SEAFDEC Annual Report 2025

Southeast Asian Fisheries Development Center

SEAFDEC

Annual Report 2025

Southeast Asian Fisheries Development Center

Preparation and Distribution of this Document

This SEAFDEC Annual Report 2025 was prepared by the Secretariat of the Southeast Asian Fisheries Development Center (SEAFDEC) in collaboration with the SEAFDEC 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). The SEAFDEC Annual Report 2024 is distributed to the SEAFDEC Member Countries and SEAFDEC Departments, collaborating agencies, fisheries-related organizations, and to the public to promote the activities and achievements as well as the visibility of SEAFDEC.

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EXECUTIVE SUMMARY

The progress and achievements of SEAFDEC through the programs and activities undertaken from January to December 2025 were summarized in this SEAFDEC Annual Report 2025. The programs implemented by SEAFDEC were in line with the priority needs and policy directives of the Member Countries that were conveyed through the SEAFDEC Council and the SEAFDEC Program Committee, and were categorized into 1) Projects under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism (18 projects); Departmental Programs (10 programs); and Other Programs (2 programs). Moreover, these programs had also been aligned with the "SEAFDEC Strategies Towards 2030" adopted by the SEAFDEC Council in 2017, comprising six Strategies, namely: 1) Securing the sustainability of fisheries to contribute to food security, poverty alleviation and livelihood of people in the region; 2) Supporting the sustainable growth of aquaculture to complement fisheries and contribute to food security, poverty alleviation and livelihood of people in the region; 3) Ensuring the food safety and quality of fish and fishery products for the Southeast Asian region; 4) Enhancing trade and compliance of the region's fish and fishery products with market requirements; 5) Addressing cross-cutting issues, such as labor, gender and climate change, related to international fisheries; and 6) Empowering SEAFDEC to strengthen its roles in the region and to improve its services for the Member Countries.

While sustaining the implementation of the approved programs in 2025, SEAFDEC also continued to strengthen its cooperation and partnership with other international and regional organizations, national agencies of the Member Countries, as well as non-member governments that share common interests toward sustainable development of fisheries and aquaculture, specifically in availing of their expertise and relevant resources for the programs and activities that are of mutual interest.

It is the hope of SEAFDEC that the SEAFDEC Annual Report 2025 will serve as a reference for the Member Countries, collaborating organizations, and the public in obtaining a better view of the roles, activities, and achievements of SEAFDEC in supporting the Member Countries in their respective efforts towards achieving sustainable development of fisheries and aquaculture in the Southeast Asian region.

MESSAGE FROM THE CHAIRPERSON OF THE SEAFDEC COUNCIL

Mr. Leong Der Yao

Deputy Chief Executive Officer (Corporate, Industry & Technology),
Singapore Food Agency

The year 2025 has proven to be a landmark year for SEAFDEC, marked by significant achievements across programmes and projects implemented in alignment with the policy directives of Member Countries. I am pleased to note that most of the projects implemented this year remain on track, reflecting the efficiency and commitment required to translate our shared goals into measurable results

The challenges facing the fisheries and aquaculture sectors continue to evolve, requiring intensified and forward-looking efforts. In response, SEAFDEC has implemented initiatives that are already delivering tangible impacts. These include combating IUU fishing, which continues to undermine both the sector and resource sustainability; addressing the needs of small-scale fisheries as a significant sub-sector; strengthening the knowledge base on fishery resources to support informed management; and promoting responsible fishing technologies and practices, including improved catch preservation and the exploration of alternative energy sources. Beyond these efforts, by advancing good aquaculture practices, promoting emerging species and monitoring the impact of climate changes, SEAFDEC remains at the forefront of enhancing food security in the region.

On this occasion, and on behalf of the SEAFDEC Member Countries, I would like to express my sincere appreciation to SEAFDEC and its Departments for their dedication in implementing a wide range of activities with technical expertise and effective coordination. We commend SEAFDEC's continued efforts to harmonize programs and support the Member Countries in implementing the Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2030. I also extend my gratitude to partners, donors, and collaborators for their invaluable support, which has been instrumental at every stage of project development and implementation.

Last but not least, I would also like to commend my colleagues, Council Directors, for their cooperation and steady guidance, which have been essential to the achievements highlighted in this report. Fisheries sustainability and development are shared responsibilities that can only be realized through collective action. I therefore encourage all Member Countries to continue building on this progress by strengthening cooperation and collaboration to advance sustainable fisheries initiatives across the region in the years ahead.

Mr. Leong Der Yao

Deputy Chief Executive Officer
(Corporate, Industry & Technology),
Singapore Food Agency
and
SEAFDEC Council Chairperson, 2025–2026

MESSAGE FROM THE SEAFDEC SECRETARY-GENERAL

Ms. Sampan Panjarat

SEAFDEC Secretary-General

As we take stock of the achievements made in 2025, SEAFDEC remains dedicated to its mission toward sustainable fisheries development and management in the region. The year has been defined by steady progress across various programs and projects. Activities under the ASEAN-SEAFDEC FCG/ASSP Mechanism, Departmental Programs, and Other Programs remain on track, addressing concerns on multiple fronts, including sustainable marine and inland capture fisheries, aquaculture, trading and marketing compliance, management of commercially-exploited inland and marine species/resources, responsible fishing technologies, information dissemination, as well as cross-cutting issues such as gender and climate change.

Ensuring that fisheries continue to support food security and poverty alleviation remains central to SEAFDEC's mandate. At the same time, priority has been given to combating illegal, unreported and unregulated (IUU) fishing, while increasing attention is being directed toward biodiversity and environmental challenges, particularly abandoned, lost, or otherwise discarded fishing gear (ALDFG). Efforts to address these issues have been intensified through ongoing programs. In parallel, initiatives to advance the digital transformation of regional fisheries data are underway, enhancing accessibility for policymakers, researchers, academia, and other stakeholders.

On behalf of SEAFDEC, I sincerely acknowledge the contributions of all who made these achievements possible. Our progress made in 2025 reflects the strong collaboration with SEAFDEC Member Countries, particularly the guidance and support of the Council Directors, which have been instrumental in the effective implementation of regional initiatives. We also extend our appreciation to our partners, collaborators, and funding agencies from national and non-government institutions for their invaluable support. Special thanks are due to the Government of Japan, through the Japanese Trust Fund, for its continued patronage.

SEAFDEC remains steadfast in its commitment to sustainable fisheries development in Southeast Asia. As we move forward, I look forward to continued collaboration with our partners and stakeholders to secure a more sustainable future for the region's fisheries.

Sampan Panjarat

Ms. Sampan Panjarat
Secretary-General

LIST OF ACRONYMS

ACDS	ASEAN Catch Documentation Scheme
ALDFG	Abandoned, Lost or Otherwise Discarded Fishing
AMAF	ASEAN Ministers on Agriculture and Forestry
AMSs	ASEAN Member States
AQD	SEAFDEC Aquaculture Department
ASEAN	Association of Southeast Asian Nations
ASPIC	A Stock-Production Model Incorporating Covariates
ASSP	ASEAN–SEAFDEC Strategic Partnership
ASWGFi	ASEAN Sectoral Working Group on Fisheries
BOBP-IGO	Bay of Bengal Programme Inter-Governmental Organization
CBFM	Community-based Fisheries Management
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
COFI	Committee on Fisheries, FAO
CPUE	catch per unit effort
DA-BFAR	Bureau of Fisheries and Aquatic Resources, Department of Agriculture, Philippines
DAFF	Department of Agriculture, Fisheries and Forestry, Australia
DLF	Department of Livestock and Fisheries, Lao PDR
DMCR	Department of Marine and Coastal Resources, Thailand
DOF	Department of Fisheries
eACDS	electronic ASEAN Catch Documentation Scheme
EAFM	ecosystem approach to fisheries management
EEZ	exclusive economic zone
ENZO	El Niño-Southern Oscillation
EU	European Union
FiA	Fisheries Administration, Cambodia
FAO	Food and Agriculture Organization of the United Nations
FCG	Fisheries Consultative Group
FRA	Fisheries Research and Education Agency, Japan
GEF	Global Environmental Facility
GESI	Gender Equality and Social Inclusion
GIES	Global Information Exchange System
GIS	Geographic Information System
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
IFRDMD	SEAFDEC Inland Fishery Resources Development and Management Department
IMR	Institute of Marine Research, Norway
IOD	Indian Ocean Dipole
IUCN	International Union for Conservation of Nature
IUU Fishing	illegal, unreported and unregulated fishing
JAIF	Japan-ASEAN Integration Fund
JICA	Japan International Cooperation Agency
JIRCAS	Japan International Research Center for Agricultural Sciences
JTF	Japanese Trust Fund
LOA	Letter of Agreement
MCS	Monitoring, control and surveillance
MFRD	SEAFDEC Marine Fisheries Research Department
MFRDMD	SEAFDEC Marine Fishery Resources Development and Management Department
MMAF	Ministry of Marine Affairs and Fisheries, Indonesia
MOU	Memorandum of Understanding
NFRDI	National Fisheries Research and Development Institute, Philippines
NOAA	U.S. National Oceanic and Atmospheric Administration
PCA	Project Cooperation Agreement

PSM	Port State Measures
PSMA	Port State Measures Agreement
RDMA	Regional Development Mission for Asia, USAID
RFVR	Regional Fishing Vessels Record
RPOA	Regional Plan of Action
RS	Remote Sensing
ROV	Remotely Operated Vehicles
SDGs	Sustainable Development Goals
SFA	Singapore Food Agency
SEAFDEC	Southeast Asian Fisheries Development Center
SEC	SEAFDEC Secretariat
SOM-AMAF	Senior Officials Meeting of the ASEAN Ministers on Agriculture and Forestry
SPEECTRA	Special Area for Conservation and Fish *Refugia*
SSF	Small-scale Fisheries
SWG	Scientific Working Group
TOR	Terms of Reference
TD	SEAFDEC Training Department
TUMSAT	Tokyo University of Marine Sciences and Fisheries, Japan
UNEP	United Nations Environment Programme
USAID	United States Agency for International Development
US-DOI	U.S. Department of Interior
WWF-US	World Wildlife Fund, Inc.

CONTENTS

ABOUT SEAFDEC

The Southeast Asian Fisheries Development Center (SEAFDEC) is an autonomous inter-governmental body established in 1967. SEAFDEC comprises 11 Member Countries, namely: Brunei Darussalam, Cambodia, Indonesia, Japan, Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Viet Nam. The Center operates through the Secretariat located in Thailand and has five technical Departments, namely: Training Department, Marine Fisheries Research Department, Aquaculture Department, Marine Fishery Resources Development and Management Department, and Inland Fishery Resources Development and Management Department. The mandate of SEAFDEC as endorsed by the Forty-first Meeting of the SEAFDEC Council is *"to develop and manage the fisheries potential of the region by rational utilization of the resources for providing food security and safety to the people and alleviating poverty through transfer of new technologies, research and information dissemination activities."*

SEAFDEC Secretariat

The SEAFDEC Secretariat is mandated to coordinate and oversee the general policy and planning of the Center, and acts as the focal point for channeling and implementing the decisions and resolutions of the SEAFDEC Council of Directors. In addition, the SEAFDEC Secretariat organizes regular SEAFDEC meetings to obtain directives and guidance from the Member Countries on the operations of the Center as well as regional technical consultations and meetings to address emerging issues as recommended by the Member Countries.

Training Department (TD)

Established in Thailand in 1968, TD has been focusing its efforts on the development of modern fishery techniques to aid regional fisheries in a more sustainable approach through the promotion of responsible fishing technologies and practices, exploration of fishery resources, and advancement of the coastal fisheries management approach. Under the new Strategic Plan which was endorsed by the SEAFDEC Council in 2006, the structure and activities of TD have been adjusted to also cover the promotion of coastal fisheries management to ensure responsible resource utilization and sustainable livelihoods in coastal communities, and offshore fisheries through the development of best fishing practices, and energy optimization technology to ensure a stable supply of food fish and reduce fishing pressure in coastal areas.

Marine Fisheries Research Department (MFRD)

MFRD was established in Singapore in 1969 and is responsible for promoting, undertaking, and coordinating research on fisheries post-harvest technology and furthering the development of the fish processing industry in the Southeast Asian region. Its tasks include research and development on fisheries post-harvest technology and practices such as fish processing technology to optimize the utilization of harvested fish and enhance the quality and safety of fish and fishery products. MFRD also develops technology-based analytical methods to assess seafood safety and quality and publishes several manuals as reference materials for the Member Countries.

Since 2007, the Post-Harvest Technology Centre of the Agri-Food and Veterinary Authority, Singapore (PHTC/AVA) has been serving as the collaborating center of SEAFDEC to undertake the activities of MFRD under the SEAFDEC Regional Programmes. However, with the formation of a new statutory board Singapore Food Agency (SFA) in 2019, the SFA continued to uphold the commitment of Singapore to implement the MFRD programmes through the Marine Aquaculture Centre serving as the new collaborating center. In 2025, the mandate of MFRD is focused and sharpened on food security and safety through sustainable production technologies.

Aquaculture Department (AQD)

Established in the Philippines in 1973, AQD has been carrying out activities in aquaculture research, technology verification, training, and information dissemination on a wide range of aquaculture disciplines, including broodstock management and seed quality improvement, promotion of responsible and environment-friendly aquaculture, diagnosis and control of aquatic diseases, aquaculture for stock enhancement, and culture of aquatic species under international concern. The aquaculture commodities covered by AQD include fishes, shrimps, mangrove crab, mollusks, seaweeds, and others. In addition, AQD also promotes good aquaculture practices and effective management of aquatic resources to support rural development and poverty alleviation.

Marine Fishery Resources Development and Management Department (MFRDMD)

MFRDMD was established in Malaysia in 1992 to conduct activities on marine fishery resources focusing on biological studies of commercially important fish species, resource assessment and management, and conservation and management of aquatic species under international concern, *e.g.* sharks and rays. MFRDMD also implements activities that support the Member Countries, especially in the compilation of information on small pelagic species and the establishment of indicators that could be used for the sustainable development and management of fisheries.

Inland Fishery Resources Development and Management Department (IFRDMD)

Established in 2014 in Indonesia, IFRDMD is tasked to carry out activities that support the sustainable development and management of inland capture fisheries. The activities of IFRDMD include the development of methodologies for data collection as well as monitoring and assessment of inland fishery resources to provide a scientific basis for the sustainable development and management of inland fisheries in the Southeast Asian region.

SEAFDEC COUNCIL OF DIRECTORS IN 2025

Chairpersons of the SEAFDEC Council

Mrs. Drusila Esther E. Bayate *(until 20 May 2025)*
Mr. Leong Der Yao *(since 20 May 2025)*

SEAFDEC Council and Alternate Council Directors

Brunei Darussalam

Council Director:	**Ms. Wanidawati Tamat** Acting Director of Fisheries, Department of Fisheries
Alternate Council Director:	**Ms. Noor Dafinah Haji Jelani** Head of Policy and Planning Division, Department of Fisheries

Cambodia

Council Director:	**Mr. Buoy Roitana** Deputy Director-General, Fisheries Administration
Alternate Council Director:	**Mr. Suy Serywath** Deputy Director-General, Fisheries Administration

Indonesia

Council Director:	**Mr. Rudy Heriyanto Adi Nugroho** Secretary-General, Ministry of Marine Affairs and Fisheries
Alternate Council Director:	**Dr. I Nyoman Radiarta** Chairman of Marine and Fisheries Human Resources Development and Extension Agency, Ministry of Marine Affairs and Fisheries

Japan

Council Director:	**Mr. Fukuda Takumi** Councillor, Resources Management Department, Fisheries Agency of Japan
Alternate Council Director:	**Mr. Ishimaru Jun** *(until 15 April 2025)* Director, First Country Assistance Planning Division, International Cooperation Bureau, Ministry of Foreign Affairs **Mr. Enoshita Kenji** *(since 16 April 2025)* Director, Country Assistance Planning Division I, International Cooperation Bureau, Ministry of Foreign Affairs **Mr. Kato Yota** *(since 22 October 2025)* Director, Country Assistance Planning Division I, International Cooperation Bureau, Ministry of Foreign Affairs

Lao PDR

Council Director:	**Dr. Kaviphone Phouthavong** *(until 28 July 2025)* Director-General, Department of Livestock and Fisheries **Mr. Akhane Phomsouvanh** *(since 29 July 2025)* Deputy Director-General, Department of Livestock and Fisheries, Ministry of Agriculture and Environment
Alternate Council Director:	**Dr. Phantavong Vongsamphanh** *(until 18 March 2025)* Deputy Director-General, Department of Livestock and Fisheries **Mr. Akhane Phomsouvanh** *(since 19 March until 28 July 2025)* Deputy Director-General, Department of Livestock and Fisheries, Ministry of Agriculture and Environment

Malaysia

Council Director:	**Dato' Haji Adnan bin Hussain** Director General, Department of Fisheries Malaysia
Alternate Council Director:	**Mr. Haji Bohari bin Haji Leng** *(until 22 March 2025)* Deputy Director General of Fisheries (Development) **Mr. Nazri bin Ishak** *(since 23 March 2025)* Director of Policy and Strategic Planning Division, Department of Fisheries Malaysia

Myanmar

Council Director:	**Mr. Wai Lin Maung** *(until 16 July 2025)* Director-General, Department of Fisheries **Mr. Myint Zin Htoo** *(since 17 July 2025)* Director-General, Department of Fisheries
Alternate Council Director:	**Mr. Myint Zin Htoo** *(until 9 November 2025)* Deputy Director-General, Department of Fisheries **Mr. Nyunt Win** *(since 10 November 2025)* Deputy Director-General, Department of Fisheries

Philippines

Council Director:	**Mrs. Drusila Esther E. Bayate** Undersecretary for Fisheries, Department of Agriculture
Alternate Council Director:	**Mr. Isidro M. Velayo, Jr. MDM** Officer-in-Charge, Bureau of Fisheries and Aquatic Resources

Singapore

Council Director:	**Dr. Jiang Jun Hui** *(covering until 30 April 2025)* Director of Aquaculture Department, Singapore Food Agency **Mr. Leong Der Yao** *(since 1 May 2025)* Deputy Chief Executive Officer (Corporate, Industry & Technology), Singapore Food Agency
Alternate Council Director:	**Dr. Jiang Jun Hui** Director of Aquaculture Department, Singapore Food Agency

Thailand

Council Director:	**Mr. Bancha Sukkaew** *(until 13 November 2025)* Director-General, Department of Fisheries **Dr. Thitiporn Laoprasert** *(since 14 November 2025)* Director-General, Department of Fisheries
Alternate Council Director:	**Dr. Thitiporn Laoprasert** *(until 20 February 2025)* Deputy Director-General, Department of Fisheries **Mr. Prathet Sorrak** *(since 21 February 2025)* Deputy Director-General, Department of Fisheries

Viet Nam

Council Director:	**Dr. Tran Dinh Luan** Director General, Department of Fisheries and Surveillance
Alternate Council Director:	**Mrs. Nguyen Thi Phuong Dung** Head of Science, Technology and International Cooperation Division, Department of Fisheries and Surveillance

SEAFDEC SENIOR OFFICIALS IN 2025

Secretary-General

Dr. Suttinee Limthammahisorn (until 15 September 2025)
Ms. Sampan Panjarat (since 2 October 2025)

Deputy Secretary-General

Dr. Nakazato Tomoko (until 31 May 2025)
Mr. Koishi Tahara (since 1 June 2025)

Training Department (TD)

Chief
Dr. Suttinee Limthammahisorn (until 15 September 2025)
Ms. Sampan Panjarat (since 2 October 2025)

Deputy Chief
Dr. Nakazato Tomoko (until 31 May 2025)
Mr. Koishi Tahara (since 1 June 2025)

Marine Fisheries Research Department (MFRD)

Chief, MFRD Programmes
Mr. Tan Yit Wee

Aquaculture Department (AQD)

Chief
Mr. Dan D. Baliao

Deputy Chief
Dr. Sayaka Ito (until 31 March 2025)
Dr. Takahiro Sajiki (since 1 April 2025)

Marine Fishery Resources Development and Management Department (MFRDMD)

Chief
Mr. Abd. Haris Hilmi bin Ahmad Arshad

Deputy Chief
Dr. Masahito Hirota

Inland Fishery Resources Development and Management Department (IFRDMD)

Chief
Mr. Andi Soesmono

Deputy Chief
Mr. Toru Shimoda

OVERVIEW OF SEAFDEC PROGRAMS IN 2025

The activities of SEAFDEC in 2025 were formulated and implemented in line with the policy directives given by the SEAFDEC Member Countries during SEAFDEC annual meetings, *i.e.* Forty-seventh Meeting of the SEAFDEC Program Committee (2–4 December 2024 in Singapore), Twenty-seventh Meeting of the Fisheries Consultative Group of the ASEAN–SEAFDEC Strategic Partnership (FCG/ASSP) (5–6 December 2024 in Singapore), and Fifty-seventh Meeting of SEAFDEC Council (20–22 May 2025 in Singapore).

Head Delegates attending the Fifty-seventh Meeting of SEAFDEC Council on 20–22 May 2025 in Singapore

Moreover, the development and implementation of the SEAFDEC programs and activities for 2025 have also been guided by regional and international fisheries policy frameworks, particularly the "*Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2030*" adopted by the ASEAN Senior Officials and Ministers during the Special Senior Officials Meeting of the 41st Meeting of the ASEAN Ministers on Agriculture and Forestry on 5 August 2020, 42nd Meeting of the ASEAN Ministers on Agriculture and Forestry on 21 October 2020, as well as the Senior Official and Minister responsible for fisheries of Japan *ad referendum*. Furthermore, the programs and activities of SEAFDEC, especially those under the ASEAN-SEAFDEC Strategic Partnership (ASSP), also support ASEAN in its efforts in the implementation of the "Strategic Plan of Action on ASEAN Cooperation on Fisheries 2021–2025.*"*

The progress of implementation of the programs and activities in 2025 was considered and endorsed by the Forty-eighth Meeting of the SEAFDEC Program Committee, organized on 3–5 November 2025, and the Twenty-seventh Meeting of the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) on 6–7 November 2025, both in Langkawi, Malaysia; and would be submitted to the SEAFDEC Council at its Fifty-eighth Meeting in 2026. Nonetheless, in this Annual Report, all SEAFDEC Programs and projects, including those under the ASEAN-SEAFDEC Fisheries Consultative Group (FCG), the Departmental Programs, and Other Programs, were categorized and reported based on the "SEAFDEC Strategies Towards 2030" adopted by the SEAFDEC Council at its Special Meeting in 2017.

Participants in the Forty-eighth Meeting of the SEAFDEC Program Committee on 3–5 November 2025 in Langkawi, Malaysia

National head delegates of the ASEAN–SEAFDEC Member Countries together with the SEAFDEC Secretary-General and Deputy Secretary-General, representative from the ASEAN Secretariat, and other participants attending the Twenty-eighth Meeting of the FCG/ASSP on 6–7 November 2025 in Langkawi, Malaysia

The programs and projects implemented by SEAFDEC in 2025 are shown below:

1) Projects under the ASEAN-SEAFDEC FCG/ASSP Mechanism

Project no.	Project title	Lead Department	Funding source	Status
Strategy 1: Securing the sustainability of fisheries to contribute to food security, poverty alleviation and livelihood of people in the region				
1.	Implementation and Assessment of the ASEAN Regional Plan of Action for the Management of Fishing Capacity	MFRDMD	JAIF	Ongoing (on track)
2.	Enhanced Marine Research Capacities to Manage Fisheries Resources	MFRDMD/TD	JTF	Ongoing (on track)
3.	Improving Fishers' Livelihood and Fisheries Co-Management in Inland and Coastal Small-Scale Fisheries	IFRDMD/TD	JTF	Ongoing (on track)
4.	Digital Transformation of Regional Fishery Statistics and Enhanced Utilization of Fishery Statistics and Information	SEC	JTF	Ongoing (on track)
5.	Enhancement of Regional Cooperation and Human Resource Development to Eliminate IUU Fishing	TD	JTF	Ongoing (on track)
6.	ASEAN-JICA Capacity Building Project on IUU Fishing Countermeasures in Southeast Asia	TD	JICA	Ongoing (on track)
7.	Research and Dissemination of Sustainable Fishing Technology	TD	JTF	Ongoing (on track)

Project no.	Project title	Lead Department	Funding source	Status
8.	Regional Collaborative Research and Capacity Building for Monitoring and Reduction of Marine Debris from Fisheries in Southeast Asia	SEC	JAIF	Ongoing (on track)
9.	Enhanced Research Capacities for Sustainable Utilization and Management of Eel and Other Inland Fisheries Resources	IFRDMD	JTF	Ongoing (on track)
10.	Development of Stock Assessment Methods and Strengthening of Resources Management Measures for Tropical Anguillid Eel in Southeast Asia	SEC	JAIF	Ongoing (on track, with no-cost extension until 31 May 2026)
11.	Sustainable Management of Fisheries, Marine Living Resources and Their Habitats in the Bay of Bengal Region for the Benefit of Coastal States and Communities (BOBLME Phase II)	TD	FAO/GEF and Norad	Ongoing (on track)
12.	Promoting the Blue Economy and Strengthening Fisheries Governance of the Gulf of Thailand through the Ecosystem Approach to Fisheries (GoTFish)	TD	FAO/GEF	Ongoing (on track)
Strategy 2 :Supporting the sustainable growth of aquaculture to complement fisheries and contribute to food security, poverty alleviation and livelihood of people in the region				
13.	Promotion of Aquaculture Technologies for Emerging Species through Good Aquaculture Practices (GAqP) in Southeast Asia	AQD	JTF	Ongoing (on track)
14.	Blue Horizon: Ocean Relief through Seaweed Aquaculture	SEC/PMU & AQD	WWF-US/GEF	Ongoing (on track)
Strategy 3 :Ensuring the food safety and quality of fish and fishery products for the Southeast Asian region				
	-			
Strategy 4: Enhancing trade and compliance of the region's fish and fishery products with market requirements				
15.	ASEAN-JICA Food Value Chain Development Project	SEC	JICA	Ongoing (on track)
Strategy 5: Addressing cross-cutting issues, such as labor, gender and climate change, where related to international fisheries				
16.	Enhancing Regional Responses to Emerging International Fisheries-related Issues	SEC	JTF	Ongoing (on track)
Strategy 6: Empowering SEAFDEC to strengthen its roles in the region and to improve its services to Member Countries				
17.	Fisheries Resource Survey & Operational Plan for M.V. SEAFDEC 2	TD	JTF	Ongoing (on track)
Special Project				
18.	USAID Southeast Asia Fisheries Partnership	SEC	USAID	Ongoing (on track)

2) Departmental Programs

Program no.	Program title	Responsible Department	Funding source	Status
1.	Quality Seed for Sustainable Aquaculture	AQD	AQD*	Ongoing (on track)
2.	Healthy and Wholesome Aquaculture	AQD	AQD*	Ongoing (on track)
3.	Maintaining Environmental Integrity through Responsible Aquaculture	AQD	AQD*	Ongoing (on track)
4.	Meeting Socioeconomic Challenges in Aquaculture	AQD	AQD*	Ongoing (on track)
5.	Collaborative projects with the Philippine Government	AQD	AQD*	Ongoing (on track)

Program no.	Program title	Responsible Department	Funding source	Status
6.	Promotion on Strengthening of SEAFDEC Visibility and Enhancing Human Capacity Building	TD	TD*	Ongoing (on track)
7.	Collaborative Program with the Government of Thailand	TD	TD*	Ongoing (on track)
8.	Ghost Fishing in a Global South Demonstration Project	TD	IMR, Norway	Completed (accomplished)
9.	USAID DOI International Technical Assistance Program	TD	USAID	Suspended
10.	Water and Sediment Quality Monitoring Network	MFRD	SFA	Ongoing (on track)

***** From the regular contributions of the respective host Governments

3) Other Programs

Program no.	Program title	Responsible Department	Funding source	Status
1.	Regional Capacity Building Workshop for strengthening SEAFDEC and its Members' capacity in responding to SoSI-FIRMS & SDG 14.4.1 Data Calls	SEC	FAO	Completed (accomplished)
2.	Regional Small-scale Fisheries (SSF) Workshop in Asia: Building on a decade of the SSF Guidelines for a sustainable future	TD	FAO	Completed (accomplished)

Remarks: Program/project Status

- Completed (the project has been completed by the end of 2025)
    - Accomplished: Over 80 % of expected outputs achieved
    - Partially accomplished: Less than 80 % of expected outputs achieved
- Ongoing (the project has not yet been completed in 2025 and will continue in 2026)
    - On track: Over 80 % of planned activities are implemented within the reporting year
    - Partially on track: Less than 80 % of planned activities up to the reporting year are implemented
- Not yet started

SEAFDEC PROGRAMS OF ACTIVITIES IN 2025

The programs of activities of SEAFDEC have been formulated and undertaken in response to the requirements of the Member Countries. This was the same for the year 2024, notwithstanding the need to consider the priority issues stipulated in the "*Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2030*" adopted in 2020, and also adhere to the "*Resolution on the Future of SEAFDEC: Vision, Mission, and Strategies Towards 2030*" adopted by the SEAFDEC Council during its Special Meeting in 2017. Thus, the programs and activities carried out by SEAFDEC in 2022 had been structured in this Annual Report based on the "*SEAFDEC Strategies Towards 2030*," *i.e.* 1) Securing the sustainability of fisheries to contribute to food security, poverty alleviation and livelihood of people in the region; 2) Supporting the sustainable growth of aquaculture to complement fisheries and contribute to food security, poverty alleviation and livelihood of people in the region; 3) Ensuring the food safety and quality of fish and fishery products for the Southeast Asian region; 4) Enhancing trade and compliance of the region's fish and fishery products with market requirements; 5) Addressing cross-cutting issues, such as labor, gender and climate change, where related to international fisheries; and 6) Empowering SEAFDEC to strengthen its roles in the region and to improve its services to Member Countries. Moreover, there was also a cross-cutting project that could not be categorized into specific strategies and is therefore categorized as the "Special Project."

The results and progress of the programs and activities of SEAFDEC implemented in 2025 that include those under the ASEAN-SEAFDEC FCG/ASSP Mechanism (18 projects), Departmental Programs (10 programs), and Other Programs (2 programs), are summarized as follows:

1. Strategy 1: Securing the sustainability of fisheries to contribute to food security, poverty alleviation and livelihood of people in the region

1.1 Assessment and management of marine fish stock

Implementation and Assessment of the ASEAN Regional Plan of Action for the Management of Fishing Capacity

FCG/ASSP Project No. 1

Status: *Ongoing (on track)*

Marine capture fisheries production consistently accounted for a significant share of total fisheries production in Southeast Asia. While the marine capture fisheries production in the region has generally increased over the past two decades, some fluctuations have been observed since 2019. Concerns have been raised among stakeholders and fisheries agencies regarding the rapid expansion of the fishing industry, including the introduction of more efficient fishing gear, the increasing number of fishing vessels, and insufficient regulation of fishing capacity. Limited management, regulation, and control of active fishing capacity often allow fisheries to operate under an "open-access regime," resulting in a continuous increase in the number of vessels and individuals engaged in fishing activities. Furthermore, the absence of an effective monitoring, control, and surveillance (MCS) mechanism has contributed to the persistence of illegal, unreported and unregulated (IUU) fishing activities within the exclusive economic zones (EEZs) of neighboring countries. Without effective fisheries management, particularly with respect to fishing capacity, the long-term sustainability of the fisheries sector may be at risk.

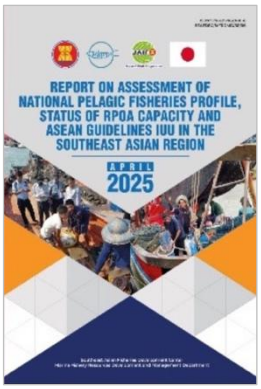
In response to these concerns, SEAFDEC/MFRDMD initiated the project titled "**Implementation and Assessment of the ASEAN Regional Plan of Action for the Management of Fishing Capacity**," funded by the Japan-ASEAN Integration Fund (JAIF). The project is implemented over a two-year period from April 2024 to April 2026. The overall objective of the project is to enhance cooperation among the ASEAN Member States (AMSs) in managing transboundary fishing capacity and facilitate the improvement of regional fisheries information systems, specifically within the framework of pelagic fisheries management, towards resource sustainability and environmental well-being.

The project is design to achieve six expected outputs, *i.e.*: 1) the status of the RPOA-Capacity implementation in AMSs is assessed through surveys; 2) the relevant existing fisheries information systems and mechanisms are compiled and enhanced; 3) simple and practical indicators are standardized in supporting the planning and monitoring of sustainable fisheries for pelagic fish; 4) the current status and establishment of the closed season, closed areas, or other management strategies of selected pelagic species in AMSs are identified and documented; 5) a terminal report is prepared and published; and 6) project monitoring and evaluation are conducted.

Under the first expected output, following the development of the questionnaire for management and assessment of fishing capacity in 2024, MFRDMD proceeded in 2025 with the "Regional Technical Consultation (RTC) on Fishing Capacity Profiles and Implementation Status of the RPOA-Capacity in the Asian Region," on 25–27 February 2025 in Kuala Lumpur, Malaysia. The RTC was attended by 41 participants, including representatives from Brunei Darussalam, Cambodia, Indonesia, Malaysia, Myanmar, the Philippines, Thailand, and Viet Nam; as well as representatives from the Fisheries Research Institute (FRI) Kg. Acheh, FRI Batu Maung, FRI Bintawa, two resource persons from Universiti Malaysia Terengganu (UMT); representative from SEAFDEC Secretariat and TD, and officials from MFRDMD. During the RTC, the AMSs presented their feedback based on the questionnaire on their respective fishing capacity profiles, as well as updates on the implementation status of the RPOA-Capacity and the ASEAN Guidelines for Preventing the Entry of Fish and Fishery Products from IUU Fishing Activities into the Supply Chain (ASEAN IUU Guidelines). The participants actively exchanged views, experiences, and suggestions, fostering constructive dialogue and cooperation. Discussion also focused on the challenges in managing fishing capacity, implementing the RPOA-Capacity, and combating IUU fishing in the region.

Participants at the RTC on Fishing Capacity Profiles and Implementation Status of the RPOA-Capacity in the Asian Region held on 25–27 February 2025 in Kuala Lumpur, Malaysia (left), and the RTC report (right)

Subsequently, MFRDMD organized the "Workshop on the Analysis of the Regional Fishing Capacity Questionnaire" on 9–12 April 2025 in Langkawi, Malaysia. The Workshop was attended by 22 participants, including resource persons, representatives from the headquarters of the Department of Fisheries (DOF) Malaysia, DOF Sabah, FRI Kg. Acheh, FRI Batu Maung, FRI Bintawa, and officials from MFRDMD. The Workshop analyzed the feedback from the questionnaire previously distributed to the AMSs, together with the information presented by each country during the RTC in February 2025. The result of the analysis was subsequently published in the "Report on Assessment of National Pelagic Fisheries Profile, Status of RPOA Capacity and ASEAN Guidelines IUU in Southeast Asian Region."



The participants of the Workshop on the Analysis of the Regional Fishing Capacity Questionnaire, held on 9–12 April 2025 in Langkawi, Malaysia (left), and the Report on Assessment of National Pelagic Fisheries Profile, Status of RPOA Capacity and ASEAN Guidelines IUU in Southeast Asian Region (right)

For the second expected output, following the preparation at the end of 2024 of the questionnaire on the status of existing fisheries statistics and information or relevant systems in AMSs and the distribution of this questionnaire to the AMSs, MFRDMD proceeded activities under this output by organizing the "Regional Technical Consultation on the Current Status of the Regional Fisheries Information or Mechanism in the Asian Region," on 28–30 May 2025 in Kuala Lumpur, Malaysia. The RTC was attended by 38 participants, including representatives from Brunei Darussalam, Cambodia, Indonesia, Malaysia, Myanmar, Thailand, and Viet Nam; as well as from FRI Kg. Acheh, FRI Bintawa, FRI Batu Maung; the SEAFDEC Secretariat, TD, and MFRDMD officials. At this RTC, the AMSs presented their feedback based on the questionnaire on fisheries information systems/mechanisms in their respective country. The consultation generated several recommendations to address the issues and challenges identified in managing fisheries information among AMSs, particularly in the areas of marine capture fisheries, recreational fisheries, imports and exports, and the supply chain.

The participants of the Regional Technical Consultation on the Current Status of the Regional Fisheries Information or Mechanism in the Asian Region on 28–30 May 2025 in Kuala Lumpur, Malaysia (left); and the published meeting report on the RTC (right).

Subsequent to the RTC, MFRDMD organized the "Workshop on the Analysis of the Fisheries Information Questionnaire" on 17–18 July 2025 in Cherating, Pahang, Malaysia. The Workshop was attended by 20 participants, including resource persons, representatives from DOF Malaysia Headquarters, DOF Sabah, FRI Kg. Acheh, FRI Batu Maung, FRI Bintawa, and MFRDMD officials. While each country presented its respective information, feedback from the questionnaire distributed prior to the RTC was analyzed. The results were compiled in the "Report on the Current Status of the Regional Information Systems/Mechanisms in AMSs."

The participants of the Workshop on Analysis on the Fisheries Information Questionnaire on 17–18 July 2025 in Cherating, Malaysia (left), and the Report on the Current Status of the Regional Information Systems/Mechanisms in AMSs (right)

For the fourth expected output, the activity began in 2025 with the "Workshop for Developing a Questionnaire on the Pelagic Fisheries Management Strategies in the Asian Region" held on 10–12 September 2025 in Sabak Bernam, Selangor, Malaysia, with 18 participants, including two resource persons from UMT, representatives from DOF Malaysia, DOF Sabah, FRI Kg. Acheh, FRI Batu Maung, and FRI Bintawa, as well as MFRDMD officials. A draft questionnaire entitled "Current Status of Conservation Effort and Management Strategies of Pelagic Species in AMSs" was prepared and to be validated at another RTC scheduled in October 2025.

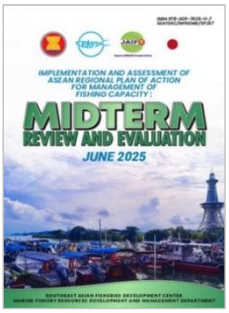
The participants of the Workshop for Developing a Questionnaire on the Pelagic Fisheries Management Strategies in the Asian Region held on 10–12 September 2025 in Sabak Bernam, Selangor, Malaysia (left), and the workshop report (right)

Activities under this Project in 2025 concluded with the conduct of the "Regional Technical Consultation on Harmonization of Simple and Practical Indicators for Sustainable Pelagic Fisheries in Southeast Asia," organized as part of "Output 3," on 22–24 October 2025 in Subang, Malaysia. The RTC was attended by 37 participants, including representatives from Brunei Darussalam, Cambodia, Indonesia, Malaysia, Myanmar, Thailand, and Viet Nam; representatives from DOF Sabah, FRI Kg. Acheh, and FRI Bintawa; two resource persons from UMT; as well as MFRDMD officials. During the RTC, the representatives from the AMSs presented the indicators currently used in their respective countries for pelagic fisheries. Guided by the resource persons, participants discussed and identified suitable and simple indicators that could be applied across all AMSs. As a result, a draft harmonized set of indicators for sustainable pelagic fisheries was developed and reviewed by all participants, while the AMSs agreed to prepare and submit one country report as a pilot initiative.

Moreover, the RTC also reviewed the draft questionnaire entitled "Compilation and Assessment on the Conservation Effort and Management Strategies of Pelagic Species," which will be distributed to the AMS focal points for further input.

The participants of the RTC on Harmonization of Simple and Practical Indicators for Sustainable Pelagic Fisheries in Southeast Asia, on 22–24 October 2025 in Subang, Malaysia (left), and the RTC report (right)

For project monitoring and evaluation under "Output 6," MFRDMD organized two "Midterm Review and Evaluation Sessions." The first session was the "Midterm Review and Evaluation Meeting" held on 22–24 April 2025 in Penang, Malaysia with 20 participants, including a resource person from Universiti Utara Malaysia (UUM), representatives from DOF Malaysia, and FRI Kg. Acheh, FRI Bintawa, as well as officials from MFRDMD. The meeting reviewed the project's progress at the mid-point of its implementation, assessed achievements against the project objectives, and identified implementation challenges and areas requiring further attention. Subsequently, the second session, the "Workshop on Finalization of Midterm and Evaluation Meeting," was held on 11–13 June 2025 at the MFRDMD office in Kuala Terengganu.



The first and second midterm review and evaluation sessions (left and middle) and the Midterm Review and Evaluation report (right)

The focus for 2026 will be on the final phase of project implementation, during which remaining activities under Outputs 4, 5, and 6 will be completed, thereby bringing the project to its conclusion.

Enhanced Marine Research Capacities to Manage Fisheries Resources

FCG/ASSP Project No. 2

Status: *Ongoing (on track)*

Southeast Asia is a leading global supplier of marine products that are vital to both local food security and international trade. However, the sustainability of the marine resources has been threatened by overfishing and stock depletion, exacerbated by limited human resources and inadequate monitoring infrastructures in certain countries. This vulnerability is further intensified by environmental changes, such as rising sea temperatures, ocean acidification, and shifting currents, which disrupt marine ecological processes, including primary productivity. With scientific studies predicting up to 40 % decline in marine products in tropical zones by 2050, there is an urgent need to establish integrated ecological and oceanographic monitoring systems to assess these changing conditions.

Over the past years, SEAFDEC has addressed these challenges using statistical approaches, such as the ASPIC surplus-production model introduced in 2016. While technical mastery of this model could be achieved, its regional application has been hindered by inconsistent data series and differing statistical standards across ASEAN Member States (AMSs). To overcome these limitations, the SEAFDEC Training Department (TD), through the new project supported by the Japanese Trust Fund (JTF) under the Project "**Enhance Marine Research Capacities to Manage Fisheries Resources**," aims to design a new stock assessment system that is more robust, ecologically sound, and information based. This innovative approach integrates hydroacoustic science—using advanced systems such as the SIMRAD EK80 on the research vessel M.V. SEAFDEC 2—with environmental impact assessments to refine biomass data and parameter quality. The project will disseminate these improved methodologies among the SEAFDEC Member Countries, establishing a sustainable, scientifically backed management system in preparation for the high uncertainties posed by future climate impacts on marine environments.

