

# Recounting the Major Accomplishments of JTF 6-2 Projects for the Sustainability of Fisheries Development in Southeast Asia

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SEAFDEC has been promoting sustainable fisheries to contribute to food security, poverty alleviation and livelihood of people in the Southeast Asian region since its establishment in 1967. As one of the SEAFDEC Member Countries, the Government of Japan has supported SEAFDEC to implement its endeavors. Through the Japanese Trust Fund (JTF), the Fisheries Agency of Japan started to support SEAFDEC in 1998 to implement projects in the Southeast Asian region. Since then, JTF has constantly contributed to the fundamental research needs and capacity building of the ASEAN Member States (AMSs) to promote sustainable fisheries in the region not only in terms of budgetary support for projects but also human resources to manage the projects. From 2020 to 2024, which included the severe years of the COVID-19 pandemic, SEAFDEC implemented 12 projects under the second phase of the sixth cycle of JTF (JTF 6-2).

This article elucidates the status of fisheries and aquaculture in Southeast Asia including fishery and aquaculture production and issues and challenges. Moreover, this article highlights the significant achievements of the JTF 6-2 projects which were intended to support the AMSs in addressing the prevalent issues and challenges in fisheries and aquaculture in the region.

Since 1998, the Japanese Trust Fund (JTF) supported a number of projects implemented by SEAFDEC under the ASEAN-SEAFDEC Fisheries Consultative Group (FCG) mechanism to support the ASEAN Member States (AMSs) to address the issues and challenges in the fisheries and aquaculture sector. The momentum to support the AMSs in addressing the issues and challenges has been sustained through the second phase of the sixth cycle of JTF (JTF 6-2) projects in 2020–2024. Under JTF 6-2, 12 projects were implemented by the SEAFDEC Secretariat and Departments, namely: Training Department (TD); Marine Fisheries Research Department (MFRD); Aquaculture Department (AQD); Marine Fishery Resources Development and Management Department (MFRDMD); and Inland Fishery Resources Development and Management Department (IFRDMD) (Figure 1).

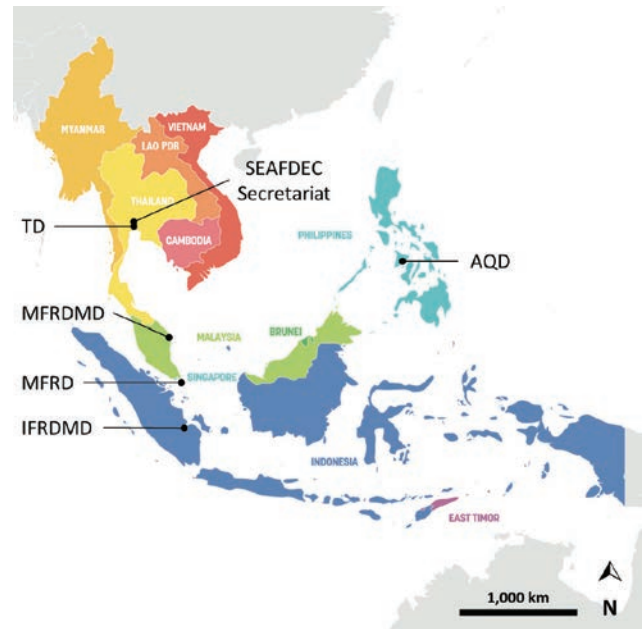


Figure 1. Location of the SEAFDEC Secretariat and Departments in their respective host countries

## Status of Fisheries and Aquaculture in Southeast Asia

### A glance at fishery and aquaculture production

Fish and fishery products are becoming increasingly important as primary sources of protein for many people in the world. In 2022, the global production of aquatic animals reached a new record of 185.4 million t (live weight equivalent), which is an increase of four percent from 2020 (FAO, 2024a). An estimated 94.4 million t (51 percent) was produced from aquaculture, surpassing capture fisheries for the first time with the production of 91.0 million t (49 percent) (Figure 2).

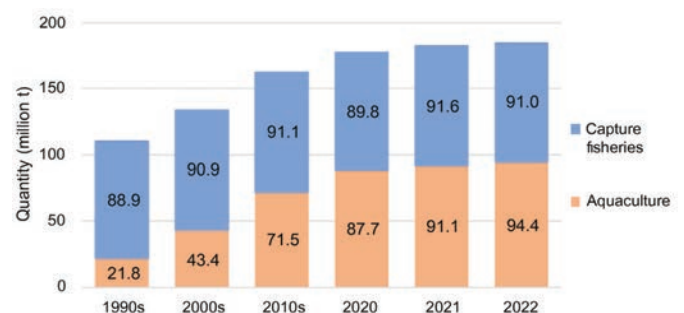


Figure 2. Trends of world fishery and aquaculture production by quantity (million t) (FAO, 2024a)

It is important to note that Southeast Asia is a significant producer of fish and fishery products contributing to the world fishery production with an average of around 20.1 percent per year between 2005 and 2021 (Figure 3). The trend of total fishery production of the ASEAN Member States (AMSs) increased from 23.0 million t in 2005 to 45.8 million t in 2021 (Figure 4). The production from the capture fisheries subsector remained stable between 2005 and 2021 with an average of 17.2 million t per year (Figure 5). Remarkably, the aquaculture subsector contributed the largest portion of fishery production by both quantity and value starting in 2012, and the quantity of aquaculture production remained the largest proportion denoting its increasing significance in securing stable food supply in the region (Figure 5).

