to activities happening before and after the fishing itself.

For instance, tasks like building boats, repairing nets, processing fish and selling seafood are also part of small-scale fisheries.

What are small-scale fisheries?

Small-scale fisheries are often done by families, communities or small organizations.

The gear and technology used typically requires relatively low capital investment. The fish and fishery products are mostly sold in local markets, but can also reach domestic and international markets.

Blue Transformation Roadmap...sustaining supplies into the future

OBJECTIVE 1

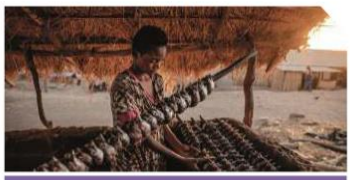
Sustainable aquaculture intensification and expansion satisfies global demand for aquatic foods and distributes benefits equitably.

OUTCOME: Achieve 35% growth in global aquaculture by 2030 with quality foods, produced sustainably

OBJECTIVE 2

Effective management of all fisheries delivers healthy stocks and secures equitable livelihoods.

OUTCOME: 100 per cent of marine and inland fisheries are placed under effective management, ending IUU fishing and able to produce Maximum Sustainable Yields



OBJECTIVE 3

Upgraded value chains ensure the social, economic and environmental viability of aquatic food systems.

OUTCOME: halving loss and waste, more transparency and traceability, better market access, more consumer awareness...

Blue Transformation

- FAO's Blue Transformation outlines a vision to expand aquatic food systems and increase their contribution to nutritious and affordable healthy diets for the most vulnerable, while fostering equitable growth, especially for those communities that depend on fisheries and aquaculture.

An equitable future

Sustainable aquatic food systems can respect the rights and incomes of dependent communities and ensure more equitable outcomes.

A pledge for resilience

Sustainable aquatic food systems help address human and environmental impacts on aquatic resources, such as the loss of biodiversity or the climate crisis.

A practical solution

Sustainable harvesting and production of aquatic foods provide people with affordable nutrition and healthy diets while maintaining a low environmental footprint.

Innovation & efficiency

Sustainable and efficient aquatic food systems can increase access to safe and nutritious food, reducing loss and waste across the entire value chain through innovative practices or novel technologies.

OBJECTIVE 1

Sustainable aquaculture intensification and expansion satisfies global demand for aquatic foods and distributes benefits equitably.

OUTCOME: Achieve 35% growth in global aquaculture by 2030 with quality foods, produced sustainably

Aquaculture in Asia-Pacific is extraordinarily diverse, with a broad range of farming systems, all environments, hundreds of species, millions of producers - large and small

Sustainable aquaculture expansion and intensification

Aquaculture transformation in Asia and the Pacific region

Vision to 2030

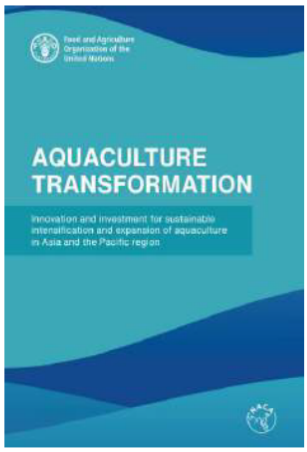
Aquaculture in Asia and the Pacific region is transformed into more efficient, inclusive, resilient and sustainable aquatic food systems through innovation, investment and partnerships.

Promote Equity - Empower small producers, women, youth and Indigenous Peoples to receive equal opportunities for access to training, information, technology and markets.

- Encourage more opportunities and market access for **small-scale and artisanal aquaculture** through value chain improvements and marketing.

Establishing and promoting transparency, certification and improvement systems

- Give special attention to the **empowerment of small farmers and value chain actors** in certification and aquaculture improvement schemes, including through better farmer and stakeholder organizations that enable better access to knowledge, services, markets and certification



https://www.fao.org/3/cc4962en/cc4962en.pdf

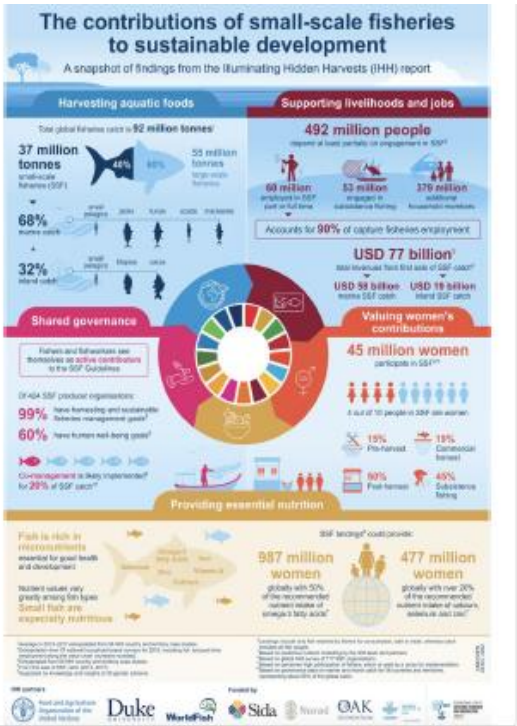
OBJECTIVE 2

Effective management of all fisheries delivers healthy stocks and secures equitable livelihoods.

OUTCOME: 100 per cent of marine and inland fisheries are placed under effective management, ending IUU fishing and able to produce Maximum Sustainable Yields

Why small-scale fisheries?

- Over 90% of all capture fishers and fish workers are small-scale
- Most are in developing economies
- 40 % are women
- Many occasional fishers and fish workers
- Small-scale fisheries contribute to food security and poverty alleviation
- They are often "Hidden"
- Diverse and an important source of income and nutrition to many communities



Illuminating SSF in Asia

SSF catch:

0.41 million tonnes Oceania

23 million tonnes Asia

SSF formally under co-management:

89% Oceania

25% Asia

SSF catch could provide:

20% of the recommended daily intake for Ca, Se Zn, O3 to

SSF employment:

50,000 Oceania

46.1 million Asia

Women participating in SSF:

0.68 million Oceania

36.9 million Asia

OBJECTIVE 3

Upgraded value chains ensure the social, economic and environmental viability of aquatic food systems.

OUTCOME: halving loss and waste, more transparency and traceability, better market access, more consumer awarenes

Estimating contribution of SSF in international trade

- Asia dominates participation in small-scale fisheries activities with 92.6 million (81.9 percent) of the estimated 113.0 million people worldwide who are either employed along the small-scale fisheries value chain or engaged in subsistence activities (harvesting or processing).
- The majority (69.1 percent) of the landed economic value from small-scale fisheries estimated is generated in Asia

Blue Transformation

Support the development of market insertion possibilities for businesses, including in collaboration with other international organizations, focusing on equitable market access for small-scale actors.