The ultimate goal of this project is to design a system that integrates ecological and oceanographic research activities to better understand marine ecosystem conditions and fish stock status. This will ensure that fishery management and policymaking related to food security are effectively carried out, even in the face of environmental changes. The project provides a tool to promote the sustainable use of fish stocks and to assess future impacts on marine ecosystems, with a focus on securing food security policies. The project comprises three expected outcomes, namely: 1) System design of bioresearch for marine fish stock in the Southeast Asian region; 2) Capacity building on marine environment changes, monitoring and assessing their impact on fishery resources; and 3) Enhancing capacity for estimating fishery biomass through scientific hydroacoustic surveys.

Under **Expected Outcome 1**, for the first expected output aiming at "Biology and ecology information and data collection for pelagic," MFRDMD in collaboration with TD and the Department of Fisheries (DoF) Malaysia organized the "Fisheries Acoustic Survey in the West Coast of Peninsular Malaysia (WCPM)" from 2 to 27 September 2025. With the objectives to collect and identify fish larvae that spawned in the area, this survey was conducted onboard the M.V. SEAFDEC 2, equipped with the echo sounder SIMRAD EK80. During the survey, MFRDMD collected pelagic fish samples and identified the species by their morphological characteristics. Simultaneously, MFRDMD collected larvae samples at some stations. The sample analysis is planned for 2026.

Fisheries Acoustic Survey in the West Coast of Peninsular Malaysia from 2 to 27 September 2025

Coastal fisheries acoustic surveys using the portable echo sounder" Furuno FCV600" from August to November 2025 in the west coast of Malaysia

MFRDMD also conducted three (3) coastal fisheries acoustic surveys using the portable echo sounder, Furuno FCV600, from August to November 2025. This survey was conducted in Kapas Island (Terengganu) and in Pangkor Island (Perak) to locate the spawning ground of small pelagic species, especially anchovies, given that Pangkor Island is the main area for anchovy fisheries in Malaysia. The activity was also intended to enhance the MFRDMD staff's skills in operating the FCV600. This activity would continue in 2026.

On 16–20 February 2025, MFRDMD organized the "Fisheries Acoustic Survey and Data Analysis Training" in Kuala Terengganu, Malaysia. The objective of this training is to provide capacity-building and hands-on experience for researchers, *i.e.* officials from MFRDMD, TD, the DoF Malaysia, and the DoF Brunei Darussalam, in fisheries acoustics. Guided by two resource persons, *Dr. Koki Abe* from TD and *Dr. Zhu Yanhui* from Hokkaido University, Japan, the participants learned to analyze fisheries acoustic data using EchoView software.

Fisheries Acoustic Survey and Data Analysis Training at MFRDMD in Kuala Terengganu, Malaysia on 16–20 February 2025

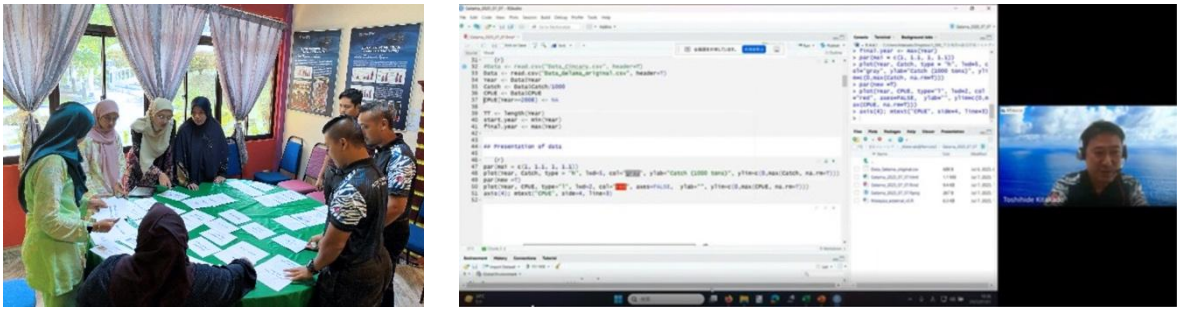
As for the second expected output "Landing data collection and age-length key development," in 2025, MFRDMD collected landing data for growth-rate estimation of selected small pelagic species for cohort-based stock assessments. From January to December 2025, a total of 2,189 samples of *Rastrelliger kanagurta*, 2,374 samples of *Decapterus maruadsi*, and 32 samples of *D. macrosoma* were collected from the Pulau Kambing, Marang, and Chendering landing sites in Malaysia. Length and weight parameters were recorded, and gonad samples were also examined to obtain physiological information.

MFRDMD staff collecting landing data and develop age-length for small pelagic and sharks

Furthermore, a total of 1,131 pelagic samples were collected for age-length key analysis in the WCPM and East Coast Peninsular Malaysia (ECPM). For WCPM, 260 samples of *Rastrelliger kanagurta*, 230 samples of *R. brachysoma*, 230 samples of *Decapterus maruadsi*, and 3 samples of *D. macrosoma* were collected from Kuala Perlis and Pengkalan Gurun Tengah landing sites. As for the ECPM, 200 samples of *R. kanagurta*, 200 samples of *D. maruadsi*, and 8 samples of *D. macrosoma* were collected from Pulau Kambing and Marang landing sites. Otoliths for all these samples were extracted and will be further analyzed for age estimation in 2026.

Moreover, from January to December 2025, a total of 806 specimens of bamboo shark (*Chiloscyllium punctatum*) were collected from five landing sites along the ECPM: Tok Bali, Kuala Besut, Pulau Kambing, Kuala Dungun, and Kuantan. The vertebrae of the specimens were extracted and will be further analyzed in 2026 for age determination and growth rate analysis.

Under another expected output, "Establishment of Stock Assessment Methodology for Pelagic and Sharks," MFRDMD organized a series of stock assessment training sessions to enhance its operational skills in the surplus production model for assessing the targeted pelagic stocks under this project. The training was conducted three times, *i.e.* in May in Terengganu, in June/July online, and in November at Tokyo University of Marine Science and Technology (TUMSAT). An expert from TUMSAT, *Prof. Dr. Toshihidae Kitakado,* was appointed as a resource person to share his knowledge and expertise in stock assessment models and tools using R software. This training is crucial for developing stock assessment analysis and management for small pelagic species in Southeast Asia, given the multi-species and multi-fisheries characteristics of this region.



Stock assessment training sessions to enhance its operational skills in the surplus production model for assessing the targeted pelagic stocks

For **Expected Outcome 2**, the objective is for researchers of the SEAFDEC Member Countries to have a better understanding and enhanced capacity to analyze the impacts of marine environmental changes on fisheries resources, thereby raising awareness of the environmental issue in the Southeast Asian region.

Two collaborative research studies were carried out on 1) Climate Variability Caused by the Indian Ocean Dipole (IOD) and Its Impacts in the Andaman Sea, and 2) Impact of Hypoxia on the Abundance of Demersal Fish and Benthos in the Upper Gulf of Thailand.

In 2025, TD organized the "Consultation Workshop on the Collaborative Study on Climate Variability Caused by the Indian Ocean Dipole (IOD) and Its Impacts in the Andaman Sea" on 14 November 2025 in Samut Prakan, Thailand. Nineteen participants are members of the collaborative research team, including officers from the Ministry of Marine Affairs and Fisheries (MMAF) Indonesia, the Department of Fisheries (DOF) Malaysia, and the DOF Thailand, as well as experts from Japan, a university in Thailand, and the SEAFDEC Departments. By the end, the members of the collaborative research team obtained an understanding of the concept and framework of the collaborative study on climate variability caused by IOD and its impacts on fishery resources. The members have also agreed on the five-year activities and collaborative framework to collect the data for analysis together with the strengthened network of researchers in the region.

Consultation Workshop on the Collaborative Study on Climate Variability Caused by the IOD and Its Impacts in the Andaman Sea on 14 November 2025, Samut Prakan, Thailand

As for the Study on the Impact of Hypoxia on the Abundance of Demersal Fish and Benthos in the Upper Gulf of Thailand, an onboard survey was conducted to collect data during 2–6 November 2025 using the M.V. PLALUNG. The survey collected data on the abundance of benthos and benthic fisheries, CPUE data, and oxygen data during that period.

An onboard survey was conducted to collect data on the impact of hypoxia on the abundance of demersal fish and benthos in the Upper Gulf of Thailand on 2–6 November 2025

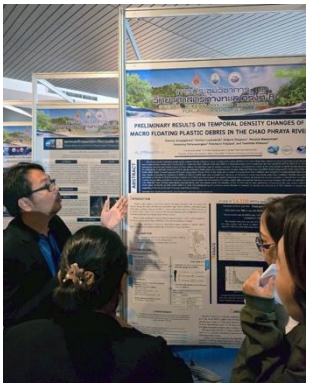
In order to improve knowledge on vulnerability assessment of fisheries resources in response to climate change, TD organized the "Technical Workshop to Develop the Draft Working Handbook for Productivity and Susceptibility Analysis (PSA) and Vulnerability Analysis (VA) for Southeast Asia" from 28 to 30 August 2025 in Samut Prakan, Thailand. Nine participants attended the Workshop and came up with the five-year work plan to complete the working handbook on assessing the vulnerability of fisheries resources in response to climate change and the report on the PSA and VA of three fish species in the Andaman Sea to climate change.

On capacity building for researchers of SEAFDEC and the Member Countries in the monitoring of marine environment changes and its impact on fisheries resources, TD organized the "Regional Training Course on the Introduction of El Niño-Southern Oscillation (ENSO) and Indian Ocean Dipole (IOD) and Its Impacts in Southeast Asia" from 10 to 13 November 2025 at the TD premises in Samut Prakan, Thailand. Twenty-six trainees, including officers and researchers from SEAFDEC Member Countries and the SEAFDEC Department, participated in the Training with two resource persons from JAMSTEC, who shared their knowledge, information, and experience. By the end of the Training, all trainees had enhanced their understanding of ENSO and IOD phenomena and their impact on the Andaman Sea, marine life, and aquaculture, and had strengthened a network of researchers in the region.

Regional Training Course on the Introduction of ENSO and IOD and Its Impacts in Southeast Asia from 10 to 13 November 2025 at SEAFDEC/TD

On SEAFDEC staff capacity building, four TD staff members enhanced their skills by participating in training and seminars. Two TD researchers under this Project participated in the "Internal Training Program on Basic Stock Assessment of Marine Pelagic Fisheries Resources" from 5 to 8 May 2025,

organized by SEAFDEC/MFRDMD; while the other two participated in the "8th Marine Science Conference" on 25–27 June 2025 in Trang Province, Thailand.



Researchers from TD participated in the 8th Marine Science Conference on 25–27 June 2025 in Trang Province, Thailand

For **Expected Outcome 3**, the objective is for researchers and officers of the SEAFDEC Member Countries to conduct effective hydroacoustic surveys using quantitative echo sounders.

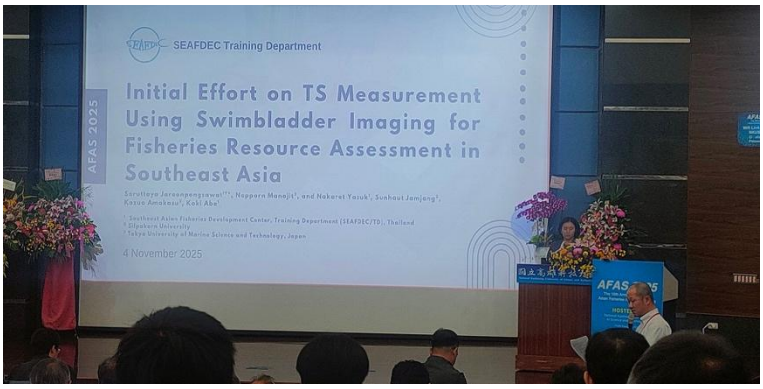
In 2025, the activity to enhance hydroacoustic survey capabilities through on-the-job training and event participation for researchers from SEAFDEC and the AMSs began with the "Fisheries Acoustic Survey & Data Analysis Training in Terengganu Coastal Waters," conducted from 16 to 22 February 2025 at the SEAFDEC/MFRDMD premises. This training enhanced the capacity of two TD researchers in fisheries acoustic surveys and data analysis and strengthened a network of researchers from different Departments and fisheries acoustics experts.

TD researchers participating in the Fisheries Acoustic Survey & Data Analysis Training in Terengganu Coastal Waters from 16 to 22 February 2025 at SEAFDEC/MFRDMD

Another research study on the Target Strength (TS) of the economically important fish species in 2025 started with the "Expert Consultation on Target Strength Measurement Methods for Biomass Estimation in Southeast Asia" held from 29 to 30 July 2025 at TD premises. Eighteen participants attended the Consultation, including eleven staff from TD, two from MFRDMD, one from IFRDMD, one from DOF Thailand, and three Japanese experts from the Fisheries Research and Education Agency (FRA), the Tokyo University of Maritime and Technology (TUMSAT), and SEAFDEC. By the end, the Consultation came up with the recommendation for TS research study and strengthened network of researchers from different SEAFDEC Departments and fisheries acoustics experts on TS study. The project initiated a research study on TS from the swim bladder of economically important species, which will continue in 2026.

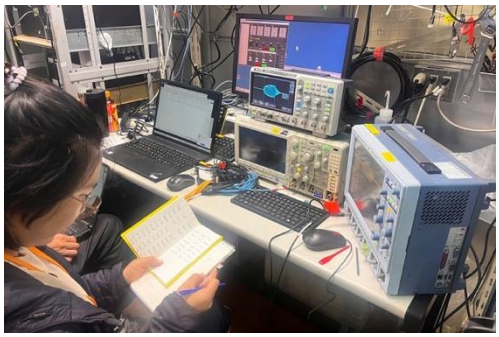
Expert Consultation on Target Strength Measurement Methods for Biomass Estimation in Southeast Asia from 29 to 30 July 2025 at SEAFDEC/TD

Subsequently, TD demonstrated its commitment to scientific excellence and the development of next-generation researchers at the "18th Annual Meeting of the Asian Fisheries Acoustics Society (AFAS 2025)," held from 2 to 5 November 2025 in Kaohsiung, Taiwan. Representing TD, *Ms. Saruttaya Jaroonpongsawat* presented the pioneering research titled "Initial Efforts on Target Strength (TS) Measurement Using Swimbladder Imaging for Fisheries Resource Assessment in Southeast Asia." This work addressed the unique challenges of conducting acoustic surveys in regional waters and introduced innovative methodologies using swimbladder imaging and theoretical modeling to improve the accuracy of fish stock assessments. The impact of this research was recognized by the international scientific community as *Ms. Saruttaya* was honored with the prestigious "Young Fisheries Acoustician Award (AFAS 2025)." This award, reserved for outstanding researchers under the age of 40, highlights SEAFDEC's significant contributions to underwater acoustic technology and its leadership in fostering sustainable fisheries management through advanced scientific research.



TD researcher honored with the prestigious "Young Fisheries Acoustician Award"

Before the year's end, one researcher, together with an expert from TD, enhanced their technical proficiency and theoretical knowledge in the calibration of portable scientific echosounders through the "Specialized Training on the Calibration Test of the FURUNO FCV-600 Echo Sounder" from 25 to 28 November 2025 in Japan.



Specialized Training on the Calibration Test of the FURUNO FCV-600 Echo Sounder

Regional Capacity Building Workshop for strengthening SEAFDEC and its Members' capacity in responding to SoSI-FIRMS & SDG 14.4.1 Data Calls

Other Program No. 1

Status: *Completed (accomplished)*

While FAO has collaborated with intergovernmental fisheries organizations to provide information on the state of fish stocks, forming part of FAO's flagship publication Status of Fisheries and Aquaculture (SOFIA), FAO has more recently served as the custodian agency for *SDG Indicator* ***14.4.1:*** **"*Proportion of fish stocks within biologically sustainable levels*."** In this role, countries report national data that contribute to the **State of Stocks Index (SoSI).** The processes and outcomes of the first two reporting rounds, conducted in 2019/20 and 2022/23, were presented in **SOFIA 2024.** The third reporting round commenced in 2024, and its results are currently under analysis. However, many countries continue to face challenges in reporting on SDG 14.4.1 and SoSI, particularly due to limited capacity for data collection and stock assessment, underscoring the need for continued capacity-building support.

To strengthen the capabilities of SEAFDEC Member Countries in this regard, SEAFDEC and FAO signed a Letter of Agreement (LOA) for the provision of Funds for the implementation of the Project "**Regional Capacity Building Workshop for Strengthening SEAFDEC and its Members' Capacity in Responding to FIRMS & SDG 14.1.4 Data Calls**" in support of FAO's State of Stocks Index (SoSI). The three-day Workshop was conducted on 8–10 September 2025 in Bangkok, Thailand and was attended by 17 representatives from seven SEAFDEC Member Countries, namely: Brunei Darussalam, Cambodia, Indonesia, Malaysia, the Philippines, Thailand, and Viet Nam; and by representatives from the FAO Headquarters and FAO/RAP as resource persons. With technical support from FAO, the participants were introduced to new approaches for the SoSI and the application of data-limited methods using the FAO SDG 14.4.1 VRE. The Workshop also identified challenges and provided recommendations for improving reporting and enhancing convergence between SDG 14.4.1 and SoSI. Furthermore, an Action Plan was developed and agreed upon by Member Countries to strengthen data collection and reporting in preparation for the next SoSI/FIRMS/SDG 14.4.1 data call.

Participants of the Regional Capacity Building Workshop for Strengthening SEAFDEC and its Members' Capacity in Responding to FIRMS & SDG 14.4.1 Data Calls in support of FAO's SoSI, 8–10 September 2025, Bangkok, Thailand

1.2 Assessment and management of inland and small-scale fisheries

Improving Fishers' Livelihood and Fisheries Co-Management in Inland and Coastal Small-Scale Fisheries

FCG/ASSP Project No. 3

Status: *Ongoing (on track)*

Small-scale fisheries are vital to food security, nutrition, and poverty alleviation in Southeast Asia, providing nutritious food and contributing significantly to local and national economies. However, these

fisheries are highly dependent on ecosystem health, seasonal conditions, and primarily operate in coastal areas, increasing the vulnerability of fishing communities. Small-scale fishers, often located in remote areas, continue to face low and unstable incomes, as well as limited access to markets, healthcare, education, livelihood diversification, financial services, and other essential services. Moreover, based on the regional workshop organized under the JTF6-2 project, fishers were also found to have limited awareness of resource management with growing vulnerability to climate change and environmental impact, underscoring the need for capacity building to support adaptation and resilience efforts in the fishing community.

To continue to address challenges faced by small-scale fisheries in Southeast Asia, SEAFDEC/TD, in collaboration with IFRDMD, formulated and started implementing the new Project, "**Improving Fishers' Livelihood and Fisheries Co-management in Inland and Coastal Small-scale Fisheries**." The Project runs from 2025 to 2029, with the goal of strengthening sustainable fisheries management in small-scale fisheries in SEAFDEC Member Countries by implementing effective fisheries management approaches, enhancing livelihoods, and promoting the sustainable utilization of marine fisheries resources for future generations.

Under **expected outcome 1**, *i.e.* Fisheries officers in participating Member Countries enhance their capacity on the community-based fisheries management and co-management approaches in small-scale fisheries, promoting sustainable livelihoods and utilization of fisheries resources; the expected outputs are: 1) Development and implementation of community-based fisheries management/co-management and support livelihood of coastal small-scale fisheries in the pilot sites (by TD); 2) Development and implementation of community-based fisheries management/ co-management and support livelihood of inland small-scale fisheries in the pilot sites (by IFRDMD); 3) Enhanced regional cooperation and knowledge sharing for sustainable small-scale fisheries management (by TD and IFRDMD); and 4) Guidelines for fisheries management in inland fishers' livelihoods developed (by IFRDMD). For **expected outcome 2**, *i.e.* Fisheries officers develop their comprehensive understanding of the supply chain dynamics in small-scale fisheries to improve the fishers' livelihood; the expected output is an improved supply chain in small-scale fisheries in the pilot sites.

Under **Output 1.1**, TD selected and implemented activities in two coastal fisheries pilot sites in Cambodia and Thailand.

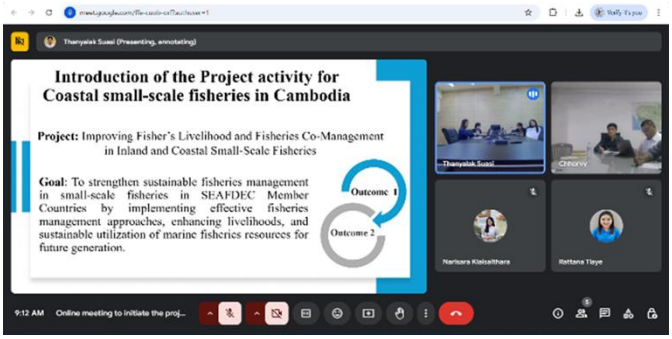
For the pilot site in Thailand, the first activity in 2025 was the "Preliminary field survey in Bangsaphan District, Prachuap Khiri Khan Province, Thailand" from 15 to 18 July 2025. The information gathered from surveys and stakeholder consultations indicated that Bangsaphan District is the most suitable pilot site to implement the activity, covering nine fisher groups under the Bangsaphan Fishers Network. This site selection was guided by key criteria, including strong and active local leadership, high community willingness to participate, active involvement of relevant agencies, and availability of dedicated officers to support implementation. Subsequently, the "First Meeting and Socioeconomic Survey in the Selected Pilot Site, Bangsaphan District, Prachuap Khiri Khan Province, Thailand" was convened on 7–9 October 2025. This Meeting aimed to formally introduce the project activities to key stakeholders and the local community. A socioeconomic survey was also conducted through face-to-face interviews with 83 fishers from nine fisher groups using the KoboToolbox mobile application to collect baseline information and assess the community's status, needs, and challenges. The findings served as a foundation for developing a comprehensive fisheries management plan to support sustainable resource use and community development. In addition, the "Key Stakeholder Engagement Workshop to Develop the Fisheries Management Plan (FMP) in Bangsaphan District, Prachuap Khiri Khan Province" was conducted from 18 to 19 November 2025 with a total of 31 participants. The Workshop aimed to strengthen participatory fisheries management by bringing together local stakeholders, community representatives, and government agencies to jointly draft a Fisheries Management Plan (FMP) guided by the ecosystem approach to fisheries management (EAFM). By the year-end, the "Draft Fisheries Management Plan for Bangsaphan" was developed and would be finalized in 2026.


Preliminary field survey in Bangsaphan District, Prachuap Khiri Khan Province, Thailand from 15 to 18 July 2025


The first meeting and socioeconomic survey in Bangsaphan District


Key Stakeholder Engagement Workshop to Develop the Fisheries Management Plan (FMP) in Bangsaphan District, Prachuap Khiri Khan Province from 18 to 19 November 2025

For the pilot site in Cambodia, TD, in collaboration with the Fisheries Administration (FiA) of Cambodia, conducted the "Initial Online Meeting for Site Selection in Cambodia" on 11 March and 21 April 2025 to identify a suitable pilot site. As a result, Trapaing Sangke CFi in Kampot Province was selected, while a data collection questionnaire was developed using the Kobo application. This pilot site was selected due to its community readiness, ecosystem importance, and strong institutional support. After that, the "Online meeting with FiA in preparing the activities for Letter of Agreement (LOA) in the pilot site (Trapaing Sangke CFi), Cambodia" was organized on 10 September 2025. After the signing of the LOA, the FiA proceeded with the "Socioeconomic Data Collection at the pilot site (Trapaing Sangke, Cambodia)" on 16–22 November 2025, and the "Meeting to Initiate the Fisheries Management Plan (FMP) for the pilot site (Trapaing Sangke, Cambodia)" on 16–19 December 2025. The outputs of this activity are the raw fisheries and socioeconomic data, and the draft EAFM-based FMP for Trapaing Sangke CFi.

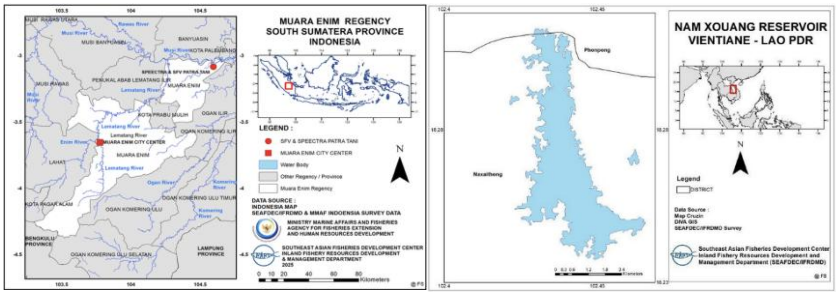


An Initial Online Meeting to identify a suitable pilot site in Cambodia

Socioeconomic data collection at the pilot site in Trapaing Sangke on 16–22 November 2025

Meeting to initiate FMP for the pilot site in Trapaing Sangke on 16–19 December 2025

For **Output 1.2** "Development and Implementation of Community-based fisheries management/Co-management and support livelihood of inland small-scale fisheries in the pilot sites through improving capacity building of the community," IFRDMD implemented activities at two pilot sites, namely: 1) Muara Enim Regency in Indonesia and 2) Nam Xouang Reservoir in Lao PDR. These two sites are highly dependent on inland fisheries as a primary source of livelihood, and faced similar challenges related to resource fluctuations, climate variability, and limited economic access. The methodology combined quantitative and qualitative approaches, including socioeconomic surveys of fishing households, descriptive statistical analysis, Ordinary Least Squares (OLS) regression to identify key determinants of income, SWOT analysis for strategic formulation, and stakeholder consultations for discussion and validation.



Maps showing study sites in Muara Enim Regency, Indonesia (left) and Nam Xouang Reservoir, Lao PDR (right)

In Muara Enim, surveys were conducted on 25–26 February 2025 with 52 fishing households, whereas in Nam Xouang, 48 households participated in the surveys on 9–10 August 2025. Secondary data were collected from relevant government institutions and from previous studies of IFRDMD, enabling a comprehensive and context-specific analysis.

Participants being interviewed in study sites in Indonesia (left) and Lao PDR (right)

IFRDMD engagement with the fisheries officers of Muara Enim Regency, local fish processors, and the Regent of Muara Enim Regency in Indonesia

IFRDMD engagement with the fisheries officers of the DLF and fishers in Lao PDR

The results indicate that fishers in both pilot sites experience generally low incomes that are highly influenced by seasonal conditions. In Muara Enim, fishers' incomes tend to increase during the dry season when river and wetland water levels decline, causing fish to concentrate and become easier to catch. Conversely, during the flood season, incomes drop sharply as fish disperse widely and become more difficult to harvest. A similar pattern is observed of fishers in Nam Xouang Reservoir, although income variability there is also strongly influenced by residential location, the quality of fishing assets, and proximity to landing sites and market access. To cope with this uncertainty, many fishing households combine capture fisheries with other activities such as agriculture, daily labor, small-scale aquaculture, or micro-enterprises, although most of these supplementary activities remain low-paid and seasonal.

Socioeconomic analysis further reveals that fishers in both locations generally have low to moderate levels of formal education, which limits their access to information, non-fishing livelihood

opportunities, and formal financial services. Most fishing households also lack adequate savings, leaving them without financial buffers to cope with shocks such as poor fishing seasons, gear damage, or health emergencies. Although ownership of physical assets such as houses, land, or boats is relatively common, these assets are illiquid and difficult to mobilize for short-term needs. This situation reinforces economic vulnerability and constrains fishers' ability to invest in productivity improvements or value-added activities.

OLS regression analysis conducted at both sites shows consistent findings that fishers' income is not determined solely by catch volume but is more strongly influenced by human capacity and economic access. Working time has the most significant effect on income, indicating that income increases remain heavily dependent on physical labor intensity. Education level also has a positive influence, suggesting that better-educated fishers are more capable of managing their livelihoods, understanding market information, and exploring alternative economic opportunities. Fishing experience contributes positively as well, highlighting the importance of local knowledge and social networks in improving economic outcomes. The most influential factor affecting income, particularly in Nam Xouang, is access to capital, which enables fishers to invest in better fishing gear, production inputs, or processing and marketing activities. These findings confirm that increasing production alone is insufficient to improve fishers' welfare without parallel investments in capacity building and financial inclusion.

SWOT analysis at both sites indicates that inland fisheries possess strong resource potential and face robust market demand, yet continue to struggle with internal weaknesses such as low education levels, limited technology, and underutilization of available time. Development opportunities lie in livelihood diversification, fisheries processing, strengthening fisher groups, and support from government programs and regional organizations. At the same time, major threats include resource degradation due to unsustainable practices, climate change impacts, price volatility, and excessive dependence on a single livelihood source. Based on this analysis, development strategies were formulated with an emphasis on strengthening co-management arrangements, enhancing the capacity of fishers and local institutions, promoting livelihood diversification, and expanding access to capital and markets.

On 26–28 November 2025, IFRDMD organized in Muara Enim the "Workshop on Livelihood Diversification and Entrepreneurship for Small-Scale Inland Fisheries*"* to strengthen the capacity of fisheries extension officers and local government staff to support fishers in developing alternative and value-added livelihood options. Training modules covered market-ready product ideation, entrepreneurship communication, and simple digital marketing strategies. Evaluation results demonstrated a significant increase in participants' knowledge, with a 77.5 percent improvement between pre-test and post-test scores. All 20 participants also gained practical skills that can be directly applied in community facilitation, including product quality improvement, packaging, and the use of digital platforms for marketing.

Workshop brochure and participants during the opening session and the certificate awarding

The results of the 2025 activities demonstrated that an integrated approach combining community-based fisheries management, capacity building, livelihood development, and regional cooperation is more effective in enhancing the socioeconomic resilience of inland small-scale fishing communities than approaches focused solely on increasing production. The shared challenges observed in Muara Enim and Nam Xouang Reservoir highlighted the regional nature of these issues, making the lessons and good practices generated by this project relevant for replication and adaptation in other ASEAN Member States. The project provided a strong foundation for the future development of inland fisheries management guidelines and livelihood improvement strategies, underscoring the importance of sustained investment in human capacity, financial inclusion, and participatory fisheries governance.

Under **Output 1.3**, TD organized the "Online Inception Workshop to Introduce Project of Small-scale Fisheries" on 30 July 2025. A total of 47 participants gained a clear understanding of the project's goals, objectives, and planned activities at the pilot site. The recommendations and suggestions shared during the Workshop contributed to the development of appropriate future actions for the project. Subsequently, the "Regional Training on Socioeconomic Data and Community Resilience in Small-scale Fisheries" was organized on 27–31 October 2025 at TD premises in Samut Prakan and in Chonburi Province. A total of 45 participants attended the Training, which comprised two main sessions: lecture sessions held at TD and field practice in Chonburi Province. This Training contributed to strengthening regional collaboration and enhancing the capacity of fisheries officers to understand and apply socioeconomic information for sustainable small-scale fisheries management.

Online Inception Workshop to Introduce Project of Small-scale Fisheries on 30 July 2025 at SEAFDEC/TD

Regional Training on Socioeconomic Data and Community Resilience in Small-scale Fisheries" was organized on 27–31 October 2025 at SEAFDEC/TD

TD also organized the "Annual Meeting of the Project Improving Fishers' Livelihood and Fisheries Co-management in Inland and Coastal Small-scale Fisheries" from 2 to 3 December 2025 in Lao PDR. The Meeting aimed to review progress at the pilot sites in 2025, identify challenges and lessons learned to strengthen project implementation, plan activities for 2026, and enhance knowledge sharing and coordination among SEAFDEC Departments and national focal points. A total of 11 participants attended, including representatives from TD, IFRDMD, focal persons from Cambodia, Lao PDR, and Thailand, and officers from the Department of Livestock and Fisheries (DLF) of Lao PDR. The two-

day program included a one-day meeting and a study visit to the Nam Xouang Reservoir pilot site, which has demonstrated successful fisheries co-management and the development of alternative livelihoods under the project. The visit provided an opportunity to exchange experiences, best practices, and lessons learned, contributing to improved guidance and effectiveness in future project implementation.

Annual Meeting of the Project Improving Fishers' Livelihood and Fisheries Co-management in Inland and Coastal Small-scale Fisheries on 2–3 December 2025 in Lao PDR

To enhance regional cooperation and knowledge sharing, the Project staff of TD participated in the "8th Marine Science Conference" on 25–27 June 2025 in Trang Province, Thailand; while TD and IFRDMD staff participated in the "9th Global Conference on Gender in Aquaculture & Fisheries" on 1–3 October 2025 at AIT, Pathum Thani Province, Thailand. At the Marine Science Conference, findings, together with knowledge and experiences gained from the project, were shared through a poster session; while at the Global Conference on Gender, the results were communicated through an oral presentation, highlighting project outcomes and promoting discussion on gender aspects in fisheries.

TD staff participating in the 8th Marine Science Conference on 25–27 June 2025 (left) and the 9th Global Conference on Gender in Aquaculture & Fisheries (right)

Under **Output 2.1**, TD organized the "Regional Consultation Workshop on the Study of the Small-scale Fisheries Supply Chain in Southeast Asia" from 24 to 26 September 2025 at TD premises in Samut Prakan Province, Thailand. A total of 32 participants attended the Workshop with the aim of selecting the study sites for the small-scale fisheries supply chain in both inland and coastal areas, and developing the study methodology. Throughout the Workshop, participants actively engaged in lectures and planning activities, enhancing their knowledge and skills to conduct supply chain studies in small-scale fisheries. They also gained valuable insights and experience from case studies shared during the sessions. The Workshop developed the study's concept and objectives, reviewed existing information, and finalized site selection, including Lao PDR for inland fisheries and the Philippines and Thailand for coastal fisheries.

However, further work is needed to define the study's scope and to develop appropriate methodologies for each site. This includes formulating guiding questions and outlining analysis processes to ensure

clarity and consistency across all locations. Therefore, the "Consultation Workshop on Developing the Methodology for the Study of Small-Scale Fisheries Supply Chains in Selected Sites" was conducted on 5 November 2025 at the SEAFDEC Secretariat in Bangkok, Thailand. The Workshop provided the details and process for the small-scale fisheries supply chain study in the selected site, including guiding questions and data collection tools.

After finalizing the questionnaire, two small-scale fisheries supply chain studies were conducted. The first study was the "Study on the Indo-Pacific Mackerel Supply Chain in Thasala District, Nakhon Si Thammarat Province, Thailand" from 10 to 14 November 2025 in collaboration with the DOF Thailand. A survey was conducted through semi-structured interviews with fishers, traders, restaurant operators, and consumers to examine how profits and costs are shared along the supply chain. The findings will contribute to assessing economic efficiency, market dynamics, and value addition, thereby providing insights to promote equity, fair income distribution, and sustainability in small-scale fisheries.

For another study, TD, in collaboration with the DLF of the Lao PDR, conducted the "Study on Thai River Sprat Supply Chain in the Ngum Reservoir, Keo Oudom District, Vientiane Province" from 15 to 19 December 2025 in the Lao PDR. The objective of the study was to comprehensively analyze the supply chain for Thai River Sprat harvested from the Nam Ngum Reservoir by systematically mapping key actors and examining stakeholder interactions and relationships at different supply chain stages. Data were collected through semi-structured interviews with fishers, traders, processors, and consumers to assess cost structures, pricing mechanisms, and the distribution of profits along the supply chain. The study findings are expected to contribute to a better understanding of economic efficiency, market dynamics, and opportunities for value addition, while providing evidence-based insights to support the promotion of equity, fair income distribution, and the long-term sustainability of small-scale fisheries in the Nam Ngum Reservoir.

Regional Small-scale Fisheries (SSF) Workshop in Asia: Building on a decade of the SSF Guidelines for a sustainable future

Other Program No. 2

Status: Completed (accomplished)

Small-scale fisheries (SSF) in Asia contribute nearly half of the region's total capture fishery production, providing livelihoods for approximately 46 million people—over 90 percent of the fisheries workforce—and generating an estimated USD 53.3 billion annually. Beyond their economic significance, SSF are vital for food security, supporting livelihoods, and sustaining the cultural identity of coastal and inland communities. Women also play a vital role throughout the SSF value chain, contributing significantly to post-harvest and community-based activities. In recognition of their importance, in 2014, the FAO Committee on Fisheries (COFI) endorsed the "Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries (SSF Guidelines)," providing a global framework to promote inclusive, equitable, and sustainable development of the sector.

To commemorate the milestone, TD collaborated with FAO through the "**Letter of Agreement (LOA) for organizing the Regional SSF workshop in Asia to commemorate 10 years of the SSF Guidelines**" to provide a platform to reflect on achievements, share lessons learned, and identify future direction aligned with FAO's Blue Transformation initiative. The workshop aims to 1) Assess the uptake and implementation of SSF Guidelines in selected countries across the region, 2) Compile existing guidance materials and tools to support the continued implementation of the SSF Guidelines, 3) Identify key policy processes and actors relevant to the SSF Guidelines implementation at regional and national levels, 4) Strengthening partnerships and collaboration among stakeholders to accelerate progress, 5) Share lessons learned, including challenges, good practices, and gaps related to the implementation of SSF Guidelines and National Plan of Action for Small-Scale Fisheries (NPOA-SSF), and 6) Develop actionable recommendations to guide efforts in advancing sustainable small-scale fisheries in the region. The key expected outputs of the Workshop included 1) Baseline overview of the SSF Guidelines implementation in Asia, including initiatives, resources, relevant regional policy processes, stakeholder map, key lessons learned (challenges and good practices), 2) Actions to

advancing the implementation of the SSF Guidelines including regional cooperation, 3) Identification of capacity-building needs and current resources, and 4) A joint statement from the region's fisheries agencies and participating stakeholders.

To achieve these objectives, TD, in collaboration with FAO, organized the "Regional Small-Scale Fisheries (SSF) Workshop in Asia: Building on a Decade of the SSF Guidelines for a Sustainable Future" from 26 to 27 March 2025 in Bangkok, Thailand. Participants included representatives from government agencies, regional and national fisheries organizations, international partners, and academic institutions from 13 countries: Bangladesh, Brunei Darussalam, Cambodia, India, Indonesia, Lao PDR, Malaysia, Maldives, the Philippines, Sri Lanka, Thailand, Timor-Leste, and Viet Nam, along with staff from FAO, SEAFDEC Secretariat, and SEAFDEC/TD. The Workshop provided a regional platform to evaluate progress in implementing the SSF Guidelines, identify key policies and stakeholders, strengthen regional and national partnerships, exchange experiences, and develop forward-looking recommendations to advance sustainable small-scale fisheries. As a result, participants identified priority action areas, including:

- Developing and aligning national strategies with the SSF Guidelines
- Strengthening multi-stakeholder collaboration and community engagement
- Promoting capacity building and the adoption of best practices across the region

Regional Small-Scale Fisheries (SSF) Workshop in Asia: Building on a Decade of the SSF Guidelines for a Sustainable Future from 26 to 27 March 2025 in Bangkok, Thailand

The Workshop also fostered new partnerships and outlined concrete next steps for regional and national initiatives. Overall, the event represented a significant milestone in advancing sustainable small-scale fisheries in Asia. It facilitated constructive dialogue, clarified priorities, and reaffirmed collective commitment to the principles of the SSF Guidelines—paving the way toward more inclusive, resilient, and environmentally responsible fisheries in the region.

1.3 Compilation of scientific data and information to support policy formulation and management for sustainable fisheries

Digital Transformation of Regional Fishery Statistics and Enhanced Utilization of Fishery Statistics and Information

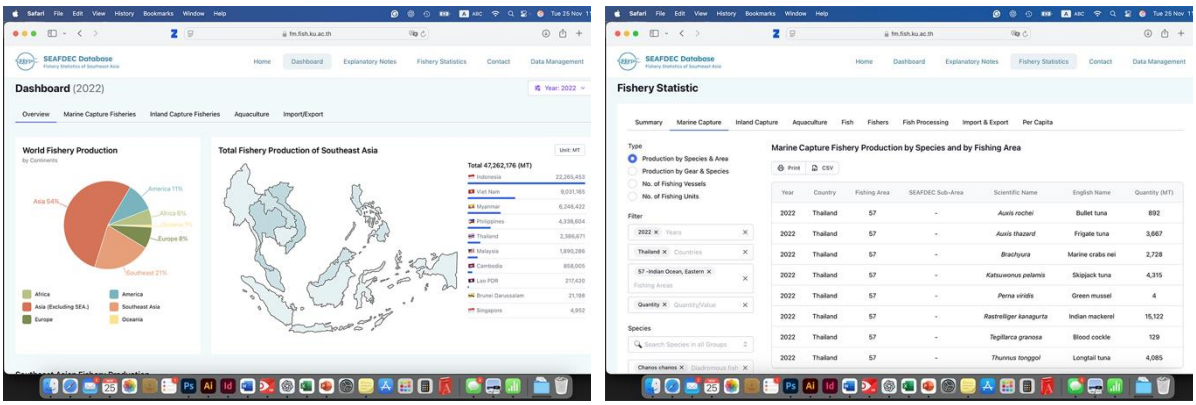
FCG/ASSP Project No. 4

Status: *Ongoing (on track)*

Recognizing the importance of fishery statistics and information to support policy planning and management of fisheries as well as other usages by researchers, the academe, etc., the compilation of fishery statistics in Southeast Asia had been undertaken by SEAFDEC from 1978 to 2007 in the form of the "Fishery Statistical Bulletin for the South China Sea Area." Starting in 2004, SEAFDEC revised its statistics framework and developed the "Regional Framework for Fishery Statistics of Southeast Asia." However, with the subsequent changes in global frameworks and standards related to fishery statistics as well as a need for the inclusion of additional statistics to enhance the usability of the Fishery Statistics Bulletin of Southeast Asia, SEAFDEC, through the project supported by the JTF 6-2, updated the Regional Framework for Fishery Statistics and came up with the revised Regional Framework (2024 Edition). The revised Framework (2024 Edition) was approved by the SEAFDEC Council during its 56th Meeting in 2024, and was subsequently endorsed by the 32nd Meeting of the ASEAN Sectoral Working Group on Fisheries (ASWGFi) and adopted by the 46th Meeting of the ASEAN Ministers on Agriculture and Forestry (AMAF) in 2024.