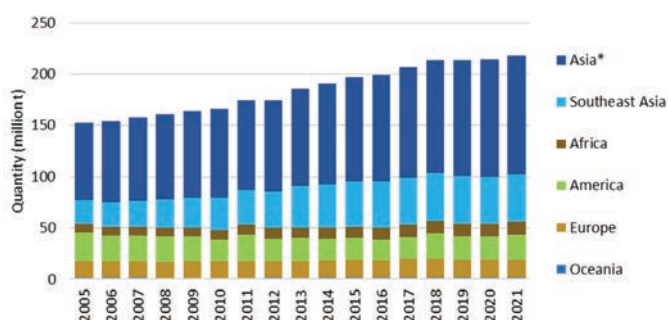


Figure 3. Fishery production of each continent in 2005-2021 by quantity (million t) (\*production from Asia excludes Southeast Asia) (SEAFDEC, 2012; 2017; 2018; 2024)

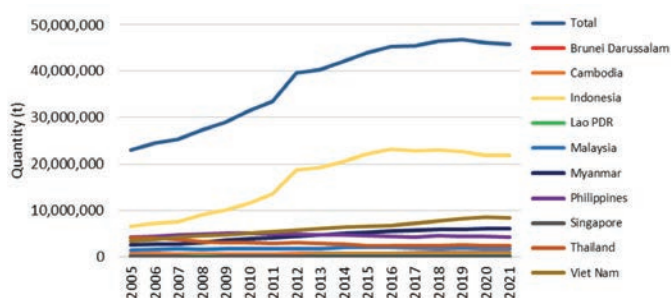


Figure 4. Fishery production of the ASEAN Member States in 2005-2021 by quantity (t) (SEAFDEC, 2012; 2017; 2018; 2024)

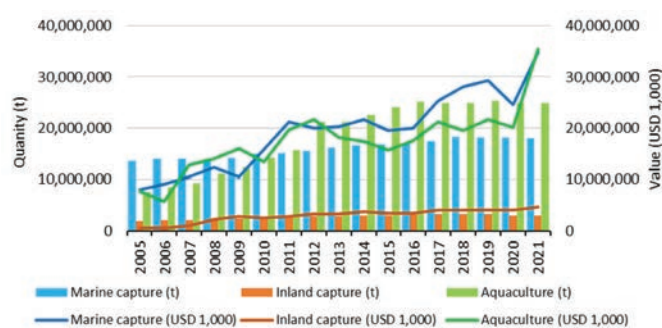


Figure 5. Fishery production of the Southeast Asian region by subsector in 2005-2021 by quantity (t) and value (USD 1,000) (SEAFDEC, 2012; 2017; 2018; 2024)

## Delving into the issues and challenges in the fisheries and aquaculture in Southeast Asia

The fisheries and aquaculture sector considerably contribute to the food security and livelihood of the people and the economies of the AMSs. However, over the past decades, several prevailing and emerging issues and challenges confronted the sustainability of the fisheries and aquaculture sector of the Southeast Asian region.

### • Marine capture fisheries

In marine capture fisheries, the utilization of modern fishing technologies has intensified fishing activities that caused adverse impacts on aquatic resources and ecosystems including overexploitation of fishery resources, especially under open access regimes. In addition, some fishing gear types (e.g. dredges and bottom trawls) are detrimental to ecosystems and resources, and non-selective fishing gear and practices resulted in the bycatch of juveniles and species under international concern (e.g. marine turtles and marine mammals). Furthermore, it is documented that abandoned, lost or otherwise discarded fishing gear or ALDFG (referred to as ghost fishing) continue to catch marine aquatic species (fish, marine turtles, marine mammals, coral reefs, etc.) and become one of the sources of marine debris and microplastics. To address such concern, FAO developed the Voluntary Guidelines on the Marking of Fishing Gear in 2019 (FAO, 2019); while the Intergovernmental Negotiating Committee (INC) under the United Nations Environment Assembly (UNEA) discussed in 2022 the development of an international legally binding instrument on plastic pollution including in the marine environment, and it is expected that this will be concluded in December 2024.