Blue Transformation Roadmap...underpinned by the SSF Guidelines

OBJECTIVE 1

Sustainable aquaculture intensification and expansion satisfies global demand for aquatic foods and distributes benefits equitably.

OUTCOME: Achieve 35% growth in global aquaculture by 2030 with quality foods, produced sustainably

OBJECTIVE 2

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OBJECTIVE 3

Upgraded value chains ensure the social, economic and environmental viability of aquatic food systems.

OUTCOME: halving loss and waste, more transparency and traceability, better market access, more consumer awareness...

The Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication

10th Anniversary

Negotiated international instrument entirely dedicated to SSF

- A global consensus on principles and guidance for small-scale fisheries governance and development

Bring together social development and responsible fisheries

- Beyond fisheries: sustainable livelihoods, social stability, food security and sustainable social and economic development

Complement other international instruments

Code of Conduct for Responsible Fisheries; Tenure Guidelines; Right to Food Guidelines; SDGs

GROUNDED IN **HUMAN RIGHTS PRINCIPLES**

https://www.fao.org/documents/card/en/c/I4356EN

Global significance

- First ever international instrument entirely dedicated to SSF
- Bring together social development and responsible fisheries
- Support individuals and communities to develop their capabilities to actively and meaningfully participate in decision-making
- Instruments that guide governments and others in improving food security and poverty eradication policies and in advancing sustainable development

Key elements of the SSF Guidelines

Part I: Introduction

1. Objectives
2. Nature and scope
3. Guiding principles
4. Relationship with other international instruments

Part II: Responsible fisheries and sustainable development

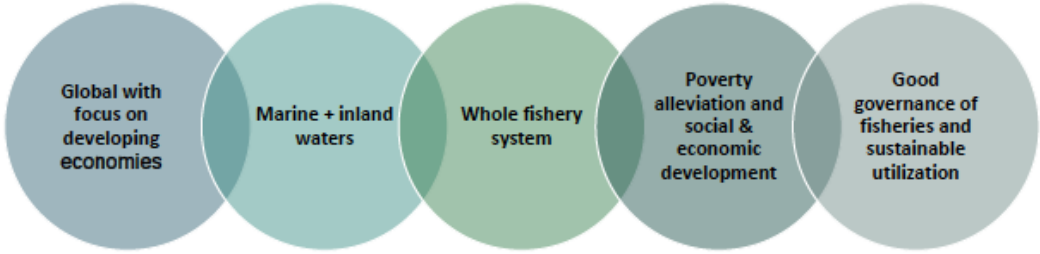
5. Governance of tenure in SSF and resource management
6. Social development, employment and decent work
7. Value chain, post-harvest and trade
8. Gender equality
9. Disaster risks and climate change

Part III: Ensuring an enabling environment and supporting implementation

10. Policy coherence, institutional coordination and collaboration
11. Information, research and communication
12. Capacity development
13. Implementation support and monitoring

Objectives of the SSF Guidelines

Scope of the SSF Guidelines



The SSF Guidelines support and build on other initiatives and instruments for sustainable development

SSF Guidelines: guiding principles

SSF Guidelines thematic areas

National Plan of Action for Small-Scale Fisheries

- The guiding principles of the SSF Guidelines require non-discriminatory and informed participation of small-scale fisheries communities, in transparent and rules-based decision-making processes.
- In support of this, FAO has developed the NPOA-SSF process to provide guidance on how to develop and implement a National Plan of Action for Small-Scale Fisheries (NPOA-SSF).
- The NPOA-SSF process proposes and describes various stages, steps, outputs and tools for developing and implementing an NPOA-SSF in a systematic and participatory way.
- It pays particular attention to the participation of small-scale fisheries actors in the NPOA-SSF development process, which requires explicit recognition of the challenges faced by small-scale fisheries actors and their organizations in terms of effectively engaging in consultations.

Five countries have launched NPOA-SSFs, namely Namibia, Malawi, Uganda and Tanzania and Magadascar.

The Philippines and Indonesia are on the NPOA-SSF development stage.

Tools for action

- In an effort to support implementation and raise awareness on the SSF Guidelines, FAO has developed many tools, guides and publications that focus on thematic areas and/or regions.
- The SSF-LEX platform has recently been created containing country profiles with detailed information relevant to small-scale fisheries.

To learn more, access the SSF Guidelines website

https://www.fao.org/voluntary-guidelines-small-scale-fisheries/en/

Conclusions and take-home messages

- The SSF Guidelines are a powerful tool for all - Internationally agreed framework of principles and guidance for integrated development
- SSF Guidelines implementation is key to foster participation and empowerment for improved food security and poverty eradication
- Different roles for different players to work together to ensure impact and change - Needs economy-wide and local level implementation!
- The Blue Transformation roadmap emphasizes the importance of small-scale fisheries and aquaculture in achieving sustainable and inclusive aquatic food systems.
- Guided by the Code of Conduct for Responsible Fisheries and the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries – Human Rights approach.
- Promotes responsible governance of tenure to ensure inclusive, sustainable, secure, and equitable access to fisheries, land, and water resources.

Thank you

Angela Lentisco
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Regional Office for Asia and the Pacific, FAO