This new project, "**Digital Transformation of Regional Fishery Statistics and Enhanced Utilization of Fishery Statistics and Information**," therefore aims to build upon the achievements of the previous JTF-6 Project, with a total duration from 2025 to 2029. The expected outcome of the project is to achieve "Better usage by AMSs, other countries, organizations, etc. of fishery statistics and information in Southeast Asia to support policy planning and management of fishery as well as for other purposes," with three expected outputs, namely: 1) New SEAFDEC Statistical Database established in line with the Regional Framework for Fishery Statistics of Southeast Asia (2024 Edition); 2) The SEAFDEC publication "Southeast Asian State of Fisheries and Aquaculture 2027 (SEASOFIA 2027)" disseminated the latest information on the status and trends of fisheries and aquaculture in the region; and 3) The SEAFDEC publication "Fish for the People" disseminated information on fisheries issues and relevant regional initiatives.

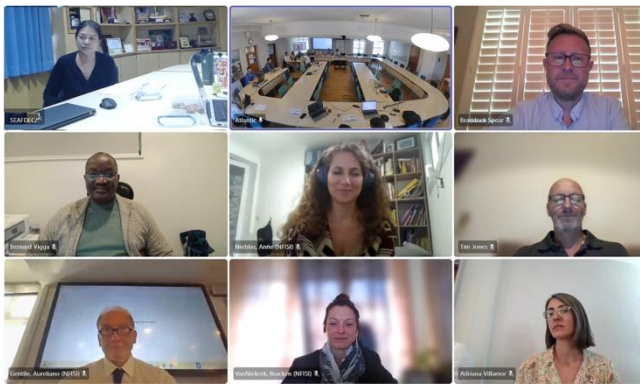
Under the first output, in 2025, SEAFDEC started the First Phase of developing a new SEAFDEC Statistical Database in line with the Regional Framework for Fishery Statistics of Southeast Asia (2024 Edition). At the end of 2025, the draft of the Statistical Database of Southeast Asia (Phase I), comprising the statistics components on: 1) Marine Fishery Production; 2) Inland Fishery Production; 3) Aquaculture Production; 4) Fishers and Fish Farmers; 5) Producer Price; 6) Fish Processing; 7) Export and Import; and 8) Per Capita Fish Consumption. At the end of 2025, the development of the Second Phase was prepared and will continue in 2026.



The draft of the Statistics Database Phase I (2025)

To sustain collaboration with international organizations in standards development and the sharing of statistical data and information, representatives from the SEAFDEC Secretariat participated in the Fourteenth Steering Committee Meeting of the Fisheries and Resources Monitoring System (FIRMS) held on 30 June–1 July 2025. As part of the long-standing cooperation between SEAFDEC and FIRMS, established in 2004, Annex 2 of the Partnership Agreement was updated in 2025 to outline SEAFDEC's potential contributions in three key areas: 1) fishery statistics of Southeast Asia, 2) geospatial information on fishing subareas based on the regional statistics framework, and 3) results from stock and risk assessment for selected species undertaken by SEAFDEC projects. SEAFDEC also participated in the Twenty-eighth Session of the Coordinating Working Party on Fishery Statistics (CWP28) on 2–4 July 2025, where key recommendations from the 3rd and 4th Regional Technical Consultations on Fishery Statistics and Information (held in 2023 and 2024) were presented. These highlighted challenges in submitting data for fishery statistics questionnaires, requests for support in improving species-level data collection for both capture fisheries and aquaculture, and the need to address inconsistencies in definitions and classifications—such as the working status of fishers and fish farmers—when compared with CWP standards.

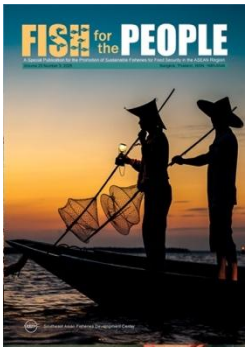
Under the second output, the SEAFDEC Secretariat organized the "Inter-Departmental Workshop on the Preparation of SEASOFIA 2027" on 5–6 August 2025 in Bangkok, Thailand, with participation from representatives of the SEAFDEC Secretariat and Departments. The Workshop discussed the publication outline, questionnaires for collecting supplementary information from the AMSs, and the work plan for 2025–2026, leading up to the publication of SEASOFIA in 2027. The draft outline of SEASOFIA 2027 was subsequently submitted to the 48PCM, and the questionnaires were circulated to the AMSs to obtain the necessary inputs for the publication.



SEAFDEC online participation in the 14th Steering Committee Meeting of FIRMS and 28th Session of CWP

Inter-Departmental Workshop on Preparation of SEASOFIA 2027, 5–6 August 2025, Bangkok, Thailand

Under the third output, the Project serves as a platform for disseminating the outputs and outcomes of various SEAFDEC-implemented initiatives. In 2025, two issues of the Special Publication "Fish for the People" (Volume 23, Nos. 1–2) were published and distributed to target audiences. Additionally, under a separate program, a special issue was produced at the end of 2025 featuring contributions from the Regional Fisheries Policy Network, representing eight SEAFDEC Member Countries stationed at the SEAFDEC Secretariat in 2025.



(Left–right) SEAFDEC Special Publication "Fish for the People" Volume 23 Nos. 1–2, and 3 (special issue) and Fishery Statistical Bulletin of Southeast Asia 2022

Meanwhile, another regular publication of the SEAFDEC Secretariat, the "Fishery Statistical Bulletin of Southeast Asia 2022," which compiles fishery statistics submitted by the AMSs in accordance with the harmonized Statistics Framework, was published and disseminated in 2025. At the same time, preparation of the 2023 Bulletin was underway, with publication expected in early 2026.

1.4 Development and promotion of regional measures and tools for combating IUU fishing

Enhancement of Regional Cooperation and Human Resource Development to Eliminate IUU Fishing

FCG/ASSP Project No. 5

Status: *Ongoing (on track)*

In 2025, the SEAFDEC/TD initiated the project "**Enhancement of Regional Cooperation and Human Resource Development to Eliminate IUU Fishing**," which builds on the activities and achievements of the recently completed project "Strengthening Regional Cooperation and Enhancing National Capacities to Eliminate IUU Fishing in Southeast Asia." The duration of this new project is from 2025 to 2029, with the expected outcome for the AMSs to be strengthened and cooperate in combating IUU fishing and the implementation of monitoring, control, and surveillance (MCS) to eliminate IUU fishing in Southeast Asia. The expected outputs are: 1) Improvement of the RFVR Database with a focus on carrier vessels for utilization between neighboring countries smaller than 24 meters in length; 2) Strengthen the traceability of fish and fishery products including commercial and small-scale fishers; and 3) Enhancement of capacity of the AMSs in combating IUU fishing relevant issues and/or MCS to eliminate IUU fishing.

Under the first expected output, a primary milestone was achieved during the "Regional Technical Consultation on the Regional Fishing Vessel Record (RFVR) Database and Sharing Information to Support Eliminating IUU Fishing" organized from 23 to 24 April 2025 in Bangkok, Thailand, where 37 representatives from AMSs reached a consensus on expanding the Regional Fishing Vessel Record (RFVR) database to include carrier vessels under 24 meters in length.

Regional Technical Consultation on the Regional Fishing Vessel Record (RFVR) Database and Sharing Information to Support Eliminating IUU Fishing, 23–24 April 2025 in Bangkok, Thailand

For the second expected output, technical advancement was matched through field-level activities. The TD staff team conducted vital baseline studies in General Santos City, Philippines, and Yangon, Myanmar, on 17–21 February and 15–19 December 2025, respectively. In Yangon, through in-depth engagement with the DOF Myanmar and local seafood industry actors, the team identified technical gaps in existing systems to ensure that Myanmar's seafood exports—essential to the national economy—meet the rigorous traceability requirements of international markets, including the EU, China, and Southeast Asia.

Baseline studies in General Santos City, Philippines on 17–21 February 2025

Baseline studies in Yangon, Myanmar on 15–19 December 2025

For the third expected output, TD significantly bolstered its regional leadership by participating in high-level international fora. At the "10th Our Ocean Conference" on 28–30 April 2025 in Busan, Republic of Korea, TD promoted its commitments to sustainable fisheries and maritime security, showcasing Southeast Asia's proactive stance to the global community. This advocacy continued at the "Regional Coordination Meeting on the Agreement on Port State Measures (PSMA)" on 21–25 July 2025 in Davao City, Philippines, where TD presented relevant ongoing initiatives supported by the Japanese Trust Fund. By actively addressing common challenges—such as fragmented vessel registration and the need

for harmonized electronic databases—TD has strengthened the collaborative framework for monitoring, control, and surveillance (MCS). These efforts ensure that regional mechanisms, such as the RFVR system, are effectively integrated into port and flag State performances to deter illicit fishing across the region.

TD representative at the 10th Our Ocean Conference on 28–30 April 2025 in Busan, Republic of Korea

TD representative at the Regional Coordination Meeting on the PSMA on 21–25 July 2025 in Davao City, Philippines

ASEAN-JICA Capacity Building Project on IUU Fishing Countermeasures in Southeast Asia

FCG/ASSP Project No. 6

Status: *Ongoing (on track)*

Recognizing that IUU fishing is one of the priority issues for the AMSs, the "ASEAN Guidelines for Preventing the Entry of Fish and Fishery Products from IUU Fishing Activities into the Supply Chain" was adopted by the ASEAN Ministers during the 37th AMAF in 2015, followed by the adoption of the "Joint ASEAN-SEAFDEC Declaration on Regional Cooperation for Combating IUU Fishing and Enhancing the Competitiveness of ASEAN Fish and Fishery Products" during the High-level Consultation in 2016. To supplement the efforts of ASEAN and enhance the capacities of AMSs to prevent and combat IUU fishing, the project "**ASEAN–JICA Capacity Building Project on IUU Fishing Countermeasures in Southeast Asia**" was formalized and approved by JICA for implementation by SEAFDEC/TD during 2024–2027. The Project comprises three expected outputs, namely: 1) Responsible fishing technologies and practices to combat IUU fishing are promoted, 2) The capacity of AMSs to combat IUU fishing activities is enhanced through effective management tools of traceability for fish and fishery products, and 3) Policy measures to combat IUU Fishing are enhanced in AMSs.

Under the first expected output, TD organized a nine-day intensive "Training Course on Responsible Fishing Technologies/Practices to Combat IUU Fishing in Southeast Asia" on 19–27 November 2025 in Bangkok and Chon Buri Province, Thailand, to enhance the knowledge and skills of key regional officers in implementing effective countermeasures against IUU fishing. Covering a wide range of topics, including an overview of recent international issues on IUU fishing, SEAFDEC initiatives, vessel monitoring systems (VMS), and the inspection of fishing vessels and gears, the participants were equipped with improved knowledge to promote responsible fishing technologies and practices, ultimately contributing to a more sustainable and well-regulated fishing industry in Southeast Asia.

Training Course on Responsible Fishing Technologies/Practices to Combat IUU Fishing in Southeast Asia on 19–27 November 2025

Under the second expected output, the capacity-building activities focus on localized traceability, starting with the "On-site Training on Traceability for Fish and Fisheries Products in Lao PDR" on 18–20 March 2025 in Lao PDR, followed by the "Regional Training on Traceability and Effective Management Tools for Fish and Fishery Products in Southeast Asia" on 10–12 June 2025, in Bangkok, Thailand where 45 participants aligned their practices with international standards like the US SIMP and EU-CATCH systems. Moreover, "On-site Training on the Implementation of National Fish Traceability and Logistic System (STELINA) in Indonesia" was organized on 11–13 November 2025 in Surabaya, Indonesia, bridging the gap between national logistics and regional IUU countermeasures.

On-site Training on Traceability for Fish and Fisheries Products on 18–20 March 2025 in Lao PDR

Regional Training on Traceability and Effective Management Tools for Fish and Fishery Products in Southeast Asia on 10–12 June 2025, in Thailand

On-site Training on the Implementation of National Fish Traceability and Logistic System (STELINA) on 11–13 November 2025 in Surabaya, Indonesia

Under the third expected output, activities focus on enforcement and policy frameworks to strengthen regional defenses against illicit fishing. This started with the "Regional Training for Fisheries Inspectors on Port State Measures (PSM)" on 15–18 September 2025 in Samut Prakan, Thailand. This event utilized cutting-edge analysis tools from partners like the National Oceanic and Atmospheric

Administration (NOAA), the IMCS Network, Global Fishing Watch, and Skylight to improve PSM inspection. By the end of the course, participants had increased knowledge, skills, and experience in conducting inspections to support the implementation of PSM and port control

Subsequently, TD organized the "Regional Workshop on Enhancing Policies and Countermeasures Against IUU Fishing" on 6–8 October 2025 in Bangkok, Thailand, that served as a pivotal platform for 38 representatives from AMSs and international organizations to align regional strategies. The workshop successfully updated the implementation status of National Plans of Action (NPOA-IUU) and deepened the collective understanding of global frameworks, including the Bali Strategy and the Global Information Exchange System (GIES). Another key achievement of the event was the formulation of initial recommendations for the ASEAN Voluntary Guidelines for Transshipment, addressing a critical gap in regional maritime oversight.

Regional Training for Fisheries Inspectors on Port State Measures (PSM) on 15–18 September 2025 in Samut Prakan, Thailand

Regional Workshop on Enhancing Policies and Countermeasures Against IUU Fishing on 6–8 October 2025 in Bangkok, Thailand

1.5 Development and promotion of responsible fishing technologies

Research and Dissemination of Sustainable Fishing Technology

FCG/ASSP Project No. 7

Status: *Ongoing (on track)*

The Project "Research and Dissemination of Sustainable Fishing Technology" was formulated by SEAFDEC/TD with the goal to modernize Southeast Asian fisheries for long-term sustainability by optimizing fuel usage, adapting alternative/renewable energy, raising awareness of hygienic fish handling tools and techniques, and improving the efficiency and sustainability of trawl net fishing operations. The duration of the Project is from 2025 to 2029, with two expected outcomes, *i.e.* 1) Enhanced technical knowledge of officials from SEAFDEC Member Countries on best practices and innovative technologies for optimizing fuel use, adopting alternative and renewable energy sources, and improving fishing gear efficiency; and 2) Increased awareness among officials of SEAFDEC Member Countries on hygienic fish handling tools and techniques, ensuring catch quality, promote food safety, and reduce post-harvest losses in the Southeast Asian region.

Throughout 2025, SEAFDEC/TD implemented a range of activities aiming at reducing the carbon footprint and operational costs of Southeast Asian fisheries while enhancing postharvest efficiency. A major activity was the "Regional Consultation on Advancing Small-Scale Fisheries: Reducing Costs and Environmental Impact" organized on 27–28 May 2025 in Samut Prakan, Thailand. The Consultation introduced innovative technologies to optimize fuel use and to adapt to alternative/renewable energy sources, as well as innovations in post-harvest fish handling practices to reduce fish losses and waste in small-scale fisheries. Through the discussion, the Consultation identified the adoption of improved propeller efficiency and the solar ice bank and/or cooling ice packs as the most effective strategies for reducing emissions and improving onboard fish handling. These low-cost,

high-impact innovations empower small-scale fishers to maintain catch quality and lower fuel consumption, directly addressing both environmental sustainability and economic resilience.

Regional Consultation on Advancing Small-Scale Fisheries: Reducing Costs and Environmental Impact" organized on 27–28 May 2025 in Samut Prakan, Thailand

Simultaneously, the project started an activity to advance research aiming at reducing fuel consumption and greenhouse gas emissions from bottom trawl fishing through innovative techniques. A field interview was conducted with fishers using a vee-type otter board in trawl fishing in Ranong Province, Thailand, on 4–6 June 2025. In 2026, the project plans to conduct bottom trawling experiments by alternating between vee-type and rectangular flat otter boards to compare their performance and fuel efficiency. In 2027, experimental trawling will be conducted using modified trawl nets with reduced mesh size in the upper cover, and the results will be compared with those obtained from the standard trawl net.

Field interview with fishers in Ranong Province on 4–6 June 2025

Regional Collaborative Research and Capacity Building for Monitoring and Reduction of Marine Debris from Fisheries in Southeast Asia

FCG/ASSP Project No. 8

Status: *Ongoing (on track)*

Marine debris is a significant global challenge that requires coordinated and collaborative responses. The severity of marine debris is particularly acute in Southeast Asia, underscoring the need to improve understanding of its impacts and to develop effective management and prevention approaches to mitigate its adverse effects on sustainable economic growth. In this context, the ASEAN Member States (AMSs) adopted the *Bangkok Declaration on Combating Marine Debris in the ASEAN Region* at the 34th ASEAN Summit in 2019 and encouraged the implementation of the *ASEAN Framework of Action on Marine Debris*.

SEAFDEC entered into collaborative efforts to implement the Project "**Regional Collaborative Research and Capacity Building for Monitoring and Reduction of Marine Debris from Fisheries in Southeast Asia**" to strengthen regional collaborative research and capacity building in fisheries through the application of scientific knowledge to policy development for monitoring and reducing

marine debris. The Project was approved by the Japan-ASEAN Integration Fund (JAIF) in April 2022, with an original implementation period from 2022 to 2023. However, the Project period was extended until March 2026 following revisions to the work plan and budget. This Project is being implemented by the SEAFDEC Secretariat in collaboration with IFRDMD, MFRDMD, and TD.

Aligning with the four priorities of the "ASEAN Framework of Action on Marine Debris," the Project works toward achieving expected outputs under each Framework, *i.e.*:

Framework I: Policy Support and Planning
1.1 A technical guideline outlining the status of ALDFG in ASEAN and measures to prevent and remove ALDFG in the Southeast Asian Region

Framework II: Research, Innovation and Capacity Building
2.1 Risk assessments outlining the status of microplastic in aquatic environments
2.2 Enhancement of AMSs capacity on methods to collect and analyze marine debris and microplastics

Framework III: Public Awareness, Education and Outreach
3.1 Marine debris management are strengthened and promoted in AMSs
3.2 Updated scientific-based knowledge and technical guidance are shared and enhanced among relevant sectors

Framework IV: Private Sector Engagement
4.1 Marking of fishing gears is promoted

The activities undertaken in 2025 under each Framework are as follows:

Framework I

Toward achieving **Output 1.1,** TD and MFRDMD implemented the activity entitled "Information Gathering to Estimate the Amount of ALDFG at Pilot Sites." The planned implementation covers 12 pilot sites along the coastal waters of the Gulf of Thailand and the Andaman Sea by TD, and 6 pilot sites along the east and west coasts of Peninsular Malaysia by MFRDMD. In 2025, TD, in consultation with DOF Thailand, conducted the surveys targeting gillnets and traps covering both small-scale (artisanal) and commercial fisheries in Thailand from October to November 2025. This study involved two target groups: small-scale fishers operating in the Gulf of Thailand and the Andaman Sea, and commercial fishers in the same regions. For analytical purposes, the study area was divided into six zones: four in the Gulf of Thailand (1) Eastern Gulf, (2) Upper Gulf, (3) Middle Gulf, and (4) Lower Gulf, and two in the Andaman Sea (1) Upper Andaman and (2) Lower Andaman.

Meanwhile, MFRDMD conducted interviews from July to September 2025 with fishers operating trawls, gill nets, and traps across all coastal districts in Kelantan, Terengganu, and Pahang (East Coast of Peninsular Malaysia), and in Perlis and Kedah (West Coast of Peninsular Malaysia), to investigate fishing gear loss.

For another activity under output 1.1, MFRDMD also gathered video and photo records from May to July 2025 to estimate the amount of ALDFG at 12 pilot sites in Terengganu and Pahang, Malaysia, and to develop removal guidance for ALDFG.

Furthermore, an Internal Workshop to develop a questionnaire on Marine Debris and ALFDG Countermeasures was held on 13–15 May 2025 at MFRDMD, Kuala Terengganu, Malaysia. Subsequently, MFRDMD sent the questionnaire to the AMSs on 10 August 2025. The results would be reviewed at the Regional Technical Meeting (RTM) on Marine Debris and Abandoned, Lost or Discarded Fishing Gear (ALDFG) in Southeast Asian Region, 21–23 January 2026 in Seremban, Malaysia. The information gained through the questionnaire will contribute in consolidating regional

overview of the current status of marine debris and ALDFG in Southeast Asian region, identifying gaps, key challenges and opportunities for regional collaboration, and drafting Regional Technical Guidelines on ALDFG for Southeast Asian region.


Activity under Output 1, interviews with fishers operating trawls, gill nets, and traps in Kedah (left) and Pahang (right), Malaysia in July and August 2025

Framework II

Under Framework II, it comprises two expected outputs: Output 2.1 on risk assessments outlining the status of microplastics in aquatic environments, and Output 2.2 on enhancing the capacity of ASEAN Member States (AMSs) in methods to collect and analyze marine debris and microplastics. The Progress has been made as follows:

For **Output 2.1**, ***Activity 2.1*** "Assessment of the situation of marine debris and microplastics in the Gulf of Thailand" was implemented by TD. In 2025, TD conducted the assessment to estimate the density of marine debris in the Gulf of Thailand, including floating debris through visual observation, estimation of microplastics contamination, and seafloor debris using trawl nets through a cruise survey of M.V. SEAFDEC 2 from 10 February to 14 March 2025. The density of floating marine debris (number per square kilometer) was estimated by visual observation during daytime while the ship was moving.

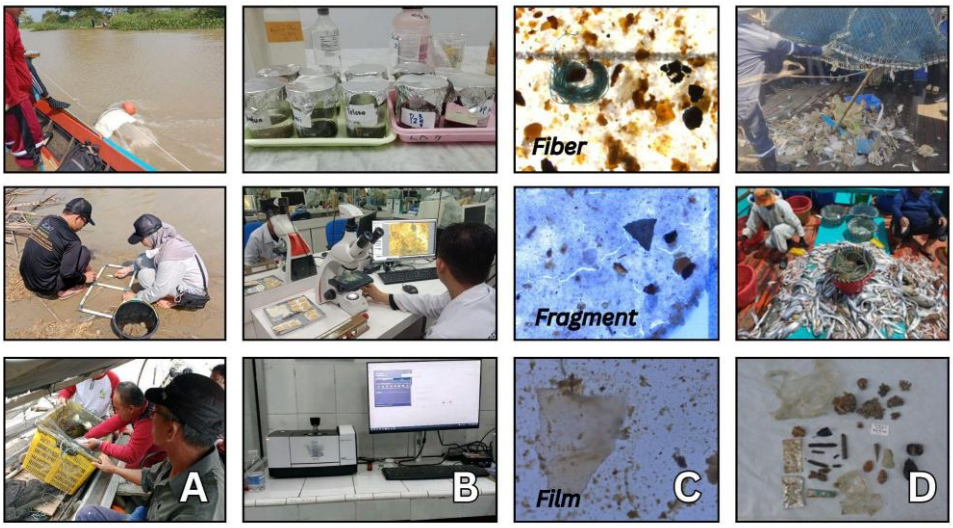
Another ***Activity 2.2*** "Research and evaluation on the amount of marine debris collected by fishing activities" was implemented by MFRDMD, focusing on assessing marine debris accumulation during fishing operations. The surveys were conducted on 4–7 February, 17–19 February, 4–5 May, 18–19 May, 2–3 June, 2–4 July and 6–7 August 2025, by collecting the marine debris from different types of fishing gears, targeting trammel nets, anchored bottom gill nets, and trawl nets, during the fishing activities at each pilot site (Terengganu waters and Kelantan waters), respectively. These surveys aimed to quantify the ALDFG from fishing activities by sorting, categorizing, and analyzing the collected debris. The data would support risk assessments of microplastic contamination and contribute to regional efforts to enhance AMSs' capacity for marine debris monitoring and management.

The results indicated that the amount and types of marine debris collected varied depending on the fishing gear used, the sampling area, and the season. Bottom-trawled gears recorded a higher number of debris categories, as they operate close to the seabed where debris tends to accumulate. In contrast, gears operating in mid-water layers collected fewer debris items. Seasonal effects were also evident: trawl operations conducted during the monsoon season captured more debris, likely due to stronger currents transporting materials from coastal areas, whereas trawl operations outside the monsoon period recorded significantly less debris. ALDFG was mainly recorded in deeper areas because heavy or sunken gear naturally settles on the seabed, and larger bottom-trawl nets cover a wider area, making them more likely to encounter and retrieve these debris hotspots.

For ***Activity 2.3***, "Research study on the impact from contaminants of microplastics in freshwater fish and marine fish", TD and IFRDMD conducted in 2025 the assessment of the microplastic contamination in the Gulf of Thailand and in the Musi River, Indonesia. TD assessed and characterized microplastic contamination in 10 fishery species from the Gulf of Thailand collected by Activity 2.1, and evaluated microplastic levels in relation to fishing areas, species traits, and habitats. IFRDMD collected microplastics samples from freshwater fish in the pilot rivers in Indonesia on 10–15 February, 26–29 May, 11 June, and 22–26 September 2025, respectively.

The results showed the status, distribution, and abundance of microplastics in aquatic environments including the sediment, water, and fish bodies. Research also characterized the microplastics into form classified (fragment, film, fiber, foam, and pellet) using inverted and stereo microscope, and polymer materials (PP, PE, PS, PC, nylon, etc) using FT-IR instrument.

On 2–3 July 2025, IFRDMD successfully held a workshop on "Mitigation and Strategic Policy for Combating Microplastic Pollution for Marine and Freshwater Fisheries in the Southeast Asia Region," in Jakarta, Indonesia. The workshop provided knowledge about microplastic-related issues in the Southeast Asian region, encompassing aspects such as distribution, characteristics, impacts, and the various efforts, including policy initiatives and programs, to reduce and combat microplastics, particularly in the fisheries sector and in safeguarding human health.



Microplastic sampling from water, sediment, and fish in the Musi River (A), extraction and characterization of MPs using microscope and FT-IR (B), identified microplastic structure (c), sampling process using trawl net and plastic debris form which caught in Kuala Terengganu waters (D)

Under **Output 2.2**, TD organized two batches of "Regional Training Courses on Reliable Research Methods to Collect and Analyze Marine Debris and Microplastics." The first batch was conducted on 24–31 January 2025, and the second batch on 15–22 December 2025, at the TD premises in Samut Prakan, Thailand.

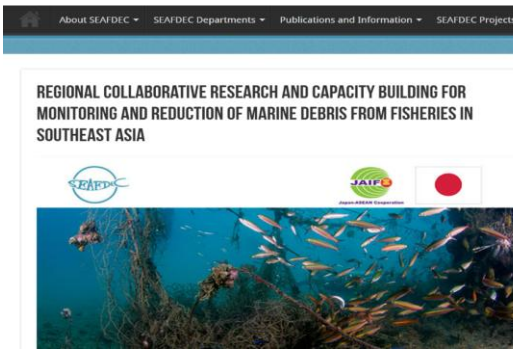
The major outcomes of the training were enhanced human resource capacity in sampling and analysis of marine debris and microplastics through both theory and hands-on skills, as well as strengthened cooperation among researchers from SEAFDEC Member Countries on marine debris and microplastics in the Southeast Asian region. To impart knowledge and enhance understanding of the training subjects, resource persons from Chulalongkorn University, Burapha University (Chanthaburi Campus), Kasetsart University, Kyushu University, Tokyo University of Marine Science and Technology, Kumamoto University, and SEAFDEC/TD were invited.


The 2nd Regional Training Course on the Liable Research Methods to Collect and Analyze the Marine Debris and Microplastic" on 15–22 December 2025 at SEAFDEC/TD in Samut Prakan, Thailand

Framework III

To enhance the visibility of the Project, progress updates and activities were disseminated through the webpage (https://www.seafdec.org/jaif-marine-debris/).

The webpage serves as a platform for sharing the project description and activities implemented in collaboration with the AMSs, as well as for disseminating key project outputs.



In addition, to strengthen collaboration with international partners, Project staff participated in international fora, including the SEA of Solutions Forum jointly organized by the United Nations Environment Programme (UNEP) and the Coordinating Body on the Seas of East Asia (UNEP-COBSEA), which was held in Bangkok on 16–17 December 2025.

Ghost Fishing in a Global South, Demonstration Project

Departmental Program No. 8

Status: *Completed (accomplished)*

Loss of fishing gear during operations is one of the common issues among fishers worldwide. In addition to the pollution it causes, lost gear continues to capture marine life for years, and this phenomenon is known as "ghost fishing." The unintended catch of fish and other marine organisms in this manner leads to substantial economic losses, contributes to pollution, raises welfare concerns, and threatens sustainability. To address such concern, SEAFDEC/TD in cooperation with the Institute of Marine Research (IMR), Norway collaborated through the "**Ghost Fishing in the Global South, Demonstration Project**." The duration of this project is from 2024 to 2025, with the goal of reducing ghost fishing and marine pollution in the Southeast Asian region. The expected outputs are: 1) carry out an abandoned, lost, or otherwise discarded fishing gear (ALDFG) retrieval demonstration in Thailand; 2) identify reasons for gear loss and potential measures to reduce future gear loss and mortality; 3) evaluate the feasibility of carrying out this type of ALDFG retrieval within the Southeast Asian region; and 4) identify local partners that can collaborate with IMR after the demonstration project.

In 2025, TD, in partnership with IMR, conducted field trials to locate and retrieve ALDFG using remotely operated vehicles (ROVs) aboard the M.V. PLALUNG from 4 to 6 February 2025 near Samet Island in Rayong Province, Thailand. The field trials demonstrated that the ROVs can effectively locate and retrieve the ALDFG, significantly minimizing environmental disruption and aiding in the restoration of marine ecosystems. SEAFDEC invited relevant agencies to participate in the field

activities, and strong interest was demonstrated by the DOF Thailand, the DMCR, and the Environment Justice Foundation (EJF), Thailand. Their engagement highlighted the potential for partnership and collaboration in expanding this initiative into a larger project in the future.

Field trials to locate and retrieve ALDFG using ROVs aboard the M.V. PLALUNG

Collaborative Program with the Government of Thailand

Departmental Program No. 7

Status: *Ongoing (on track)*

Over the years, SEAFDEC/TD has implemented various research and capacity-building activities in support of the Department of Fisheries (DOF), Thailand, and other relevant national agencies in Thailand, including the Department of Marine and Coastal Resources (DMCR), the Fish Marketing Organization (FMO), fisheries academies, institutes, and universities.

In 2025, these activities were consolidated under the Departmental Program entitled the "**Collaborative Program with the Government of Thailand**." The expected outcomes of the Program include the provision of scientific evidence to support fisheries management measures in Thailand and the enhancement of technical capacity among officers of the DOF Thailand and SEAFDEC. Furthermore, the knowledge, experience, and lessons learned from these activities are envisaged to contribute to other regional initiatives and benefit the other SEAFDEC Member Countries.

Based on the shared priorities of DOF Thailand and TD, a "Five-Year Cooperation Plan" was developed under three components: 1) Fishing Technology and Marine Engineering; 2) Fisheries Management; and 3) Fisheries Resources, Oceanography, and Marine Environment. The 5-Year Plan comprises 11 projects, including research studies and training activities as follows:

1) Fishing Technology and Marine Engineering

Project 1. Monitoring Carbon Dioxide Emissions from Fishing Vessels at Fishing Ports

This study was formulated and undertaken by TD in collaboration with the Marine Fisheries Research and Development Division of the DOF, Thailand, with the aim of quantifying carbon dioxide (CO_2) emissions generated by fishing vessels during the loading and unloading of catches at fishing ports in Thailand. With the duration from 2025 to 2026, the study specifically measures CO_2 emissions from purse seine and trawl fishing vessels in relation to the duration of their port operations. The expected outputs include empirical data on carbon emissions from purse seiners and trawlers during unloading activities at fishing ports.

In 2025, data collection was conducted in two periods. The first period was from 15 to 26 November 2025 at fishing ports in Rayong, Chanthaburi, Trat, Samut Sakhon, Samut Songkhram, and Phetchaburi Provinces. The second duration was from 1 to 17 December 2025 at fishing ports in Prachuap Khiri Khan, Chumphon, Surat Thani, Nakhon Si Thammarat, Songkhla, Pattani, Narathiwat, Satun, and

Phuket Provinces. The data collected will be analyzed in the subsequent year to estimate carbon emissions from fishing vessels operating at fishing ports in Thailand.

Data collection on CO_2 emissions from purse seine and trawl fishing vessels in November and December 2025

Project 2. Catch Rate and Species Composition of Anchovy Falling Net with Light Luring Fishing in the Coastal Areas of the Eastern Gulf of Thailand

This study is being implemented in collaboration with the Marine Fisheries Research and Development Division of the Department of Fisheries (DOF), Thailand, and will run from 2025 to 2027. The objective is to collect critical scientific data on catch rates, species composition, and size distribution of marine organisms harvested by small-scale anchovy falling-net vessels operating in the coastal waters of Rayong Province, Thailand. The findings are expected to provide a sound scientific basis for the Provincial Fisheries Committee in evaluating requests from local fishers seeking authorization to operate within the coastal zone. This evidence-based approach will support informed decision-making to ensure an appropriate balance between fisheries sustainability and socioeconomic considerations.

In 2025, a preliminary survey was conducted from 27 to 29 October 2025 in Rayong Province to validate the methodology, coordinate with local fishing vessels, and prepare for the subsequent full-scale survey in the next phase.

The preliminary survey from 27 to 29 October 2025 in Rayong Province

Project 3. Training Course on Cost Reduction in Local Fishing Using Solar Cells

This training course was developed in response to rising fuel prices and growing environmental concerns, necessitating a transition to clean energy solutions. Implemented through the collaboration between TD and the Marine Fisheries Research and Development Division of the DOF Thailand, the course is designed to strengthen small-scale fisheries through the application of solar energy technology. It aims to build the capacity of small-scale fishers, as well as officers of the DOF Thailand, who are responsible for promoting the adoption of solar cell systems among coastal fishing communities.

The training course is expected to launch in the second quarter of 2026 at the Bang Saphan District, Prachuap Khiri Khan Province. Through a series of targeted training workshops, government officers

and local fishers will acquire essential knowledge and technical skills in the design, installation, operation, and maintenance of solar cell systems for fishing vessels and related equipment, including cooling systems and post-harvest facilities. The training is expected not only to enhance technical competencies but also to promote environmental responsibility and sustainable fishing practices. By reducing operational costs and lowering greenhouse gas emissions, the project will contribute to improving the livelihoods of small-scale fishers while supporting national policies on marine resource conservation and sustainable development.

Project 4. Research and Development of High-Frequency Acoustic Transmitter Technology to Mitigate Impacts of Fishing Gear on Marine Mammals

This R&D project is a collaborative initiative among TD, the Marine Fisheries Research and Development Division of the DOF Thailand, and the DMCR. The project will be implemented from 2026 to 2027. The project focuses on research and development of a prototype pinger—an advanced, cost-effective high-frequency acoustic transmitter—designed to mitigate marine mammal entanglement in fishing gear. The prototype operates within the 50–120 kHz frequency range, comparable to commercially available pingers, and emits signals detectable by marine mammals to help them avoid fishing gear without harming marine fish species. Field trials will be conducted to assess the effectiveness of the prototype by comparing its sound-wave patterns with those of a commercial pinger.

Project 5. Study on the Alternative Thai Vessel Monitoring System

The study is being implemented in collaboration between TD and the Fishing and Fleet Management Division of the DOF Thailand, with a duration from 2026 to 2028. The study aims to identify and assess solutions that could support the DOF Thailand's policies for tracking small-scale fishing vessels, while addressing the limitations of existing satellite communication systems, including high operational costs, limited coverage in remote areas, and complex installation procedures. The objective is to ensure that any proposed system does not impose undue financial or technical burdens on fishers, nor compromise the effectiveness of vessel monitoring and inspection operations. Available technological options will be explored and prioritized based on criteria such as user-friendliness, affordability, coverage reliability, and minimal maintenance requirements to ensure that fishermen can easily adopt and benefit from the new tracking system.

Project 6. Training Program on the Basic Knowledge of Inland Fishing Gear and the Fishing Gear Survey of Gillnets

This training program is developed in collaboration between TD and the Inland Fisheries Research and Development Division of the DOF Thailand. The training is expected to be organized in 2027 and will cover a range of essential topics, including the various types of freshwater gillnet fishing gear, fundamental knowledge of gear assembly (materials, design, and calculations), effective survey techniques, identification of specific freshwater fishing gear types, and in-depth analysis of ecological impacts. Additionally, the training will also provide guidelines for collecting and managing data, and creation of a freshwater fishing gear database.

Project 7. Training Program on the Hydroacoustic Operator for Fish and Biomass Estimation

The training program is developed by TD in collaboration with the Marine Fisheries Research and Development Division of the DOF Thailand, with a period from 2026 to 2029. Covering hydroacoustic operations for both inland and marine fishery resource research surveys, the program aims to introduce the basic principles of fisheries acoustics, practical applications, and the interpretation of acoustic data for fish and biomass estimation. A Strategic Planning Meeting is scheduled in early 2026 to finalize the activities under this project

2) Fisheries Management

Project 8. Valuation of Marine Fisheries Resources in Rayong Bay, Thailand

This activity is implemented in collaboration between TD and the Marine Fisheries Research and Development Division of the DOF Thailand, over the period 2025–2026. The activity aims to strengthen the capacity of fisheries officers of the DOF Thailand to conduct economic valuation of marine fisheries resources in Rayong Bay, Rayong Province, Thailand. It also seeks to develop a practical and standardized valuation framework capable of generating reliable valuation data to support evidence-based decision-making, facilitate compensation negotiations, and contribute to environmental damage assessments.

Project 9. Promotion of Gender Equality and Social Inclusion in Fisheries Management

This activity aims to raise awareness of Gender Equality and Social Inclusion (GESI) among fisheries officers of the DOF Thailand, and to strengthen their capacity to integrate gender considerations into fisheries management projects. It also seeks to support the participants in applying gender perspectives to their current work within their respective groups. As a result of the activity, the officers are expected to demonstrate increased awareness of gender perspectives and a stronger willingness to apply gender lenses in their future work. They will also gain enhanced knowledge of GESI concepts and tools and be able to apply them effectively in fisheries management. Two events are scheduled in 2026: 1) Seminar on International Women's Day: Give to Gain for Gender Equality in Fisheries in Thailand (in March 2026), and 2) Training on Gender Equality and Social Inclusion in Fisheries Management (in the 3rd or 4th quarter of 2026).

Project 10. Ecosystem Approach to Fisheries Management in Freshwater Ecosystems

The project is being implemented in partnership between TD and the Inland Fisheries Research and Development Division of the DOF Thailand. With a duration from 2026 to 2029, the project focuses on providing a comprehensive understanding of the ecosystem approach to fisheries management (EAFM) and its practical application to inland resources in Thailand. The training curriculum will cover the basic principles of EAFM, community-based participatory fisheries resource management, and stakeholder analysis. The activity will also introduce various management concepts/tools such as zoning, co-management, and monitoring, as well as strategies for resource enhancement plans, illustrated by relevant case studies from both Thailand and other countries.

3) Fisheries Resources, Oceanography, and Marine Environment

Project 11. Project to Develop Skills in Writing R Commands from User to Coder for Analyzing Fisheries Resource Data

The project is implemented in partnership between TD and the Marine Fisheries Research and Development Division of the DOF Thailand, with the period from 2026 to 2029. The project aims to enhance R programming skills for fisheries scientists, targeting those with little to no foundational understanding of R. Through the training course that covers topics such as basic coding, data management, writing functions, statistical analysis, and creating graphs in R, participants will gain confidence in writing R commands at the trainer level. A key component of the training will also include the application of these skills with real fisheries resource data.

1.6 Integration of habitat and fisheries management and provision of support for the conservation of important fishery resources

Enhanced Research Capacities for Sustainable Utilization and Management of Eel and Other Inland Fisheries Resources

FCG/ASSP Project No. 9

In 2025, SEAFDEC/IFRDMD began implementing the Project "**Enhanced Research Capacities for Sustainable Utilization and Management of Eel and Other Inland Fisheries Resources,**" with a total duration of 2025–2029. The Project goal is to promote the strategies for sustainable eel fisheries and improve stock data collection in inland fisheries for sustainable fisheries resources to support food security and livelihood. The Project has two expected outcomes. For the **expected outcome 1**, *i.e.* SEAFDEC Member Countries can practice the stock assessment model of Anguillid eels; the expected output is: 1) Development and dissemination of stock assessment model of Anguillid eels. For the **expected outcome 2**, *i.e.* SEAFDEC Member Countries can enhance knowledge about the biomass estimation approach and conservation of inland fishery resources; the expected outputs are: 1) Development of the biomass estimation approach and conservation of inland fishery resources; and 2) The project management.

Under **Output 1.1** "Development and dissemination of stock assessment model of Anguillid eels," in 2025, IFRDMD strengthened fisheries-dependent monitoring, standardized catch per unit effort (CPUE) analyses, and improved data management systems for tropical anguillid eels. Monitoring was implemented at three selected pilot sites in Indonesia that represent key life stages of tropical eels: glass eel fisheries in Palabuhan Ratu (West Java), elver fisheries in Cilacap (Central Java), and yellow eel fisheries in Poso Lake (Central Sulawesi). Together, these sites form a practical life-cycle monitoring design that captures recruitment, juvenile, and adult stages, providing a robust foundation for stock assessment development and management indicators. Monthly catch and effort data were collected by trained local enumerators and fishers and centrally processed by IFRDMD. CPUE datasets were standardized and analyzed using R, with data manipulation conducted using *dplyr* and *tidyr*, summary reporting using *report*, and visualization using *ggplot2*. Generalized Linear Models (GLMs) with Gamma distributions were applied to standardize CPUE, using month and fishing effort as predictor variables, with effort defined according to site-specific fishing practices.