Illegal, unreported and unregulated (IUU) fishing is one of the important issues faced by countries in the region as it undermines national and regional efforts to conserve and manage fish stocks and, as a consequence, inhibits progress towards achieving the goals of long-term sustainability and responsibility. In addressing the IUU fishing issue, the global framework — International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing (IPOA-IUU) — was adopted by FAO in 2001 which outlines the measures to combat IUU fishing, including coastal State measures, flag State measures, and port State measures (FAO, 2001). Also, FAO developed the Global Record of Fishing Vessels Refrigerated Transport Vessels and Supply Vessels in 2017 (FAO, 2024b) and the Voluntary Guidelines for Transshipment in 2023 (FAO, 2023). Moreover, major importing markets, e.g. United States, European Union, and Japan, issued regulations that require fish and fishery products entering their markets were not derived from IUU fishing activities, which necessitated more stringent measures to combat IUU fishing. Effective combating of IUU fishing



requires political and policy support, legal frameworks, as well as national systems for monitoring, control, and surveillance (MCS), port State measures, traceability, and documentation, among others. Combating IUU fishing also requires cooperation and collaboration, especially for information sharing and exchange of information among countries as well as with regional fisheries management organizations (RFMOs) and relevant regional/international organizations.

The management of transboundary fish species (*e.g.* neritic tunas, tuna-like species, pelagic species) is another important issue in the Southeast Asia region requiring cooperation among relevant countries in conducting stock and risk assessments. Biological knowledge obtained from data collection is essential to reliable stock assessment to support the formulation of science-based policies and regulations for sustainable utilization and management of fishery resources.

For commercial fishing operations, several countries (*e.g.* Thailand, Indonesia, Malaysia) have faced an issue of shortage of fishing crew. It should be noted, however, that fishing is also recognized as one of the most dangerous occupations in the world. Therefore, in addition to improving safety at sea, there is a need to enhance the working conditions of the fishing crew onboard. The use of technologies including deck machinery would reduce the number of fishing crew, improve onboard working conditions, and reduce costs in fishing operations. Furthermore, increasing earnings is one of the important factors for securing fishing crews; thus, keeping fish fresh onboard by learning the techniques for fish handling would increase the earnings of fishers.

As a cross-cutting issue not only for marine fisheries but also for other subsectors, fishery statistics and information are crucial in formulating fisheries policies and management frameworks and understanding the status of fishery resources in the region. However, there are several constraints in the compilation of fishery statistics and information. At the national level, the issues include the inadequacy in the capacity of countries to collect reliable statistics in a timely manner, insufficient disaggregation of statistics

by species (or species group) to support policy planning and management, and underreported statistics, especially from small-scale fisheries (marine and inland fisheries) in the context of high aquatic biodiversity where the catches comprise of multispecies aquatic organisms. Moreover, it is also crucial to sustain the regional contribution to global initiatives including the FAO Coordinating Working Party on Fishery Statistics (CWP) which provides the harmonized standards, definitions, and classification of fishery statistics to facilitate the compilation, sharing, and exchange of statistics (FAO, 2024c); as well as the FAO Fisheries and Resources Monitoring System (FIRMS) that facilitate the sharing of information on the global monitoring and management of fishery marine resources (FAO, 2024d).

- ***Small-scale Fisheries***

In the Southeast Asian region, it is recognized that the majority of fishers (including part-time and occasional fishers) are engaged in small-scale fishing activities. However, small-scale fishers are among the marginalized groups vulnerable to poverty. Meanwhile, small-scale fisheries production is mainly intended for household consumption and, thus, is usually not recorded at the landing sites. The management of small-scale fisheries therefore requires appropriate management approaches, *e.g.* co-management, ecosystem approach to fisheries management (EAFM), that involve various groups of stakeholders in the development of management measures. Furthermore, FAO established the Voluntary Guidelines for Securing Sustainable Small-scale Fisheries in the Context of Food Security and Poverty Eradication (SSF Guidelines) in 2015 to address the issues and challenges in small-scale fisheries (FAO, 2015).

For inland capture fisheries, its important role as a source of animal protein and income for local communities is generally undervalued due to insufficient data and information. Besides, inland water resources are used by several sectors including irrigation, transportation, hydropower, as well as fisheries and aquaculture, among others. There is therefore a need to improve the collection of information on inland capture fisheries to raise its profile and such information could be



considered in the development of national policies for the use of inland water resources by various sectors.

- **Aquaculture**

The production from aquaculture has been increasing continuously in the Southeast Asian region. Nevertheless, the countries in the region still need to systematically increase aquaculture production to meet the growing demand of the increasing population for aquatic food. Also, the development of aquaculture technologies for high-value and low-trophic species would support income generation and economic development and ensure food security and rural development. Responsible aquaculture practices are essential for the mitigation of impacts of aquaculture on ecosystems and biodiversity, and for compliance with food safety and other standards and market requirements (especially importing markets). Other challenges in aquaculture are feed development by improving feed conversion ratio (FCR), reducing feed cost, and exploring alternative feed ingredients. Furthermore, infectious diseases could seriously impact aquaculture production and the economy, thus disease control should be established by ensuring biosecurity, avoiding overreliance on antimicrobials, and disease management including early warning systems for transboundary diseases. Furthermore, the control of the use of chemicals and drugs in aquaculture activities as well as monitoring of chemical and drug residues in aquaculture products are also necessary to safeguard consumers.