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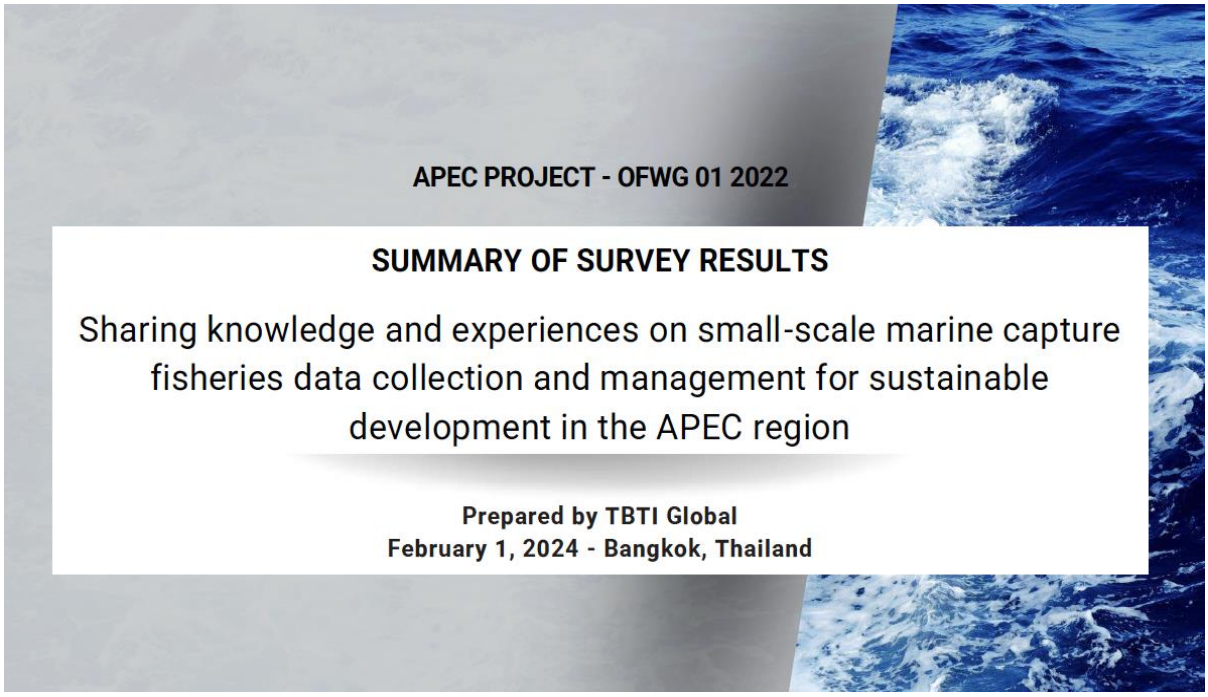
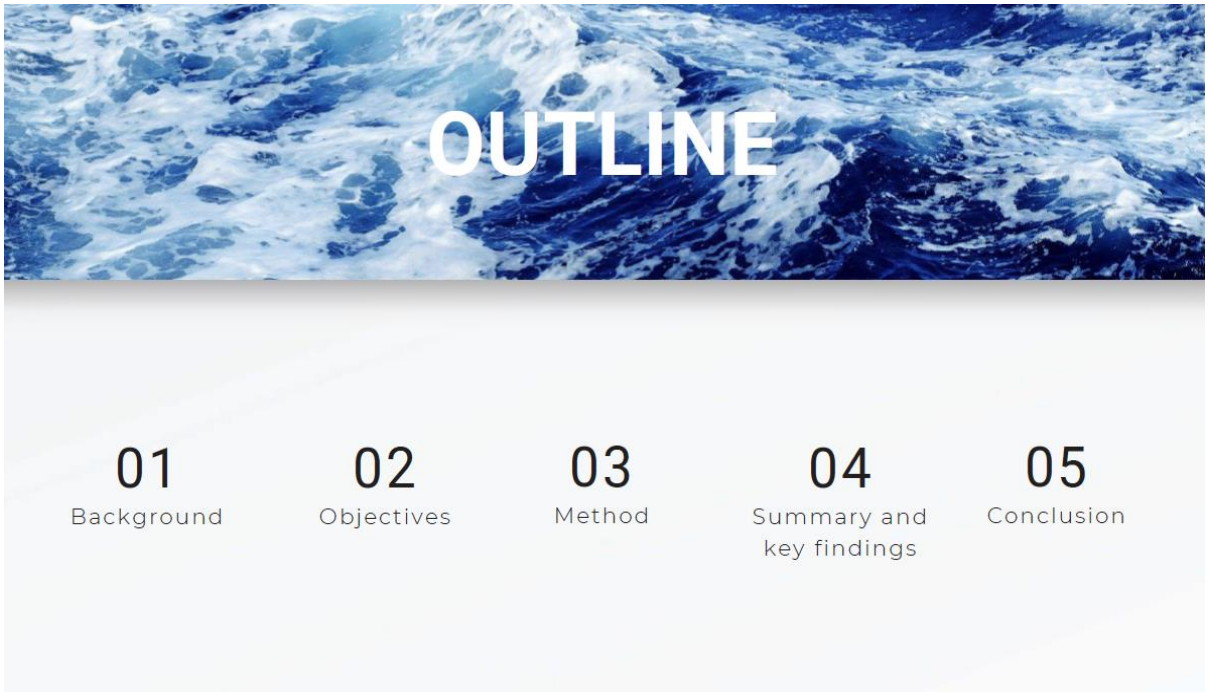
Don't miss!
Subscribe to the SSF Guidelines newsletter

http://bit.ly/subscribe_SSFUpdate

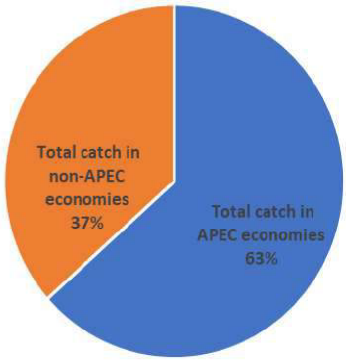

APEC PROJECT - OFWG 01 2022
SUMMARY OF SURVEY RESULTS
Sharing knowledge and experiences on small-scale marine capture fisheries data collection and management for sustainable development in the APEC region
Prepared by TBTI Global
February 1, 2024 - Bangkok, Thailand


OUTLINE
01 Background
02 Objectives
03 Method
04 Summary and key findings
05 Conclusion

BACKGROUND

Marine fisheries in the APEC region contribute about 63% of the global marine catch in 2019 demonstrating its importance to the economies and livelihoods of many APEC member economies.

Catches from small-scale marine capture fisheries in the APEC economies account for approximately 37% of the global catches.



Source of estimates: www.seaaroundus.org

OBJECTIVES

01 The project aims to address data gaps in small-scale fisheries, supporting informed decision-making, ecosystem-based management, and achieving Sustainable Development Goals.

02 The main goal is to improve information about small-scale marine capture fisheries through the understanding of data and data collection system, and the management of the sector in the APEC region.

03 By fostering collaboration and knowledge exchange, the initiative seeks to implement sustainable practices aligned with global guidelines and frameworks, contributing to the APEC Roadmap on Combatting IUU fishing and promoting sustainable development on land and sea.

METHODS

(1)
Desk study review

(2)
Examining existing data, like FAO Illuminating Hidden Harvest (IHH) and Too Big To Ignore (TBTI) Information System on Small-Scale Fisheries (ISSF)

(3)
Development of survey questionnaire, with a mix of questions. Expert reviews, including feedback from FAO, government representatives, and academics, contribute to the survey's refinement

(4)
Distributed survey to APEC's OFWG focal points and other stakeholders, Compiling data for analysis and synthesis. Zero drafting of "Best Practices"

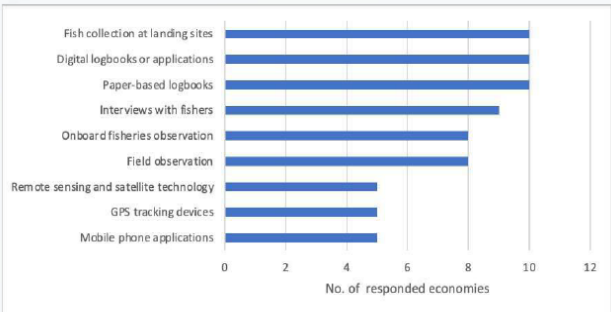
SUMMARY AND KEY FINDINGS

- A total of 17 responses were returned from 11 economies.
- Given the limited sample size, these results do not claim to represent the entirety of the APEC region but offer valuable insights about the participated economies.
- The collected data provides a preliminary understanding of trends and practices in small-scale marine capture fisheries within the APEC community.