At Palabuhan Ratu, a major glass eel fishing ground supplying seed for Indonesian eel aquaculture, catches showed strong interannual variability. After declines in 2020–2021, the fishery recovered, reaching the highest annual catch in 2025 (4,254 kg) despite lower gear numbers, suggesting improved efficiency and/or stronger recruitment. Monthly data revealed a clear seasonal recruitment window, with peak catches typically occurring from March to June and episodic recruitment pulses during peak months. Nominal CPUE displayed pulse-like dynamics, emphasizing the need for long-term monitoring rather than reliance on single-year indicators. GLM results indicated fishing effort as a significant predictor of CPUE, while month alone was not significant, reflecting the likely influence of unmodeled environmental drivers. In Cilacap, which supports both elver supply for aquaculture and yellow eel for domestic processing, annual catches increased after a low point in 2020 and remained relatively high through 2025. Monthly catch patterns exhibited a bimodal structure, with peaks in early and late parts of the year and a distinct pulse around September. CPUE showed marked interannual variability, declining in mid-years before improving toward 2025. GLM analysis indicated a significant negative relationship between effort and CPUE, suggesting competition or effort-dilution effects, while month was not a significant predictor. At Poso Lake, an inland yellow eel fishery dominated by *Anguilla marmorata* and *A. celebesensis*, annual catches declined sharply in 2020 before gradually recovering to their highest level in 2025 (742 kg). Monthly catches were relatively stable throughout the year, with slightly higher variability during May–August. Nominal CPUE increased steadily from 2017 to 2025, potentially reflecting improved efficiency, availability, or fisher strategies. GLM results showed a significant negative effect of effort on CPUE, while overall explanatory power remained weak, indicating that key ecological or operational drivers are not yet captured in the model.

Across the three pilot sites, strong interannual variability was consistently observed, with pulse-like recruitment particularly evident in the glass eel fishery. Fishing effort was a significant driver of CPUE at all sites, though its direction varied, reflecting differences in fishery structure and competition dynamics. Month alone was not a consistent predictor of standardized CPUE, underscoring the need to integrate environmental covariates and fishery-specific operational variables. Overall, the results confirm the value of long-term, standardized CPUE monitoring as a core component of tropical eel stock assessment and adaptive management in Indonesia.

To improve the capacity building on collecting data on Anguillid Eel fisheries, IFRDMD convened the "Regional Workshop on Enhancing Species Identification Capacity for Sustainable Glass Eel Fisheries in Southeast Asia" on 25–26 September 2025 in Palabuhan Ratu. The Workshop gathered 35 participants from Indonesia, Myanmar, the Philippines, Viet Nam, and local fisher groups. It addressed the region-wide challenge of accurately identifying glass eel species, particularly differentiating *Anguilla bicolor* and *A. marmorata*, which directly affects monitoring accuracy, stock assessment confidence, traceability, management decisions, and fisher livelihoods. Key components included: technical sessions on eel biology, identification principles, and monitoring needs; country updates highlighting shared issues (overfishing, weak enforcement, habitat degradation, and limited species-level monitoring); practical field and laboratory sessions reinforcing morphological and genetic methods; and discussion of management implications (quota setting, roles of science and authorities, and strengthening data systems). The Workshop concluded with strong recommendations for continued regional training, broader knowledge transfer, and the development of supporting infrastructure, including focal laboratories, molecular barcoding capacity, improved traceability, and strengthened regional cooperation.

Workshop on Enhancing Species Identification Capacity for Sustainable Glass Eel Fisheries on 25–26 September 2025 in Palabuhan Ratu, Indonesia

IFRDMD also strengthened national capacity by mentoring 11 interns and research students through hands-on training and supervision of eel-related studies. These mentoring activities strengthened applied competencies in eel biology, sampling, identification, and stock assessment support, and expanded collaboration between IFRDMD and Indonesian universities.

Moreover, IFRDMD achieved a major operational upgrade by transitioning from Excel-based data storage to a centralized, structured CPUE database system. Previously, multiple spreadsheets created fragmentation and increased the risk of human error. The new system compiles data from multiple sites in a standardized digital format, improving consistency, accessibility, and readiness for analysis. The upgraded platform is supported by an online dashboard enabling near-real-time visualization and access. This transition is a key institutional step toward improved transparency and long-term data management for tropical eel monitoring. Continued improvement is recommended to strengthen system functionality, user experience, and sustainability.

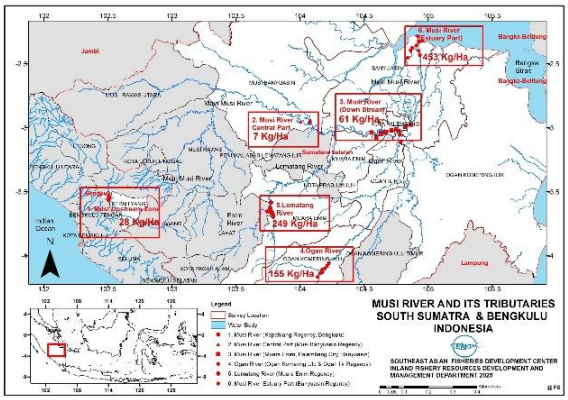
For **Output 2.1** "Development of the biomass estimation approach and conservation of inland fishery resources," a number of activities were carried out in 2025:

The Activity "*Development of a Biomass Estimation Approach for Inland Fisheries Using Hydroacoustic Technology*" aims to improve inland fisheries stock assessment through the application of hydroacoustic technology in support of sustainable fisheries management, food security, and

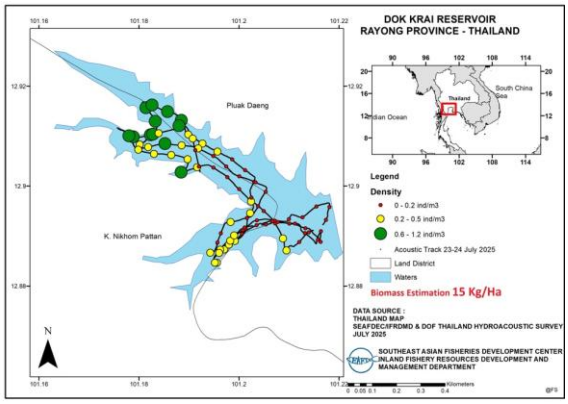
community livelihoods in the AMSs. Hydroacoustic surveys were applied as they provide rapid, non-invasive, and high-resolution information on fish biomass, spatial distribution, and population structure in inland waters. This approach is particularly suitable for rivers, reservoirs, and estuarine systems where conventional sampling methods are often constrained by logistical, temporal, and environmental limitations. The integration of acoustic measurements with environmental parameters and biological information improves the reliability of biomass estimation.

In Indonesia, surveys were conducted in the Musi River system and its tributaries, including the upstream, central, and downstream sections of the Musi River, as well as the Ogan River, Lematang River, and the Musi River Estuary using a Biosonic DT-X 200 kHz split-beam echosounder. The results revealed a clear longitudinal gradient in fish biomass, with lower biomass observed in upstream and central river sections and higher biomass recorded in major tributaries and estuarine areas. The Musi River Estuary exhibited the highest biomass density, reflecting the high ecological productivity of estuarine systems influenced by tidal mixing, nutrient inputs, and habitat complexity. Productive tributaries such as the Lematang and Ogan Rivers also showed relatively high biomass, highlighting their importance as key inland fishery resources. Conversely, the central and upstream sections of the Musi River displayed reduced biomass and fish density, likely associated with anthropogenic pressures, habitat degradation, and less favorable environmental conditions. Water quality parameters, particularly dissolved oxygen, temperature, pH, and salinity, were found to strongly influence fish distribution and abundance across the surveyed areas.

In Thailand, a hydroacoustic survey was conducted at Dok Krai Reservoir, Rayong Province, using a Simrad EY 60 200 kHz split-beam echosounder. The results showed spatial variation in fish density across reservoir zones, with fish populations dominated by small- to medium-sized individuals and a moderate biomass level typical of inland reservoir fisheries. Environmental conditions were generally suitable for freshwater fish, supporting a stable stock structure.



Estimation of Biomass Density (Kg/Ha) in Musi River and its Tributaries, South Sumatera, Indonesia

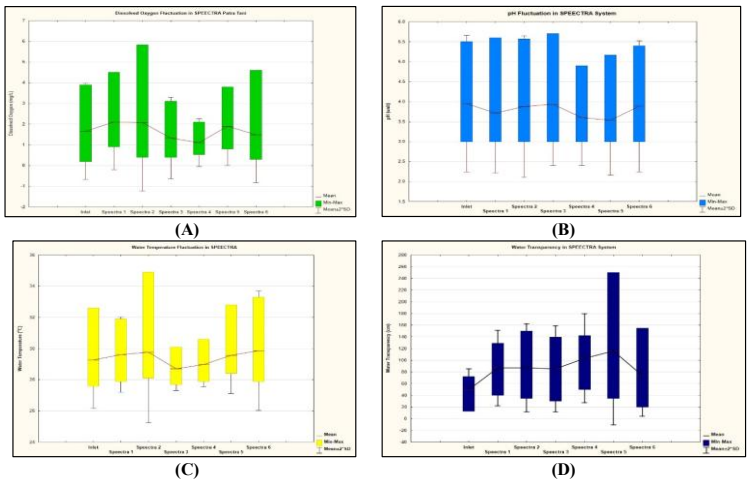


Estimation of Biomass Density (Kg/Ha) in Dok Krai, Rayong Province, Thailand

Overall, this Activity demonstrates that hydroacoustic technology is an effective and reliable tool for estimating biomass in inland fisheries. The integration of acoustic surveys with environmental monitoring provides a strong scientific basis for evidence-based fisheries management, regional capacity building, and the sustainable conservation of inland fishery resources.

Another Activity was the "*Implementation of SPEECTRA system as the inland fisheries management model*." Ongoing water quality monitoring within the special area for conservation and fish *refugia* (SPEECTRA) system is essential for understanding the environmental condition of floodplain ecosystems and their capacity to support aquatic life. Key parameters monitored include dissolved oxygen, pH, water temperature, and water transparency, all of which play critical roles in determining habitat suitability for aquatic species. Dissolved oxygen levels were found to be particularly low in several locations, reflecting the acidic characteristics of peat swamp waters. While such conditions are generally unfavorable for most aquatic organisms, certain species, such as blackfish, are able to survive

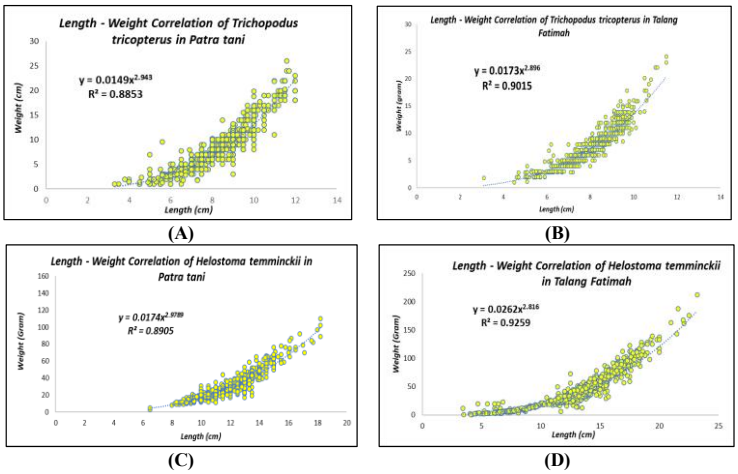
due to physiological adaptations like the labyrinth organ, which enables them to utilize atmospheric oxygen.



Water quality fluctuation includes dissolved oxygen, pH, water temperature, and transparency in SPEECTRA system.

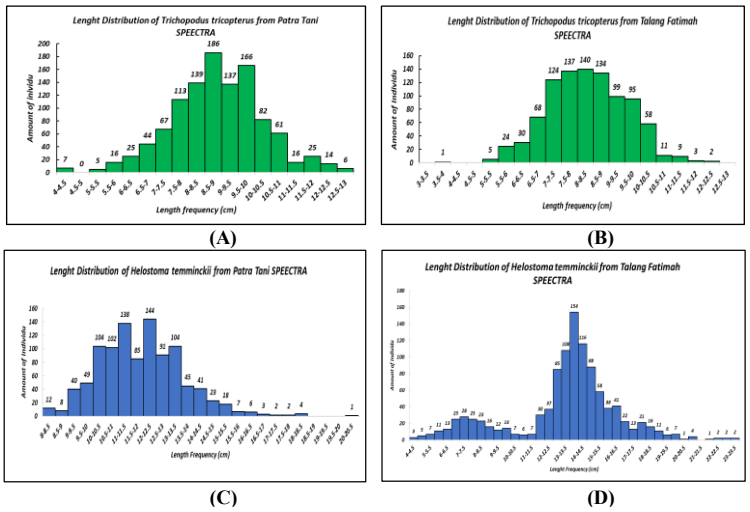
To improve water quality conditions, several management strategies are recommended, including water transfer through pumping and the establishment of aquatic vegetation. Persistently low pH levels, resulting from the oxidation of ferrous sulfate compounds in peat soils, pose a significant threat to biodiversity and hinder the decomposition of organic matter, thereby reducing overall water quality. Increasing river water inflow and applying chalk to neutralize acidity may serve as effective pH management measures. In addition, fluctuations in water temperature and transparency were observed and are known to influence aquatic life cycles and productivity. Maintaining a stable temperature range and improving water clarity would contribute to healthier aquatic ecosystems. Continuous monitoring of these water quality parameters is therefore crucial to ensuring the sustainability of the SPEECTRA system and strengthening the effectiveness of future conservation interventions.

Furthermore, fish population dynamics serve as a key indicator of the effectiveness of the SPEECTRA system in supporting inland fisheries biodiversity. The observed growth of species such as *Helostoma temminckii* (Kissing gourami) and *Trichopodus trichopterus* (Three spot gourami) provides valuable insights into the system's conservation performance. Data collected from the Patra Tani and Talang Fatimah sites indicate negative allometric growth patterns, where increases in fish length outpaced gains in weight. This growth trend suggests potential limitations in food availability or other environmental stressors that may constrain biomass accumulation.



Length–weight correlation of Trichopodus tricopterus *(A–B), and* Helostoma temminckii *(C–D) in the Patra Tani and Talang Fatimah SPEECTRA sites*

In addition, further analysis of fish length distribution and population structure throughout the year reveals important information on population health and reproductive dynamics. The appearance of new population cohorts in June indicates spawning events that likely coincide with favorable environmental conditions. Nevertheless, challenges related to limited food resources and intra-species competition persist within the ecosystem. Although the consistency of population patterns across seasons demonstrates the SPEECTRA system's capacity to support fish life cycles, it also underscores the need for enhanced ecosystem stability and improved management of natural food resources to optimize fish population growth.



Length-class distribution of Trichogaster tricopterus *(A–B) and* Helostoma temminckii *(C–D) at SPEECTRA Patra Tani and Talang Fatimah*

The application of other effective area-based conservation measures (OECMs) is increasingly recognized as a complementary approach to conventional protected areas, particularly in the context of inland fisheries conservation. In support of this approach, IFRDMD conducted a training entitled "Assessment of Other Effective Area-based Conservation Measures (OECMs) for Inland Fisheries" on 5–8 May 2025. The training aimed to strengthen participants' capacity to evaluate inland fisheries habitats located outside formal protected areas by examining ecological conditions, governance arrangements, and socioeconomic dimensions.

Documentation of internal training on OECM Assessment for Inland Fisheries at the IFRDMD Office, Ogan Komering Ilir, and Patra Tani, Indonesia

Three sites, namely Teluk Rasau, Patra Tani, and Talang Fatimah, were selected for the OECM assessment. Patra Tani and Talang Fatimah demonstrated relatively strong governance structures, active community participation, and functional management systems. In contrast, Teluk Rasau still lacked adequate documentation and formal legal recognition, highlighting disparities in conservation governance across regions. These findings reflect broader challenges in Indonesia, where some conservation areas are well established while others face significant gaps in legal frameworks and environmental monitoring. The training emphasized the importance of inclusive governance, particularly the involvement of local communities and government stakeholders, to ensure that conservation efforts align with biodiversity objectives and local socioeconomic values. Strengthening OECM implementation in inland fisheries can contribute significantly to achieving global biodiversity targets while enhancing ecosystem resilience in the face of climate change and ongoing habitat degradation.

Development of Stock Assessment Methods and Strengthening of Resources Management Measures for Tropical Anguillid Eel in Southeast Asia

FCG/ASSP Project No. 10

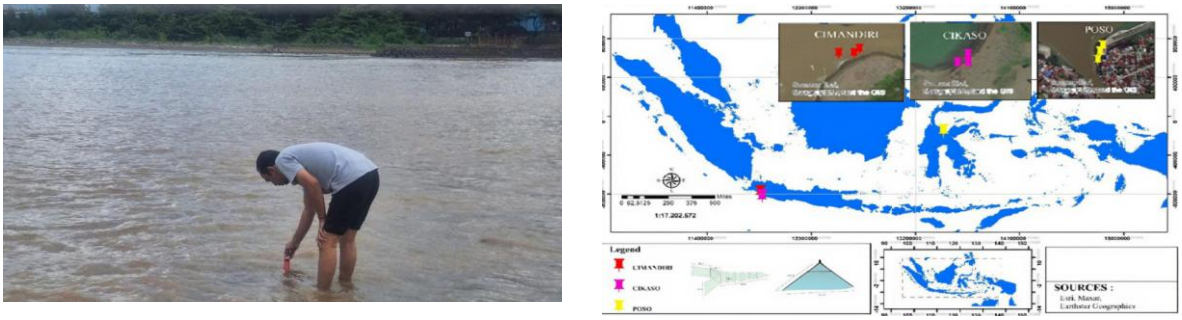
Status: *Ongoing (on track, with no-cost extension until 31 May 2026)*

Several tropical anguillid eel species can be found in Southeast Asia. Of the eight (8) species and subspecies recorded in the region, the most economically important are the Indonesian shortfin eel (*Anguilla bicolor bicolor* and *A. bicolor pacifica*) and giant mottled eel (*A. marmorata*). There is an increasing demand and use of tropical anguillid eel resources in Southeast Asia. For the sustainable use of the anguillid eel resources in the region, effective management measures are required. However, the trends of stock abundance, areas of distribution, and stock structure of the tropical anguillid eel species are unknown. Consequently, a lack of relevant information prevents the AMSs from determining the effective resource management measures for tropical anguillid eels.

To obtain data and information for the management of anguillid eels, the project "**Development of Stock Assessment Methods and Strengthening of Resources Management Measures for Tropical Anguillid Eel in Southeast Asia"** was implemented by the SEAFDEC Secretariat in collaboration with SEAFDEC/IFRDMD, with funding from the Japan-ASEAN Integration Fund (JAIF). The original Project duration was from 2020 to 2022, and was extended until 23 January 2026. The Project aimed to achieve its objectives through three expected outputs: 1) collection of data on the stock status of tropical anguillid eel resources, including catch and effort data, biological and ecological information, and species distribution and diversity; 2) development of comprehensive methods for stock assessment and the calculation of allowable catch; and 3) formulation of effective management measures based on stock assessment results.

Under **Output 1**, the project continued to collect data and information on eel catches, fishing effort, as well as the biological and ecological characteristics of eels in Indonesia and Myanmar. For Indonesia, catch per unit effort (CPUE) data were collected four days every month; while environmental data were collected one day every two months at three (3) pilot sites, *i.e.* Cimandiri River, Cikaso River, and Poso River from April 2020 to December 2025, and with the engagement of 27 Indonesian fishers.

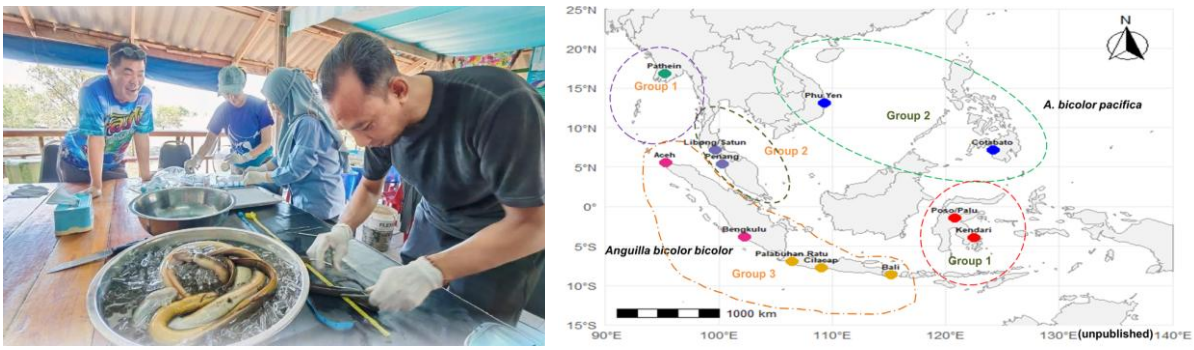
Meanwhile, in Myanmar, CPUE and biological data were collected every day from July 2024 to June 2025 at five (5) pilot sites, *i.e.* Yangon, Pyapon, Pathein, Myaunggmya, and Labutta. Environmental data and information collected under the Project included water depth, dissolved oxygen (DO), temperature, pH, current velocity, precipitation, tidal conditions, fishing effort, and eel life stages (glass eel and elver/yellow eel). However, not all parameters were collected at every pilot site.



Environmental data collection (left) and map showing location data collection in Indonesia (right)

Another activity under Output 1 was the "genetic study for species identification and genetic diversity." The aim of this Activity was to identify the genetic population structure of *Anguilla bicolor pacifica* and *A. bicolor bicolor* using different markers, *e.g.* COI, Cyt-B, and microsatellite. In Indonesia, eel tissue samples were collected in conjunction with the environmental data surveys every two months at three (3) pilot rivers: the Cimandiri River, Cikaso River, and Poso River. Similarly, tissue samples were also collected in Thailand (Trang and Satun Provinces) and Malaysia (Penang) from 14 to 20 May 2025.

In addition, SEAFDEC organized an "In-house Training Workshop on Genetic Data Integration" on 9–14 September 2025 in Yogyakarta, Indonesia. The analysis results showed moderate genetic differentiation in *A. bicolor bicolor*, particularly among populations from Myanmar, Thailand, Malaysia, and Indonesia. These patterns indicate limited gene flow and support the recognition of three (3) Management Units, which would enable countries to tailor conservation and harvest measures to local population dynamics. In contrast, *A. bicolor pacifica* populations from Viet Nam and the Philippines were found to be genetically highly similar, indicating strong connectivity, whereas populations from Indonesia formed a slightly differentiated group. These results support the delineation of two (2) Management Units for this species (These findings are under consideration for publication in a peer-reviewed paper). These serve as fundamental references on stock units when assessing stock status and strengthening of resource management measures.



Eel sampling in Thailand (left) and map showing Anguilla bicolor *genetic diversity and stock units in the region (right)*

Under **Output 2** "Development of comprehensive methods for stock assessment and calculation of allowable catch," SEAFDEC held three "In-house Training Workshops on CPUE Analysis and Stock Assessment" on 10–13 January 2025 in Jakarta, 19–22 June 2025 in Bandung, and 27–31 August 2025 in Bali, Indonesia, respectively, with a resource person from Tokyo University of Marine Science and Technology (TUMSAT). During these Workshops, survey data collected in the Philippines, Myanmar, and Indonesia from 2020 to 2025 were analyzed. CPUE data collected in Indonesia under Output 1 were standardized using environmental variables. Based on the standardized CPUE, spatio-temporal analyses were conducted to identify key environmental drivers influencing glass eel recruitment. The results indicated that river morphology significantly influences recruitment dynamics. The results indicate that water flow affects glass eel recruitment, resulting in higher recruitment success. Furthermore, a method for estimating the abundance and biomass of glass eels in pilot rivers in Indonesia was developed.

Meanwhile, data collected in Myanmar and the Philippines under Output 1 were also analyzed, and the results showed significant temporal changes in a one-year timeframe, potential effects of precipitation on abundance or catchability, and constant effects of the lunar phase (These findings are under consideration for publication in a peer-reviewed paper). These are key methodological considerations to improve stock assessment, particularly for the calculation of allowable catch.

Under **Output 3** "Effective management measures based on stock assessment," based on the data analysis, a method for setting the total allowable catch (TAC) based on a pre-defined rule, together with evaluation methods based on routine stock assessment and monitoring, was introduced. These methods included simulations of future biomass, catch, exploitation rate, and related indicators. In addition to allowable catch limits, other stock management approaches, such as input controls, were also proposed as potential regulatory measures for eel fisheries, taking into account seasonal variations and the effects of precipitation. In addition, it was suggested that site-specific management strategies are necessary to ensure the sustainable utilization of eel resources.

These proposed management measures were presented at the Project End Meeting of the "Development of Stock Assessment Methods and Strengthening of Resource Management Measures for Tropical Anguillid Eel in Southeast Asia," held on 30–31 October 2025 in Bangkok, Thailand. These diverse ideas were presented, providing useful references to more appropriate approaches for culturally and environmentally distinct contexts in the region.

Project End Meeting on 30–31 October 2025 in Bangkok, Thailand

Project extension

Although the Project was originally scheduled for completion in January 2026, a no-cost extension has been granted to allow continued project implementation until 31 May 2026.

1.7 Projects under cross-cutting sub-strategies

Sustainable Management of Fisheries, Marine Living Resources and Their Habitats in the Bay of Bengal Region for the Benefit of Coastal States and Communities (BOBLME Phase II)

FCG/ASSP Project No. 11

Status: *Ongoing (on track)*

The Transboundary Diagnostic Analysis (TDA) and Strategic Action Programme (SAP) phase of the BOBLME identified three priority transboundary concerns: 1) overexploitation of marine living resources, 2) degradation of critical habitats, and 3) pollution and water quality. A BOBLME program framework was developed with BOBLME countries to agree on priority issues to be addressed, which were included in the project "**Sustainable Management of Fisheries, Marine Living Resources and**

Their Habitats in the Bay of Bengal Region for the Benefit of Coastal States and Communities (BOBLME Phase II)." The project will address the following barriers: i) Institutional, legal and administrative barriers; with incomplete regional policy cycles and weak national-regional as well as science-policy interfaces, leading to poor governance; ii) socioeconomic barriers; by improving stakeholder awareness, capacity, gender equity and participation, and introducing valuation of ecosystem services, leading to improved governance; and iii) reversing the lack of integration of climate change in planning and management to enhance the resilience of its fisheries, critical habitats, and people's livelihoods.

The project objective is to contribute to sustainable management of fisheries, marine living resources and their habitats in the Bay of Bengal region, to reduce environmental stress and improve environmental status for the benefit of coastal states and communities. This will be achieved through five interlinked Project components based on the SAP themes, and with an added component to strengthen the institutional arrangements for regional partnerships coordination and collaboration, ecosystem-based monitoring, and assessment, *i.e.:*

- **Component 1**: Sustainable Management of Fisheries
- **Component 2**: Restoration and conservation of critical marine habitats and conservation of biodiversity
- **Component 3**: Management of coastal and marine pollution to improve ecosystem health
- **Component 4**: Improved livelihoods and enhanced resilience of the BOBLME
- **Component 5**: Regional mechanism for planning, coordination, and monitoring of the BOBLME

The project has three executing agencies, namely: the Bay of Bengal Programme Inter-Governmental Organization (BOBP-IGO), the International Union for Conservation of Nature (IUCN), and the Southeast Asian Fisheries Development Center (SEAFDEC). While IUCN serves as the Regional Coordinating Unit (RCU), ***SEAFDEC leads activities in the Southeast Asian region for Components 1, 3, and 5***, to be implemented in 2024–2028, except for Component 3, which will be implemented in 2025–2027.

Significant administrative milestones were achieved in 2025 following the signing of the Project agreement between Thailand and FAO in 2022. In 2025, Indonesia and Malaysia also signed their respective Project Agreements, solidifying the countries' commitment to the SAP.

The activities implemented by SEAFDEC in 2025 are as follows:

Under **Component 1**:

Outcome 1.1 *The ecosystem approach to fisheries management institutionalized at national level, including targeted transboundary fish stocks*

In 2025, TD achieved significant milestones in institutionalizing the ecosystem approach to fisheries management (EAFM) through a series of strategic workshops and field activities in Thailand. The year's efforts began with the "EAFM Start-up Workshop for the Fisheries Management Unit (FMU) in Koh Panyee and Rawai" on 2–3 April 2025, and on 24–25 April 2025, respectively, where local stakeholders and fisheries officers collaboratively defined management scopes and baseline data needs for these two critical learning sites. To ensure long-term sustainability, the "Capacity of Training Providers to Deliver Essential Ecosystem Approach to Fisheries Management (E-EAFM)" was conducted in Krabi Province on 26–30 May 2025, equipping 39 practitioners and educators with the skills to embed ecosystem-centric principles into regional fisheries education. These foundational activities culminated in the "Workshop on EAFM Plan Development for Koh Panyee, Phang Nga Province and Rawai, Satun Province" on 19–21 August 2025, which produced finalized, actionable community management plans, including specific measures for the sustainable harvest of short-body mackerel.

EAFM Start-up Workshop for the FMU in Koh Panyee on 2–3 April 2025

EAFM Start-up Workshop for the FMU in Rawai on 24–25 April 2025

Capacity of Training Providers to Deliver E-EAFM on 26–30 May 2025 in Krabi Province, Thailand

Workshop on EAFM Plan Development on 19–21 August 2025

The project's momentum continued into the final quarter with a focus on the implementation of the EAFM plan, focusing on scientific validation and regional synergy. From October to December 2025, TD conducted a comprehensive Fishery Resource Survey in the Rawai Community, collecting 52 datasets across various gear types to document the diversity and abundance of key species, particularly the blue swimming crab and banana prawn. This biological data provided the essential indicators for monitoring the success of the newly developed EAFM plans. In addition, a National Workshop held on 25 September 2026 reviewed the achievements of 2025 and shared outcomes, challenges, and lessons learned from EAFM implementation in the Koh Panyee and Rawai FMUs, while identifying priority actions and strengthening collaboration among government agencies, research institutions, and community representatives for 2026.

National Workshop Report on EAFM Implementation: Sharing Results and Lessons Learned from 2025 and Activities & Planning for 2026 on 25 September 2025 in Phuket, Thailand

The year concluded with a focus on cooperation during the "Regional Workshop on EAFM Implementation: Sharing Results and Lessons Learned from 2025 Activities & Planning for 2026," held on 25–26 November 2025 in Pulau Langkawi, Malaysia. By reviewing achievements and conducting field visits to pilot sites in Malaysia, TD successfully strengthened regional networks and established a clear, collaborative roadmap for sustainable fisheries governance in the Bay of Bengal for the coming year.

Regional Workshop on EAFM Implementation: Sharing Results and Lessons Learned from 2025 Activities & Planning for 2026 organized on 25–26 November 2025 in Pulau Langkawi, Malaysia

Outcome 1.2 *IUU catch in the BOBLME reduced*

In 2025, the progress under this Outcome was made through the "Regional Training Course on Enhancing Capacity Development for Implementing Port State Measures (PSM) Inspection to Combat IUU Fishing" organized on 1–3 April 2025 in Samut Prakan, Thailand, where 21 inspectors from Indonesia, Malaysia, and Thailand participated in practical vessel inspection simulations and field visits to the Bangkok fishing port. This was followed by the "Training on the Implementation of Thailand's National Plan of Action to Combat IUU Fishing (NPOA-IUU), Second Edition" on 14 August 2025, which equipped 80 fishery officers of the DOF Thailand with a comprehensive understanding of their roles as flag, coastal, and port States. These initiatives ensured that national enforcement frameworks were aligned with international obligations of creating a more transparent and accountable fisheries sector.

Practical inspection (left) and field visits to the Bangkok fishing port (right) during the Regional Training Course on Enhancing Capacity Development for Implementing Port State Measures (PSM) Inspection to Combat IUU Fishing on 1–3 April 2025 in Samut Prakan, Thailand

Training on the Implementation of Thailand's NPOA-IUU, Second Edition on 14 August 2025 at the DOF Thailand

The project further strengthened regional monitoring, control, and surveillance (MCS) through specialized sessions and cross-border information sharing. Toward this, TD conducted the "Training Course on Enhancing Capacity for Monitoring, Control, and Surveillance (MCS) of Domestic and International Fishing Vessels to Combat IUU Fishing" on 19–21 August 2025 in Jakarta, Indonesia, where participants utilized innovative technologies and real-world case studies from the Ministry of Marine Affairs and Fisheries (MMAF) to improve fleet oversight. The year's IUU countermeasures culminated in the "Regional Workshops on Information Exchange on Monitoring, Control, and Surveillance of Combating IUU Fishing" held on 24–26 November 2025 in Bangkok. Bringing together 30 representatives from seven BOBLME Phase II countries—Bangladesh, India, the Maldives, and Sri Lanka—this Workshop successfully modernized regional communication protocols and established enhanced mechanisms for sharing real-time MCS experiences. Collectively, these events have fortified the collaborative defenses of the Bay of Bengal against illegal fishing, directly contributing to the long-term health of the region's marine ecosystems.

Training Course on Enhancing Capacity for MCS of Domestic and International Fishing Vessels to Combat IUU Fishing on 19–21 August 2025 in Jakarta, Indonesia

Regional Workshops on Information Exchange on Monitoring, Control, and Surveillance of Combating IUU Fishing" held on 24–26 November 2025 in Bangkok, Thailand

Under **Component 3**:

TD expanded its mandate under this Component, focusing on pollution management through improved infrastructure. A key activity was the "Webinar on Fishing Port Standards and Fishing Port Management" on 20 June 2025, organized by TD in collaboration with the BOBP-IGO. This virtual session brought together 27 participants from across the region to address the urgent need for enhanced waste management systems at fishing harbors. Representatives from Indonesia, Malaysia, and Thailand actively shared current operational challenges and localized updates on marine pollution, while experts from FAO-India and the Pollution Control Department (PCD) of Thailand provided critical lessons on enforcing environmental laws and establishing international port standards.

Webinar on Fishing Port Standards and Fishing Port Management" on 20 June 2025

The Webinar emphasized the need to shift toward more practical, standardized approaches to waste handling within the maritime sector. By facilitating dialogue on the intersection of environmental law and fisheries management, the event empowered participants to integrate pollution-control measures directly into their port management strategies. This collaborative effort has laid the groundwork for future regional initiatives to mitigate the environmental footprint of fishing operations, ensuring that the shared ecosystems of the Bay of Bengal remain healthy and resilient for the coastal communities that depend on them.

In addition, SEAFDEC organized the "Regional Verification Workshop on Fishing Port Sustainability" on 1–2 October 2025 in Phuket, Thailand, convening 28 participants from Indonesia, Malaysia, and Thailand to establish a sub-regional framework for developing national fishing port waste management guidelines. The Workshop designated pilot sites along the Andaman Sea coast, including PPS Bungus with ISO 14001:2015 certification, the Penang and Kuala Perlis complexes under Lembaga Kemajuan Ikan Malaysia, and Phuket International Fishing Port, while drafting a regional study proposal, identifying policy and operational gaps particularly in Malaysia and Thailand, aligning actions with international standards such as MARPOL Annex V and FAO Blue Fishing Ports criteria, and adopting a three-year implementation roadmap from 2025 to 2027 with designated national focal points to guide coordinated implementation and knowledge sharing.

Regional Verification Workshop on Fishing Port Sustainability on 1–2 October 2025 in Phuket, Thailand

Building on the outcomes related to the promotion of fishing gear marking and the development and dissemination of corresponding regional guidelines, the "Webinar on Sharing Knowledge and Experiences on Fishing Gear Marking" was organized on 21–22 October 2025, aiming to further strengthen sub-regional cooperation among Indonesia, Malaysia, and Thailand to address abandoned, lost, or discarded fishing gear in the Bay of Bengal. A total of 76 participants attended the two-day virtual webinar, with 57 on the first day and 19 on the second. The Webinar promoted the coordinated implementation of gear-marking systems in line with the FAO Voluntary Guidelines on the Marking of Fishing Gear and with global initiatives highlighted by the Global Ghost Gear Initiative. During the event, SEAFDEC introduced a regional project supported by the Japan-ASEAN Integration Fund that aimed at developing a regional manual on gear marking and pilot testing methods for gillnets and traps in small-scale fisheries. Participating countries identified priority gear types for pilot implementation, agreed on harmonized and cost-effective marking approaches and database development, and confirmed next steps, including the commitment of Thailand to submit a formal proposal in December 2025 and SEAFDEC's plan to convene follow-up technical consultations in April 2026 to finalize implementation arrangements and strengthen regional coordination.

Webinar on Sharing Knowledge and Experiences on Fishing Gear Marking on 21–22 October 2025

Promoting the Blue Economy and Strengthening Fisheries Governance of the Gulf of Thailand through the Ecosystem Approach to Fisheries (GoTFish)

FCG/ASSP Project No. 12

Status: *Ongoing (on track)*

The project "**Promoting the Blue Economy and Strengthening Fisheries Governance of the Gulf of Thailand through the Ecosystem Approach to Fisheries**" or GoTFish is a five-year project designed to address the key barriers to sustainable transboundary fisheries management of the Gulf of Thailand (GoT), related to institutional, legal, and administrative issues at regional and national levels, including the lack of an appropriate forum for GoT-wide multinational dialogue for planning, monitoring, and reporting to address current unsustainable practices in fisheries resource use and management and conservation of aquatic biodiversity; the lack of integration of socioeconomic constraints such as lack of or inadequate incentives, climate resilience, and gender considerations into the planning and management of GoT fisheries.

With the Gulf of Thailand countries, namely: Cambodia, Malaysia, Thailand, and Viet Nam, as participating countries, the aim of the Project is "Improved natural resource governance in the GoT through the implementation of the Ecosystem Approach to Fisheries (EAF) contributing to the broader, regional fisheries objectives of the South China Sea Strategic Action Programme (SCS-SAP)."

To achieve this, the GoTFish project will work on four main components, *i.e.*:

- **Component 1**: Regional transboundary fisheries governance and management strengthened, will focus on the institutionalization of transboundary fisheries governance and management issues for more effective decision-making in the GoT. This will be achieved by supporting the

creation of a regional mechanism that can set the protocols for information sharing related to shared stocks of priority species and/or fisheries, as well as setting up the governance structure and enhanced capacity for developing the Ecosystem Approach to Fisheries regional and national plans.

- **Component 2**: Alignment of incentive mechanisms will work on improving the understanding of the roles of incentives (positive and negative) that can support sustainable and well-managed fisheries resources in the GoT, particularly market incentives such as the Fisheries Improvement Schemes for transboundary species, and behavior change incentives.
- **Component 3**: Ecological Corridor of Critical and Important Habitat for Aquatic Resources in the Gulf of Thailand (with a focus on Malaysia), will contribute to the conservation of globally significant biodiversity, identifying the existing ecological corridors in the GoT that are important both for biodiversity and fisheries. This component will be primarily executed in Malaysia (in particular, in the East Coast of Peninsular Malaysia) through the use of Biodiversity funding from GEF.
- **Component 4**: Stakeholder engagement, communication, monitoring, and evaluation will contribute to the IW focal area by facilitating project coordination and monitoring of project performance to achieve the expected outputs, enhancing the participation of stakeholders (with a strong focus on women's involvement), and on creating, documenting, sharing, and using of knowledge related to transboundary sustainable fisheries practices and aquatic ecological corridors.

After receiving the GEF CEO's endorsement in June 2023, the Food and Agriculture Organization (FAO), as the GEF Agency, initiated the operationalization process, which included officially notifying all participating countries and requesting their signatures to proceed. Subsequently, two out of four countries, *i.e*. Cambodia and Thailand, signed the project document, while signatures from Malaysia and Viet Nam are still pending. FAO also signed the Operational Partner Agreements (OPAs) with two Executing Agencies, *i.e*. the Sustainable Fisheries Partnership (SFP) and SEAFDEC, which are responsible for Components 1 and 4; while an OPA with the University of Queensland (UQ), tasked with implementing Component 3, will be finalized once the project document receives signatures from Malaysia.

During the inception phase, the principal focus was on establishing the Regional Coordination Unit (RCU) for the project. SEAFDEC facilitated this by providing office space and setting up the RCU within its Training Department in Samut Prakan, Thailand. The Regional Chief Technical Advisor (CTA) was appointed in December 2025 to lead the RCU, overseeing the delivery and management of SEAFDEC project components at both national and regional levels, while coordinating with other execution and operational partners involved in the GoTFish project.

A major milestone during this period was the "Regional Inception Meeting for the GoTFish Project, Promoting the Blue Economy and Strengthening Fisheries Governance of the Gulf of Thailand through the Ecosystem Approach to Fisheries" organized on 18–19 November 2025 in Bangkok, Thailand. The workshop brought together 54 participants, including representatives from the GoTFish Project Participating Countries (Cambodia, Malaysia, Thailand, and Viet Nam) and key project partners, *i.e.* FAO, SEAFDEC, SFP and UQ. Members of the academe, fisherfolk organizations, and the private sector acted as observers. The workshop aimed to introduce the project's objectives, management framework, and expected outputs, while fostering knowledge sharing, partnership development, and regional cooperation. Throughout the discussions, participants explored joint strategies to strengthen sustainable fisheries governance and promote the blue economy, marking an important milestone in advancing the collaborative management of marine resources in the Gulf of Thailand.

Regional Inception Meeting for the GoTFish Project on 18–19 November 2025 in Bangkok, Thailand

This was followed by the "First Project Steering Committee (PSC) Meeting of the GoTFish Project" on 20 November 2025 in Bangkok, Thailand, bringing together 28 delegates from FAO, SEAFDEC, SFP, UQ, participating countries' representatives as PSC Members, and National Focal Points from Cambodia and Thailand, as well as observers from Malaysia and Viet Nam. During the Meeting, the PSC Member from Thailand was elected as Chairperson, with the Member from Cambodia as Vice-Chairperson. The meeting marked the official launch of the project's governance structure to improve natural resource governance in the Gulf of Thailand through the implementation of the ecosystem approach to fisheries. The PSC endorsed the Terms of Reference for the Project Steering Committee. The Year 1 Workplan and Budget for 2025 up to the 2nd quarter of 2026 were endorsed, along with key recommendations from the Inception Meeting. The PSC also discussed coordination mechanisms, safeguards, and upcoming actions, establishing a solid foundation for effective regional cooperation under the project.

First Project Steering Committee (PSC) Meeting of the GoTFish Project on 20 November 2025 in Bangkok, Thailand

Promotion on Strengthening of SEAFDEC Visibility and Enhancing Human Capacity Building

Departmental Program No. 6

Status: *Ongoing (on track)*

SEAFDEC/TD continued implementing its ongoing Departmental Program, "**Promotion on Strengthening of SEAFDEC Visibility and Enhancing Human Capacity Building**." The Program has the overall objective of strengthening the visibility and image of SEAFDEC, while also enhancing the knowledge of relevant agencies and stakeholders on fisheries-related issues. The activities were categorized into 1) Promotion and enhancement of SEAFDEC visibility and image; 2) Production of information materials, *e.g.* books, brochures, videos, and other media, to raise awareness and understanding of fishers, stakeholders, and the public; 3) Enhancing the capacity of human resources including the conduct of tailor-made training based on the needs of partners and donors.