- **Post-harvest and food safety**

Fish and fishery products are highly perishable; thus, proper onboard fish handling would help maintain the quality and freshness of the catches before landing. It is also necessary to establish cold chain management (landing, processing, transport, storage, and marketing) to maintain the quality of fish and fishery products for human consumption. For the preservation of excess production (*e.g.* during the peak season

of inland fisheries), it is important to improve post-harvest technologies and develop products that meet market demands. Furthermore, there is also a need to reduce food loss and waste (*e.g.* heads, bones, and trimmings) from fish processing. Good handling and post-harvest practices contribute to ensuring food security, increasing the income of fishers, and eventually reducing pressure on fishery resources.

- **International fish trade**

Several countries in Southeast Asia are important producers and exporters of fish and fishery products. However, the exporting countries should meet the requirements of importing markets in the trading of fish and fishery products including the assurance that the products were not derived from IUU fishing and passed through traceability and documentation schemes. The importing markets also require the safety and quality of fish and fishery products to fit human consumption.

Furthermore, several international instruments have significant implications for the international trade of fish and fishery products. The Convention on International Trade in Endangered Species of World Fauna and Flora (CITES) is one of the important Conventions that obliges countries to ensure that the existence of the species is not threatened by international trade. The listing of some commercially exploited aquatic species (CEAS) under the CITES Appendices including several species of tunas, sharks and rays, seahorses, sea cucumbers, and anguillid eels, among others, resulted in difficulties in international trade of the species, especially in the identification of species from traded specimens, and development of non-detriment findings (NDF) documents.



In 2022, several species including not only endangered shark and ray species but also look like species were listed in CITES Appendices during the CITES 19<sup>th</sup> Meeting of the Conference of the Parties (CoP19) (CITES, 2022). Additionally, the US Marine Mammals Protection Act or MMPA is another recent regulation that requires all products from commercial fisheries to be exported to the US should be classified by the level of incidental marine mammal death and serious injury. For fisheries that are classified to cause “frequent” or “occasional” incidental death or serious injury of marine mammals, these would lead to further reduction plans (US Marine Mammal Commission, 2024). Lastly, the WTO Fisheries Subsidies Agreement adopted at the 12<sup>th</sup> Ministerial Conference in June 2022 prohibits subsidies that were thought to contribute to IUU fishing and overfished stock; thus, parties are required to prove its subsidies do not contribute to the damage of resources (WTO, 2024).

- **Fisheries and climate change**

The use of fossil fuels in fisheries and aquaculture activities and the discharge of waste and organic matter to the environment contributed to climate change. Therefore, requiring the effective use of environmentally friendly technologies, effective use of energy, and clean energy would minimize the impacts of fisheries and aquaculture activities on climate change.

On the other hand, it is also known that climate change has adverse impacts on aquatic ecosystems such as seawater temperature increase, sea level rise, ocean acidification, coral bleaching, and others. There have been also concerns on species tolerance to temperature changes, migration, distribution, and the existence of aquatic species. Moreover, extreme climate and weather events (*e.g.* heavy rainfall, flood, drought) occur frequently and require mitigation and adaptation measures. Therefore, it is necessary to regularly monitor the marine and inland environments and the status of aquatic animals to assess the impacts and identify the adaptation measures to mitigate the impacts.



## Key achievements of the JTF 6-2 Projects

To continue supporting the AMSs in addressing the multifaceted issues and challenges in the fisheries and aquaculture sector, the JTF 6-2 supported 12 projects from 2020 to 2024 which were categorized into three pillars, namely: Pillar I. Strengthening the promotion of sustainable fisheries in Southeast Asia; Pillar II. Promotion of sustainable aquaculture and resources enhancement in Southeast Asia, and Pillar III. Promotion of sustainable development of inland fisheries in Southeast Asia (**Box**). The key achievements of each JTF 6-2 project as well as the capacity-building support provided by JTF 6-2 are summarized below.