APEC Economies	OFWG Focal Point	Independent researchers
Japan		3
Republic of Korea		1
Malaysia	1	1
Papua New Guinea	1	
Peru	1	
The Philippines	1	1
Chinese Taipei	1	
Thailand	2	
Mexico		1
Chile	2	
Viet Nam	1	
Total	10	7

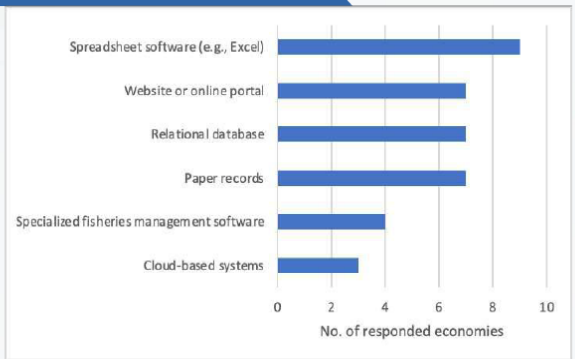
A. DATA COLLECTION TOOLS AND METHODS

- Paper-based logbooks are still common but there are noticeable shifts towards digital logbooks and applications.
- The use of remote sensing and satellite technology also suggests that there is a level of technological integration for data collection.
- The emphasis on location-based data highlights the importance of spatial information for informed decision-making in fisheries management.



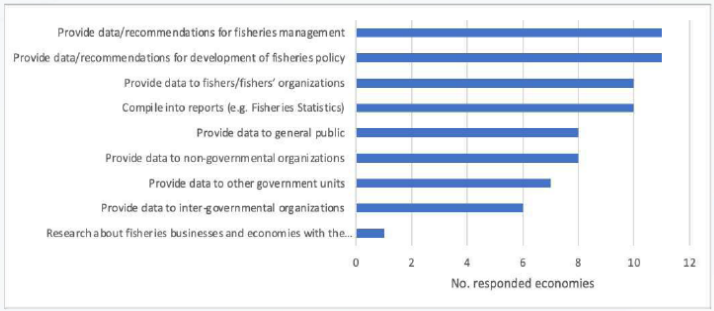
B. DATA STORAGE AND MANAGEMENT SYSTEM

- The use of paper records and spreadsheet to store and manage fisheries data are common method, indicating reliance on traditional tools.
- There is a higher adoption of various information management systems such as the use of relational databases, cloud-based systems, and online portals, showcasing technological advancement..
- The utilization of specialized fisheries management software reveals a tailored and advanced approach in data management
- The adoption of cloud-based systems reflects a trend towards scalable and remotely accessible solutions in small-scale marine capture fisheries data management,



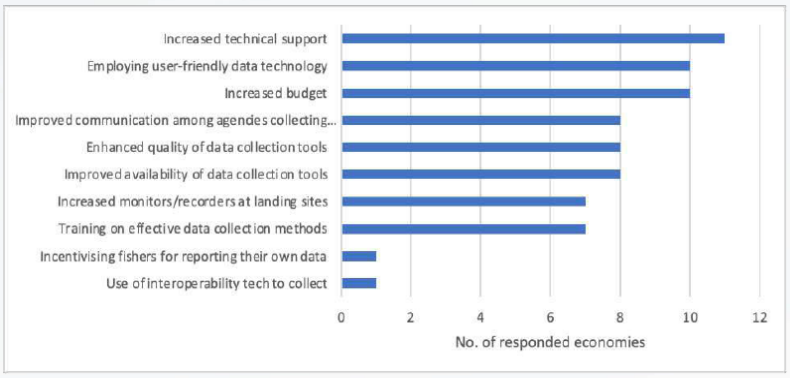
C. DATA UTILIZATION

- Data compilation for reports recognizes its importance for dissemination and policymaking.
- Some economies indicate lesser emphasis on public and international organization access,
- The emphasis on data for research and assistance during calamities highlights the broader societal and emergency applications of small-scale fisheries data.



D. RESOURCES/SUPPORT TO IMPROVE SMALL-SCALE MARINE CAPTURE FISHERIES DATA COLLECTION AND MANAGEMENT

- Common goals include increase budget allocation, user-friendly technology, technical support, and the importance of training and capacity building.
- Real-time monitoring at landing sites.
- Improved communication, user-friendly technology, and incentivizing fishers for greater fisher participation.



E. AGENCIES RESPONSIBLE FOR DATA COLLECTION

- APEC economies involve multiple institutions in data collection, indicating a collaborative and sector-specific approach.
- Government fisheries agencies are crucial in enforcing regulations, promote community involvement, and ensure adherence to regulatory requirements.
- The engagement of local government units, cooperatives, and international organizations indicates multi-level and cross-border approach.