In 2025, to promote and enhance SEAFDEC visibility and image, TD joined the 2025 celebration of the National Children's Day on 11 January 2025 at the Phra Chulachomklao Fort at the mouth of the Chao Phraya River, Samut Prakan Province, which was organized by the Royal Thai Navy. TD displayed information and games under the theme of fishery resources conservation. Several groups of children, guided by their chaperones, were drawn to the activities, which drew around 1,600 visitors.

Another exhibition was arranged as part of the 10-day National Fishery Exhibition or "Pramong Nomklao" organized by the DOF Thailand from 27 June to 6 July 2025. The TD exhibition was held under the theme "Marine Safety Equipment," featuring a vessel display with radar and echo sounder, life raft, life jacket, marine survival equipment, and other marine safety equipment. Moreover, information materials, such as technical publications, brochures, and posters, were distributed to promote SEAFDEC's activities. There were 226,005 visitors to the TD exhibition.

Visibility of TD promoted at the National Children's Day on 11 January 2025

TD booth at Pramong Nomklao" exhibition from 27 June to 6 July 2025

The visibility of TD on the utilization of SEAFDEC vessels was enhanced during the "Departure Ceremony of M.V. SEAFDEC 2 for Research Survey in the West Coast of Peninsular Malaysia" on 2 September 2025. The event was attended by representatives from the Embassy of Japan in Thailand and DOF Thailand. In addition, this year, the TD website was developed with monthly updates, while the TD repository was maintained with information uploaded.

Departure Ceremony of M.V. SEAFDEC 2 for Research Survey in the West Coast of Peninsular Malaysia on 2 September 2025

Under the scope of activities on the production of information materials, 29 articles on fisheries knowledge, including fishery management, fishing technology, combating IUU fishing, fisheries resources, and relevant fishing activities, were published on the TD website and official Facebook page. Moreover, two video clips on fisheries subjects and activities were produced and published on the TD YouTube channel.

The project also emphasized human capacity building. This year, nine training courses were organized for 43 students, 10 DOF Malaysia staff, 69 SEAFDEC staff, and 40 members of the general public.

2. Strategy 2. Supporting the sustainable growth of aquaculture to complement fisheries and contribute to food security, poverty alleviation and livelihood of people in the region

2.1 Sustainable aquaculture through cost-effective culture systems, and prompt and effective aquatic animal health management

Promotion of Aquaculture Technologies for Emerging Species through Good Aquaculture Practices (GAqP) in Southeast Asia

FCG/ASSP Project No. 13

Status: *Ongoing (on track)*

In 2025, the regional program "**Promotion of Aquaculture Technologies for Emerging Species through Good Aquaculture Practices (GAqP) in Southeast Asia**" was implemented in collaboration with several research partners in the Southeast Asian region. Three components under this Project include: 1) Development of aquaculture technologies for emerging species in the hatchery, nursery, and grow-out stages; 2) Development of high-quality and reliable oyster and seaweed production systems based on GAqP; and 3) Capacity enhancement on GAqP through technological training courses. Furthermore, the following activities were implemented:

- ***Development of aquaculture technologies for emerging species in the hatchery, nursery, and grow-out stages***

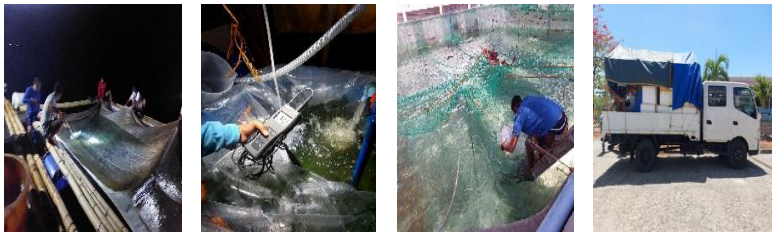
This component aims to: (1) develop technologies for the stable production of kawakawa, (2) develop technologies for the husbandry and mass production of round scad, (3) develop technologies to improve the survival and quality of cultured tropical anguillid eels during the nursery and grow-out stages, and (4) develop technologies for the mass production of slipper lobster seedlings.

- *Development of full-life cycle culture and stable production technology for kawakawa*

This activity aims to close the life cycle of the kawakawa (*Euthynnus affinis*) in captivity and develop culture technologies for hatchery, nursery, and grow-out.

In 2025, transport trials were conducted with captive juvenile/mature kawakawa broodstocks, clarifying key considerations for reducing stress during transportation. While developing techniques for broodstock management, the maturity of kawakawa in captivity has been reached, leading to natural spawning. The first spawning of kawakawa in captivity was recorded on July 21, 2025, after 506 d. The second spawning occurred on July 29, 2025, after 514 d in captivity. This is the first report of natural spawning in captivity anywhere in the world.

In 2026, broodstock management techniques will be enhanced and each stage of embryonic development documented to improve the hatching and early survival rates of kawakawa.



Transportation trial of kawakawa

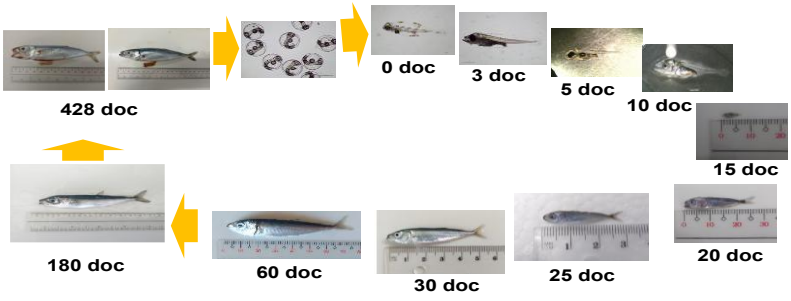
Feeds used for broodstock management: anchovy (L), sardine (Mid), and squid (R)

- *Development of husbandry and mass production technology for shortfin scad*

This activity aims to close the life cycle of shortfin scad (*Decapterus macrosoma*) and to develop hatchery-based aquaculture technologies for shortfin scad; if successful, it will proceed to the nursery and grow-out stages.

In 2025, the post-transport survival rate of wild-caught juvenile and mature shortfin scad broodstock kept in captivity improved. Eight transport trials were conducted this year, and five achieved a 100 % survival rate upon arrival. The complete life cycle of shortfin scad was successfully achieved through natural spawning of the first generation (F1), marking the first report of life cycle completion worldwide.

In 2026, basic requirements for shortfin scad, including appropriate environmental conditions, stocking density, and nutrition for optimal growth, will be identified to establish broodstock management techniques.

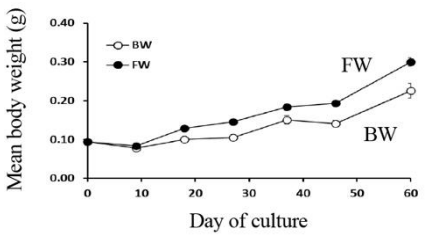


The complete life cycle of shortfin scad

- *Development of feeds and feeding regimes to improve survival and quality of cultured tropical anguillid eel in nursery and grow-out stages*

This activity aims to use several techniques to provide a more in-depth understanding of the factors affecting the quality, nutrient assimilation, growth, and survival of tropical anguillid eels (*Anguilla bicolor pacifica*) during the nursery and grow-out stages.

In 2025, seasonal sampling of wild glass eels was conducted to examine size and quality, and nursery rearing was performed under captive conditions. It was revealed that glass eels reared in freshwater showed better growth, survival, and RNA/DNA ratios than those reared in brackish water conditions. Therefore, future nursery rearing trials can be conducted only under freshwater rearing conditions. This finding differs from the results reported for the American eel (2008), European eel (2006), Japanese eel (2003), Australian shortfinned eel (2004), and longfinned eel (2006).



Growth comparison of glass eels in freshwater (FW) and brackish water (BW)

Collection of glass eels

In 2026, nursery rearing of glass eels will be conducted using diets supplemented with endogenous probiotics to assess their effects on survival, growth, intestinal morphology, and other related parameters, with the aim of producing high-quality glass eels.

- *Development of seedling mass production system for slipper lobster*

This activity aims to develop optimized rearing procedures to increase the production of phyllosoma and juveniles of the slipper lobster (*Thenus orientalis*).

In 2025, preliminary reports were made on appropriate techniques for broodstock management of slipper lobsters, as well as initial reports on suitable larval rearing protocols. 1) Communal rearing also resulted in higher survival and better breeding success than rearing lobsters in individual tanks. 2) The use of chlorine-treated water supplemented with microalgae significantly improved larval survival in terms of larval survival.

In 2026, the larval rearing protocol for slipper lobsters will be refined through improved feeding methods, optimized stocking density, and water-quality management to enhance larval survival and molting success from the nisto to juvenile stages.

Comparison of individual and communal rearing in broodstock management

Larval performance of slipper lobster under different water treatments and microalgal supplementation

- ***Development of high-quality and reliable oyster and seaweed production systems based on GAqP***

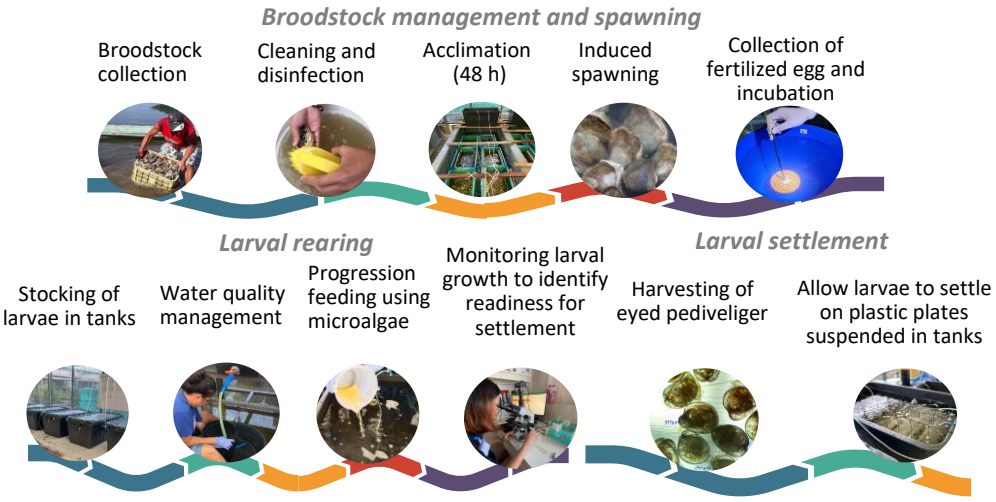
This component aims to (1) develop technologies for a more reliable production system of high-quality oysters, and (2) improve the productivity and quality of cultured seaweeds.

- *Development of a more reliable production system for high-quality oyster*

This activity aims to develop or enhance aspects of GAqP in the different phases of oyster production (hatchery, nursery, grow-out), while ensuring food safety of harvested products (post-harvest) and maintaining the environmental integrity of culture sites through suitability and carrying capacity assessments.

In 2025, an initial water quality profile, including salinity and pH, was conducted, and a profile map was generated. In addition, spat were produced from eyed pediveliger larvae. Across three runs, a total of 218,425 spat were produced, resulting in a 2.48 % survival rate from the D-larval stage. Although a survival rate of 1 % from the D-larval stage is typically considered satisfactory, this study achieved a notably higher rate of 2.48 %.

In 2026, while continuing hatchery production of oysters, a nursery trial using hatchery-produced spat will be conducted. Regular monitoring of water quality parameters (*e.g.* salinity, pH, dissolved oxygen, turbidity, chlorophyll-a) will also continue at the study site. These efforts will support the stable production of oyster spat and the establishment of an oyster culture model suited to the environmental conditions of the study area.



The oyster spat production process

- *Improvement of productivity and quality of cultured seaweeds*

This activity aims to identify putative microorganisms affecting farmed and tissue- cultured seaweeds that contribute to the occurrence of ice-ice disease (IID) and to determine their seasonal variations. It also aims to demonstrate innovative culture techniques with the potential to prevent IID occurrence. The results will be used to develop appropriate recommendations for GAqP in disease mitigation for seaweeds, as well as to establish site suitability and seasonal guidelines for seaweed farming.

In 2025, the dry-season monitoring of tissue-cultured seaweed reared in a sea-based nursery was completed. In addition, bacteria with carrageenan-lysing properties were isolated from seaweed affected by IID.

In 2026, tests will be conducted on carrageenan-lysing bacterial isolates obtained from seaweeds infected with IID to determine the bacterial concentrations capable of triggering the disease.

Healthy seaweed (L) and IID-infected seaweed (R)

Large craters on carrageenan medium inoculated with IID-infected seaweed

- ***Capacity enhancement on GAqP through technological training courses***

This component provides two types of training courses: (1) online courses and (2) face-to-face courses or station-based training courses.

- *Online training courses on aquaculture technologies, fish health management, and fish nutrition*

Online training course on giant freshwater prawn hatchery and grow-out operations
The online training course on giant freshwater prawn hatchery and grow-out operations is expected to be conducted in March 2026. The rescheduling is due to some unavoidable circumstances. This course will have seven participants from Cambodia (1), Malaysia (1), Philippines (3), Thailand (1), and Viet Nam (1).

Distance learning course on principles of health management in aquaculture (AquaHealth Online)
The online training course on distance learning course on principles of health management in aquaculture is expected to be conducted in April or May 2026. The rescheduling is due to the updating of the Learning Management System (LMS) and review of the online module contents. This course will have nine participants from Brunei Darussalam (1), Cambodia (1), Malaysia (1), Philippines (3), 1 Singapore (1), Thailand (1), and Viet Nam (1).

- *Face-to-face training courses on commodity- and community-based aquaculture in the Southeast Asian Region*

Training course on fish nutrition and feed development
The 13-day training course on fish nutrition and feed development was conducted face-to-face at AQD Tigbauan Main Station from 14 to 26 May 2025. This course had five participants from Malaysia (1), Philippines (3), and Thailand (1).

Training course on marine fish hatchery operations
The 37-day training course on marine fish hatchery operations was conducted face-to-face at AQD Tigbauan Main Station from 16 June 16 to 22 July 2025. This course had four participants from Myanmar (1) and Philippines (3).

Training course on community-based freshwater aquaculture for remote rural areas of Southeast Asia
The 15-day training course on community-based freshwater aquaculture for remote rural areas of Southeast Asia was conducted face-to-face at AQD Binangonan Freshwater Station from 11 to 25 November 2025. This course had four participants from Malaysia (1), Myanmar (1), and the Philippines (2).

Various practical sessions of the training courses

Blue Horizon: Ocean Relief through Seaweed Aquaculture

FCG/ASSP Project no. 14

Status: *Ongoing (on track)*

The Project "**Blue Horizon: Ocean Relief through Seaweed Aquaculture**" is a four-year initiative (2024–2028) funded by the Global Environment Facility (GEF) and implemented through WWF-US as the GEF Agency. The project is executed by three partners, namely: 1) SEAFDEC Project Management Unit (PMU); 2) Bureau of Fisheries and Aquatic Resources (BFAR) of the Philippines; and 3) Department of Fisheries and Surveillance (DFiS) of Viet Nam. To achieve the overarching goal of the Project to "create new sustainable seaweed value chains that will deliver ecosystem services and provide socio-economic benefits to communities, particularly to households whose livelihoods depend on marine ecosystems," the Project is structured into four Components, namely: 1) Regional capacity building for seaweed aquaculture; 2) Enabling environment for seaweed aquaculture in the Philippines and Viet Nam; 3) Seaweed value chains (product + processing + marketing); and 4) Knowledge management, monitoring and evaluation (M&E), and IW Learn (regional). The SEAFDEC PMU, in particular, is responsible for implementing Components 1 and 4; while the Philippines and Viet Nam are responsible for national-level project implementation and policy integration under Components 2 and 3.

In 2025, the SEAFDEC PMU established the foundational infrastructure for project implementation, including the full operationalization of the SEAFDEC PMU, led by the Project Manager/Technical Advisor. The SEAFDEC PMU successfully implemented the Annual Work Plan and Budget (AWPB) for Year 1 (1 July 2024–30 June 2025) and began implementing the AWPB for Year 2 (1 July 2025–30 June 2026). As for the national-level implementation, the Philippine BFAR signed the Grant Agreement in July 2025 and was in the process of establishing its National PMU and finalizing AWPB Year 1 (1 July 2025–30 June 2026). For Viet Nam, the country was progressing toward finalizing its Grant Agreement, which is expected to be completed in the first quarter of 2026.

To mark the official start of the four-year Project implementation, the SEAFDEC PMU, together with the Philippine BFAR and the DFiS of Viet Nam, convened the "Virtual Inception Workshop of the Blue Horizon: Ocean Relief through Seaweed Aquaculture Project" on 14 August 2025. The Workshop brought together 41 participants, including representatives from the SEAFDEC Member Countries, the SEAFDEC Secretariat, SEAFDEC/AQD, SEAFDEC PMU, and partner agencies.

The Virtual Inception Workshop of the Blue Horizon: Ocean Relief through Seaweed Aquaculture Project on 14 August 2025

For the activities under SEAFDEC responsibility, in **Component 1**, the SEAFDEC PMU achieved major milestones, notably the establishment of the Seaweed Technical Working Group (S-TWG) and strengthened coordination with AQD technical experts and the Global Seaweed Coalition. The "First Meeting of the Seaweed Technical Working Group (S-TWG)" was organized on 25–26 November 2025 in Bangkok, Thailand. These efforts laid the foundation for key outputs, including the development of a Regional Guide to Sustainable Seaweed Farming, accompanying Principles and Toolkits, and capacity-building activities.

The First Meeting of the Seaweed Technical Working Group (S-TWG) on 25–26 November 2025 in Bangkok, Thailand

For **Component 4**, the SEAFDEC PMU strengthened project governance and coordination by establishing the Project Steering Committee (PSC) and successfully convened the "First Project Steering Committee (PSC) Meeting" on 27–28 November 2025 in Bangkok, Thailand. The 1st PSC Meeting brought together high-level representatives from the Philippine BFAR, the DFiS of Viet Nam, and SEAFDEC serving as Project Steering Committee members, as well as observers from WWF-US. Progress was also made on the development of a monitoring and evaluation system. The project also initiated engagement with IW:LEARN to strengthen knowledge management and communication, ensuring that project results and lessons learned would be disseminated widely. In support of transparency and outreach, the project also developed a dedicated website, www.bluehorizonseaweed.org, to serve as a central platform for information sharing.

The First PSC Meeting on 27–28 November 2025 in Bangkok, Thailand

Gender mainstreaming was integrated across all project components and activities through the implementation of a Gender Action Plan, particularly in the design of activities, project governance structures, capacity-building initiatives, and knowledge products. This approach ensures that women and men, including youth, benefit equitably from project interventions. Gender-responsive approaches are being applied in stakeholder engagement, technical guidance development, monitoring and evaluation, and communication outputs, reinforcing the project's commitment to inclusive and socially

Maintaining Environmental Integrity through Responsible Aquaculture

Departmental Program No. 3

Status: *Ongoing (on track)*

The steady increase in aquaculture production has significantly contributed to more than 50 % of the total fish food volume globally. However, along with intensive production, there are growing concerns about its adverse environmental effects, particularly in areas that have long

been used for aquaculture activities. Conversely, there are varying needs to develop new aquaculture fields and explore new species using environmentally friendly approaches. The MEITRA program was designed for SEAFDEC's Aquaculture Department to explore and address these issues and establish green aquaculture technologies. SEAFDEC/AQD has been developing aquaculture technologies for various species of finfish, crustaceans, mollusks, seaweeds, sea cucumbers, and other emerging aquaculture species. These efforts aim to enhance production in the Philippines and other countries in Southeast Asia, while also leading the development and promotion of eco-friendly aquaculture strategies.

In 2025, activities under the Departmental Program "**Maintaining Environmental Integrity through Responsible Aquaculture**" or MEITRA explored concepts and technologies to enhance aquaculture productivity without increasing feed inputs, either through co-culture and polyculture or by promoting non-fed aquaculture species like sea cucumbers, oysters, and seaweeds. The program also involved detailed exploration and monitoring of environmental conditions affecting specific aquaculture species. This was done to define a more reliable suitability criterion and set of parameters for locating appropriate sites for conducting aquaculture activities, especially in the field. Potential new species for production were also tested, specifically for an alternative seaweed commodity and a potential new alternative microalgae as larval feed.

- *Assessment and development of an Intermediate Culture System for tropical aquaculture species*

The collaborative project between JIRCAS and SEAFDEC/AQD has continued this year since 2022. One of the studies under this project aims to develop and assess an appropriate Intermediate Culture System (ICS) for tropical aquaculture species such as sea cucumbers by improving seedling production and intermediate or nursery culture for the sandfish *Holothuria scabra*.

In previous years of this study, various field-based experiments were conducted to establish some best practices for sea-based pen intermediate culture of sandfish. Some of the most relevant results confirmed that larger sandfish juveniles at initial stoking is better (*e.g.* >5 g vs <3 g); lower density promoted better growth and survival (*e.g.* <15 individuals vs >30 in a 20 m^2 pen); dry season being better then wet season.

In 2025, when comparing two locations with varying weather exposures, nursery pen rearing of sandfish in sites protected against SW monsoon or habagat (Site B) is better than sites protected against NE monsoon or amihan (Site A). The results imply that environmental or site-specific factors may play a crucial role in optimizing rearing conditions. Further correlation with environmental data will be conducted once the data are completed.

In addition, field experiments tested the impacts of regular (every two weeks) pen cleaning, with implications for added labor costs relative to no cleaning (and therefore reduced or no labor costs). Results revealed that treatments without cleaning promoted even better growth and survival for sandfish. This suggested that no cleaning may be required for sandfish pen nursery culture, at least for the 5-month duration of the experiment.

*Study sites at Panobolon Island, Nueva Valencia, Guimaras: Sitio Punta (Site A) and Sitio Proper (Site B), which have varying environmental exposures (*e.g. *NE winds vs SW winds)*

In 2025, another sub-study under this project aimed to improve the reliability of producing sandfish early juveniles from the hatchery after the settlement stage by testing a novel benthic diatom species, *Cylindrotheca* sp., as a potential alternative to the more common *Navicula* sp. as feed. In the previous year, storage of pure starter stocks of *Cylindrotheca* sp. was stable, and portions of the stock could be scaled up to larger volumes predictably. With the live culture available, replicated experiments in indoor tanks were conducted to compare the growth performance of early juvenile sandfish fed with either *Cylindrotheca* sp. or *Navicula* sp. diatom species. Initial results showed that both groups of sandfish fed by *Cylindrotheca* sp. or *Navicula* sp. had very comparable survival, with no significant difference detected. Although *Navicula* sp. showed a tendency to promote better growth of sandfish pentactula, the results were not significantly different from those fed with *Cylindrotheca* sp. This indicated that the latter can be a viable alternative live food for newly settled sandfish juveniles.

- *Assessment of growth traits of* Hypnea *sp. as a potential tropical seaweed species for aquaculture*

Another collaborative project between JIRCAS and SEAFDEC/AQD focuses on the potential of *Hypnea* sp. as a candidate alternative carrageenophyte seaweed species for aquaculture in the Philippines. This study aims to characterize the growth traits and stress tolerances of *Hypnea*, verify its growth in a pilot marine farm, and assess the potential for carrageenan production.

The evaluation of the quantity and quality of extracted carrageenan began in 2024. It continued through the collection and maintenance of wild *Hypnea* and the production of seedlings for experiments. Conducting preliminary runs in sea-based culture was also continued. The tissue culture experiment was also started in 2025, based on standard protocols used for *Kappaphycus* spp., which include regular supplementation with nutrients and fertilizer. However, in the case of *Hypnea* sp., heavy epiphyte contamination was observed, hindering growth. Hence, the protocol will be modified to limit nitrogen concentration in the culture media.

The sea-based nursery and grow-out culture experiments continued. This year, *Hypnea* sp. was cultured at different depths, with initial results showing better growth at the surface. However, after six weeks, all samples were covered with epiphytes. Hence, the tissue-cultured thallus was used to test resistance to epiphytes.

Hypnea *sp. contaminated with epiphytes*

The study on *Hypnea* sp., which is likely a new species, shows promising suitability for cultivation. Although not examined in the present study, closely related species, including *H. stellulifera*, may also be potential candidates for future utilization. In the coastal waters around Panay Island, several *Hypnea*-related species are known to occur, highlighting the need for further taxonomic and cultivation studies.

Hypnea *sp. (a) and* Hypnea stellulifera *(b)*

- *Co-culture of milkfish and giant freshwater prawn in ponds*

Polyculture is a strategy that improves production by combining multiple species within the same rearing space. This also minimizes overall feed inputs and waste, as complementary species form synergistic interactions, optimizing resource utilization, and maintaining favorable environmental conditions.

In this study, milkfish (*Chanos chanos*) and giant freshwater prawn (*Macrobrachium rosenbergii*) were cultured together in brackishwater ponds. Initial experiments were conducted from August 2023 to February 2024. Results showed that milkfish exhibited higher growth rates and yield, with lower FCR in a co-culture compared to monoculture system. In contrast, giant freshwater prawn showed comparable production performance in both mono- and co-culture systems. These findings provide a basis for refining culture protocols, particularly stocking density optimization. The cost-effectiveness of the culture technology will also be determined at the end of each trial.

In 2025, grow-out experiments were conducted to determine the best stocking density for giant freshwater prawn co-cultured with milkfish. A total of 3,600 milkfish fingerlings and 27,600 freshwater prawn post-larvae were stocked following respective density treatments in a polyculture system. Milkfish were sampled fortnightly in the first two months of rearing, while growth rates of freshwater prawn were monitored monthly until the completion of the culture experiment.

After 120 day of culture (DOC), milkfish co-cultured with freshwater prawn at a 1:3 stocking ratio (milkfish:prawn) showed the highest mean body weight. In contrast, the lowest mean body weight was observed in 1:15. Similarly, freshwater prawn showed the highest mean body weight at a 1:3 stocking ratio, while the lowest growth was observed at a 1:15 ratio. The economic feasibility of the milkfish-freshwater prawn polyculture system will be assessed.

- *Establishing grow-out culture techniques of sea grapes* Caulerpa *in tanks*

In the Philippines, seven species of sea grapes *Caulerpa*, are consumed as food and for medical applications. The *Caulerpa lentillifera* is the most favored one due to its succulent texture, hypocholesterolemic and hypoglycemic effects, and its ability to lower cholesterol and the glycaemic index. *C. lentillifera* has a high protein content, which is comparable to that of soybeans. Although sea grapes are commercially important, production in the Philippines is currently limited to wild harvests and a few extensive farms in marine ponds, which can be highly seasonal and prone to collapse during adverse weather fluctuations. Thus, growing in tanks is considered a more stable production system.

The sourcing of sea grape stocks from the wild and culture farms started in 2023 and continued in 2024. Experiments using different culture vessels, such as flat trays versus box-type cages, were conducted. Growth and survival were compared with those of plants directly planted onto the sediments, as in wild or pond systems. Another experiment was conducted using different stocking densities (100 g, 200 g, and 300 g ton^{-1}) for 60 d.

In 2024, around 30 kilograms of *Caulerpa* sp. seedstocks were collected from the wild in Barangay Pandaroanan, Nueva Valencia, Guimaras. The collected seaweeds were transported to SEAFDEC/AQD. These were stocked in the Biotech Wetlab and Seaweeds Nursery, and acclimated with flow-through seawater (flow rate: 0.5 L min^{-1}) and moderate aeration for at least 30 days. After three runs of Experiment 1, the results showed that Treatment 1 achieved the highest average growth rate (2.5 % day^{-1}±0.16), while the lowest growth was observed in Treatment 3 (1.2 % day^{-1}±0.33). Based on the results obtained in Experiment 1, the Treatment using Amazon/chicken wire will be employed in Experiment 2 of the stocking density experiment.

To determine the ideal stocking density for *Caulerpa* tank culture, an initial run was conducted from January to March 2025. The second and the third runs were conducted from April to June 2025 and from June to August 2025, respectively. The experiment included three treatments: Control (100 g),

Treatment 2 (200 g), and Treatment 3 (300 g). The highest SGR was recorded in the Control group with 3.83 % day^{-1}. Based on the results after three runs, the highest growth rate was obtained by Control (2.46 % day^{-1}±0.18), while the lowest was observed in Treatment 2 (2.20 day^{-1}±0.13). The cost and return analysis is still ongoing.

Caulerpa *cuttings after 60 DOC in tanks, at an initial stocking density of 100 g (Control)*

Caulerpa *cuttings after 60 DOC, at an initial stocking density of 200 g (Treatment 2)*

Caulerpa *cuttings after 60 DOC, at an initial stocking density of 300 g (Treatment 3)*

- *Resource assessment and refinement of nursery and grow-out culture techniques for Spiny Lobster,* Panulirus ornatus *in a sea-based system*

Spiny lobsters provide livelihood opportunities to coastal communities in the Philippines. However, overfishing and inadequate fisheries management have led to declines in wild populations. The complex and protracted larval cycle of this species constrains hatchery production, necessitating reliance on wild-caught seeds and juveniles for aquaculture. Therefore, the development of sustainable management practices is critical for ensuring the viability of lobster aquaculture.

This ongoing study aims to identify the natural sources of spiny lobsters, characterize associated environmental conditions, and generate data for informed fisheries management. Additionally, the study seeks to establish a standard rearing baseline by determining optimum stocking densities and feeding practices, and to conduct economic analysis for both the nursery and grow-out stages.

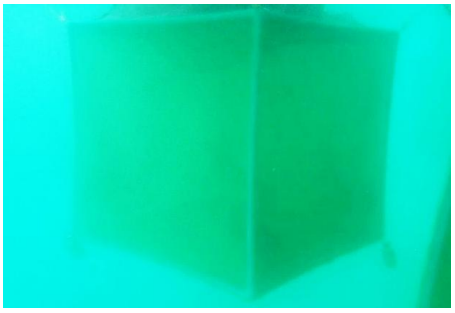
Environmental data, along with sediment and water samples, were collected and analyzed at three designated lobster collection sites in Sibunag, Guimaras. Site documentation was also conducted using a modified underwater photo-video capturing device. Site 1, as the deepest, features a homogenous sandy substrate; Site 2 is rocky and coralline with macroalgae and diverse flora; Site 3 has hard rock, coral reefs, and seagrass beds. Furthermore, monthly documentation of spiny lobster catch landing, particularly for *P. ornatus*, has been conducted at these sites. From January to September, *P. ornatus* catches were highest at Site 2 (248 lobsters) and Site 3 (214 lobsters), likely due to better shelter protection while Site 1 had the lowest (185 lobsters). Lobster caches were observed to be influenced by the Monsoon season, with the "habagat season" (southwest monsoon) identified as particularly favorable for lobster collection.

Experiments on nursery feeding and grow-out stocking densities are underway. Lobsters fed the combination diet (50 % fish and 50 % mussel) showed the best growth [carapace length (CL):17.02

mm, body weight (BW): 5.04 g] and the highest survival (54 %) after 60 DOC. For stocking density, lobsters at $10m^{-2}$ had the best growth (CL: 91.91 mm, BW: 646.69 g) and the highest survival (85 %). The total culture duration for spiny lobsters, specifically *P. ornatus,* is approximately six to eight months in the nursery, followed by 11 to 12 mos in the grow-out, totaling around 18 to 20 months.

The experiments on feeding ratios and frequencies are scheduled for 2026.

Set-up of spiny lobster cage facility at Igang Marine Station of SEAFDEC/AQD, Nueva Valencia, Guimaras, Philippines



Lobster cages used in the nursery (L); underwater photo of a lobster cage (R).

P. ornatus *lobster at different stocking densities collected in the grow-out during monthly sampling at 270 DOC*

- *Grow-out culture of SEAFDEC/AQD-produced hatchery-bred spat of oysters* Magallana bilineata *in floating bags at different densities and water depths*

Oyster farming is considered an essential source of livelihood in many coastal communities, both in developed and developing countries. Thus, the high demand has led to the overexploitation of natural stocks, eventually resulting in dwindling spat fall and unstable production.

Magallana bilineata is considered one of the most economically important species in the Philippines. Using oyster spat from AQD's hatchery, this study utilized floating bags to grow *M. bilineata* at different stocking densities and water depths.

This study aims to establish the optimum stocking density for AQD's hatchery-bred spat in grow-out culture. Specifically, it will determine the growth and survival rate of the spat reared in culture containers set up on the water surface and those laid on the substrate at different densities. Subsequently, the economic analysis will compare oyster production at different densities and depths.

This study started in 2024 with site selection in New Washington, Aklan. The rafts were constructed, and the experimental culture containers were transported to the study site, where they were suspended from the rafts to the desired depth. In October 2024, 5,000 oyster spat were transported from AQD to the site and stocked in Batan Bay, New Washington, for nursery rearing until they attained a minimum size of at least 2 cm SL for grow-out culture. Grow-out culture commenced in November 2024.

Initial results showed that oysters reared on the water surface had significantly higher growth rates both in length and weight than those reared on the bottom, except in May for length and in July for both length and weight. After nine months of culture, oysters reared on the water surface had a mean shell length (SL) and body weight (BW) of 59.99±0.36 mm SL and 30.04±0.42 g BW, respectively, while those on the bottom had 51.39±0.44 mm SL and 21.65±0.41 g BW. Since December 2024, one month from the commencement of culture, survival was higher in oysters reared on the water surface than those on the bottom. Data from August 2025 sampling showed that the survival of oysters reared on the water surface was higher (87.01 1.71 %) than that of those reared on the bottom (31.30±6.06 %).

Mean dissolved oxygen was higher in surface water than in the bottom, sulfide was the same in both, while phosphate, nitrite, nitrate, and total suspended solids were lower. Daily means±S.E. of temperature was significantly higher (T = 21.23; df = 1836; p = 0.000) in the surface (31.20±0.03°C) than in the bottom (30.44±0.01°C), while that of salinity was significantly higher (T = -2.85; df = 537; p = 0.005) in the bottom (22.23±0.04 ppt) than in the surface (21.02±0.04 ppt).

- *Development of appropriate grow-out culture systems and operational modalities for the sea cucumber* Holothuria scabra *(sandfish)*

In the Philippines, the farming of sandfish is still presently limited to research-based project sites. Some are operated on a small-scale, community-based approach in pilot farms of not more than a couple of hectares. The production from these “demonstration” sites is still limited in terms of volume because of the relatively small spaces and unoptimized operations.

To achieve significant impacts in promoting sandfish aquaculture, research efforts must now focus on determining the optimal modalities or strategies for sandfish grow-out farming. Therefore, this study will identify farming sites and operate sandfish farming in collaboration with local partners. The prospective locations were initially identified during the successful “Regional Sea Cucumber Roadshow” held at SEAFDEC/AQD in June 2024, including islands in Guimaras and Bantayan.

For this year, the main focus location is at Panobolon Island, Nueva Valencia, Guimaras. Two sandfish grow-out farming systems are to be tested in Panobolon Island – sea pens and pond-based pens. There are six pilot sea pens constructed and one pilot pond culture site. The sea pens, constructed in July, follow a design that incorporates a smaller nursery pen within a wider grow-out pen. These were constructed and managed by local fishers as the farming partners. The initial activity commenced in July, with the stocking of sandfish juveniles (ABW of 8 g) in each pen. After the initial 30 d, juveniles grew to sizes ranging from 15 to 50 g, and a recovery rate of 40 %.

Sandfish juveniles at initial stocking (L) and after 30 d (R)

- *Refinements on Nile tilapia (*Oreochromis niloticus*) - giant freshwater prawn* Machrobrachium rosenbergii *polyculture in tank-based biofloc system*

Biofloc technology is dubbed the new "blue revolution" due to its recycling and reuse mechanism, which is based on naturally occurring processes within the system. In this scheme, flocs that are formed by clusters of microbes and organic matter serve as additional feed for the cultured organisms.

While the results of several studies are promising, a consensus on the optimal stocking density, carbon-to-nitrogen ratio, and effective carbon source for the polyculture of tilapia and freshwater prawn in biofloc systems remains elusive. Neither verified information on the effect of these factors on the growth response and survival of these species up to marketable size, nor knowledge of the economic viability of the refined-biofloc system, is available.

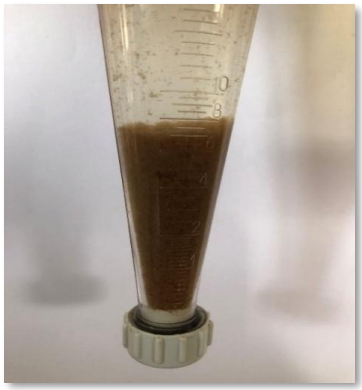
This new study aims to refine the existing technology for Nile tilapia – giant freshwater prawn polyculture in a biofloc system. Specifically, (1) to determine the optimum stocking density for Nile tilapia and giant freshwater in polyculture under tank-based biofloc system in terms of growth and survival, (2) to compare the effects of different C: N ratios on Nile tilapia – giant freshwater prawn in polyculture under tank-based biofloc system in terms of growth and survival parameters, (3) to compare the effects of different combinations of carbon sources in the growth and survival of Nile tilapia – giant freshwater prawn in polyculture under tank-based biofloc system, and (4) to conduct costs and return analysis for Nile tilapia-giant freshwater prawn polyculture in refined-biofloc system.

In 2025, procurement of necessary materials will already have started. Seven units of 1,200-L-capacity fiberglass tanks and two units of 1-hp-capacity Roots blower have been delivered. Once the required number of fiberglass tanks has been completed, installation of the new aeration lines will commence. A total of 1,500 tilapia fry and 1,000 freshwater prawn PLs are currently being nursed to reach the desired stocking sizes for polyculture.

The approved treatments will focus on determining the optimum stocking density for tilapia and freshwater prawn; however, since most farmers practice indoor biofloc for tilapia, they use a stocking density of more than 75 individuals per liter. In contrast, the approved study will only attempt to evaluate stocking densities of 50 and 75 ind. L^{-1} for tilapia. Hence, the stocking densities for this experiment were increased to 75 and 100 ind. L^{-1}.

The biofloc grow-out experiment is ongoing.

Experimental biofloc setup in fiberglass tanks at Tigbauan Main Station, SEAFDEC/AQD, Tigbauan, Iloilo, Philippines



Settleable solids from one of the treatments

Water and Sediment Quality Monitoring Network

Departmental Program No. 10

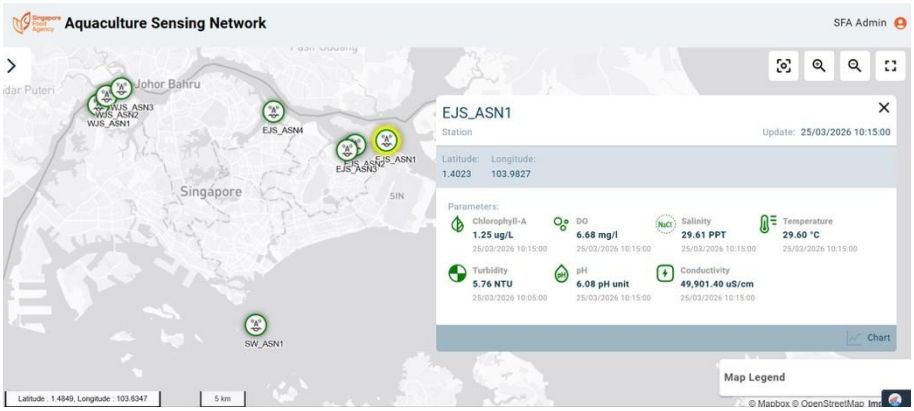
Status: *Ongoing (on track)*

Global concern over climate change and other environmental challenges affecting seafood production and safety continues to grow. The Marine Aquaculture Center under the Agrifood Technology Division of Singapore Food Agency (SFA) is the Collaborating Center to implement MFRD programs. In 2025, MFRD refined its mandate and expanded the Plan of Operations and Program of Work to encompass food security and safety through sustainable production technologies. The SEAFDEC/MFRD Programs were further strengthened to cover research and development, as well as the promotion and dissemination of innovative technologies to support and enhance sustainable and safe seafood production in the region. Key focus areas include, among others, the monitoring and surveillance of the coastal marine environment to safeguard seafood production and mitigate the impacts of climate change on production systems.

In this context, departmental activities are being implemented by SEAFDEC/MFRD under **"Water and Sediment Quality Monitoring Network."** The objective is to monitor water and sediment quality as part of SFA's Aquaculture Sensing Network (ASN) to safeguard aquaculture production by tracking environmental conditions in Singapore's coastal farming areas, thereby ensuring sustainable and safe seafood production.

Singapore has a small but dynamic aquaculture industry, which, like many countries in the region, relies on sea-based farming. Most of these farms utilize open net-cage systems and are therefore highly vulnerable to adverse environmental conditions such as low dissolved oxygen, harmful algal blooms (HABs), and pollution incidents. These events can result in significant losses, fish mortality or contamination, thereby affecting both food safety and production.

To address these challenges, continuous monitoring of the aquatic environment is essential. The **Aquaculture Sensing Network (ASN),** established by the SFA, is a comprehensive monitoring system designed to track water quality in Singapore's aquaculture areas. The ASN comprises real-time monitoring stations, scheduled field sampling, and an integrated information management system. Its purpose is to safeguard farm production by detecting changes in water quality across Singapore's farming zones. The system enables monitoring of environmental threats, such as low-dissolved-oxygen events and HABs, while also supporting sustainable farm operations through nutrient and sediment monitoring. Near-real-time water quality data and alerts on potential risks are shared with relevant agencies and industry stakeholders, enabling timely responses to protect aquaculture production and address food safety concerns.

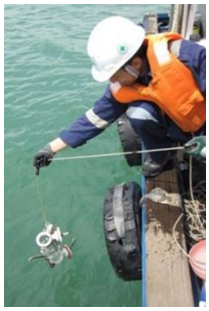


The Integrated information management system

The ASN was successfully established and became fully operational in September 2024, with eight online monitoring stations deployed across Singapore's aquaculture farming areas. These stations

provide real-time monitoring of key physical water parameters. In addition, designated water and sediment sampling sites have been identified, with routine sampling conducted to enhance understanding of environmental conditions.