Box. SEAFDEC projects supported by JTF 6-2 (2020-2024)
<p><b>Pillar I. Strengthening the promotion of sustainable fisheries in Southeast Asia</b></p> <ul style="list-style-type: none"> <li>• Strengthening a Regional Cooperation and Enhancing National Capacities to Eliminate IUU Fishing in Southeast Asia (TD)</li> <li>• Harmonization and Enhancing Utilization of Fishery Statistics and Information (Sec)</li> <li>• Responsible Fishing Technology and Practice (TD)</li> <li>• Enhancing Food Safety and Competitiveness of Seafood Products (MFRD)</li> <li>• Assistance for Capacity Development in the Region to Address International Fisheries-related Issues (Sec)</li> </ul>
<p><b>Pillar II. Promotion of sustainable aquaculture and resources enhancement in Southeast Asia</b></p> <ul style="list-style-type: none"> <li>• Research for Enhancement of Sustainable Utilization and Management of Sharks and Rays in the Southeast Asian Region (MFRDMD)</li> <li>• Sustainable Utilization of Anguillid Eels in the Southeast Asian Region (IFRDMD)</li> <li>• Sustainable Utilization of Fisheries Resources and Resources Enhancement in Southeast Asia (TD)</li> <li>• Fisheries Management Strategies for Pelagic Fish Resources in the Southeast Asian Region (MFRDMD)</li> <li>• Sustainable Aquaculture through Cost-Effective Culture Systems, and Prompt and Effective Aquatic Animal Health Management (AQD)</li> </ul>
<p><b>Pillar III. Promotion of sustainable development of inland fisheries in Southeast Asia</b></p> <ul style="list-style-type: none"> <li>• Management Scheme for Inland Fisheries in the Southeast Asian Region (IFRDMD)</li> <li>• Small-scale Fisheries Management for Better Livelihood and Fisheries Resources (TD)</li> </ul>

### Pillar I. Strengthening the promotion of sustainable fisheries in Southeast Asia

- **“Strengthening a Regional Cooperation and Enhancing National Capacities to Eliminate IUU Fishing in Southeast Asia” (TD)**

TD implemented the Project with the goal of sustainable utilization and sound management of fisheries resources in Southeast Asia and the outcome of countermeasures to

reduce IUU Fishing in Southeast Asia. The outputs of the Project include 1) enhanced Regional Fishery Vessel Records (RFVR) Database; 2) strengthened capacities of the AMSs in the implementation of port State measures (PSM) and monitoring, control and surveillance (MCS) through training and workshops where six AMSs have ratified PSMA with FAO; 3) expanded promotion of the electronic ASEAN Catch Documentation Scheme (eACDS) in Brunei Darussalam, Myanmar, Malaysia, Thailand, and Viet Nam; and 4) enhanced coordination and promotion of national/regional/international networks for collaborative activities to combat IUU fishing.

- **“Harmonization and Enhancing Utilization of Fishery Statistics and Information” (Sec)**

The harmonization of data is an important issue to facilitate the compilation and exchange of statistics at the regional and international levels. The SEAFDEC Secretariat implemented the Project with the goal of effective utilization of fishery statistics data and information for policy planning and management of fisheries toward sustainability. The outputs of the Project include 1) improved SEAFDEC fishery statistics data through the revision of the Regional Framework for Fishery Statistics of Southeast Asia with the inclusion of new statistics in the revised Regional Framework (*i.e.* statistics on fish processing, fish trade (export and import), small-scale and commercial fisheries, fishers and fish farmers disaggregated by nationality and gender, and per capita fish consumption), 2) dissemination to the public of updated status and trends of fisheries and aquaculture in the region were through the SEAFDEC publication “Southeast Asian State of Fisheries and Aquaculture 2022 (SEASOFIA 2022),” and 3) dissemination to the public of fisheries issues and relevant regional initiatives through the SEAFDEC publication “*Fish for the People.*”

Under this Project, the SEAFDEC Secretariat shared views and experiences on data compilation and the situation of fishery statistics of the countries in the region at the meetings of the FAO Coordinating Working Party on Fishery Statistics (CWP). The Project also sustained coordination with the AMSs and relevant organizations to support the submission of national statistics for regional and international compilation.

- **“Responsible Fishing Technology and Practice” (TD)**

TD implemented the Project for sustainable utilization and sound management to minimize the impact of fishing activities on fishery resources and the marine ecosystem by strengthening responsible fishing technology and practice in Southeast Asia. The Project outputs include 1) workshops on fishing technologies (*i.e.* fishing gear, fishing accessories, fishing practices), 2) workshops on marine engineering technologies (*i.e.* fuel efficiency, greenhouse gas reduction, and safety of fishing operations at sea), 3) training on fish handling techniques onboard fishing vessels including a

case study on the sherbet ice system onboard M.V. Plalung to maintain the freshness of fish caught by purse seine, and 4) training on the operation and data analysis of the scientific echosounder SIMRAD EK80 in the M.V. SEAFDEC 2.

- **“Enhancing Food Safety and Competitiveness of Seafood Products” (MFRD)**

Seafood is an important commodity in many Southeast Asian countries and serves as an important source of food supply and foreign exchange. There is an increasing demand for seafood as consumers around the world recognize its nutritional value. However, seafood is highly perishable and several chemical and biological changes occur immediately after capture and/or harvest. Thus, good handling practices and technologies are critical in keeping seafood products fresh and safe, extending shelf life, and maintaining their quality and economic value from catch to consumer. In this regard, MFRD implemented the Project to improve food safety and the competitiveness of seafood products in the region through training workshops and developing guidelines with the support of technical experts.