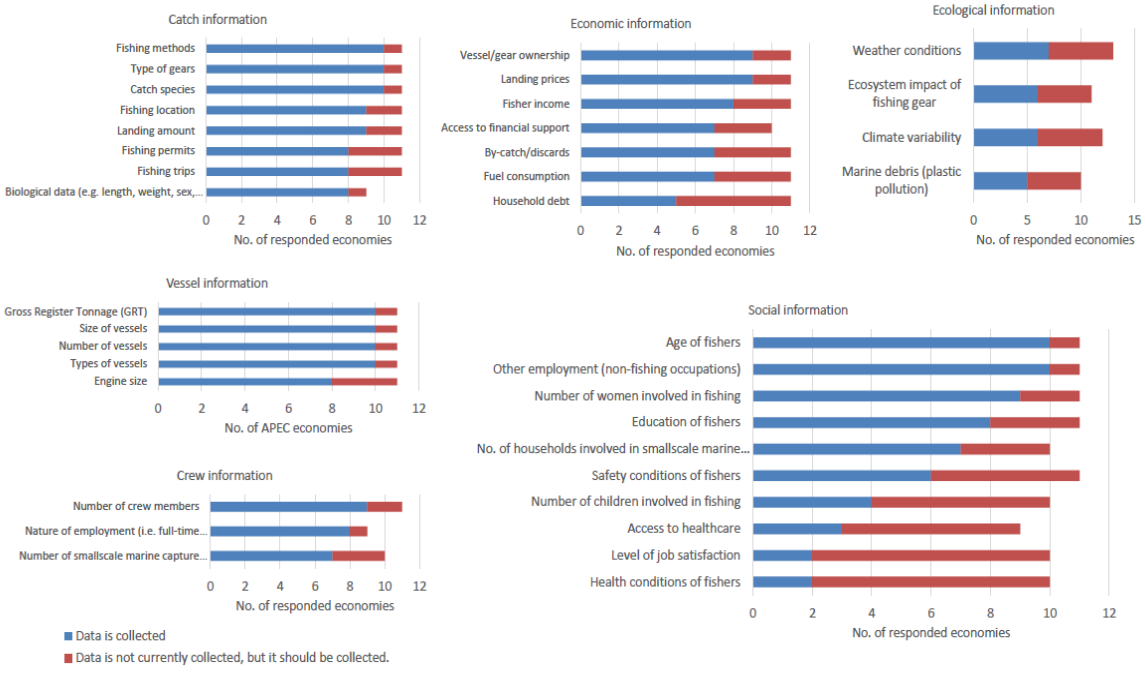
F. DEFINING SMALL-SCALE FISHERIES

- Varying criteria exist among economies for categorizing small-scale fisheries, often reflecting a close connection to local marine environments and cultural heritage.
- Among the APEC economies surveyed, 47% have defined small-scale fisheries, 41% have not explicitly defined them, and 12% indicates lack of any definition.
- The responses suggest differences in legal frameworks and management approaches, hindering targeted policies for sustainable management.

G. INFORMATION ON THE FISHERIES VALUE CHAIN

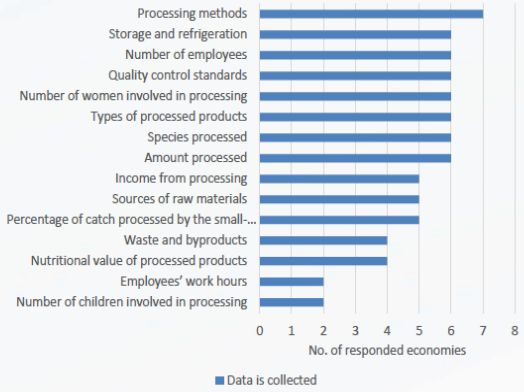
• HARVESTING INFORMATION

- Catch/fishing information is uniformly collected but improvement is needed in gathering biological data and workforce size details.
- Vessel information is consistent, with slight gaps in engine size data.
- Economic data, including landing prices and fisher income, is well-collected, but areas like household debt and fuel consumption need improvement.
- Social information collection varies, with health conditions, access to healthcare, and job satisfaction needing enhancement.
- Regular collection of data on marine debris, weather conditions, climate variability, and ecosystem impact is crucial to address climate change impacts.



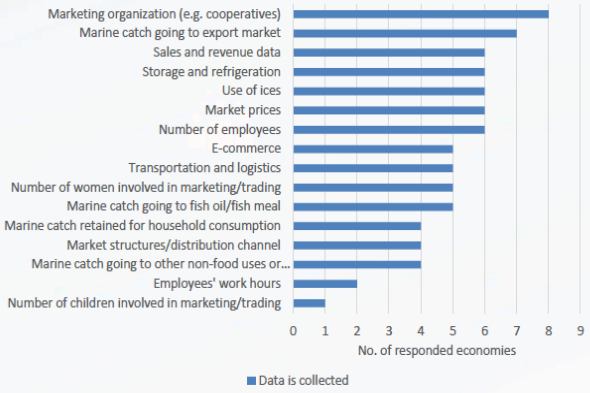
• FISH PROCESSING INFORMATION

- Data collected includes sources, amounts, and types of species, processing methods, and details on social and economic aspects, nutritional values, quality, and byproducts.
- Notable gaps exist in data on children's involvement, employees' work hours, nutritional value, waste and byproducts.



• MARKETING/TRADING INFORMATION

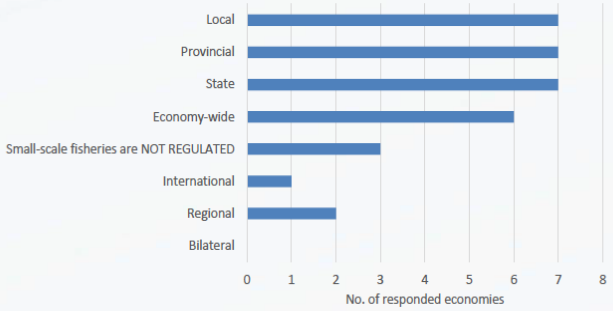
- Data collection on marketing/trading includes fish utilization, export markets, e-commerce, sales, revenue, and social aspects.
- There is a recognition of data collection gaps on human dynamics, especially related to women, children, employees, and work hours.
- The importance of e-commerce and integrating technology-related data collection methods is essential to adapt to evolving and emerging market trends



H. GOVERNANCE INFORMATION

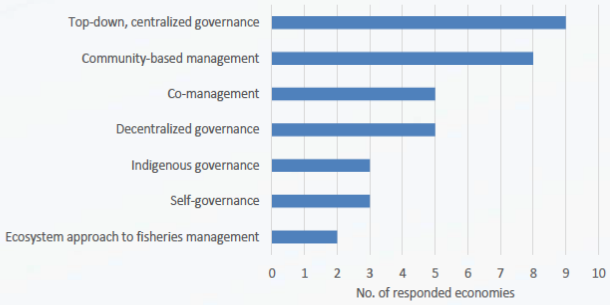
• LEVELS OF REGULATIONS IN SMALL-SCALE MARINE CAPTURE FISHERIES

- Several economies reported several levels of regulations of small-scale marine capture fisheries, from local, to provincial and state, or economy wide.
- A few responses indicated no regulations.
- There is also an indication of international and regional regulations.



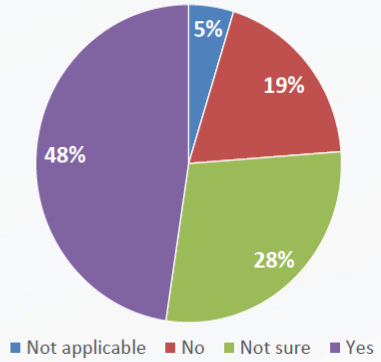
• WHAT MANAGEMENT/GOVERNANCE SYSTEM IS IN PLACE FOR SMALL-SCALE MARINE CAPTURE FISHERIES?

- Top-down governance and community-based management are common.
- Self governance is reported with some economies.
- However, there is also an indication that small-scale fisheries management and governance have not been implemented in some economies.