Online monitoring stations

Water and sediment sampling

In 2025, the Program moved forward to data collection, analysis, and refinement of operational systems. The data generated are being utilized to support decision-making by both the aquaculture industry and relevant government agencies. Overall, the monitoring program contributed significantly to ensuring sustainable and safe seafood production while minimizing the impacts of climate change on seafood safety and production systems. The experience gained from this Program is expected to be shared with other SEAFDEC Member Countries.

2.2 Improvement of broodstock and seed production technologies

Quality Seed for Sustainable Aquaculture

Departmental Program No. 1

Status: *Ongoing (on track)*

A sustainable supply of high-quality seedstock is the key to a successful aquaculture enterprise. The rearing of quality seedstock to commercial sizes requires efficient husbandry techniques and suitable farm conditions to achieve higher yields. With the intensification of aquaculture systems in several Southeast Asian countries and the environmental challenges, such as those resulting from climate change, the development and/or production of high-quality broodstock and the adoption of innovative, optimal culture management methods are equally important in ensuring the steady production of hatchery seeds and, later, marketable aquaculture products.

In 2025, SEAFDEC/AQD continued to implement its Departmental Program "**Quality Seed for Sustainable Aquaculture,**" which focuses on studies and activities that determine optimal conditions and cost-effective science-based methods for producing high-quality seedstock. Specifically, the studies centered on the following themes: a) enhancement of the breeding performance, development of potential broodstock and adoption of efficient broodstock management schemes; (b) nutritional interventions, *e.g*. formulation of broodstock diets and larval nutrition schemes; and (c) other non-genetic/environmental interventions or approaches that are being adopted. The approved QSSA studies were on the verification of the breeding and seed production technologies of priority commodity species such as shrimps, giant freshwater prawn, tilapia, oyster, abalone, sandfish, mangrove crab, seaweeds, and natural food with the end view of packaging these technologies for transfer to the target beneficiaries, the fish farmers.

Suitable hatchery and nursery protocols that have been developed are further refined depending on the level of technology for each species. These technologies are verified and packaged into the most viable or cost-effective seed production method. Once ready for dissemination, industry stakeholders, primarily fish farmers, shall be informed of advances in hatchery and nursery production methods through training, publication of aquaculture extension manuals, and other information materials.

- ***Broodstock management and development of breeding protocol***

Information obtained on the reproductive biology of the Bali sardine may be used for management and breeding of this species under captive conditions.

- *Biological study and transport trials of Bali sardinella (*Sardinella lemuru*)*

This study aims to support the sustainability of sardine fisheries (*Sardinella lemuru*) in the country by examining the reproductive biology to provide information on how to breed and culture this fish species in captivity.

The reproductive biology of *S. lemuru* was assessed by collecting specimens from the Visayan Sea between August 2024 and July 2025. The gonads of the specimens were dissected to provide estimates of gonadosomatic index (GSI) and histologically examined to determine the gonad developmental stages.

Except in February, a total of 3,000 fish samples were collected monthly from January to November 2025 from the Visayan Sea. About 9 % (270 samples) were categorized by sexual orientation. GSI peaked in January for both males and females, with average values of 3.7 and 3.1, respectively, relative to the other months sampled.

Collection of S. lemuru *samples using otoshi-ami in Barbaza, Antique, Philippines (L), and ring nets (sinsuro and likupan) in Concepcion, Iloilo, Philippines (R)*

Construction of the tamban hatchery is now complete and operational. Experiments on broodstock management for *S. lemuru* are underway to enable captive spawning.

- ***Refinement of hatchery and nursery protocols.***

To increase the production of larval and juvenile stages of important aquaculture species, strategies that (a) enhance laboratory-scale production of microalgae (*e.g.* live and algal paste) and alternative food organisms (*e.g.* euryhaline rotifers (*Brachionus rotundiformis*) as initial diets, and (b) improve rearing conditions that allow the aquatic organisms to adapt and survive well during development are evaluated.

- *Evaluation of various chemical inducers in enhancing settlement and metamorphosis of oyster larvae (*Magallana bilineata*)*

Settlement and metamorphosis are critical transitions in oyster life cycles, and failure to optimize these stages can lead to production losses. While several chemical inducers have been shown to enhance settlement and metamorphosis in oyster species, only epinephrine (EPI) and L-3,4-dihydroxyphenylalanine (L-DOPA) have been tested on *Magallana bilineata*. This new study aims to evaluate the effectiveness of various chemical inducers (γ-aminobutyric acid (GABA), L-DOPA, ammonium chloride (NH_4Cl), and potassium chloride (KCl)) in enhancing settlement and metamorphosis rates in oyster larvae and the economic feasibility of using the two most effective chemical inducers in the hatchery production of single-spat oysters.

Eyed veligers were exposed to different concentrations of GABA and L-DOPA (10^{-4} M, 10^{-5} M, and 10^{-6} M), ammonium chloride (2.5, 5, and 7.9 mM), and potassium chloride (9, 14, and 19 mM), and their settlement behavior was examined at 24 h intervals for 96 h.

Eyed veligers subjected to no feeding and aeration, and exposed to 10^{-5} M L-DOPA, resulted in a 6.8 % settlement rate after 96 h; however, no metamorphosis was observed. In comparison, those subjected to different concentrations of GABA, NH_4CL, and KCl failed to settle after 24 h or 48 h. In another trial with aeration, all chemical inducers, regardless of concentration, promoted the settlement of eyed veligers. Metamorphosis, as indicated by secondary shell growth, was noted only in treatments exposed to 10^{-5} M L-DOPA and 10^{-6} M GABA at a very low rate of 0.25 %.

Further trials at a higher water volume (5 L), providing both food and aeration, and later in 100-L capacity tanks using the two most effective chemical inducers, will be conducted.

- *Optimization of mangrove crab* **(**Scylla serrata**)** *larval rearing protocols in a biofloc system*

Studies examining the beneficial use of biofloc technology (BFT) in mangrove crab hatchery production are still limited, with earlier studies on *Scylla paramamosain* and *S. olivacea* focusing on the effects of sedimentable solids in the floc system. In this study, the effects of different biofloc sedimentable solids (SS) and the combined biofloc SS and photoperiod on the growth, survival, and stress resistance of *S. serrata* larvae were investigated.

Two trials were carried out to examine the effect of four biofloc sedimentable solids (0 mL/L (clearwater serving as the control), 2 mL/L, 4 mL/L, and 6 mL/L) on the survival and growth of Zoea 1 to 5 stage crab larvae. In the first trial, the highest larval survival of 13.5 % was observed at 2 mL/L, followed by 4 mL/L at 2.91 %, and 6 mL/L at 0.05 %. In the second trial, survival rates were highest at 4 mL/L (5.9 %), followed by 2 mL/L (1.1 %) and 6 mL/L (0.96 %). Progression to the megalopa stage was observed in the 4 mL/L and 2 mL/L groups only. In both trials, 100% mortality in the control group recorded as early as day three or before harvest was associated with the presence of luminous bacteria in the tank rearing water.

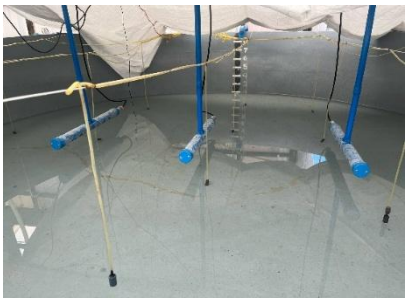
Another run to validate these preliminary results will be conducted in the latter part of the year.

Outdoor mature biofloc tanks stocked with saline tilapia (L); mangrove crab larval rearing set-up (R)

- *Enhanced production of mangrove crab (*Scylla serrata*) via improved feeding strategies, water management, and thermal manipulation*

Production of hatchery-bred crab seedstock remains a crucial solution to the industry's seed supply challenges. Despite reaching commercial scale, mangrove crab seed production still experiences inconsistent, low survival rates from zoea to crab instar due to fluctuations in temperature and insufficient live food supply. To address these issues, this new study aims to improve hatchery rearing protocols by maintaining optimal water temperature and feeding rotifer-fed algal paste to achieve a survival rate of at least 1.5 % and, consequently, produce 600,000 crab instars to support in-house research studies and interested nursery and grow-out farmers.

A preliminary larval rearing trial in 10-ton-capacity tanks showed that providing heaters was not beneficial, with a lower survival rate of 0.55 % compared to 0.66 % without heaters. A confirmatory trial is ongoing to further evaluate the beneficial use of heaters. After nine months, about 188,405 crab instars and 600 megalopa were produced in the hatchery, valued at USD 20,173.50.

Mangrove crab larval rearing set-up with the inclusion of water heaters

Future plans include further refinement of hatchery rearing protocols and improvement of survival from the present 1.3 % to 1.5 %, and consistency in the mass production of hatchery-produced crablets.

- *Integrating tilapia greenwater recirculating water systems in mangrove crab (*Scylla serrata*) hatchery operation*

This continuing study aims to improve *S. serrata* larval rearing techniques by integrating tilapia green water technology using *Nanochlorum* sp. in a recirculating aquaculture system (RAS). The feasibility of this integrated system is currently being evaluated against the traditional batch culture system, focusing on the growth and survival of crab larvae at various developmental stages.

Three hatchery rearing trials, each lasted for 15 d, were carried out this year to test the performance of crab larvae in these six treatments (Treatment 1: RAS + Tilapia greenwater (TGW-R), Treatment 2: RAS + Clear water (CW-R), Treatment 3: RAS + Green microalgae Nan (N-R), Treatment 4: Batch method (B) + TGW (TGW-B), Treatment 5: B + CW, and Treatment 6: B + N (control).

Recirculating set-up using microalgae and tilapia green water

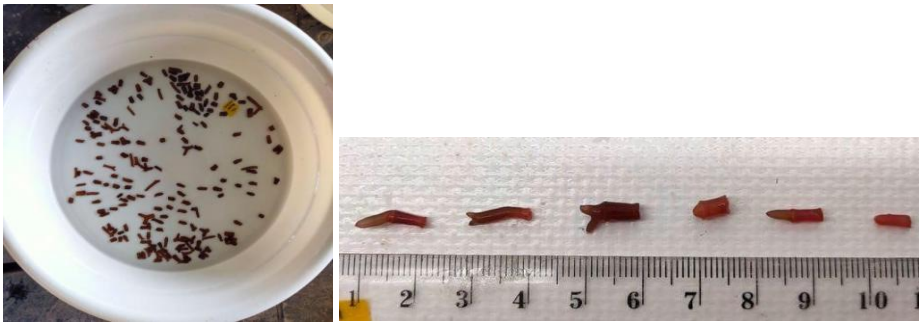
Regardless of the water management scheme, the survival rate of crab larvae was higher in the Batch method (1.24-5.14 %) than in RAS (0.70-2.93 %). Irrespective of the culture system, larval stage index, as an indicator of growth, was higher in Nan (4.76-4.82) and TGW (4.56-4.66). Notably, the lowest luminous bacterial count was detected in the TGW treatment in both culture systems.

Plans include modifying the current tilapia greenwater RAS, such as preconditioning with microalgae or adding probiotics, and conducting additional growth trials, including on the inhibitory effects of monospecific *Nanochlorum* sp. greenwater with tilapia on pathogenic *Vibrio* spp. affecting crab larvae.

- *Production of farmed eucheumatoids by micropropagation in the land-based nursery*

This continuing production study aims to increase the production of seaweed propagules from 7,200 to 14,000 per month by improving the survival, and through expansion of a seaweed land-based nursery, produce micropropagules to support the needs of the sea-based seaweed nursery of SEAFDEC/AQD, estimate the profitability of micropropagule production, and publish a brochure on laboratory-based seaweed micropropagule production. The study projected an estimate of 168,000 seaweed propagules with a 75 % survival rate at the end of the year.

Monthly production of seaweed propagules increased from 7,200 to 10,800 pieces. From January to December 2025, a total harvest of 103,694 *Kappaphycus alvarezii* propagules were achieved with a mean survival rate of 79.79 %.



Seaweed propagules produced through micropagation in the land-based nursery

Updating of the cost-and-returns analysis of laboratory-based production of micropropagules and preparation of brochure and manual are in progress.

- *Sea-based nursery cage production of farmed eucheumatoids*

This study attempts to increase the production of tissue-cultured seaweed plantlets by 100 % or 40,000 pieces per year, while achieving a 30-50 % survival rate, to reduce the cost of production. Part of the activities is to implement biosecurity measures to improve the survival of seaweed plantlets reared in a sea-based nursery. The growth and quality of tissue-cultured seaweed is likewise being compared with farmed-sourced seaweed explants.

As of December 2025, a total of 34,578 seaweed plantlets were produced from the sea-based nursery, with an average survival of 42.3 %. Aside from supporting AQD in-house studies, tissue-cultured plantlets were also distributed in Cebu and Iloilo for on-farm trials.

Sea-based nursery seaweed plantlets during the 1st (L), 2nd (Mid), and 3rd (R) month of culture

- *Integrated hatchery and nursery production of sandfish (*Holothuria scabra*)*

In this study, the sandfish hatchery and nursery production are integrated to harmonize rearing schedules and optimize the production of sandfish spats and juveniles for grow-out trials. Specifically, this continuing verification study aims to conduct at least 12 spawning batches per year, producing >25,000 spats per batch or >300,000 sandfish spats per year, with an average survival rate of >1 %, and producing >120,000 sandfish fingerlings per year with >40 % survival.

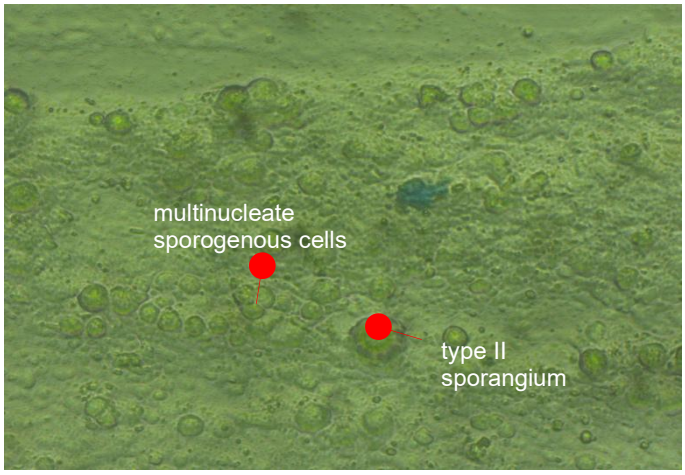
In 2025, the hatchery produced 542,694 spats, with an average survival of 2.47 %. These juveniles are currently being utilized for in-house AQD studies.

30 to 45 days sandfish spats (5-10 mm, 0.01 g)

- *Isolation, preservation, and growth kinetics of selected thraustochytrids from natural mangrove areas in Panay Island*

This study aims to re-establish the thraustochytrid collection of AQD by isolating and characterizing local thraustochytrid strains from natural mangrove areas in Panay Island, optimizing storage and preservation techniques, and developing a low-cost laboratory production setup.

A total of six sampling points were identified within the Katunggan It Ibajay Mangrove Eco-park (KII), with a range of salinity (5.7 to 32 ppt) and temperature values (26.8 to 30.6 °C). Based on salinity profile, three locations with salinity of 32, 28.5, and 5.7 were selected. At each sampling point, ten naturally detached, senescent leaf samples were collected from each mangrove species present. About six leaves were randomly selected for microbial isolation, and from each leaf, blade segments (1-2 cm^2) from the apex, central portion, and base near the petiole were excised and plated directly onto YPG agar media to promote thraustochytrid growth. Further purification and identification of isolates are ongoing.



Thraustochytrid vegetative cells under 40x magnification

- *Application of advanced photosynthetic metrics to optimize microalgae monitoring and harvesting for enhanced* Epinephelus fuscoguttatus *larval growth and survival*

This continuing study centered on integrating advanced photosynthetic metrics into practical aquaculture operations, enhancing microalgae culture, and rearing of marine fish larvae. The photosynthetic efficiency and nutritional profiles of *Nannochlorum* sp., *Isochrysis gabana*, and *Tetraselmis tetrahele* were examined by culturing them until their population reached the stationary phase to understand their respective growth kinetics. Results showed that *Nanochlorum* sp. exhibited virtually no lag phase (0 d), enabling immediate exponential growth. In contrast, *I. galbana* and *T. tetrathele* had lag phases of 1.29 and 2.79 d, respectively. *Nanochlorum* sp. has a higher carrying capacity (14.52×10^6 cells mL^{-1}) than *I. galbana* (11.71×10^6 cells mL^{-1}) and *T. tetrathele* (28.25×10^5 cells mL^{-1}). These near-maximum carrying capacities or cell densities were achieved at 15.47, 11.92, and 9.81 d, respectively, for *Nanochlorum* sp., *I. galbana,* and *T. tetrahele,* which were longer than the established 3 to 4 d harvesting protocol in the laboratory. In addition, *I. galbana* exhibited the

highest maximum growth rate (11.65×10^5 cells day^{-1}), followed by *Nanochlorum* sp. (31.81×10^4 cells day^{-1}) and then by *T. tetrathele* (28.28×10^4 cells day^{-1}).

Further, the utilization of Pulse Amplitude Modulated (PAM) fluorometry as a predictive tool, along with the comprehensive growth kinetics dataset for all microalgal species at various volumes and other predictive modeling, will be assessed to determine the optimal harvest time. Lastly, the growth and survival rates of *E. fuscoguttatus* larvae fed *Nannochlorum* sp. collected at optimal harvest time will be compared with those harvested based on standard feeding regimes of AQD.

Algal culture set-up at the Phycology Laboratory of SEAFDEC Aquaculture Department

- *Bioprospecting new microalgal strains as potential aquaculture feed and their cultivation using sugar mill wastewater*

This collaborative study with the Japan International Research Center for Agricultural Sciences (JIRCAS) aims to isolate potential microalgal species in the Philippines that can be cultured at high cell densities across different salinities, utilizing resources like molasses and sugar mill wastewater. It also attempts to develop basic technologies for their culture and preservation.

Several candidate strains of microalgae were isolated from water samples collected at 45 sampling points across the three river systems in Iloilo and purified in the laboratory. Protocols for the identification of isolated microalgae are already being prepared. In addition, the culture of *Nanochlorum* sp. in plastic bags has been initiated to serve as a control for isolated microalgae during the trials.

Indoor (L) and outdoor (R) culture of Nannochlorum *sp. in plastic bags*

- *Optimization of the culture condition of* Nannochloropsis oculata *and harvest settings using the Evodos dynamic settler for paste production*

This continuing study aims to establish culture protocols for *Nannochloropsis oculata* and the production and storage of *N. oculata* algal paste using the optimized harvest settings of Evodus dynamic settler to help provide marine fish hatcheries with a stable and increased supply of live food organisms. The optimum conditions for indoor culture of *N. oculata* have already been established with higher cell densities at 30-35 ppt, pH 8, and light intensity of 1,583-1,820 lux. The use of Conway medium also promoted the mass production of *N. oculata* in outdoor culture conditions. In terms of the harvest settings of the Evodus dynamic settler, a pump speed of 600-750 L/h, rotor speed of 3,500-4,200 rpm, and solid compression time of 30 s produced the highest biomass of algal paste. Experiments on the shelf life of algal pastes under different temperature conditions are on-going.

- *Verification of a simplified high-density culture system of rotifer* Brachionus rotundiformis *with an automated monitoring system*

This continuing study aims to verify a simplified automated system for a consistent high-density culture of rotifers fed algal paste to improve production from 90 to 500–3,000 individuals mL^{-1}. Small-scale *B. rotundiformis* cultures are initially reared in 2 L at 200 individuals mL^{-1} using different densities of live *Nanochlorum* sp.. Based on the optimum initial algal density, large-scale production of rotifers (250 L, 500 L, and 1 ton) will be conducted. Information from this study may be useful for the operation and management of legislated hatcheries in the Philippines, where the culture of natural food organisms is important.

Rotifers (*Brachionus plicatilis)* were cultured for one month using commercially available algal pastes (*Tetraselmis* 3600 Reed, rotifer diet, which is a mixture of *Tetra* and *Nanno*, *Nannochloropsis* Zinaya) and SEAFDEC algal paste products (Primo Alga® *Tetraselmis* and *Nanochlorum* sp.). Maintaining a high-density culture of rotifers in tanks with algal paste is feasible for 30 d. While the rotifer diet promoted a higher density production of rotifers, the procurement of this commercial algal paste is difficult. Trials showed that SEAFDEC algal paste products are a potential substitute for commercial algal pastes for rotifer production. An economic analysis is being prepared to determine the production cost.

- **Increase awareness of available genetically selected/improved stocks and optimize their use for improved on-farm aquaculture production.**

This is done through the mass production of high-quality seedstocks using improved strains (i-ExCEL and i-BEST) of Nile tilapia developed by the Department of Agriculture-Bureau of Fisheries and Aquatic Resources (DA-BFAR). These seedstocks can be promoted in brackish and marine water culture conditions.

- **Promotion of *technically* and economically viable breeding and seed production schemes.**

It is not enough to disseminate information on innovative and technically feasible breeding and seedstock production methods. One must ensure that such methods are cost-effective and can generate increased profits for hatchery/nursery farm operators. The objectives for this activity can be achieved if these science-based technologies are verified on-farm and their economic viability is demonstrated in the process.

- *Mass Production of hatchery-reared single spat oyster (*Magallana bilineata*)*

This study aims to mass-produce single-spats oysters (*M. bilineata*) to achieve at least 1.5 million with an average survival rate of at least 0.7 % and conduct an economic evaluation of the hatchery production system.

Out of the 15 spawning trials conducted between February and September 2025, only three production runs had larvae that reached the settlement stage, producing 244,295 spats with a survival rate of 0.21 %. This low production was attributed to the inconsistent quality of wild-sourced broodstock.

Future plans include intensifying broodstock conditioning protocols to enhance the reproductive output of oysters.

- *Mass production of donkey's ear abalone (*Haliotis asinina*) seedstocks and demonstration of a modular raft-suspended grow-out culture system*

This study aims to produce approximately 25,000 early juvenile abalones per cropping cycle, with an average survival rate of at least 1 %. It also seeks to demonstrate the feasibility of a modular grow-out culture system for producing marketable-sized abalones using raft-suspended cages and to conduct an economic analysis of hatchery operations and of an integrated hatchery-to-grow-out culture system.
Low veliger yield from old broodstock yielded only 30,308 early juveniles from five nursery runs with a survival rate of 1.76 %. The grow-out culture of juveniles in raft-suspended cages is continuing. Future

plans include verifying potential abalone sources in Sibunag, Guimaras; tagging a new set of wild-sourced abalones from Samar, currently being conditioned as broodstock; and continuing to stock batches of abalone juveniles for modular culture at the Igang Marine Station (IMS) of AQD.

- *Mass production of giant freshwater prawn (*Macrobrachium rosenbergii*)*

This study will continue producing hatchery seeds of giant freshwater prawn postlarvae (PL) for in-house research and training needs, as well as for interested prawn farmers. It will also demonstrate the refined hatchery protocols to increase larval production and produce a manual on the hatchery production of giant freshwater prawn. The study is expected to meet the annual target production of 300,000 PLs.

As of September 2025, 358,708 PLs were produced, which was already 120 % of the 2025 target PL production. Survival rate of larvae to the PL stage also increased from 29.54 % in 2024 to 38.87 %.

- *Mass production of all-male and mixed sex tilapia fingerlings and promotion of saline-tolerant tilapia*

This study aims to maintain improved strains of Nile tilapia and develop new broodstock lines of SST; produce mixed-sex and all-male tilapia fingerlings in brackishwater and/or seawater culture areas by AQD researchers and/or local fish farmers in Panay island; produce 100,000 to 120,000 pcs of tilapia fingerlings monthly; update the costs-and-returns analysis for tilapia hatchery production; and as case may require, refine the existing tilapia production in SEAFDEC/AQD.

With a total of 1,375 broodstock being maintained in the hatchery, a total of 881,154 tilapia fingerlings were produced, consisting of 55.65 % i-BEST, 33.4 % i-Excel, 9.48 % SST, and 1.11 % red tilapia, which generated a value of USD 3,367.87.

The study will continue the production of saline-tolerant tilapia and other improved strains (*e.g.* FaST of CLSU and UPV-SPIN).

2.3 Ensuring food safety through sustainable aquaculture methods

Healthy and Wholesome Aquaculture

Departmental Program No. 2

Status: *Ongoing (on track)*

Healthy and wholesome aquaculture is an integral component in meeting the protein needs of an increasing human population by improving and sustaining aquaculture production. Research and development efforts in aquaculture have resulted in the sector's phenomenal growth over the last five decades. However, additional challenges need to be studied and solved to attain significant improvements and ensure sustainability for future generations. This is crucial in the face of many challenges posed by ecological, economic, and climatic changes, among others, occurring in our world today.

This "**Healthy and Wholesome Aquaculture**" program takes a comprehensive approach, with two main components: 1) fish health, and 2) nutrition and feed. The strategies will focus on nutrition to promote healthy farmed aquatic animals, disease diagnosis, control, monitoring, and surveillance, environmental integrity, certification, and food safety. The optimization and sustainability of aquaculture production shall be based on Best Management Practices and Good Aquaculture Practices (BMP and GAqP) to ensure minimal environmental impact.

- ***Fish Health Component***

Fish health component aims to improve aquaculture production through innovations in fish health management and to maintain the environmental integrity of aquaculture systems.

- *Exploiting predatory bacteria: Development of efficient administration technology of marine predatory bacteria as antimicrobial therapy for shrimp vibrio disease management*

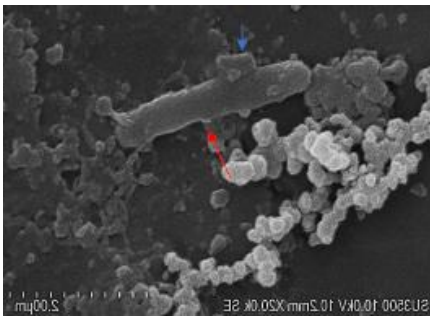
This continuing study focuses on predatory bacteria, particularly *Bdellovibrio* and like organisms (BALOs), which act as "amphibiotics" by directly killing gram-negative pathogens such as *Vibrio* in aquaculture, offering a potential alternative to traditional antibiotics. While effective at controlling pathogens, current liquid formulations face challenges with storage stability and the risk of introducing pathogens, underscoring the need for improved administration methods.

Therefore, this study aims to develop an efficient encapsulation technology for administering BALOs that is easy to use in shrimp aquaculture farms and to investigate the effects of these marine predatory bacteria on mixed populations of pathogens. This study will also compare the efficiency of *Bacillus* sp. probiotics and isolated predatory bacteria in eradicating pathogenic *Vibrio* spp. This approach will help determine which biocontrol agent can quickly and efficiently kill different *Vibrio* spp. and other pathogens in shrimp aquaculture.

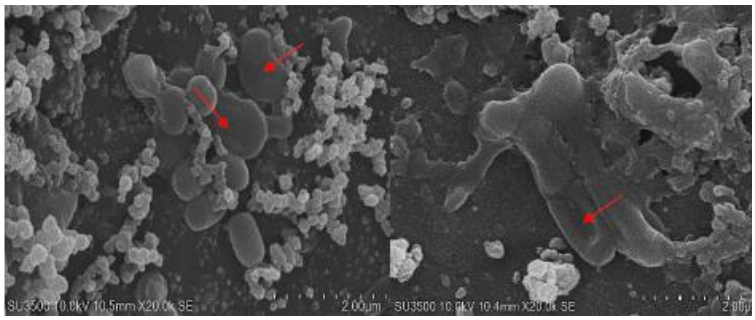
Isolates were successfully isolated from pond sediments at the Dumangas Brackishwater Station. The identification was confirmed by Polymerase Chain Reaction (PCR) and gene sequencing analysis using primers specific for the BALOs genus, which showed that the B4 isolate was 99 % similar to *Halobacteriovorax vibrionivorans*.

In 2025, *in vitro* bacteriolytic test was conducted through liquid preparation of *H. vibrionivorans* and probiotic *Bacillus badius*. The results showed a decrease in *Vibrio parahaemolyticus* (VP) after 24 h, with BALOs achieving total inhibition within five to seven days, while *B. badius* only partially reduced the pathogen. Meanwhile, no significant difference in shrimp survival relative to the control was observed in the pathogenicity test for either BALOs or *B. badius*. Neither is pathogenic to the shrimp. Another highlight of this study was the microencapsulation of *H. vibrionivorans* (B4), which efficiently reduced the quantity (CFU/mL) of non-hemolytic *Vibrios* in shrimp over seven days, demonstrating potential for faster pathogen eradication. Laboratory trials achieved total inhibition of *V. xuii* on the third day and *V. mediterranei* after the seventh day.

This study involved three dosages of encapsulated BALOs (800 mg, 1,000 mg, and 1,500 mg kg^{-1} feeds) at varying frequencies (daily, every three days, and weekly) for a 45-day experiment. Following these trials, a challenge test 30-day after feeding and a 120-day microcosm experiment were scheduled to determine the optimal administration strategy, with the study continuing until mid-2026.



The attachment of H. vibrionivorans *(blue arrow) on its host cell (*V. parahemolyticus*) viewed under 20,000x magnification in SEM*



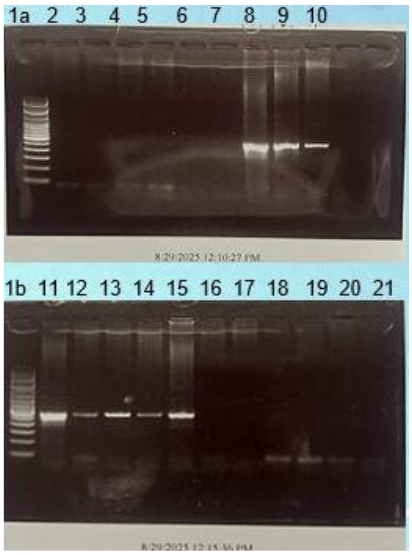
The formation of bdelloplast (red arrow) within the host cell, V. parahaemolyticus *viewed under 20,000x magnification in SEM*

- *Control, management and determination of spore activation and infectivity of* Enterocytozoon hepatopenaei *(EHP) in shrimps*

Hepatopancreatic microsporidiosis (HPM), caused by the parasite *Enterocytozoon hepatopenaei* (EHP), is a major issue in shrimp farming. While it does not cause mortality, it infects digestive cells and disrupts nutrient absorption, leading to severe growth retardation. Originally linked to white feces syndrome (WFS) in 2007 in Thailand, it has since become a global threat to production. Due to the lack of a known cure for EHP, this study focuses on identifying the etiological factors that trigger spore activation and infectivity in shrimp. By understanding these triggers and identifying germination inhibitors, the study aims to develop effective management strategies for preventing EHP infiltration and infection.

This study commenced in July 2025. Shrimp from different farm sources were submitted to the Fish Health Section (FHS) Laboratory, SEAFDEC/AQD, for EHP PCR Analysis. Shrimp DNA samples that were positive for EHP were utilized for the long method PCR analysis using Primers SWP1 and SWP2 to determine which sample (s) will be used for the quantification of EHP using qPCR analysis. The first step, which is positive at 514 bp, will be used. The sample will then be purified using a gel purification kit and cloned. The plasmid will then be extracted and utilized for qPCR.

In the first three days of the experiment, healthy shrimp were fed frozen EHP-positive samples twice daily at a 1:5 ratio. From the fourth day onward, the same ratio was used, with feeding frequency reduced to once per day. All *P. monodon* specimens were randomly sampled on the seventh and fourteenth days. However, the samples tested negative for EHP using a two-step PCR assay. At 24 days post-infection (dpi), there was no evidence of transmission. Notably, the average body weight of the *P. monodon* stocks increased steadily throughout the experimental period, which is inconsistent with the clinical manifestations typically associated with EHP infection. Monitoring is ongoing until a successful infection can be established and utilized for further study.



PCR results of EHP-positive shrimp using SWP1 primers for confirmation of 1st step positive samples (Lanes 1a & 1b- Vc100bp Ladder, Lane 2-negative control, Lanes 8-15 -EHP 1st step positive)

For 2026, the effects of different pH levels, salinities, and temperatures on EHP activation and germination will be determined. In addition, EHP carriers in shrimp ponds, such as crabs, fish, mollusks, and insects, will be identified. Moreover, EHP transmission will be conducted between shrimp and prawn species.

- ***Nutrition and Feed Component***

Nutrition and feed component aim to (a) find effective alternative protein sources to fish meal in dietary formulations, (b) determine specific nutrients that enhance growth performance, and (c) promote practices and strategies to improve production.

- *Developing insect-based feed using traditional and molecular approaches for sustainable production of Nile tilapia (*Oreochromis niloticus*) in the Philippines: I. Effect of substrates on nutritional composition of Black soldier fly (BSF) larvae; II. Impact of dietary inclusion of BSF larval meal on fish performance, biochemical composition and serum biochemistry*

Insects are promoted as high-quality, cost-effective, energy-efficient, and sustainable alternative feed ingredients in animal feeds. Among the most studied insects, the black soldier fly (BSF, *Hermetia illucens L.*) is considered a suitable candidate for mass production, due in part to its simple rearing system and high capacity to convert organic waste into high-quality protein biomass. BSF larvae have high levels of protein (40 to 60 %) and lipids (up to 35 %), containing an amino acid composition comparable to fishmeal, antioxidant properties, and other micronutrients that are essential to animal growth. Reports have shown the successful use of BSF larvae in the diets of other fish species, including Nile tilapia, turbot, rainbow trout, and African catfish.

Since BSF larvae are insatiable consumers of various organic wastes and by-products, their industrial or laboratory-scale production will benefit organic waste management and efforts to efficiently utilize them as a cost-effective alternative feed ingredient in aquafeeds.

This continuing study is a part of the collaborative project between SEAFDEC/AQD, the Department of Agriculture-National Fisheries Research and Development Institute (DA-NFRDI), the University of the Philippines Visayas (UPV), and UP Diliman, that will evaluate the feasibility of utilizing BSF as replacement for fishmeal in tilapia feeds and its effects on the physiology, immune response, disease resistance, gut microbiota and expression of amino acid transporter genes in the gut of Nile tilapia.

Specifically, this study aims to examine the effect of substrates on the nutritional composition of black soldier fly larvae and the performance of Nile tilapia fingerlings. This study also aims to determine the optimum inclusion level of BSF larvae meal in Nile tilapia fingerling diet and its influence on growth and survival, feed utilization, body composition, and serum biochemistry.

In 2025, sourcing and pre-drying of rearing substrates *(e.g.* aquatic plant (water hyacinth), fruit waste (banana peel), coconut pulp residue, and okara) were done in preparation for the laboratory BSF rearing trial. BSF eggs were purchased from a private BSF farm in Silang, Cavite, and reared for five days on a diet of okara meal. Six-day-old BSF larvae were stocked in rectangular plastic bins and fed different substrates, with three replicates per substrate. Changes in the substrate temperature (30.8 to 35.9 °C), pH (7.0 to 7.2), and moisture levels (45.75 to 93.94 %) were monitored.

Results showed that individual larval weight was lowest in water hyacinth and highest in okara and coconut pulp residue. The same trend was observed in biomass, which varied from 63 g in water hyacinth to 1,140 g in okara. Survival of BSF larvae was highest in okara and coconut pulp residue. Furthermore, the feed conversion ratio (FCR) was lower for okara, coconut pulp residue, and banana peel than for water hyacinth. Additional trials will be conducted.

The feeding trials at BFS and TMS continued through February 2025 to complete the 12-week feeding period. In both trials, the same five test diets, formulated and prepared by replacing fishmeal (on a protein basis) with BSF larvae meal (harvested in the Bacolod BSF semi-industrial trial), were tested at 0, 20, 40, 60, and 80 % inclusion levels. In the BFS trial, a total of 600 i-ExCEL tilapia fingerlings (4.33 g) were stocked in 20 units of 250-L fiberglass tanks with 30 pcs per tank and randomly assigned into five dietary groups, each with four replicate tanks. In the TMS trial, an initial stocking density of 14 fish per tank of i-BEST fingerlings (mean body weight of 7.40 g) was stocked in 250-L fiberglass tanks filled with brackishwater. Test diets were administered three times daily (0800 h, 1100 h, and 1500 h) at 10 % of total body weight for weeks 0 to 4, 7 % for weeks 4 to 8, 5 % for weeks 8 to 10, and 3 % for the remaining two weeks. At the end of the trial, growth (final body weight, percent weight gain, and specific growth rate), survival, and feed utilization (FCR) parameters were determined and compared among treatment groups. In addition, blood serum samples were also obtained for the analysis of total protein, cholesterol, glucose, triglycerides, and the activities of glutamic-oxaloacetic transaminase

(GOT) and glutamic-pyruvic transaminase (GPT). Frozen fish samples were also freeze-dried for proximate, amino acid, and/or fatty acid composition analysis.

Rearing of BSF larvae in semi-industrial conditions at Brgy. Felisa, Bacolod City, Negros Occidental, Philippines

Rearing of BSF larvae in lab-scale conditions at SEAFDEC/AQD-BFS, Binangonan, Rizal, Philippines

- *Verification studies on grow-out diets for rabbitfish (*Siganus guttatus*) farming in floating marine net cages*

Rabbitfish, or siganids, are members of the family Siganidae and are commonly found in the Indo-Pacific region. Locally, they are known by various names, including “samaral,” “malaga,” “danggit,” “kitong,” “mobead,” “ngisingisi,” and “balabis.” There are 28 species of siganids, all belonging to the genus *Siganus*. Among these, *Siganus guttatus* is considered a promising species for aquaculture due to its rapid growth rate, large size, resilience, and tolerance to various environmental factors. *S. guttatus* can be cultivated in brackishwater ponds, floating net cages, and pens.

However, fish fed solely on fresh algae exhibited slower growth and required a longer culture period, whereas those fed formulated diets demonstrated better performance. In a previous study, juvenile rabbitfish weighing 100 g grew to 258 g with a survival rate of 99 % after 105 d in pond culture, using the SEAFDEC/AQD feed formulation containing 35 to 37 % crude protein and 7 to 8 % crude fat. Despite this, many farmers rely on readily available commercial diets formulated for milkfish because of the high cost of diets for siganids. Hence, this new study aims to validate the SEAFDEC/AQD grow-out diets formulated explicitly for farming *S. guttatus* in marine floating net cages.

In July 2025, the experimental setup was completed through the fabrication of 36 net cage units, including three bamboo cages with dimensions of 10 m × 10 m. The nursery rearing of the 50,000 rabbitfish fry is ongoing.

Stocking of siganid fry at SEAFDEC/AQD Igang Marine Station, Nueva Valencia, Guimaras, Philippines

- *Development of a cost-effective grow-out diet for snubnose pompano (*Trachinotus blochii*) farming in floating marine net cages*

The snubnose pompano (*Trachinotus blochii*) is a valuable marine finfish from the Carangidae family. It is locally known as "pompano" or "pampanong puti," as well as “talakitok,” “ampahan,” and “bitilya.” This euryhaline species can thrive in a wide salinity range of 3 to 33 ppt, making it suitable for cultivation in earthen brackishwater ponds, coastal cages, and floating marine net cages.

Snubnose pompano requires a high-protein diet (42 to 50 %) for optimal growth; however, the rising cost of commercial feeds, primarily due to the increasing price of fishmeal—the primary protein source—poses a challenge. To address this, various studies have explored cost-effective feed formulations using alternative protein sources. Plant-based options include soybean meal, canola meal, cottonseed meal, and corn protein concentrate. Animal-based alternatives, such as poultry by-product meal (PBM), have also been evaluated. Despite the growing use of plant-based protein sources, particularly soybean meal, their higher inclusion is often limited by factors such as amino acid imbalances and the presence of anti-nutritional compounds. These limitations can negatively impact growth performance, reduce feed efficiency, and potentially cause histomorphological changes in the distal intestine of certain fish species. Hence, this new study aims to develop a cost-effective grow-out diet using sustainable ingredients for the culture of snubnose pompano (*Trachinotus blochii*) in marine floating net cages.

The construction of bamboo nursery cages and the fabrication of nursery nets were completed during the second quarter of 2025. Meanwhile, fabrication of net cages for the grow-out experiment—consisting of 30 units with dimensions of 2 m × 2 m × 2.5 m—is still in progress.

A total of 20,000 sixty-day-old hatchery-reared pompano fry (approximately 1” in body length) sourced from the SEAFDEC/AQD Hatchery, Tigbauan Main Station, were stocked at the Igang Marine Station. Feeding was conducted four times daily—6:00 AM, 11:00 AM, 2:00 PM, and 5:00 PM—using AQD-formulated feed in crumble or 3 mm pellet form, at a daily feeding rate ranging from 7 % to 12 % of body weight. To attract natural food organisms, a 7-watt LED light (35.09 µmol/s/m^2) was used for night illumination from 6:00 PM to 6:00 AM.

The nursery rearing of pompano fry is ongoing and will continue until they reach a body weight of 30 to 40 g.

Nursery set-up of pompano with artificial light at SEAFDEC/AQD Igang Marine Station, Nueva Valencia, Guimaras, Philippines

- *Optimization of feeding strategy, the use of an intermittent feeding regime to reduce production cost in milkfish culture in cages*

Fish may exhibit compensatory growth, a phase of rapid growth above normal levels, following periods of starvation. As such, the capacity to recover from starvation is a crucial adaptation for survival in a fluctuating environment. During food deprivation, the fish rely solely on their stored body nutrients, which may lead to behavioral and physical changes that cause stress and affect growth.

To maximize feed efficiency and growth, feeding intervals should be adjusted to optimize digestion and protein utilization. Feeding frequency is also crucial for reducing production costs in aquaculture and maintaining good water quality by preventing overfeeding. Therefore, this new study aims to evaluate the effects of various feeding regimes, including short-term feed deprivation and refeeding, on growth performance, whole-body composition, antioxidant status, blood biochemical parameters, and the economic efficiency of milkfish fingerlings.

50-grammer milkfish juveniles that were stocked in IMS cages for the growth experiment

In this study, milkfish juveniles (25 to 30 g) were conditioned to reach a 50 g body weight. These were then reared in a 75 m³ cage, with 30 animals per m³, for 150 days of culture (DOC), following five treatments (T1:Daily, Control, T2: Alternate days, T3: Alternate days, Normal feeding for the last 30 days; T4: one week starvation /three weeks refeeding; and T5: one week starvation /three weeks refeeding, Normal feeding for the last 30 d).