The outputs of the Project included training and workshops that were aimed at building the capacity of the AMSs on the application of high-pressure processing (HPP) technology and good manufacturing and handling practices (GMP & GHP) for ready-to-eat raw fish and fisheries products. The Project also developed the Regional Guidelines on GMP & GHP for Ready-to-Eat (RTE) Raw Fish and Fisheries Products.

- **“Assistance for Capacity Development in the Region to Address International Fisheries-related Issues” (SEAFDEC Secretariat)**

Throughout the decades, SEAFDEC has been providing platforms where discussions among the ASEAN-SEAFDEC Member Countries can be made, including regional approaches that could be raised to the international fisheries fora (*e.g.* UN, FAO, RFMOs, CITES, ASEAN, WTO, and Convention on Biological Diversity (CBD), among others). In this regard, the SEAFDEC Secretariat implemented the Project for sustainable utilization and sound management of fishery resources through appropriate regional approaches.

Under the Project, the SEAFDEC Secretariat continued monitoring, raising awareness, and building the capacity of the AMSs on international fisheries-related issues and their impacts on fisheries and aquaculture in the region. One of the major accomplishments of the Project was sharing information on international fisheries-related issues including the marine mammal protection scheme under the U.S. Marine Mammal Protection Act, catch documentation scheme of Japan, and fishery subsidies negotiation under WTO. The Project also organized a regional technical consultation to develop the ASEAN-SEAFDEC common positions on the proposed listing of commercially exploited aquatic species (CEAS) into

the CITES Appendices. Furthermore, the cooperation with AMSs was sustained under the Project through the Regional Capacity Building Network (RECAB) program on capacity building on relevant subjects including gender mainstreaming in small-scale fisheries and aquaculture, advanced aquaculture technologies, and basic fish stock assessment.

**Pillar II. Promotion of sustainable aquaculture and resources enhancement in Southeast Asia**

- **“Research for Enhancement of Sustainable Utilization and Management of Sharks and Rays in the Southeast Asian Region” (MFRDMD)**

The Southeast Asian region has around 200 species out of more than 1,200 species of sharks and rays worldwide. However, the increase in landings of sharks and rays in the last decades to meet the demand for fins and other downstream products has caused a decrease in shark and ray resources worldwide. For sustainable utilization of sharks and rays in the region, MFRDMD implemented this Project. The outputs of the Project include the collection of data on the landing of sharks and rays in Malaysia and the sharing of scientific data and practical information on stock management among the AMSs through workshops and publications. Furthermore, since sharks and rays are among the species listed in CITES Appendices, the Project built the capacity of the AMSs in species identification and genetic studies for providing knowledge and information on non-detriment findings (NDF).

- **“Sustainable Utilization of Anguillid Eels in the Southeast Asian Region” (IFRDMD)**

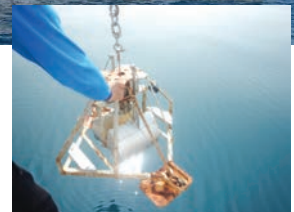
With the rapid decline of temperate eels, the market value of tropical eels has risen in recent years and led to a dramatic increase in glass eel capture fisheries in tropical countries. In order to promote sustainable management and utilization of anguillid eel fishery resources in the Southeast Asian region, IFRDMD implemented this Project through the development and implementation of the strategic program of sustainable eel resources management. The two main outputs of the Project include 1) standardization of the data collection system where IFRDMD collected data on eel catch and effort in Indonesia and Philippines, carried out monthly sampling and catch data collection for the baseline of adult eel (silver eel) and their biology, and 2) collection of data on catch and catch per unit effort (CPUE) and biological surveys.

- **“Sustainable Utilization of Fisheries Resources and Resources Enhancement in Southeast Asia” (TD)**

In the past decades, SEAFDEC and its Member Countries have been conducting regional and national activities toward sustainable utilization and enhancement of marine and coastal fishery resources. However, the statistics of marine catch of



The M.V. SEAFDEC 2 that supports the Southeast Asian countries in the conduct of fishery resources and environmental surveys



several countries in the region revealed a declining trend due to the increasing number of fishery vessels which continues to be an important challenge for the region. Therefore, TD implemented this Project to strengthen the sustainable management of marine fishery resources in Southeast Asia. The outputs of the Project include 1) organization of training courses on fish population dynamics and fisheries management using R-statistical program, 2) geographic information system (GIS) to analyze carrying capacity in aquaculture, 3) determining spawning and nursing grounds and fish larvae survey, and 4) marine debris and microplastics sampling collection and analysis. In addition, the Project also conducted a study of the procedures for the evaluation of artificial reef installation to enhance marine resources.