C. ASSESSMENT OF MANAGEMENT/GOVERNANCE EFFECTIVENESS

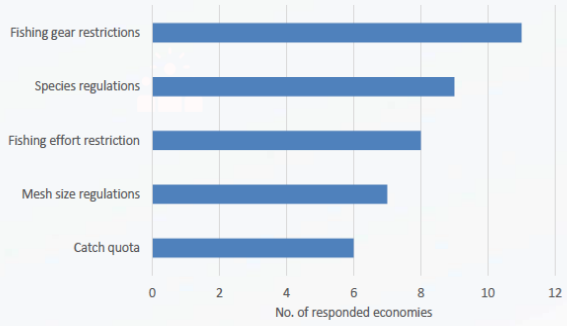
- 28% express uncertainty about government authorities assessing the effectiveness of small-scale marine capture fisheries management/governance
- while 48% are certain assessments occur
- 19% state no assessment is conducted
- 5% state assessment is not applicable



D. MEASURES, RULES, AND REGULATIONS APPLICABLE TO MANAGE SMALL-SCALE MARINE CAPTURE FISHERIES

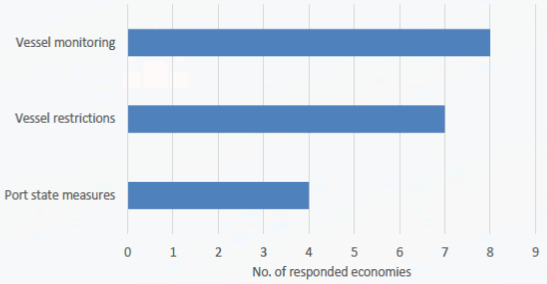
I. CATCH/FISHING REGULATIONS

- Fishing gear and fishing effort restrictions, mesh size, and species regulations, and catch quotas are common across economies
- Certain economies prioritize fishing gear restrictions and catch quotas highlights their technological and infrastructural capability.
- others focus on comprehensive measures reflecting overall ecosystem sustainability and local livelihood management



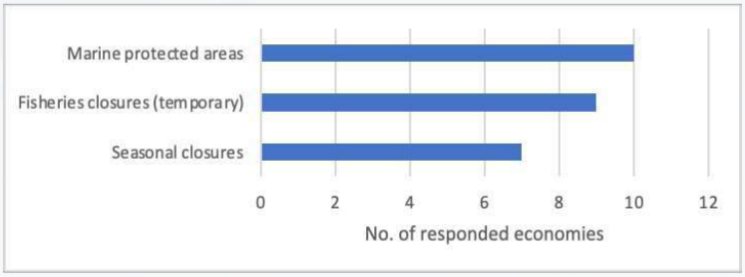
II. VESSEL REGULATION

- There is an emphasis on vessel monitoring and restrictions
- Port state measures should be adopted across economies because equal adoption signifies a shared responsibility for sustainable fisheries globally especially when dealing with IUU fishing



III. CLOSURE MEASURES

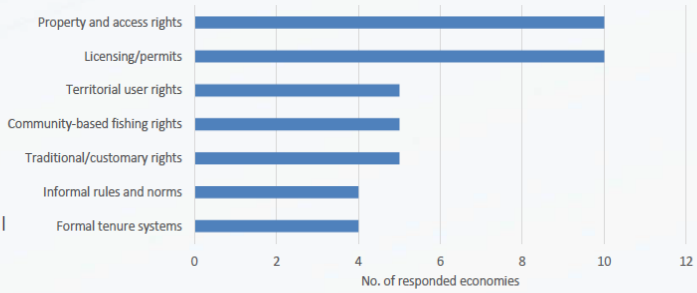
- Seasonal and temporary closures, along with marine protected areas, are adopted across economies



- the common use of marine protected areas underscores their potential for global marine biodiversity consideration, requiring careful considerations in terms of funding, enforcement, and stakeholder engagement for effective implementation while balancing conservation goals with the needs of local communities.

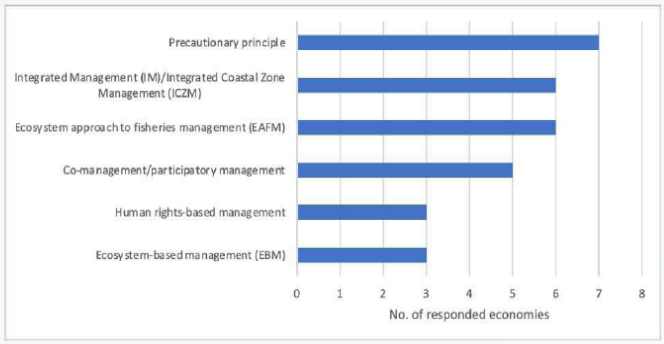
IV. ACCESS/RIGHTS

- Property and access rights and licensing/permits are common across economies, emphasizing formal regulatory mechanisms for sustainable fishing
- some economies prioritize traditional/customary rights, recognizing the importance of local cultural practices



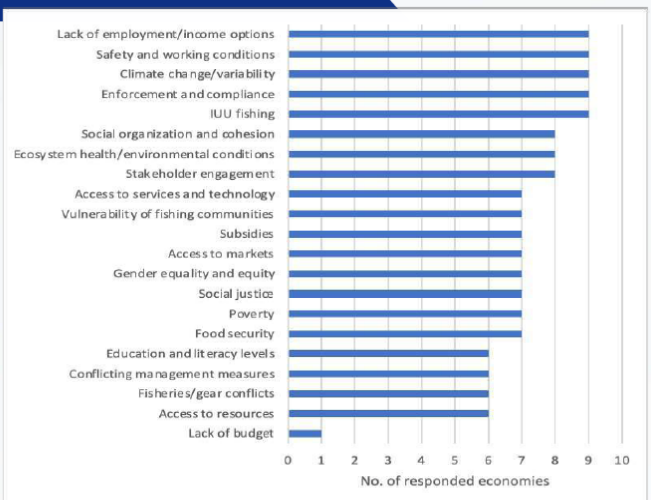
E. KEY PRINCIPLES, MAIN PURPOSE, MANDATES, FOR THE MANAGEMENT OF SMALL-SCALE MARINE CAPTURE FISHERIES

- There is a strong emphasis on the Precautionary Principle and Ecosystem Approach, highlighting caution and holistic ecosystem consideration
- Integrated Management (IM)/Integrated Coastal Zone Management (ICZM) is also common.
- Co-management/participatory management is equally emphasized, recognizing the importance of involving local communities in decision-making processes across the region.



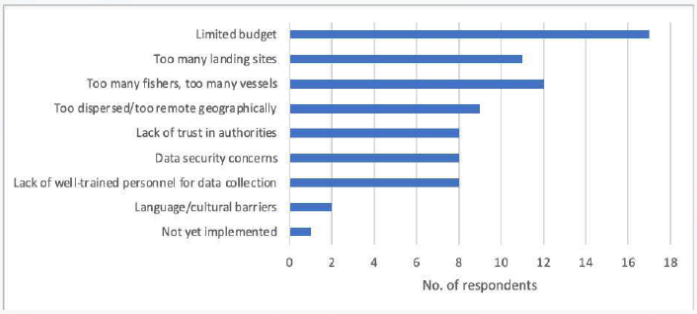
F. KEY ISSUES AND CHALLENGES FACING SMALL-SCALE MARINE CPATURE FISHERIES

- challenges faced by small-scale fisheries in the APEC region spanning economic, social, environmental, and governance dimensions
- Lack of employment, climate change, safety concerns, IUU fishing, enforcement, and poverty are some of key challenges for many economies.