At the end of the growth experiment, the following paramaters will be measured and analzyed: (1) plasma Igf1 quantification (Igf1 concentrations are influenced by recent food intake over periods of days and weeks), (2) quantification of RNA: DNA ratio (biochemical indicator of growth), (3) glucose and Cortisol (plasma stress indicators); (4) alanine transaminase (liver health indicator), aspartate aminotransferase (liver and muscle condition), and (5) liver and intestine morphology.

- *Assessing the viability of snails (*Pirenella *sp.) as a potential supplemental feed to snubnose pompano (*Trachinotus blochii*) in brackishwater pond grow-out culture*

Gastropods play an essential role in the ecosystem. However, some are considered pests, such as the brackishwater snail *Pirenella* sp., especially where predators and competitors are less common. Triphenylene (TPT) compounds, Brestan and Aquatin, have been introduced to control these pests. However, due to their toxic composition, which is harmful to other species, including humans, these pesticides were banned. Recognizing this concern, a safer, more sustainable alternative method must be explored.

The snubnose pompano, *Trachinotus blochii*, is a high-value finfish now being cultured for its rapid growth, high-quality meat, and high market demand. As the snubnose pompano is naturally feeding on mollusks, it has the potential to be used as a biological control for *Pirenella* sp.

Therefore, this ongoing study aims to assess the use of *Pirenella* sp. as a supplementary diet for snubnose pompano and to potentially reduce its populations in brackishwater ponds. Furthermore, this study will assess the growth performance and survival rate of pompano fed with a commercial diet and supplemented with *Pirenella* sp., compared with a commercial diet alone.

In 2025, the study showed that pompano fed 100 % commercial feed achieved better growth performance in terms of ABW, Weight gain, SGR, and Total length. Treatment II, in which pompano were fed 50 % feed and 50 % snails, was found to have comparable growth performance to Treatment 1. Treatment III, however, showed a low growth performance. While the survival rate was found to have no significant difference ($p>0.05$), a 100 % survival rate was obtained in all the Treatments.

FCR was found to be lower in Treatment II, both in terms of the amount and value of feeds, as it is divided into two feed types. Treatment III was found to have the highest FCR but the lowest value, as snails can be acquired from a pond or already present on its surface. The treatment I, however, was found to have the highest growth performance and value, since pompano feeds are expensive.

Further, the gut content analysis showed that pompano positively consume snails as part of their diet in the brackishwater pond.

Gut analysis showing pompano's positive ingestion of snails

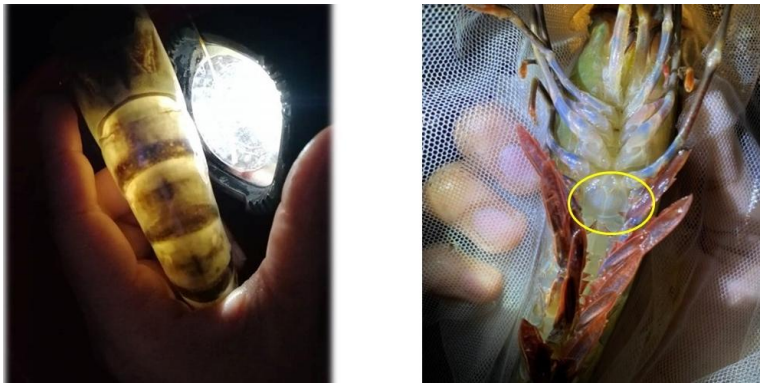
- *Efficiency of polychaete phospholipid in promoting* Penaeus monodon *maturation*

Optimizing polychaete inclusion in penaeid broodstock maturation diets can significantly influence reproductive performance and ultimately have a lasting impact on overall seed production. Diet manipulation is the most effective intervention for increasing penaeid reproductive performance, with polychaetes an indispensable component. Known to contain high protein levels, highly unsaturated fatty acids (HUFA), and reproductive hormones, a recent study reported that polychaete phospholipid extract supplemented at 0.25 % was the most efficient component and dose in promoting maturation of Indian white prawn, *Penaeus indicus*. The recorded gonad maturation was even better than when the broodstock was fed fresh-frozen polychaete, squid, and mussel.

Reducing dependence on polychaete by replacing it with other cheaper alternative diets can boost the profitability of penaeid hatchery operations and ensure a more stable supply of good-quality post-larvae. Hence, the primary objective of this ongoing study is to verify the efficacy of supplementing polychaete phospholipids in enhancing reproductive performance and quality in *P. monodon*.

All feeding trials aimed at evaluating the efficacy of polychaete and krill phospholipid inclusions in *P. monodon* maturation diets were completed by the end of 2024. Post-experiment dissections of live specimens were performed, and measurements of weights and lengths were recorded. Additionally, ovary and hepatopancreas samples were harvested, weighed, and preserved at -80 °C for subsequent analysis of gene expression and quantification of proteins and lipids. Throughout the trials, nearly all individuals across dietary treatments reached maturity and spawned. Individuals fed with the Control Diet (alternate feeding of Basal Diet and Fresh Diet) have shown superior maturation (80 %) and OSR (45.76 %). However, rematuration rates were higher in groups fed a PLF-supplemented diet than in the control. Based on the weight data recorded during the feeding trials, individuals fed with the P.25 experimental diet exhibited the highest weight gain, averaging 16.55%. This diet also demonstrated a superior rematuration rate of 66.67 % among all dietary treatments. Conversely, individuals fed with Diet K.25 achieved the highest survival rate at 73.33 %, compared to the average survival rate of 46.67 % observed across other experimental diets.

Ovary and hepatopancreas samples were weighed to obtain Hepatosomatic Index (HSI) and Gonadosomatic Index (GSI) data, revealing that individuals fed with Diet P.25 had higher HSI (3.05 %) and GSI (4.06 %) values.



A P. monodon *broodstock fed with maturation diet supplemented with polychaete polar lipid fraction to enhance reproductive performance (L). Sperm deposits in the thelycum of female* P. monodon *were checked to assess successful captive mating (R).*

The procurement of synthesis kits for gene expression analysis has commenced. The kits are projected to arrive in the first part of the second quarter, and the analysis of the preserved samples will follow.

- *Refinement of* Scylla serrata *maturation diet*

Broodstock nutrition is a fundamental component of any hatchery production. For mangrove crab broodstock, the existing artificial formulated diet combined with a natural fresh diet was proven to be efficient. However, due to its unpredictable quantity and quality, highly variable pricing, and potential to degrade water quality and cause disease, the use of a natural fresh diet is not advisable. Further, the previously formulated diets contained lower average protein and lipid levels. Hence, refining existing maturation diets for *S. serrata* may reduce dependence on natural fresh diets.

This continuing study aims to refine the existing maturation diets used for mangrove crab and improve its reproductive performance by optimizing protein and lipid inclusion levels. It will also assess the effect of partially or fully substituting the natural, fresh diet with a formulated diet on the maturation of *S. serrata*.

Additional experimental runs were conducted in the first quarter of 2025. The dietary treatments evaluated include Diet 1 (54/12), Diet 2 (54/8), Diet 3 (47/12), Diet 4 (47/8), Diet 5 (40/12), Diet 6 (40/8), and Control. The experimental organisms were housed in 250-liter tanks located in the basement of the Nutrition Building (Fig. 1). Water quality parameters are monitored routinely, with the following average values recorded: pH (7.95), salinity (33.10 ppt), temperature (27.94°C), dissolved oxygen (DO) (6.35 mg/L), and ammonia (0.25 mg/L). The seawater supply is continually changed via a flow-through system, with complete water exchange occurring every 15 d. Sampling is performed at 15 d intervals, up to 90 DOC.

In the current experimental runs, maturation, spawning, and hatching have been systematically observed with at least one individual from each treatment maturing and spawning. The individuals fed with the Control diet (alternate feeding of fresh feed and maintenance pellets) have demonstrated the highest number of hatched zoea (1,476,666). They have also rematured, producing an additional 422,000 zoea with a mean survival rate of 88 % following the administration of the formalin stress test.

The samples collected from the first and second experimental runs after live dissection have been preserved for subsequent analyses and quantifications. Fresh ovary and hepatopancreas samples were preserved in RNA later for future analyses, while the remaining samples were stored in a -80 °C bio freezer for protein and lipid quantification. These preserved samples have been freeze-dried to enhance the accuracy of subsequent tests. Freeze-dried samples showed approximately 67.58 moisture loss, which may positively affect test accuracy. Upon completion of sample collection, analyses will commence immediately.

Formulated diets with different protein: lipid combinations were developed at SEAFDEC/AQD to test the reproductive performance of S. serrata

- *Nursery and grow-out culture of mangrove crab (*Scylla serrata*) in brackishwater ponds and mangrove pens*

SEAFDEC/AQD remains committed to maximizing the potential of the Philippine mangrove crab industry by developing innovative grow-out culture techniques and leveraging available resources, such as brackishwater and mangrove areas. Furthermore, the Department aims to develop effective strategies to enhance mangrove crab production, improve the livelihoods of coastal communities, and ensure the sustainability of the crab industry. Hence, this study aims to demonstrate the nursery and grow-out culture of *S. serrata* in different culture systems. Specifically, (1) to verify and refine the nursery culture using net cages installed in brackishwater ponds and (2) to conduct the grow-out culture in brackishwater ponds through a polyculture system with other fish commodities such as milkfish or pompano.

- *Intensive culture of whiteleg shrimp (*Litopenaeus vannamei*) in HDPE-lined brackishwater ponds*

Since its inception, *L. vannamei* whiteleg shrimp aquaculture has faced significant challenges, including disease outbreaks and import bans. Currently, the whiteleg shrimp dominates the global shrimp production, with Asian countries as the primary producers. While the Philippines has limited commercial whiteleg shrimp aquaculture, both domestically and internationally.

SEAFDEC/AQD's engagement includes research and development projects aimed at revitalizing this sector. The initiatives focus on developing economically viable and sustainable farming practices, enabling the country to re-establish itself as a significant player in the global shrimp aquaculture market. Therefore, this study aims to verify and refine the intensive culture method for whiteleg shrimp at the Dumangas Brackishwater Station. Specifically, (1) to study the growth, survival, and different sticking densities to be used in the grow-out culture in HDPE-lined brackishwater ponds, (2) to evaluate the potential of whiteleg shrimp in polyculture using other fish species such as milkfish or pompano, (3) to assess the viability of whiteleg shrimp culture in a shorter culture period, and (4) to determine the economic viability of whiteleg shrimp culture in HDPE-lined brackishwater ponds.

- *Pompano (*Trachinotus blochii*) production in brackishwater ponds using different stocking densities*

SEAFDEC/AQD has invested considerable time in research and development on pompano and has ultimately established its culture technology. However, this technology requires further verification before adoption by various stakeholders. Therefore, this study aims to assess the growth and survival of pompano in brackishwater ponds at different stocking densities. Specifically, this study will study the growth and survival of pompano using phytoplankton-rich water with artificial feeding.

2.5 Generation of appropriate technologies for rural aquaculture to provide livelihood and alleviate poverty

Meeting Socio-economic Challenges in Aquaculture

Departmental Program No. 4

Status: *Ongoing (on track)*

Aquaculture growth in Southeast Asia is primarily driven by scientific and technological advances adopted by receptive businesspeople and investors. However, along with the expansion of aquaculture, several unintended problematic situations have arisen, including 1) inequitable distribution of opportunities and benefits among aquaculture adopters, 2) technological and production cost dualism among aquaculturists, 3) social conflicts and economic losses due to competing uses of resources for aquaculture and other purposes; and 4) high cost of rehabilitation of habitats affected by the misuse of natural resources for aquaculture.

Through stakeholder collaboration, the Departmental Program "**Meeting the Social and Economic Challenges in Aquaculture Program**" or MSECAP aims to develop and implement social and economic strategies in aquaculture and resource management, thereby securing food and income. The primary objective is to address the specific recommendations for this Program, as identified and adopted during the 2011 ASEAN-SEAFDEC Fish for All Conference. These include 1) prioritizing collaborative R&D in aquaculture in the region to have a clear regional assessment and understanding of the role of aquaculture in poverty alleviation and provide basis for policy formulation; 2) allocating R&D resources to address emerging issues on the impacts of climate change and global trade on aquaculture with emphasis on small-holder fish farmers; and 3) enhancing multi-agency collaboration and sharing of information and resources between and among SEAFDEC and its Member Countries and other organizations in addressing the common problems of alleviating the socioeconomic conditions of the poor sector of Region.

Since its inception in June 2011, the MSECAP program has conducted research to develop sustainable livelihoods that will enhance food availability and income security for marginalized households in fishing communities. These anticipated results will be maintained through the bottom-up development of supportive local regulations, which local government institutions and equipped fisherfolk organizations will jointly implement.

In AQD's bid to transform aquaculture into a more efficient, inclusive, resilient, and sustainable industry, factors such as innovation, investment, and partnerships are considered crucial. Hence, MSECAP has been co-implemented in various studies under the Joint Mission for Accelerated Nationwide Technology Transfer Program (JMANTTP II) of the Priority Program.

- *Grow-out Polyculture of Nile Tilapia (*Oreochromis niloticus*) and Giant Freshwater Prawn (*Macrobrachium rosenbergii*) in Selected Fish Farms in Panay Island*

This study aims to promote sustainable aquaculture practices through grow-out polyculture of tilapia and GFP in selected fish farms in Panay Island, thereby generating income and improving food security. Specifically, (1) to engage at least five fish farmers-cooperators and their respective local governments and regional/national agencies in a grow-out polyculture demonstration; In this initiative, at least six fish farmers are identified within Panay Island to serve as collaborators for the grow-out demonstration on the polyculture of tilapia and ulang. Ten suitable fishponds of varying sizes are located in Mina, Iloilo, and are owned by four fish farmers. Two fish farmers in Bingawan, Iloilo, are collaborating, with three ponds available for technology transfer. The MOAs between the LGUs, AQD, and DA-BFAR 6 are properly signed by their official representatives, while the MOUs between the LGUs, AQD, and fish farmer-collaborators are scheduled to be signed before the end of 2025. A separate proposal for each site, all aiming to demonstrate polyculture technology with ulang and tilapia, has been approved to monitor the physical and financial commitments of each site projects; (2) to conduct at least three

on-site training sessions to harness fish farmers-cooperators capacities through skills development, knowledge sharing, and technology transfer; (3) to enhance cooperators' overall fish and prawn production and income by at least 10 %; and (4) to develop a simple value chain of tilapia and GFP to further promote the viability and sustainability of the polyculture technology at the selected sites.

- *Production of Seaweeds (*Kappaphycus alvarezii*) in Pandan, Antique*

This study aims to promote sustainable aquaculture practices through innovative approaches in seaweed farming, addressing seasonality and reducing predation to improve production and generate better income. This will introduce an innovative approach to seaweed farming. It features an outside-the-box strategy that employs an inside-the-box stocking technique for seaweeds. The goal of this method is to assess the feasibility of using commercially available plastic baskets—commonly used for oyster grow-out baskets—for cultivating seaweeds, especially in areas with heavy wave action and marine fish predation. The activity began with site selection in Pandan, Antique. A Memorandum of Agreement (MOA) has been signed between the local government unit (LGU) partner, AQD, and DA-BFAR 6. The seaweed grow-out process in plastic baskets is currently underway, using tissue-cultured plantlets from the outputs of the sea-based nursery in IMS. Approximately 84 baskets have been successfully stocked with 14 plantlets each, weighing 3-5 g. Modular stocking continues until all 500 plastic baskets are filled, with the final harvest expected in 60 d.

2.6 Collaborative projects with the Philippine Government

Collaborative projects with the Philippine Government

Departmental Program No. 5

Status: *Ongoing (on track)*

Since its establishment over 50 years ago, the SEAFDEC/AQD has developed technologies in broodstock management, seed production, and grow-out of economically important finfishes, crustaceans, mollusks, and seaweeds. AQD believes that to truly change the aquaculture industry, science-based technologies and approaches must be applied effectively and strategically on the ground, piloting these in the Philippine setting.

To accelerate fish production and export revenues from the aquaculture sector, AQD is committed to intensifying the techno-transfer of matured aquaculture technologies to stakeholders. This will provide additional and alternative livelihoods to fisherfolk through sustainable aquaculture technologies that are economically viable, environmentally friendly, and socially equitable.

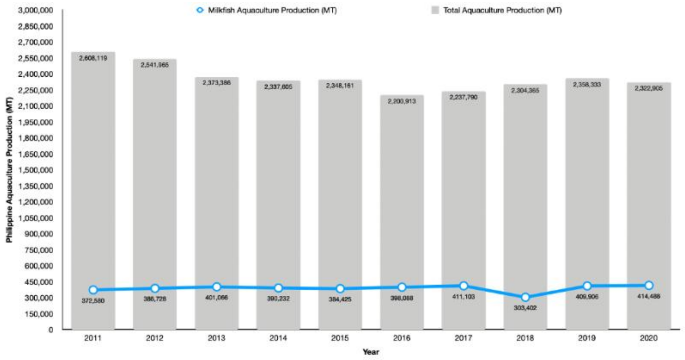
The collaborative projects with Philippine Government agencies through the Department of Agriculture-Bureau of Fisheries and Aquatic Resources (DA-BFAR) and other government organizations, including the Department of Agriculture-National Fisheries Research and Development Institute (DA-NFRDI) aim to address the pressing concerns on shortage of fry, increasing feed prices, and inadequate training efforts, among others, with the ultimate goal of accelerating fish production and export revenues from the aquaculture sector.

The Department must address the needs of the country's fish farmers and industry players. These technologies will then be extended to its partners in Southeast Asia. This program is expected to become the medium that would bridge the gap between the sciences and stakeholders. Through these collaborations, DA-BFAR, DA-NFRDI, and other government agencies will assist AQD in transferring adoptable and sustainable technologies to the industry and stakeholders. Fish farmers are expected to benefit from the projects as they will immediately reap the benefits of the research done by the Department.

- ***Fry Sufficiency Program***

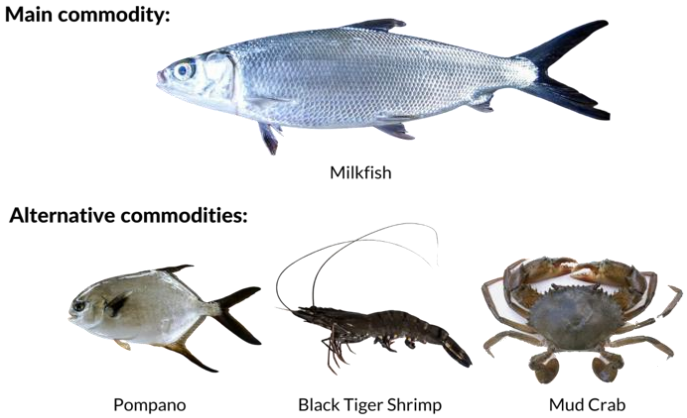
The Philippines is among the top fish-producing countries globally, with its aquaculture sub-sector dominating its fish production. In the Philippine Fisheries Profile 2020 of the Bureau of Fisheries and Aquatic Resources under the Department of Agriculture (DA-BFAR, 2021), the total volume of fish production from aquaculture constituted about 52.79 % of the Philippine total fisheries production. The bulk of aquaculture production came from seaweeds (65.60 %), followed by milkfish (18.51 %), tilapia (11.79 %), and then shrimp/prawn (3.15 %). The remaining 0.95 % is the combined production of other commodities such as oysters, mussels, and crabs.

Milkfish (*Chanos Chanos,* Forsskal*),* or *bangus* in the Philippines, is an economically important cultured fish whose aquaculture production has fluctuated recently.



Milkfish aquaculture production in the Philippines over ten years (2011–2020) by quantity (t)
Source*: DA-BFAR (2012–2021)*

To address this problem, DA-BFAR came up with the "National Bangus Fry Sufficiency Program," which aims to locally produce an estimated 1.2 billion milkfish fry by putting up hatcheries in strategic locations all over the Philippines and reducing the reliance of fish farmers on imported fry by as much as 85 %. About 48 hatcheries are needed to realize this program, and each hatchery would need to produce 25 million fry per annum. These proposed hatcheries would need about 3,750 milkfish breeders: 2,500 females and 1,250 males, following the ratio of 2 females to 1 male. Apart from addressing the scarcity of fry supply, the program would also aim to dispel the stigma that captive-bred fry is inferior to wild-caught fry in terms of growth, morphology, and survival; as DA-BFAR would ensure that the fry produced are of the highest quality. Aside from milkfish, these proposed hatcheries are versatile enough to accommodate the culture of other economically important aquaculture species such as the black tiger shrimp (*Penaeus monodon*), mangrove crab (*Scylla serrata*), and other commodities that are quickly gaining in popularity, *e.g.* pompano (*Trachinotus blochii*).



Species alternative to milkfish for culture in the hatcheries

AQD is also contributing to the Bangus Fry Sufficiency Program of the country, in addition to the legislated hatcheries, by building its own freshwater and marine hatcheries and other support facilities at the Tigbauan Main Station. In 2023, AQD inaugurated the milkfish hatchery extension facility to accommodate any excess larvae produced from the many hatcheries of AQD. AQD has also extended help to the DA-BFAR Regional Office VI (DA-BFAR VI) in profiling abandoned and non-operational hatcheries on the island of Panay and helped rehabilitate those hatcheries selected by DA-BFAR VI. The rehabilitated hatchery in Batan, Aklan, and Concepcion, Iloilo are operational and are provided with larvae by AQD.

- ***Development of Cost-Efficient Feeds***

The project aims to find cheaper alternatives to substitute fish-based feed ingredients, develop effective feed formulations using these alternatives, and promote locally sourced ingredients to reduce costs. Feed formulation of cost-efficient feeds for high-value marine fish will be recommended. Verification trials and technology transfer to the stakeholders will follow this.

In collaboration with DA-BFAR and DA-NFRDI, AQD continues its activities to identify and utilize cost-effective feed ingredients as alternatives to fishmeal. DA-BFAR has also tapped the services of SEAFDEC/AQD to provide technical assistance and conduct feasibility studies of feed mill plants in three different locations under a Memorandum of Agreement.

Aquaculture feed mill plants need to be constructed to produce cost-efficient feeds on a larger scale. Each plant has a production capacity of 5 MT/ day (10 h). The feed mill plant in Bulalacao, Oriental Mindoro, has finished construction and was inaugurated last March 2025. They are now awaiting the budget for operations. The feed mill plan at TMS of SEAFDEC/AQD has also finished construction and is awaiting commissioning of the equipment.

- ***Oplan Balik Sugpo***

The Oplan Balik Sugpo Program involves producing disease-free, high-quality Penaeus monodon fry in the hatchery to be stocked in grow-out ponds. Grow-out operations of black tiger shrimp follow the environment-friendly schemes in shrimp farming. These pre-production and production components adhere strictly to enhanced biosecurity measures until harvest.

Quarantine Area

The Shrimp Hatchery Complex located at the Tigbauan Main Station of SEAFDEC/AQD was built and utilized to produce black tiger shrimp fry. It comprises a separate spawner/broodstock facility used as a quarantine area, along with the sampling of tissues from newly arrived spawners and the hatchery modules. Spawners were acclimatized and disinfected using povidone-iodine before stocking and spawning. Newly spawned eggs were washed with UV-sterilized seawater, disinfected with povidone-iodine, and rinsed with UV-sterilized seawater. Harvesting of the nauplii is based on the PCR test results of the spent spawners. Only nauplii from the pathogen-negative spawners will be stocked for larval rearing in the shrimp hatchery.

Broodstock Facility

New *P. monodon* breeders were acquired this year. During transport, breeders were placed in a container with aerated seawater from the source to the quarantine facility. Upon arrival, the breeders were placed in white basins, provided with aeration, and disinfected with 50 ppm povidone-iodine solution. They were acclimatized for a few hours and tested for pathogen detection before being stocked in the broodstock tanks. As of September 2025, 390 breeders are at the Shrimp Broodstock Facility. These were acquired from various sources, including Himamaylan, Negros Occidental, Roxas City, Capiz, Hamtic, Antique, and DBS.

Hatchery Phase

All larvae were reared, fed, sampled, and monitored until they reached the postlarvae (PL) stage. Influent water undergoes a series of filtration to ensure good water quality for the stocks. Seawater from the source first passes through the sand filter before it reaches the reservoir. From the reservoir, the water passes through the rapid sand filter, cartridge filter, and UV sterilizer before reaching the larval rearing or natural food tanks. Filter bags with 1 µm and 5 µm mesh sizes are also installed at every seawater outlet.

Strict biosecurity measures are being implemented at the spawner/broodstock facility and shrimp hatchery as part of the standard operating procedures. The staff must shower, change into scrub suits, and put on hatchery slippers or boots upon entering the facility. Footbaths, hand sanitizers such as alcohol, and disinfectants are also provided at every entrance point. PCR tests are conducted at the PL 5, 10, and 15 stages to monitor the health condition of the shrimp fry before harvest. Fry harvesting is done when they reach PL 15- PL 20.

Harvest of P. monodon *PL from the SEAFDEC/AQD hatchery*

In 2025, a total of 3,706,000 high-quality PL were harvested and used for the verification study on *P. monodon* grow-out culture in ponds at the Dumangas Brackishwater Station (DBS). At the same time, the excess was sold to interested buyers.

Grow-out Phase

The harvested PL from the hatchery were stocked at DBS. From the hatchery, PL were acclimatized in the grow-out ponds. Fry bags were allowed to float for 10-20 minutes before opening and were gradually splashed with the pond water. The shrimp PL were allowed to swim out of the fry bags independently.

Harvest and stocking of shrimp at the DBS, SEAFDEC/AQD

In 2025, verification of this species continued using a stocking density of 60 shrimp/m². After 106 days of culture, 6,290 kgs of shrimp were harvested with an average body weight (ABW) of 13 g. The survival rate was 80.57 %, with a 1.29 FCR.

Harvest of black tiger shrimps at DBS, SEAFDEC/AQD

- ***In-situ (on-site) training courses and accelerated technology transfer***

In-situ or on-site training courses were conducted as part of the Department's initiative to promote sustainable aquaculture practices. These courses were requested by government agencies, local government units, or the private sector. Ten training courses have already been conducted throughout the Philippines since 2019.

The training courses were made possible through partnerships with DA-BFAR, DA-NFRDI, local government units, the private sector, and other government agencies.

In 2025, requests for training courses were processed by the Training Section of the Department's Training and Information Division.

- ***Site Assessments***

In 2025, a comprehensive assessment was conducted across the Western Visayas region to explore potential sites for aquaculture operations. The goal was to identify suitable locations that could support sustainable aquaculture practices for the culture of Nile tilapia, giant freshwater prawn, seaweeds, oysters, and mussels.

Mina, Iloilo
Ten farms in Mina, Iloilo, were assessed for their feasibility in the culturing of Nile tilapia and giant freshwater prawn. The ponds were checked for area, water source, water depth, and accessibility. Out of the ten farms visited, only four farmers were selected for the project. The farmers were advised to prepare the ponds following approval of the Memorandum of Agreement.

Site assessment in Mina, Iloilo, Philippines

Bingawan, Iloilo
In response to the request of Bingawan LGU headed by its Municipal Mayor, two earthen ponds were assessed for suitability of the grow-out culture of Nile tilapia and giant freshwater prawn.

Site assessment in Bingawan, Iloilo, Philippines

- ***Technology Demonstrations***

Aside from *in-situ* training courses, the Joint Mission for Accelerated Nationwide Technology Transfer Program (JMANTTP) is being implemented by demonstrating SEAFDEC/AQD's aquaculture technologies and training farm owners or technicians to adapt and conduct operations independently. Several technology demonstration projects have already been conducted in different areas of the country.

o *Polyculture of Giant Freshwater Prawn and Nile Tilapia in Freshwater Ponds*

The grow-out culture of Nile tilapia and giant freshwater prawn was conducted at the Integrated Freshwater Park and Technology Center in Nanga, Pototan, Iloilo. This facility features a hatchery and several freshwater ponds owned by the Iloilo Provincial Government's Office of the Provincial Agriculture. SEAFDEC/AQD has initiated a collaboration with the agency, in conjunction with the Bureau of Fisheries and Aquatic Resources' Regional Office VI, focusing on improving the fisheries and aquaculture sector in the province of Iloilo. The facility had long been unused, and some of the ponds were previously used for the grow-out culture of tilapia, gourami, and catfish. Given its potential for culture, the Department decided to culture Nile tilapia in polyculture with giant freshwater prawn to verify the technology and showcase the results to the fish farmers.


Stocking of giant freshwater prawn and tilapia in Pototan, Iloilo, Philippines

The grow-out ponds measured 200 m², 1,000 m², and a maximum of 1,500 m². Two of the 200 m² ponds were utilized for the nursery of giant freshwater prawns, and two 1,000 m² ponds (Ponds 12 and 16) were used for polyculture. The stocking density used for polyculture is 6 tilapia:9 GFP in Pond 12, and 6 tilapia:15 GFP in Pond 16. After five months of culture, the tilapia gained an average body weight (ABW) of 500 g, while GFP had an ABW of 18 g.



Harvest of giant freshwater prawn and tilapia in Pototan, Iloilo, Philippines

o *Monoculture of Giant Freshwater Prawn in Freshwater Ponds*

The grow-out monoculture of Nile tilapia and giant freshwater prawn was also conducted at the Integrated Freshwater Park and Technology Center in Nanga, Pototan. This aims to cultivate giant freshwater prawns solely in earthen ponds at a high stocking density of 27 prawns/m^2, using commercial shrimp feeds to improve their growth. After 4.5 mos of rearing in a 1500 m² pond, the prawns gained an ABW of 20 g.

Stocking (L) and harvest (R) of giant freshwater prawn in Pototan, Iloilo, Philippines

- *Grow-out Culture of Seaweeds (*Kappaphycus alvarezii*)*

Another technology demonstration project this year is the grow-out culture of *K. alvarezii*, which is currently being conducted in Pandan, Antique. This is a collaborative project among SEAFDEC/AQD, the local government unit of Pandan, Antique, and the Bureau of Fisheries and Aquatic Resources Regional Office VI. The project aims to enhance the local seaweed farming by utilizing HDPE plastic baskets for nursery and grow-out culture. These will be used in comparison with the existing traditional longline method used by the seaweed farmers. Additionally, this aims to promote a climate-resilient aquaculture. If proven effective in holding seaweeds despite harsh environmental conditions, it could allow farmers to culture seaweeds all year round. As of September 2025, more than 100 baskets have already been utilized for this purpose, and efforts are geared towards utilizing 500 seaweed baskets in the area.

Stocking of K. alvarezii *in baskets in Pandan, Antique, Philippines*

- *Grow-out Culture of Oyster, Mussel, and Seaweeds in Earthen Ponds*

To utilize the unused earthen ponds in Leganes, Iloilo, a private owner has partnered with SEAFDEC/AQD to explore the area's potential. To support the Department's initiative for the grow-out culture of economically important commodities, two earthen ponds measuring 1 ha each were utilized for the grow-out culture of oyster, mussel, and seaweeds.

The earthen pond containing the bamboo poles for the grow-out culture of oyster, mussel, and seaweeds

Each commodity was placed in HDPE plastic baskets and attached to a floating rope that was installed in bamboo poles inside the ponds. Initially, seaweeds were stocked in HDPE baskets and compared with the traditional longline method. In the same set-up, the tissue-cultured *K. alvarezii* plantlets were compared with the farm-sourced ones. Results showed that tissue-cultured seaweeds in HDPE baskets have increased biomass compared to the longline with farm-sourced plantlets.

K. alvarezii *plantlets used, farm sourced (L) and tissue cultured (R)*

Additionally, slipper-shaped oyster spats (*Magallana bilineata*) were stocked in a separate 1 ha pond. The spats were sourced from New Washington, Aklan, and placed in HDPE baskets. The baskets were placed with two kilograms of spats and hung in floating ropes for grow-out culture. Aside from the oysters, the feasibility of culturing mussels in earthen ponds was also assessed by stocking mussel spats acquired from Ivisan, Capiz.

Stocking of mussel and oyster spats in Leganes, Iloilo, Philippines

- *Nursery and Grow-out Culture of Snubnose Pompano in Marine Cages*

Another collaborative project was conducted in San Antonio, Nueva Valencia Guimaras on the nursery and grow-out culture of snubnose pompano in marine cages. This is in collaboration with a private farmer and DA-BFAR VI. Three thousand pieces of pompano fry were stocked on February 20, 2025, in a 10 m x 10 m x 2 m cage. After 172 days of culture (DOC), the stocks reached an ABW of 456 g, an FCR of 2.05, and a survival rate of 91 %.

Stocking of snubnose pompano in marine cages

- *Nursery and Grow-out Culture of Snubnose Pompano in Brackishwater Ponds*

A technology demonstration for the nursery and grow-out culture of snubnose pompano was carried out in collaboration with the Freshwater Fisheries Research and Development Center - National Fisheries Research and Development Center (FFRDC-NFRDI) in Butong, Taal, Batangas. An earthen pond measuring 400 m^2 was stocked with 7,830 pcs pompano fry. After 52 DOC, the stocks reached an average body weight of 20 g.

The stocking of pompano at Butong, Taal, Batangas, Philippines

- *Intensive Grow-out Culture of Whiteleg Shrimp (*Litopenaeus vannamei*) in HDPE-lined ponds*

The technology demonstration for *L.vannamei* in Butong, Taal, Batangas started in 2022 at the HDPE-lined grow-out ponds of DA-NFRDI Freshwater Fisheries Research and Development Center. Since then, several culture runs have already been conducted. Pond 1 (divided into four compartments measuring 500 m^2 each) and Pond 2 (2,000 m^2), were utilized for this demonstration, covering a total area of 0.4 ha. A total of 240,000 pcs of shrimp fry were stocked in ponds on June 27, 2025. After 90 DOC, 6.7 tons were harvested with an average body weight of 29 g and 99 % survival rate.

Harvest of L. vannamei *at DA-NFRDI, Taal, Batangas, Philippines*

- ***Manpower Development***

In 2018, a significant training initiative was launched, gathering 16 graduates from various fisheries schools in Western Visayas. They participated in the Training Course on Manpower Development for Shrimp, Marine Fish, and Tilapia Aquaculture, which aimed to enhance their skills and broaden their perspectives on aquaculture practices.

Following this, in 2021, another batch of four graduates, from different fisheries schools in Mindanao and Bicol, underwent intensive training after being carefully screened and interviewed by SEAFDEC/AQD. This rigorous program covered shrimp, marine fish, mangrove crabs, giant freshwater prawns, oysters, seaweed culture, brackishwater ponds, and cage operations.

Continuing this activity, another training session was held in 2022, which featured four graduates from the University of the Philippines Visayas. Similar to the previous groups, they received specialized training in hatchery operations for shrimp, marine fish, mangrove crab, and giant freshwater prawn culture, as well as seaweed cultivation and the management of brackishwater ponds and fish cages.

Another batch of graduates was accepted in 2024. SEAFDEC/AQD conducted interviews for the fourth batch of the Manpower Development Training Session. Fourteen promising applicants were evaluated, and five outstanding candidates were selected from the University of the Philippines Visayas, Iloilo State University of Fisheries Science and Technology, and the University of Antique. From February 9 to May 31, these selected individuals received training in the same critical areas as their predecessors, further reinforcing the commitment to advancing aquaculture education in the region. This ongoing initiative enhances individual skills and contributes to the broader development of the fisheries sector.

Graduates of the Manpower Development training course were deployed to various hatcheries and laboratories at SEAFDEC/AQD, where they have provided technical assistance in training, site assessments, broodstock sampling and transport, and other projects of the Department. This year, two graduates were sent to the Global Meet on Giant Prawn in Huzhou City, China, an international conference on the giant freshwater prawn (*Macrobrachium rosenbergii)* from June 8 to 11, 2025.

Manpower development staff attending the Global Meet on giant prawn in Huzhou City, China

Other graduates have also been participating in local training courses funded by the Government of Japan-Trust Fund. One graduate participated in the Training Course on Feed Nutrition and Development from May 14 to 26, 2025, while another one attended the Training Course on Marine Fish Hatchery Operations from June 16 to July 22, 2025. ManDev staff have also assisted with broodstock sampling and transport, AQD training courses, tours, exhibits, and other projects requested by the Department or other government and private agencies.

Manpower Development staff giving technical assistance during trainings, site assessments, and broodstock transport activities

3. Strategy 3. Ensuring the food safety and quality of fish and fishery products for the Southeast Asian region

There was no project implemented under this Strategy in 2025.

4. Strategy 4. Enhancing trade and compliance of the region's fish and fishery products with market requirements

4.1 Development and implementation of regional standards, policies, and guidelines to enhance intra-regional/international trade

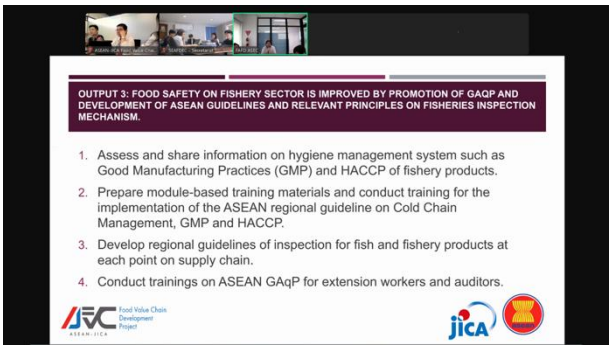
ASEAN-JICA Food Value Chain Development Project

FCG/ASSP Project no. 15

Status: *Ongoing (on track)*

The "**ASEAN-JICA Food Value Chain Development Project**" comprises four thematic areas: Output 1) Measures are developed for the marketing and promotion of national and ASEAN-GAP (Good Agriculture Practice); Output 2) Capacities of pesticide residue analysis necessary to strengthen SPS (Sanitary and Phytosanitary) measures in AMS are improved; Output 3) Food safety on fishery sector is improved by promotion of Good Aquaculture Practices (GAqP) and development of ASEAN guidelines and relevant principles on fisheries inspection mechanism; and Output 4) Strategies for promoting PPP-based Food Value Chain are developed. The Project Cooperation Agreement (PCA) between JICA and SEAFDEC was signed on 23 January 2025 for SEAFDEC to serve as the Project Executing Partner to implement activities under Output 3.

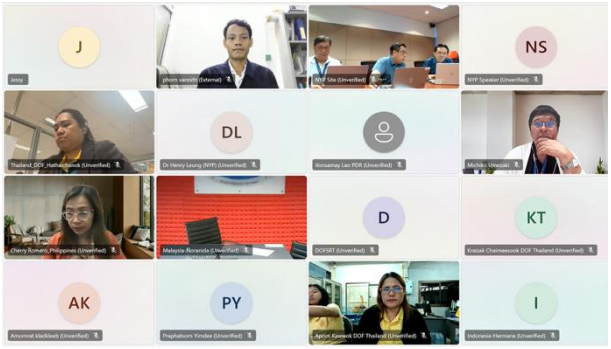
Under SEAFDEC's responsibility for Output 3, the "Project Inception Meeting" was convened on 20 March 2025. During the Meeting, SEAFDEC presented the proposed activities to the ASEAN Sectoral Working Group on Fisheries (ASWGFi) and the Expert Working Group on ASEAN Good Aquaculture Practices (EWG-GAqP); while the detailed discussions on technical activities were explained by MFRD and AQD.



Project Inception Meeting on 20 March 2025 discussing activities proposed under Output 3

For **Activity 3.1** (Assess and share information on hygiene management systems, such as Good Manufacturing Practice (GMP) and HACCP of fishery products) and **Activity 3.2** (Prepare module-based training materials and conduct training for the implementation of the ASEAN regional guideline on Cold Chain Management, GMP, and HACCP), MFRD implemented these two activities consecutively. A virtual inception meeting was held on 17 September 2025 to discuss the implementation of regional instruments on hygiene management and cold chain for fishery products. During this meeting, the AMSs updated their respective status and challenges in adopting regional guidelines. The meeting revealed a clear divide between countries with established export markets (*e.g.* Singapore, Malaysia, and Thailand) possessing more sophisticated systems, and those facing geographical or resource constraints (*e.g.* Lao PDR and Cambodia). Common challenges identified included infrastructure limitations, financial constraints for Small and Medium Enterprises (SMEs), and

the need for capacity building in areas such as HACCP and Good Manufacturing Practices. Participants were nominated as National Focal Points, and the implementation plan for the Train-the-Trainer Workshop was finalized.



Virtual Inception Meeting on 17 September 2025

Based on the results of the meeting in September 2025, MFRD convened the "Workshop on Implementation Status of Regional Instruments on Hygiene Management System of Fishery Products and Implementation of Regional Guidelines on Cold Chain Management of Seafood" on 6–9 October 2025 at Nanyang Polytechnic in Singapore. This Workshop focused on improving the participants' knowledge of Good Manufacturing Practice (GMP), Good Handling Practice (GHP), and Hazard Analysis Critical Control Point (HACCP) standards, and emphasized the adoption of the Cold Chain Management Guidelines for seafood. Twenty participants from AMSs attended the program, which included lectures and practical site visits. The participants are expected to serve as expert trainers in their respective countries, building local capacity and promoting the regional guidelines and standards.

Workshop on Implementation Status of Regional Instruments on Hygiene Management System of Fishery Products and Implementation of Regional Guidelines on Cold Chain Management of Seafood on 6–9 October 2025 in Singapore: Participants of the Workshop (left) and Participants observing a professional culinary demonstration at Nanyang Polytechnic (right)

For **Activity 3.3** (Develop regional guidelines of inspection for fish and fishery products at each point on supply chain), this activity originally focused on developing regional inspection guidelines for fish and fishery products. Discussions were held in May 2025 to revise the concept of this Activity, and SEAFDEC will provide technical inputs on laboratory testing methods relevant to inspection guidelines for imported aquaculture fish and fishery products, including the preparation of a manual for laboratory testing of biotoxins and organic contaminants. JICA will assume the comprehensive responsibility for developing the regional guidelines and is in the process of procuring a consultant, with actual human resource inputs expected to start in early 2026.