- **“Fisheries Management Strategies for Pelagic Fish Resources in the Southeast Asian Region” (MFRDMD)**

Transboundary fish species, such as mackerels, tunas, and scads, are abundant in the AMSs and there is a need to establish efficient fisheries management strategies for the respective stocks. Therefore, MFRDMD implemented this Project to evaluate the pelagic fish resources in the Southeast Asian region to establish a sustainable management strategy for the pelagic fisheries. The Project conducted stock and risk assessments of several targeted small pelagic fish resources and neritic tunas (*Euthynnus affinis* and *Thunnus tonggol*).

Also, the Project organized a workshop on stock and risk assessments of neritic tunas (*i.e. Euthynnus affinis* and *Thunnus tonggol*) in the Eastern Indian Ocean and Western Pacific Ocean using ASPIC. Furthermore, the Project also carried out DNA analysis of neritic tunas using mitochondrial DNA D-loop region to clarify the stock structure as well as otolith analysis to identify the age composition to understand their life history which will enhance the reliability of the assessment results using the continuous time series datasets.

- **“Sustainable Aquaculture through Cost-effective Culture Systems, and Prompt and Effective Aquatic Animal Health Management” (AQD)**

Currently, the development of aquaculture is remarkable with production in Southeast Asia accounting for more than 50 percent of total fisheries production. Nonetheless, basic aquaculture techniques and knowledge are needed among the AMSs. This Project was implemented by AQD to carry over and strengthen the achievements of the previous project from 2015 to 2019. This Project was composed of three components including 1) development of cost-effective culture systems, 2) prompt and effective aquatic animal health management, and 3) capacity enhancement for sustainable aquaculture.

For the first component, the Project has established a seeding supply system of giant freshwater prawn culture through community-based aquaculture, developed feed replacement of fish and soybean meals for tilapia and giant freshwater prawn diets, evaluated water purification function for organisms in a recirculating shrimp culture system, and developed of aquaculture techniques for high-value aquatic species. For the second component, the outputs of the Project include the development of diagnostic procedures against emerging crustacean diseases; evaluation of distribution, occurrence, and prevalence of EHP; detection of chemicals and methods to mitigate the effect of serious shrimp diseases; and establishment of an integrated management system for virus infection in shrimp aquaculture ponds. Finally, the third component of the Project has improved the knowledge and skills of technical staff in aquaculture through the training programs of AQD.

### **Pillar III. Promotion of sustainable development of inland fisheries in Southeast Asia**

- **“Management Scheme for Inland Fisheries in the Southeast Asian Region” (IFRDMD)**

In Southeast Asia, inland fisheries are among the most economically important subsectors significantly contributing to rural communities in terms of poverty alleviation, food security, and nutritional well-being. Therefore, there is a need to ensure the sustainability of inland capture fisheries that depend on the quality of aquatic habitats and ecosystems.

IFRDMD implemented this Project with the goal of sustainable management and utilization of inland fisheries resources in the Southeast Asian region. The Project conducted surveys to assess the status of inland fisheries and data monitoring in participating countries, namely: Cambodia, Indonesia, Lao PDR, and Viet Nam. Under the project, IFRDMD developed guidelines for inland fisheries management which includes the improvement of the livelihood program in inland fisheries, and disseminated it to the AMSs and other relevant agencies in Southeast Asia. Furthermore, the concept of “Special Area for Conservation and Fish Refugia” or SPECTRA was developed under the Project with pilot sites in South Sumatra Province, Indonesia where regular monitoring of the water quality and abundance of fish species was conducted.

- **“Small-scale Fisheries Management for Better Livelihood and Fisheries Resources” (TD)**

Small-scale fisheries contribute food and livelihoods to millions of people with their harvests amounting to about 40 percent of the global catch production. (FAO et al., 2023). In this light, appropriate local and comprehensive management plans for small-scale fisheries are necessary to support small-scale fishers to improve their income generation while sustaining the nearshore fishery resources. TD implemented this Project aiming at sustainable management of small-scale fisheries to improve the livelihood and well-being of fishers in Southeast Asia. Through the Project, TD conducted training on the ecosystem approach to fisheries management (EAFM) concept in pilot sites at Tonle Sap in Cambodia and Ranong Province in Thailand. The Project also developed the capability of human resources from the AMSs in the implementation of the FAO Voluntary Guidelines for Securing Sustainable Small-scale Fisheries in the Context of Food Security and Poverty Eradication (SSF Guidelines) for improving the livelihood and well-being of small-scale fishers. Moreover, the Project sustained the promotion of gender integration and women empowerment for sustainable fisheries management and value chain. Lastly, the Project conducted a case study on supporting fishing communities to enhance their capacity in fish and fishery product development and marketing in Thailand.