I. CHALLENGES IN DATA COLLECTION

- Majority of economies are facing more significant struggles with geographical challenges, limited budgets, and a lack of well-trained personnel.
- Trust issues with authorities and data security concerns are also pronounced
- Tailored solutions considering operational and sociocultural factors to ensure effective data collection and management



CONCLUSION

Despite the limited survey responses, there is evident interest and demand for enhanced information and data collection systems in small-scale marine capture fisheries across the APEC region

Recognizing their significance, economies prioritize data collection efforts, acknowledging areas of necessity despite challenges.

Emphasizing the role of experience sharing and discussions to inform best practices and promote sustainability in small-scale marine capture fisheries in the APEC region.

PROMOTION ON ECOSYSTEM APPROACH TO FISHERIES MANAGEMENT IN SOUTHEAST ASIAN ECONOMIES




Panitard Weerawat
Southeast Asian Fisheries Development Center/
Training Department

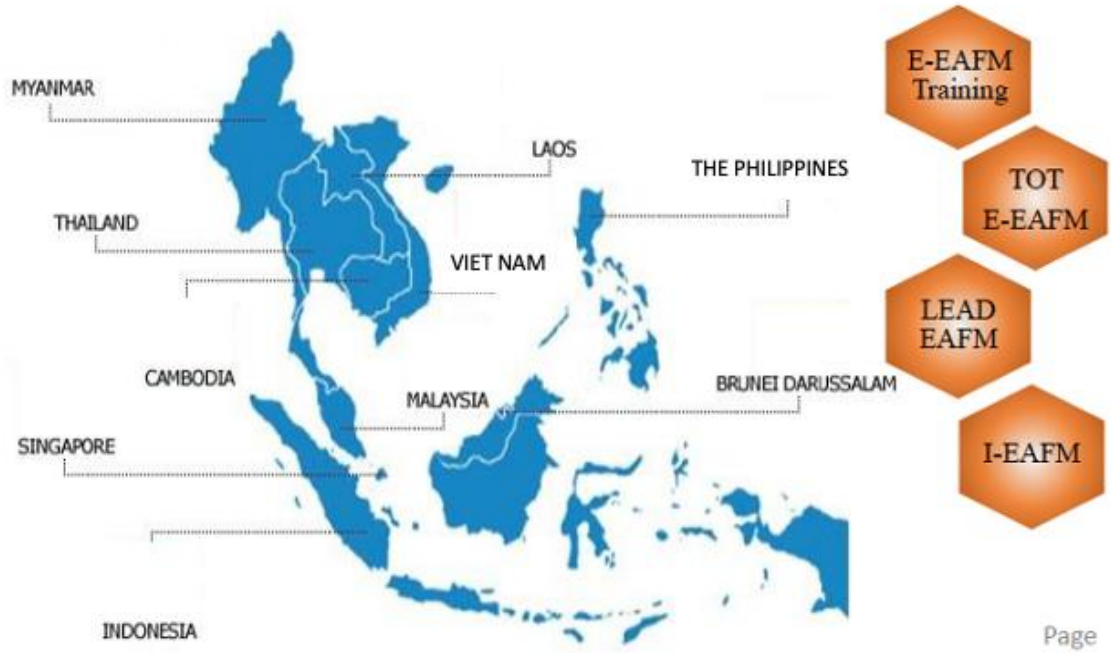
E-EAFM Training materials

www.eafmlearn.org

http://repository.seafdec.or.th/

Note: updated version in SEAFDEC website

Promoting Ecosystem Approach to Fisheries Management in Southeast Asian Economies



E-EAFM Training and TOT-EAFM

Regional

- Brunei Darussalam
- Cambodia
- Indonesia
- Lao PDR
- Malaysia
- Myanmar
- The Philippines
- Thailand
- Viet Nam

Economy-wide

- Cambodia
- Lao PDR
- Myanmar
- The Philippines
- Thailand
- Viet Nam

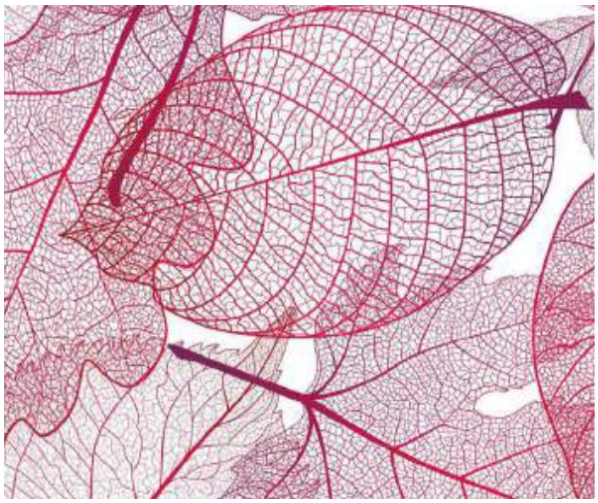
E-EAFM Trainees 550 ps.
E-EAFM Trainers 90 ps.

Lead EAFM

EAFM High-level Seminar for Leaders, Executives and Decision Makers (LEAD)*(Viet Nam (1), The Philippines (2), and MRC (1))*

I-EAFM: Learning sites

Page

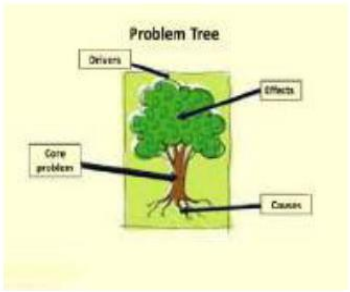


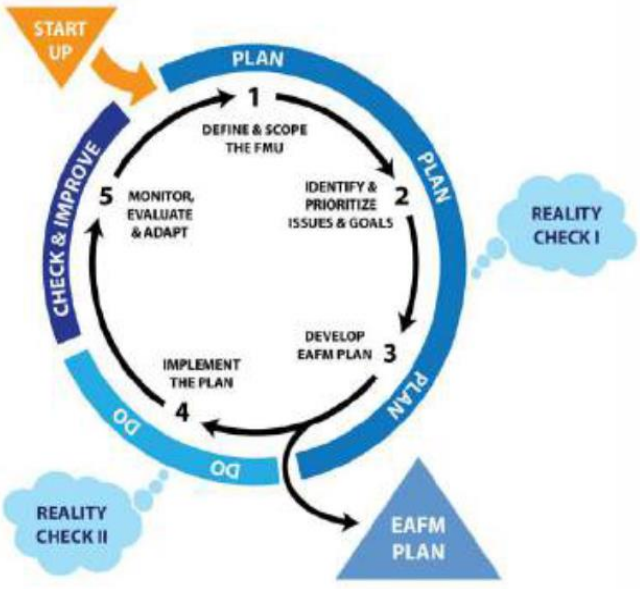
EAFM implementation in Thailand

Pilot Learning site:
Nainang village,
Krabi Province,
Thailand

Overview of Learning site

- Site: Nainang village, Muang, Krabi Province
- Area: 1,966 hectares (with natural resources)
- West side: Andaman Sea
- Population: 380 households with 1,500 people
- Livelihood: fisheries, rubber tree, palm, bee-keeping
- Community-based tourism