### **Support for capacity building**

In addition to funding support for the 12 projects implemented by SEAFDEC in 2020–2024, JTF 6-2 also supported the capacity building for SEAFDEC researchers and technical officers. As JTF 6-2 Project Managers, three researchers from the Fisheries Research and Education Institutions (FRA) of Japan were dispatched to AQD, MFRDMD, and IFRDMD to develop the capacity of the staff from the respective Departments. Moreover, one expert on scientific echosounder has been sent by the FRA to TD since September 2023.



In 2022–2024, JTF 6-2 also supported the travel of researchers from TD, AQD, MFRDMD, and IFRDMD to FRA research institutions and relevant universities, laboratories, and fishery associations in Japan to gain knowledge and establish networks related to their projects. After enhancing their capacity, the researchers are expected to lead future JTF projects.

## Way Forward

The JTF 6-2 projects were implemented during the severe years from 2020 to 2024 at the height of the COVID-19 pandemic. Nevertheless, all JTF 6-2 projects endured the difficult period and successfully achieved the objectives because of the strong cooperation with SEAFDEC and Member Countries.

For the next five years from 2025 to 2029, JTF 7 will build on the achievements of the JTF 6-2 and will focus on the improvement of the reliability of fishery stock assessment in the respective AMSs through the sharing of good practices and methods as well as on dissemination of updated aquaculture technology. With the theme “Enhanced Capability of Fisheries and Aquaculture in Southeast Asia,” the JTF 7 will be presented at the 47<sup>th</sup> SEAFDEC Program Committee Meeting in December 2024.



## References

CITES. (2022). *Nineteenth meeting of the Conference of the Parties*. <https://cites.org/eng/cop19>

FAO. (2001). *International Plan of Action to prevent, deter and eliminate illegal, unreported and unregulated fishing*. Rome. <https://openknowledge.fao.org/handle/20.500.14283/y1224e>

FAO. (2015). *Voluntary guidelines for securing sustainable small-scale fisheries in the context of food security and poverty eradication*. Rome. <https://openknowledge.fao.org/handle/20.500.14283/i4356en>

FAO. (2019). *Voluntary guidelines on the marking of fishing gear. Directives volontaires sur le marquage des engins de pêche. Directrices voluntarias sobre el marcado de las artes de pesca*. Rome/Roma. Licence/Licencia: CC BY-NC-SA 3.0 IGO. <https://openknowledge.fao.org/handle/20.500.14283/ca3546t>

FAO. (2023). *Voluntary guidelines for transshipment/ Directives volontaires relatives au transbordement/ Directrices voluntarias para los transbordos*. Rome. <https://openknowledge.fao.org/handle/20.500.14283/cc5602t>

FAO. (2024a). *The State of World Fisheries and Aquaculture 2024. Blue Transformation in action*. Rome. <https://doi.org/10.4060/cd0683en>

FAO. (2024b). *Global record of fishing vessels, refrigerated transport vessels and supply vessels*. <https://www.fao.org/global-record/en/>

FAO. (2024c). *Coordinating Working Party on Fishery Statistics (CWP)*. <https://www.fao.org/cwp-on-fishery-statistics/en/>

FAO. (2024d). *Fisheries and Resources Monitoring System (FIRMS)*. <https://www.fao.org/fishery/en/topic/18170/en>

FAO, Duke University, & WorldFish. (2023). *Illuminating hidden harvests – the contributions of small-scale fisheries to sustainable development*. Rome. <https://doi.org/10.4060/cc4576en>

SEAFDEC. (2012). *Fishery statistical bulletin of Southeast Asia 2010*. Southeast Asian Fisheries Development Center (SEAFDEC). <https://repository.seafdec.org/handle/20.500.12066/1096>

SEAFDEC. (2017). *Fishery statistical bulletin of Southeast Asia 2015*. Southeast Asian Fisheries Development Center (SEAFDEC). <https://repository.seafdec.org/handle/20.500.12066/1099>

SEAFDEC. (2018). *Fishery statistical bulletin of Southeast Asia 2016*. Southeast Asian Fisheries Development Center (SEAFDEC). <https://repository.seafdec.org/handle/20.500.12066/1818>

SEAFDEC. (2024). *Fishery statistical bulletin of Southeast Asia 2021*. Southeast Asian Fisheries Development Center (SEAFDEC). <https://repository.seafdec.org/handle/20.500.12066/7437>

US Marine Mammal Commission. (2024). *Marine Mammal Protection Act*. <https://www.mmc.gov/about-the-commission/our-mission/marine-mammal-protection-act/>

WTO. (2024). *Agreement on Fisheries Subsidies*. [https://www.wto.org/english/tratop\\_e/rulesneg\\_e/fish\\_e/fish\\_e.htm](https://www.wto.org/english/tratop_e/rulesneg_e/fish_e/fish_e.htm)

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