Background

- Conflict between groups of people (bamboo stake traps operators vs mackerel gillnet fishers)
- Decreasing aquatic animal resources and fishers' income
- In 2017, HRD- on E-EAFM and TOT-EAFM
- Revisit the existing FMP with EAFM principles
- Engage key stakeholders participating in developing and implementing EAFM plan

EAFM plan

Vision:

Developed sustainable fisheries resource management for economic security and peace of the community

Ecological

- restore and conserve healthy environment, natural habitats and fish stocks –
- To have non-toxic agricultural products

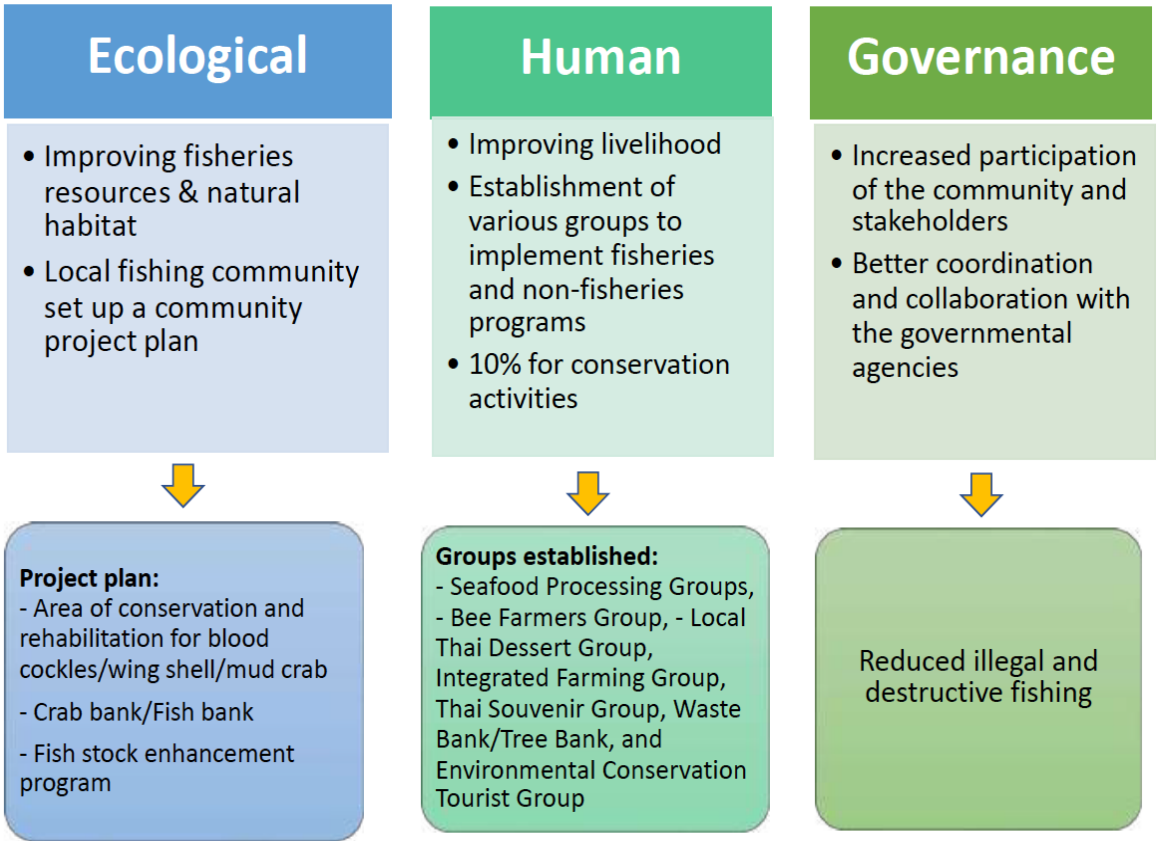
Human

- To increase income for the fishing households
- To be safe and have security for everybody's lives
- To build knowledge and skills for agriculture-based products and sustainable livelihoods

Governance

- To improve the efficiency of law enforcement and compliance
- have sufficiency infrastructure in all agriculture areas
- To improve agriculture products to the GAP standards
- To be able to access information of the agriculture sector

Results


Ecological
• Improving fisheries resources & natural habitat
• Local fishing community set up a community project plan
Project plan:
- Area of conservation and rehabilitation for blood cockles/wing shell/mud crab
- Crab bank/Fish bank
- Fish stock enhancement program
Human
• Improving livelihood
• Establishment of various groups to implement fisheries and non-fisheries programs
• 10% for conservation activities
Groups established:
- Seafood Processing Groups, - Bee Farmers Group, - Local Thai Dessert Group, Integrated Farming Group, Thai Souvenir Group, Waste Bank/Tree Bank, and Environmental Conservation Tourist Group
Governance
• Increased participation of the community and stakeholders
• Better coordination and collaboration with the governmental agencies
Reduced illegal and destructive fishing

Lesson learned

Good governance

- Effective enforcement and compliance of the rules and regulations
- Strong leadership
- Equitable and inclusive participation and collaboration among governmental officials, community members, and other stakeholders.

Increased participation

- Fishers and other stakeholder groups participate in decision-making processes and identifying solutions to develop FMP together with government officers

Coordination and collaboration

- Collaborate with the government to improve resource condition

Precautionary approach

- Understanding of the importance of sustaining fisheries resources led to initiate designating environmental conservation

I-EAFM: ACHIEVEMENTS

- Strengthen nationals' EAFM core team/key officers
- Rehabilitated and Increased fisheries resources
- Reduced stakeholder conflict
- Livelihood diversification (but most still fishing)
- Increased income
- Strengthen stakeholders engagement
- Strengthen equity opportunity of women and men in all activities


ชุมชนประมงท้องถิ่น
“ต้นแบบ”


15

Some products from the site