For Activity 3.4 (Conduct training on ASEAN GAqP for extension workers and auditors), the original proposal was reformed into two training categories, one for extension officers and another for auditors. SEAFDEC is currently modifying the original proposal for presentation to AMSs before implementation. On 13–14 November 2025, the AJFVC team visited the SEAFDEC/AQD in the Philippines to discuss comprehensive plans and activities for the upcoming training session on ASEAN GAqP for extension workers and auditors, scheduled for February to April 2026.

5. Strategy 5. Addressing cross-cutting issues, such as labor, gender and climate change, where related to international fisheries

5.1 Monitoring and enhancing awareness on international fisheries-related issues

Enhancing Regional Responses to Emerging International Fisheries-related Issues

FCG/ASSP Project No. 16

Status: *Ongoing (on track)*

In 2025, the SEAFDEC Secretariat started implementing the new project, "**Enhancing Regional Responses to Emerging International Fisheries-related Issues**," with a duration from 2025 to 2029. The main objective of this Project is to enhance the capacity of SEAFDEC Member Countries to effectively understand, assess, and respond to emerging international fisheries-related issues and challenges in global and regional fora, including UN, CITES, FAO, CBD, WTO, and ASEAN, with a view to ensure that regional interests are adequately reflected in international discussion processes, while contributing to the sustainability of fisheries and safeguarding the livelihoods of fishing communities of the region.

The Project comprises three expected outputs, namely: Output 1) Country views and positions on the proposal of commercially exploited aquatic species (CEAS) to be listed in the CITES Appendices developed in 2025 and 2028; Output 2) Regional platforms provided for sharing information on international/emerging fisheries-related issues; and Output 3) Participation in international and regional meetings and sharing and delivering the project results.

In 2025, the Project focused on Outputs 1 and 3. A summary of the achievements is as follows:

Under **Output 1**, in preparation for the 20th Meeting of the Conference of the Parties to CITES (CITES CoP20), which was held in Samarkand, Uzbekistan from 24 November to 5 December 2025, the SEAFDEC Secretariat organized the "Regional Technical Consultation (RTC) on the Development of the ASEAN-SEAFDEC Common Position on the Proposed Listing of Commercially-exploited Aquatic Species into the CITES Appendices" on 16–18 September 2025 in Bangkok, Thailand. The RTC brought together representatives from the ASEAN-SEAFDEC Member Countries, relevant SEAFDEC Departments, FAO, and invited resource persons. During the RTC, technical information as well as the views and positions of the ASEAN-SEAFDEC Member Countries on eleven proposals to list commercially-exploited aquatic species (CEAS) were compiled, and the resulting document was subsequently submitted to and approved by the SEAFDEC Council and the ASEAN *ad referendum*.

RTC on the ASEAN-SEAFDEC Common Position on the Proposed Listing of Commercially-exploited Aquatic Species into the CITES Appendices on 16–18 September 2025 in Bangkok, Thailand

Under **Output 3**, the representatives from the SEAFDEC Secretariat participated in the "20th Meeting of the Conference of the Parties to the Convention on Endangered Species of Wild Fauna and Flora (CITES CoP20), which took place from 24 November to 5 December 2025 in Samarkand, Uzbekistan. In conjunction with this CITES CoP20, SEAFDEC also organized on 24 November 2025 a side event titled "Sustainable Utilization of Commercially-exploited Aquatic Species (CEAS) in Southeast Asia." The side event highlighted the progress and achievements of Southeast Asian countries in advancing the sustainable utilization of CEAS, emphasizing the role of SEAFDEC in strengthening scientific knowledge, management frameworks, and regional cooperation in response to international requirements, including those of CITES. Initiatives for the sustainable utilization of tropical anguillid eels were highlighted, with a focus on research and capacity-building activities, as well as efforts to strengthen sustainable management frameworks across Southeast Asia.

20th Meeting of the Conference of the Parties to CITES (CITES CoP20) on 24 November– 5 December 2025 in Samarkand, Uzbekistan

A side event "Sustainable Utilization of Commercially-exploited Aquatic Species (CEAS) in Southeast Asia" organized by SEAFDEC on 24 November 2025 in conjunction with the CITES CoP20

Moreover, the representatives from SEAFDEC Secretariat also participated in regional fora to share the CITES-related initiatives, including:

- 20th Meeting of the ASEAN Working Group on CITES and Wildlife Enforcement (AWG-CITES and WE) (virtual meeting organized by ASEAN on 1 July 2025) to present updates on the implementation of CITES-related activities by SEAFDEC and its technical Departments.
- Special Senior Officials Meeting of the 46th Meeting of the ASEAN Ministers on Agriculture and Forestry (Special SOM-46 AMAF) (virtual meeting organized by ASEAN on 19 August 2025) to present the ongoing regional initiatives with a highlight on the regional initiative on management of tropical anguillid eels

Monitoring and raising awareness of international fisheries-related issues and its impact on fisheries and aquaculture in the region

In 2025, representatives from the SEAFDEC Secretariat participated in several regional and international platforms to share updates and reports on the outcomes of SEAFDEC activities, reflecting regional interest and contributions to the sustainable development of fisheries and aquaculture in Southeast Asia.

For the ***regional platforms*** under the ASEAN mechanism, the representative from the SEAFDEC Secretariat participated in the "17th Meeting of the ASEAN Fisheries Consultative Forum (17th AFCF)" on 22 July 2025 and the "33rd Meeting of the ASEAN Sectoral Working Group on Fisheries (33rd ASWGFi)" on 23–24 July 2025. Both events were organized in Yangon, Myanmar, and hosted by the Department of Fisheries of Myanmar.

At the 17th AFCF, SEAFDEC shared updates on ongoing initiatives implemented during 2025, aimed at supporting AMSs in addressing international and emerging fisheries-related issues. The initiatives covered key areas, including the management of fishing capacity and zoning systems, promotion of sustainable small-scale fisheries, addressing the impacts of climate change on fisheries and aquaculture, combating illegal, unreported and unregulated (IUU) fishing, and enhancing traceability of fisheries and aquaculture products.

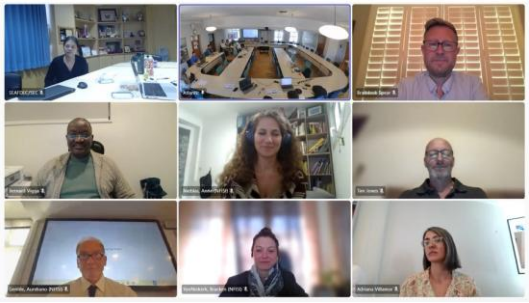
The 17th AFCF on 22 July 2025 (left) and 33rd ASWGFi on 23–24 July 2025 (right) in Yangon, Myanmar

During the subsequent 33rd ASWGFi, SEAFDEC reported the outcomes of the 27th Meeting of the Fisheries Consultative Group (FCG/ASSP) held in December 2024. The 33rd ASWGFi was informed of 23 ongoing projects implemented under the ASEAN-SEAFDEC Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) mechanism during 2024–2025. Of these 23 projects, 12 were completed in 2024, while 11 were to be continued in 2025. In addition, eight new JTF-supported projects were approved to commence in 2025. Moreover, the 33rd ASWGFi endorsed two regional policy documents for endorsement by higher ASEAN bodies, namely: 1) Report of the Stock and Risk Assessments of Two Seerfish Species (*Scomberomorus guttatus* and *S. commerson*) Resources (1950–2022) in the Southeast Asia Region using ASPIC 5; and 2) Regional Guidelines on Good Manufacturing and Handling Practices (GMP & GHP) for Ready-to-Eat Raw Fish and Fishery Products. These two regional policy documents were subsequently submitted to and adopted at the 47th AMAF held on 1 October 2025, in the Philippines.

As for the ***international platforms***, SEAFDEC participated in fisheries-related fora as follows:

- Regional Workshop on WTO Agreement on Fisheries Subsidies and Support for its Implementation (organized by BOBP-IGO, 15–16 May 2025, Chennai, India)
- Intersessional Workshop of the Sustainable Ocean Initiative Global Dialogue with Regional Seas Organizations and Regional Fishery Bodies (organized by SOI, 7–8 June 2025, Théoule-sur-Mer, France) *(online participation)*
- The Conference on Forest to Reef (organized by Forestry Department and Department of Fisheries of Brunei Darussalam, 17–19 June 2025, Bandar Seri Begawan, Brunei Darussalam)
- 14th Steering Committee Meeting of the Fisheries and Resources Monitoring System (FIRMS) (organized by FAO, 30 June–1 July and 4 July 2025, Copenhagen, Denmark) *(online participation)*
- 28th Session of the Coordinating Working Party on Fishery Statistics (CWP) (organized by FAO, 2–4 July 2025, Copenhagen, Denmark) *(online participation)*
- 34th Governing Council Meeting of the Network of Aquaculture Centres in Asia-Pacific (organized by NACA, 3–5 July 2025, Wuxi, China)

Regional Workshop on WTO Agreement on Fisheries Subsidies and Support for its Implementation on 15–16 May 2025 in Chennai, India



The 14th Steering Committee Meeting of the FIRMS held on 30 June–4 July, back-to-back with the 28th Session of the CWP on 2–4 July 2025 through the online platform

Through participation in these international dialogues, SEAFDEC enhanced its visibility and access to up-to-date information on global fisheries-related developments, while also strengthening collaboration with international and regional partners. More importantly, the regional fisheries perspectives were effectively conveyed during relevant international discussions to safeguard the region's priorities and interests toward the sustainable development and management of fisheries and aquaculture.

5.2 Recognition of the importance of gender equality in the fisheries and aquaculture sector

With the adoption of the "SEAFDEC Gender Strategy" by the SEAFDEC Council in 2019 aiming at mainstreaming gender in SEAFDEC and its programs, SEAFDEC continued to enhance knowledge on gender for its staff as well as those of the Member Countries. The gender considerations were integrated into various SEAFDEC programs and projects as relevant and applicable.

In 2025, SEAFDEC/TD organized a number of orientations for the new officers, *i.e*. "In-house Training Course on SEAFDEC Gender Mainstreaming on 1 May 2025 for new staff at TD and on 7 May 2025 for new staff and eight Regional Fisheries Policy Network (RFPN) members at the SEAFDEC Secretariat in Bangkok. A total of 32 participants, comprising 19 women and 13 men, engaged in focused discussions covering gender integration strategies, relevant workplace policies, and SEAFDEC's existing gender-responsive initiatives. Key aspects highlighted during the sessions included the critical importance of embedding gender perspectives across all levels of SEAFDEC's work, including its programs, research, and policy development, aligning with the United Nations' Sustainable Development Goal 5, which champions Gender Equality. Moreover, to enhance knowledge on gender for Thai university students, the Gender Focal Person of TD gave a lecture on "Gender Mainstreaming in Fisheries" on 25 August 2025 at the Faculty of Fisheries, Kasetsart University.

In-house Training Course on SEAFDEC Gender Mainstreaming for TD and RFPN members

To strengthen further cooperation and collaboration with Member Countries and other organizations on gender aspects, SEAFDEC officers participated in the "9th Global Conference on Gender in Aquaculture and Fisheries (GAF9)" on 1–3 October 2025 at the Asian Institute of Technology (AIT), Pathum Thani, Thailand, under the theme "Transforming Aquaculture and Fisheries for Gender Justice." GAF9 was

intended to promote equitable collaboration among stakeholders, advance gender-focused research and practice, and highlight the vital roles of women in the fisheries and aquaculture sectors. SEAFDEC actively contributed to GAF9 through presentations on "Boosting Gender Roles in Southeast Asian Fisheries and Aquaculture for Addressing Policy Gaps" and "Exploring Indonesian Women's Contribution to Inland Fisheries in the Context of the Blue Economy"; organizing a special session on "SEAFDEC's Initiative to Advance Gender Equality in Fisheries and Aquaculture in Southeast Asia"; and serving as a panelist in the FAO special session on "Exploring and Expanding Understandings of Gender Identity and Expression in Fisheries."

Furthermore, the Gender Focal Person of TD participated in the "FAO Regional Workshop on Strengthening Sustainable Aquatic Food Value Chain for Enhanced Food Security and Nutrition in Asia," held on 2–4 December 2025 in Chennai, India. During the workshop, SEAFDEC delivered a presentation entitled "Aquatic Food Value Chain: Status and Key Concerns in SEAFDEC Countries." The presentation highlighted SEAFDEC's ongoing programs that support fishers' livelihoods through improvements in supply and value chains, with particular emphasis on gender concerns within these chains. In addition, the Focal Person of TD served as the chair for the second round of country presentations, during which six countries—India, the Maldives, the Philippines, Sri Lanka, Thailand, and Viet Nam—shared their national situations, key achievements, and challenges in strengthening sustainable aquatic food value chains. Subsequently, the Focal Person participated in the virtual workshop for the "EAF-Nansen Programme Gender Strategy and Action Plan Launch," held on 9 December 2025. The workshop aimed to introduce the Programme's revised Gender Strategy and to engage partners in discussions on their roles in implementing the new Gender Action Plan. During the workshop, the Focal Person delivered a presentation on SEAFDEC's gender strategy and ongoing efforts to promote gender equality in the fisheries sector.

The Gender Focal Person of TD during GAF9 (left) and the FAO Regional Workshop on Strengthening Sustainable Aquatic Food Value Chain for Enhanced Food Security and Nutrition in Asia (right)

6. Strategy 6. Empowering SEAFDEC to strengthen its roles in the region and to improve its services to Member Countries

Fisheries Resource Survey and Operational Plan for M.V. SEAFDEC 2

FCG/ASSP Project no. 17

Status: *Ongoing (on track)*

The M.V. SEAFDEC 2, granted by the Government of Japan, has been used by SEAFDEC/TD since 2004 to support Southeast Asian countries in conducting fishery resource surveys to better understand the marine fishery resources in their respective waters. This had been facilitated through the ongoing Project of TD "Fisheries Resource Survey and Operational Plan for M.V. SEAFDEC 2." In 2025, M.V. SEAFDEC 2 carried out five cruise surveys, totaling 63 working days.

The first cruise was the "1st Shipboard Training on Research Methods to Collect and Analyze the Marine Debris and Microplastics" on 28 January 2025 as part of the "1st Regional Training Course on the Liable Research Methods to Collect and Analyze Marine Debris and Microplastics." Aimed at building

capacity in research methods for the collection and analysis of marine debris and microplastics, the shipboard training activities include trawl-net operations for seafloor debris surveys, neuston-net operations for collecting microplastics in seawater, and visual observations of floating marine debris in the upper Gulf of Thailand. A total of 27 participants attended this training.

The 1st Shipboard Training on Research Methods to Collect and Analyze the Marine Debris and Microplastics on 28 January 2025

The second cruise was the "Marine environment and fishery resource survey and evaluate the impacts of microplastics on fisheries" from 10 February to 14 March 2025. Covering 51 stations in the Gulf of Thailand, the activities at each station included measuring water properties using CTD, sampling demersal fish and seafloor debris using a bottom trawl net, collecting larvae samples using a Neuston net, collecting microplastics contamination in water using a Neuston net, and collecting floating marine debris by visual observation. In total, fisheries data from 46 stations, environmental data from 51 stations, and floating debris from 60 tracks were collected during this survey.

Sampling demersal fish and seafloor debris using a bottom trawl net (left) and collecting larvae samples and microplastics contamination in water using a Neuston net

The third cruise was the "Sea Trial to Test the Navigation and Engine Equipment" from 7 to 8 August 2025 in the Gulf of Thailand. Fourteen TD crew members, a navigator, and three engineers joined the cruise and gained experience in navigation and marine engineering.

The fourth cruise was the "Fisheries Acoustic Survey in West Coast of Peninsular Malaysia Waters for Pelagic Fish Stock Assessment" from 2 to 27 September 2025. The survey covered 29 stations in the waters off the West Coast of Peninsular Malaysia. Hydroacoustic data were recorded using the EK80 echosounder while the ship navigated between stations along horizontal lines, while water properties were measured using a CTD at each station. At 16 stations, water samples were collected using Rosette samplers, phytoplankton samples using a plankton net, and larvae and zooplankton samples using a Bongo net.

Recording hydroacoustic data using the EK-80 (left) and collecting plankton and fish samples (middle and right) during the Fisheries Acoustic Survey in West Coast of Peninsular Malaysia Waters for Pelagic Fish Stock Assessment from 2 to 27 September 2025

The last cruise in 2025 was the "2nd Shipboard Training on Research Methods to Collect and Analyze the Marine Debris and Microplastics" on 22 December 2025 in the upper Gulf of Thailand. This cruise was a part of the "2nd Regional Training Course on the Liable Research Methods to Collect and Analyze Marine Debris and Microplastics" and aimed at building capacity in research methods for the collection and analysis of marine debris and microplastics. The shipboard training activities include trawl-net operations for seafloor debris survey, neuston-net operations for collecting microplastics in seawater, and visual observations of floating marine debris. A total of 25 participants joined the shipboard training.

The 2nd Shipboard Training on Research Methods to Collect and Analyze the Marine Debris and Microplastics on 22 December 2025

6.2 Enhancing human resources within the SEAFDEC organization

USAID DOI International Technical Assistance Program (ITAP)

Departmental Program no. 10

Status: *Suspended*

The U.S. DOI International Technical Assistance Program (DOI-ITAP) is working in close collaboration with governmental and nongovernmental partners to facilitate the exchange of the DOI technical experts with international counterparts on all aspects of natural and cultural resources management, supports technical assistance and training. DOI-ITAP collaborates with State and federal U.S. agencies, foreign governments, and civil society groups to excel as an active leader in the global conservation community. Recognizing the importance of addressing IUU fishing and supporting SEAFDEC human resource development, a Memorandum of Understanding (MOU) was established between the U.S. DOI and SEAFDEC in August 2023 with the objective to enhance the capacity development of SEAFDEC staff on fisheries management and resilience in the context of climate change and strengthening capacity in fisheries resources and marine environmental research survey, which focuses on implementing a holistic way to manage fisheries and marine resources. This project is being implemented by SEAFDEC/Training Department (SEAFDEC/TD) from 1 October 2023 to 30 September 2024 and has been extended to 30 September 2025. There are three scopes of activities under this Project, *i.e.* 1) Fisheries Resilience and Management, 2) Climate Change and Fisheries Stock

Assessments, and 3) Strengthening Capacity of the Marine Fisheries Resources and Marine Environmental Research Survey.

Nevertheless, this activity has been suspended in 2025, pending consultation with DOI to verify whether it can be continued and to obtain guidance regarding the project closeout process.

7. Special Project

USAID Southeast Asia Fisheries Partnership

FCG/ASSP Project no. 18

Status: *Ongoing (on track)*

SEAFDEC entered into an Agreement with the United States Agency for International Development (USAID) via a Public International Organization (PIO) Grant provided by the USAID Regional Mission for Asia (USAID/RDMA) in October 2023 under the "**Southeast Asia Fisheries Partnership**" or **SEAFish**, a five-year project running from 1 October 2023 to 30 September 2028. The SEAFish Activity has the overarching goal for "fisheries and aquaculture practices and productions improved and managed sustainably" with three objectives, namely: 1) Fishery policies, programs, and plans supported by SEAFDEC are adopted and implemented by national fisheries agencies; 2) Commercial and small-scale fishers have appropriate financial and human resources, capacity, and good governance to adopt sustainable fishing and aquaculture practices; and 3) Increase operational and technical capacity among national fisheries agencies and fisheries institutions.

Although this PIO Grant Agreement was terminated on 25 March 2025 due to the policy adjustment by the U.S. Government, on 11 August 2025, the SEAFDEC Secretariat received a "Notice of Intent to Reinstate the USAID Southeast Asia Fisheries Partnership (SEAFish) Activity" from the U.S. Department of State. Following the receipt of the Notice, the SEAFDEC Secretariat held discussions with the Regional Strategic Assistance Section of the U.S. Embassy in Bangkok, Thailand, and developed the revised workplan for 2025–2026, focusing on Objective 3 of the original SEAFish Activity.

To be implemented by the SEAFDEC/TD and administered through the U.S. Embassy in Bangkok, Thailand, the reinstated Activity, titled "U.S. Southeast Asia Fisheries Partnership," will initially consist of two initiatives aimed at strengthening regional capacity for fisheries stock assessment using hydroacoustic survey methods. These initiatives represent a strategic investment in regional human resource development by equipping AMSs and TD with modern tools, technical expertise, and enhanced collaborative capacity to support science-based and sustainable fisheries management in the region. Due to time constraints at the end of 2025, after confirmation of the detailed workplan and budget by the U.S. Embassy, the technical activities will be implemented in 2026.

SEAFDEC PROGRAMS FOR 2026

During the Forty-eighth Meeting of the SEAFDEC Program Committee on 3–5 November 2025 in Langkawi, Malaysia, the programs and projects to be implemented by SEAFDEC in 2026 were scrutinized and endorsed. These programs and projects had been categorized as 1) Projects under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism (17 ongoing projects, one new project); 2) Departmental Programs (eight programs); and 3) Pipeline Projects (two projects). The list and description of programs and projects in 2026 are as follows:

1) Projects under the FCG/ASSP Mechanism

Ongoing Projects

Project Title	Lead Department	Funding source
Strategy 1: Securing the sustainability of fisheries to contribute to food security, poverty alleviation and livelihood of people in the region		
1. Implementation and Assessment of the ASEAN Regional Plan of Action for the Management of Fishing Capacity *(2024–2026)* The objective of this Project is to assess the implementation of the "ASEAN Regional Plan of Action for the Management of Fishing Capacity" and regional fishery information systems/mechanisms to facilitate the sharing, exchange, and compilation of fishery data and information that are required at the sub-regional and regional levels for the improvement of transboundary fisheries management. The six expected outputs include: 1) The status of the RPOA-Capacity implementation in AMSs is assessed through the survey conducted in AMSs; 2) The relevant existing fisheries information systems/ mechanisms are compiled; 3) Simple and practical indicators are harmonized in supporting the planning and monitoring of sustainable fisheries of pelagic fish; 4) Current status on conservation and management strategies of selected pelagic fishes in AMSs are identified and documented; 5) Terminal report is prepared and published; and 6) Project monitoring and evaluation are conducted. In 2026, MFRDMD plans to organize key activities under outputs 4, 5, and 6, namely: Output 4 • RTC on conservation efforts and management strategies of selected pelagic fisheries resources in AMSs Output 5 • Compilation of information for the success stories for each output • Compilation of information for the draft of the terminal report • Finalization of terminal report Output 6 • Project terminal review and evaluation workshop	MFRDMD	JAIF
2. Enhanced Marine Research Capacities to Manage Fisheries Resources *(2025–2029)* The Project has three expected outcomes. For ***Outcome 1***, *i.e.* SEAFDEC Member Countries can use the ecological information-based fish stock assessment system for pelagic fishes and sharks in the Southeast Asian region for sustainable use of regional fish stocks, the expected outputs are: 1) Biology and ecology information & data collection for pelagic species; 2) Landing data collection and age-length-key development (for cohort estimation); and 3) Establishment of stock assessment methodology for pelagic and sharks. For ***Outcome 2***, *i.e.* SEAFDEC Member Countries' researchers can have a better	MFRDMD & TD	JTF

Project Title	Lead Department	Funding source
understanding of the impacts of marine environmental change on fisheries resources, the expected outputs are: 1) Scientific research of marine environment changes impact on fisheries resources, habitat and so on; 2) Improve knowledge on vulnerability assessment of fisheries resources in response to climate change; and 3) Capacity building to SEAFDEC and Southeast Asian Member Countries researchers on marine environment change monitor and its impact on fisheries resources. For ***Outcome 3****, i.e.* Researchers and officers of SEAFDEC Member Countries can conduct effective hydroacoustic surveys using quantitative echo sounder, the expected outputs are: 1) Develop and disseminate regionally relevant methodologies for hydroacoustic surveys as well as the regional hydroacoustic survey data information; and 2) Database/catalog information on the Target Strength (TS) of the economically important fish species. In 2026, the SEAFDEC/MFRDMD in collaboration with TD plan to conduct activities under the three outcomes: **Outcome 1:** Output 1.1 • On boat larvae/egg sampling and oceanography data collection through the fishing seasons • Species identification analysis for target pelagic species by Morphological and genetic approach • Research of acoustic study Output 1.2 • Sampling and data collection of targeted small pelagic and sharks Output 1.3 • Cohort information-based stock assessment models will be designed for small pelagic in collaboration with related countries • Cohort data & info is served as a parameter of a growth rate in YPR: Yield per recruitment for targeted sharks stock assessment, to provide scientific information with NDF of sharks and related species **Outcome 2:** Output 2.1 • Consultation workshop on collaborative study on climate variability caused by the Indian Ocean Dipole (IOD) and its impacts on fishery resources in the Andaman Sea • Research survey, data gathering and data analysis Output 2.2 • Training workshops for participating countries Output 2.3 • Training course on analyzing the relationship between catch data and fish biological data and the amplitude of the IOD • Participation in national or international forum on marine environmental change and fisheries resources **Outcome 3:** Output 3.1 • Regional hydroacoustic training course • Participation of staff in AFAS 2026 Output 3.2 • Research study on the Target Strength (TS) of the economically important fish species		

Project Title	Lead Department	Funding source
3. Improving Fishers' Livelihood and Fisheries Co-management in Inland and Coastal Small-Scale Fisheries *(2025–2029)* The Project has two expected outcomes. For ***Outcome 1***, *i.e.* Fisheries officers in participating Member Countries enhance their capacity on the community-based fisheries management and co-management approaches in small-scale fisheries, promoting sustainable livelihoods and utilization of fisheries resources, the expected outputs are: 1) Development and implementation of community-based fisheries management/co-management and support livelihood of coastal small-scale fisheries in the pilot sites (TD); 2) Development and implementation of community-based fisheries management/ co-management and support livelihood of inland small-scale fisheries in the pilot sites (IFRDMD); 3) Enhanced regional cooperation and knowledge sharing for sustainable small-scale fisheries management (TD and IFRDMD); and 4) Guidelines for fisheries management in inland fishers' livelihoods developed (IFRDMD). For ***Outcome 2***, *i.e.* Fisheries officers develop their comprehensive understanding of the supply chain dynamics in small-scale fisheries to improve the fisher's livelihood, the expected output is 1) Improved supply chain in small-scale fisheries in the pilot sites. The activities in 2026 include: **Outcome 1:** Output 1.1 • Implementation of CBFM/co-management activities (Thailand and Cambodia) Output 1.2 • Conduct studies to assess the needs of communities in selected pilot sites (Lao PDR) • Capacity building on fisheries management tools will be implemented at the pilot sites (Lao PDR) Output 1.3 • Online annual meeting to share and update progress of coastal and inland pilot sites • Participation of staff in regional and international meetings **Outcome 2:** Output 2.1 • Study on small-scale fisheries supply chain • Development and improvement of small-scale fisheries supply chain	TD & IFRDMD	JTF
4. Digital Transformation of Regional Fishery Statistics and Enhanced Utilization of Fishery Statistics and Information in Southeast Asia *(2025–2029)* This Project has the expected outcome of better usage by the AMSs, other countries, organizations, etc. of fishery statistics and information in Southeast Asia to support policy planning and fishery management, as well as for other purposes. The expected outputs of the Project are: 1) New SEAFDEC Statistical Database established in line with the Regional Framework for Fishery Statistics of Southeast Asia (2024 Edition); 2) the SEAFDEC publication "Southeast Asian State of Fisheries and Aquaculture 2027 (SEASOFIA 2027)" disseminated the latest information on the status and trends of fisheries and aquaculture in the region; and 3) The SEAFDEC publication "Fish for the People" disseminated information on fisheries issues and relevant regional initiatives. In 2026, the Project will undertake the following activities: Output 1	SEC	JTF

Project Title	Lead Department	Funding source
• Improving SEAFDEC Statistical Database in line with the revised Regional Framework (Phase II, 2026) • Participation in the relevant fora and establishment of cooperation networks with other organizations on fishery statistics Output 2 • Compilation of inputs for "SEASOFIA 2027" and organizing the second workshop with SEAFDEC Departments to finalize the draft of "SEASOFIA 2027" Output 3 • Preparation, production, and dissemination of two issues of "Fish for the People" *i.e.* Vol. 24 No. 1 and No. 2		
5. Enhancement of Regional Cooperation and Human Resource Development to Eliminate IUU Fishing *(2025–2029)* The Project has the expected outcome for the AMSs to be strengthened and cooperate in combating IUU fishing and implementation of monitoring, control and surveillance (MCS) to eliminate IUU fishing in Southeast Asia. The expected outputs of this Project are: 1) Improvement of the RFVR Database with a focus on carrier vessels for utilization between neighboring countries smaller than 24 meters in length; 2) Strengthen the traceability of fish and fishery products including commercial and small-scale fishers; and 3) Enhancement of capacity of the AMSs in combating IUU fishing relevant issues and/or MCS to eliminate IUU fishing. In 2026, TD will implement activities as follows: Output 1 • Development of RFVR database on carrier vessels for utilization between neighboring countries smaller than 24 meters in length Output 2 • Study and improvement of traceability tools functionality to align with the market Output 3 • Regional workshops/meetings for sharing information relevant to combat IUU fishing and/or MCS to eliminate IUU fishing among AMSs • Participation of staff in national/regional/international meetings relevant to eliminating IUU fishing	TD	JTF
6. ASEAN-JICA Cooperation for Capacity Building on IUU Fishing Countermeasures in Southeast Asia *(2024–2027)* With the expected outcome towards improved AMSs' understanding of the practices and actions necessary to deter IUU fishing, the Project comprises three expected outputs, namely: 1) Responsible fishing technologies and practices to combat IUU fishing are promoted, 2) The capacity of AMSs to combat IUU fishing activities is enhanced through effective management tools of traceability for fish and fishery products, and 3) Policy measures to combat IUU Fishing are enhanced in AMSs. In 2026, TD plans to organize key activities, namely: Output 1 • Training courses on responsible fishing technologies/practices to combat IUU fishing in Southeast Asia Output 2 • Training course on human resource development on traceability for fish and fishery products for eliminating IUU fishing	TD	JICA

Project Title	Lead Department	Funding source
• On-site training on traceability for fish and fishery products for relevant stakeholders in AMSs (2 countries) Output 3 • Regional capacity building workshop on enhancing policies and countermeasures against IUU fishing in Southeast Asia • Training course for fisheries inspectors in the implementation of Port State Measures		
7. Research and Dissemination of Sustainable Fishing Technology *(2025–2029)* This Project has two expected outcomes. For ***Outcome 1***, *i.e.* Officials of SEAFDEC Member Countries enhance their technical knowledge of best practices and innovative technologies for optimizing fuel usage/alternative/renewable energy sources and fishing gear, there are two expected outputs, namely: 1) SEAFDEC compiles and suggests knowledge to reduce the costs of fishing operations and negative impact by avoiding greenhouse gas emissions for small-scale fisheries; and 2) Compilation of research study on fuel consumption reduction and greenhouse gas emissions in bottom trawl fishing through innovative techniques. For ***Outcome 2***, *i.e.* Officials of SEAFDEC Member Countries enhance their awareness of hygienic fish handling tools and techniques, ensuring improved quality of catches, promoting food safety, and reducing post-harvest losses in the Southeast Asian region, the expected output is: 1) SEAFDEC compiles and suggests appropriate post-harvest fish handling practices to reduce fish losses and waste for small-scale fisheries. In 2026, TD will undertake the following activities: **Outcome 1:** Output 1.1 • Field survey at a pilot site in Thailand to collect baseline data on propeller use in small-scale fishing vessels, explored ways to reduce operational costs, and identify potential improvements in propeller technology Output 1.2 • Experiment on Vee type otterboard and trawl net modification for reducing fuel consumption **Outcome 2:** Output 2.1 • Field survey to evaluate the advantages and disadvantages of cooling ice packs and solar ice banks, including a literature review to create the implementation plan.	TD	JTF
8. Regional Collaborative Research and Capacity Building for Monitoring and Reduction of Marine Debris from Fisheries in Southeast Asia *(2024–2026)* This project has the expected outcome toward regional collaborative research and capacity building in the fisheries sector including the application of scientific knowledge of regional policies and monitoring based on four priority areas of the "ASEAN Framework of Action on Marine Debris" for combating marine debris in Southeast Asia. The expected outputs are: 1*) Policy Support and Planning* – A technical guideline outlining the status and ALDFG in ASEAN and measures to prevent and remove ALDFG; 2) *Research, Innovation and Capacity Building* – Risk assessments and enhancement of AMS's capacity on methods to collect and analyze marine debris and microplastics; and 3) *Public awareness, education and outreach* – Marine debris management are strengthened and promoted in AMSs; and Updated scientific-based knowledge	SEC	JAIF

Project Title	Lead Department	Funding source
and technical guidance are shared and enhanced among relevant sectors; and 4) *Private Sector Engagement* – Marking of fishing gears is promoted. In 2026, SEAFDEC plans to organize key activities as follows: Output 1 • Preparation of report based on information gathering on fishing gear loss • In-house workshop to gather information and develop strategies for ALDFG removal methods • Preparation of the ALDFG guidelines • 2nd Regional Workshop for information exchange and the development of technical guidance on ALDFG countermeasures will be held Output 2 • Preparation of report on environmental research survey to evaluate microplastics and other marine environment situations related to fisheries resources at sea • Preparation of research report on the amount of marine debris collected by fishing activities • Preparation of research report on the impact from contaminants of microplastics in freshwater fish and marine fish • Preparation of the training on liable research methods to collect and analyze the marine debris and microplastics Output 3 • Regional Symposium on Marine Debris and Microplastics in Fisheries in Southeast Asia • Public outreach and information dissemination through the Marine Debris website and distribution of information materials Output 4 • Preparation, development and promotion of the technical manual on methods for marking fishing gears		
9. Enhanced Research Capacities for Sustainable Utilization and Management of Eel and Other Inland Fisheries Resources *(2025–2029)* The Project has two expected outcomes. For ***Outcome 1***, *i.e.* SEAFDEC Member Countries can practice the stock assessment model of Anguillid eels, the expected output is: 1) Development and dissemination of stock assessment model of Anguillid eels. For ***Outcome 2***, *i.e.* SEAFDEC Member Countries can enhance knowledge about the biomass estimation approach and conservation of inland fishery resource, the expected outputs are: 1) Development of the biomass estimation approach and conservation of inland fishery resources; and 2) the project management. Activities in 2026 under the two expected outcomes are: **Outcome 1:** Output 1.1 • Conduct a study to collect the data of catch and CPUE of Anguillid eel fisheries in Indonesia • Capacity building on collecting the data of Anguillid eel fisheries • Follow-up activities at pilot sites **Outcome 2:** Output 2.1 • Development of an approach for biomass estimation of inland fisheries • Implementation of SPEECTRA system as the inland fisheries management model Output 2.2 • Coordination by the project leader	IFRDMD	JTF

Project Title	Lead Department	Funding source
10. Development of Stock Assessment Methods and Strengthening of Resources Management Measures for Tropical Anguillid Eel in Southeast Asia *(2020–January 2026, with no-cost extension until 31 May 2026)* The Project started in 2020 and aimed to collect the catch data and biological/ecological information for the estimation of eel resources stocks, and to develop mathematical/statistical methods for estimating tropical anguillid eel resources stocks in order to formulate effective management measures for the sustainable use of tropical anguillid eels in Southeast Asia. The expected outputs are: 1) Resources stock status of the tropical anguillid eel species; 2) Annual catch and CPUE are estimated; and 3) Effective management measures based on assessment of tropical anguillid eel stocks are proposed, formulated and centralized/harmonized. Most technical activities were accomplished in 2025, and the Project was scheduled to complete in January 2026. However, JAIF approved the project no-cost extension until 31 May 2026 to complete study on the distribution, the level of diversity, and stock structure of anguillids eels, and finalization of scientific papers.	SEC	JAIF
11. Sustainable Management of Fisheries, Marine Living Resources and Their Habitats in the Bay of Bengal Region for the Benefit of Coastal States and Communities (BOBLME Phase II) *(2024–2028)* The Project objective is to contribute to sustainable management of fisheries, marine living resources and their habitats in the Bay of Bengal region to reduce environmental stress and improve environmental status for the benefit of coastal states and communities. This will be achieved through five interlinked Project components based on the Strategic Action Programme (SAP) themes, namely: 1) Sustainable management of fisheries; 2) Restoration and conservation of critical marine habitats and conservation of biodiversity; 3) Management of coastal and marine pollution to improve ecosystem health; 4) Improved livelihoods and enhanced resilience of the BOBLME; and 5) Regional mechanism for planning, coordination and monitoring of the BOBLME. SEAFDEC will be the Executing Agency responsible for the Project implementation in participating SEAFDEC Member Countries, namely: Indonesia, Malaysia, and Thailand; while the implementation in non-SEAFDEC members, *i.e.* Bangladesh, India, the Maldives, and Sri Lanka would be under the responsibility of the BOBP-IGO. For the fiscal year 2026–2027 (1 July 2026–30 June 2027), the Project will continue implementing activities, namely: **Component 1:** *Outcome 1.1 EAFM institutionalized at national level, including targeted transboundary fish stocks* Output 1.1.1 At least 2 EAFM plans implemented in each country • National Workshop to review EAFM needed (Start-up A) • National Workshop to review EAFM needed (Start-up B) • National Workshop on EAFM plans development • Regional Workshop on the development of sub-regional EAFM plan (3 species: hilsa, mackerel and neritic tuna) • E-EAFM Training • LEAD EAFM Training • EAFM Implementation in the country's sites Output 1.1.2 National and regional platforms established or strengthened to involve grassroots stakeholders in management decision-making • National EAFM to share results and lessons learned from the activities	TD	FAO/GEF and Norad

Project Title	Lead Department	Funding source
• Group monitoring and reporting to SEAFDEC and CCR-BOBLME Output 1.1.3 EAFM training embedded in national and regional training institutions • Capacity of training providers to deliver EAFM strengthened (for non-community members) • Regional network of EAFM providers developed (regional workshop: annual workplan/progress/lessons learned) <u>Outcome 1.2</u> *IUU catch in the BOBLME reduced* Output 1.2.1 BOBLME countries join and implement a Regional Plan of Action (RPOA) on IUU fishing • Series of workshops to review the status of RPOA- and NPOA-IUU through exchanging information and monitoring of IUU fishing vessels • Supporting BOBLME countries to participate in workshops or meetings to establish network on RPOA-IUU Output 1.2.2 National POAs-IUU and national IUU MCS systems and Vessel Monitoring System (VMS) strengthened • Review and report of current national MCS system, status of existing NPOA IUU through the conclusion of relevant issues • Training in support of the implementation of the NPOA-IUU for Indonesia or Malaysia • Strengthening of sub-regional hubs and sharing of lessons and needs of national capacity development will be a part of the agenda in the Regional Workshop under 1.2.1 on Innovation and development of MCS tools Output 1.2.3 Tools for promoting best practices to combat IUU developed and implemented • Study and review on the needs of each Member Country on MCS, PSM and traceability • Confirmation mechanism of capacity needs under MCS, PSM and traceability • Introduction of Innovation MCS tools developed for pilot countries • Promotion and encouragement to BOBLME Countries to implement Innovation MCS tools in pilot sites • On-site training on the use of Innovation MCS tools in participating countries • Hiring a Combating IUU Fishing Coordinator/ Project Assistant Output 1.2.4 Regional Capacity Development Program on port inspection, MCS, and traceability implemented • Review of regional capacity development partners and their capacity development needs • Regional capacity development program to support the implementation of MCS **Component 3:** <u>Outcome 3.1</u> *Pollution from discharge of untreated sewage and wastewater; solid waste and marine litter; and nutrient loading reduced or minimized in selected hotspots in river, coastal and marine waters* Output 3.1.1 Dissemination of improved waste management practices in fishing harbors • Country implements the study (desk study) on fishing harbor standard and fishing harbor management • Midterm data validation workshop (a one-day workshop will be conducted after three months of country implementation) • Online follow-up meeting Output 3.1.2 Promotion of marking of fishing gears and the development and dissemination of corresponding regional guidelines		

Project Title	Lead Department	Funding source
• Country implements the study/trial on lost fishing gear and fishing gear marking as the plan (based on results from Year 1) • Midterm data validation workshop (a one-day workshop will be conducted after three months of country implementation), in-person • Follow-up by visiting the pilot site in each country **Component 5:** <u>Outcome 5.1</u> *Strengthened institutional mechanisms at regional and national levels for planning, coordination, and monitoring of the BOBLME* • Travel for CCR-BOBLME Working group formed to develop CCRBOBLME, meetings • Travel for Meeting of CCR-BOBLME • Meetings for the establishment of National intersectoral coordination committees to support SAP implementation <u>Outcome 5.2</u> *Adaptive results-based management and sharing of information and lessons learned* • International consultant CCRBOBLME development • Meetings of the Working Groups for the Monitoring System operating and providing systematic and regular information updates on progress towards reaching BOBLME SAP targets and develop recommendations on LME SAP implementation monitoring framework workshops • Communication and awareness raising: materials, consumables, office rent for the execution of the IW related activities		
12. Promoting the Blue Economy and Strengthening Fisheries Governance of the Gulf of Thailand through the Ecosystem Approach to Fisheries (GoTFish) *(2025–2030)* The aim of the Project is "Improved natural resource governance in the GoT through the implementation of the ecosystem approach to fisheries (EAF) contributing to the broader, regional fisheries objectives of the South China Sea Strategic Action Programme (SCS-SAP)." To achieve this, the GoTFish Project will work on four components: 1) Regional transboundary fisheries governance and management strengthened; 2) Alignment of incentive mechanisms; 3) Ecological Corridor of Critical and Important Habitat for Aquatic Resources in the Gulf of Thailand (with focus on Malaysia); and 4) Stakeholder engagement, communication, monitoring and evaluation. SEAFDEC will be the Executing Agency responsible for Project Component 1 and Component 4 with the four Project participating countries, namely: Cambodia, Malaysia, Thailand, and Viet Nam. The detailed project activities plan for the first fiscal year, *i.e.* 1 December 2025 to 30 June 2026, was endorsed by the First Project Steering Committee (PSC) organized in November 2025, comprising activities to be executed by SEAFDEC/TD as follows: **Component 1.** <u>Outcome 1.1</u> *Improved regional governance and cooperation* • Review legal frameworks and policies across GoT countries to identify alignment and gaps. • Establish a sub-regional platform to enhance policy consistency. • Review past and existing regional working groups; form new stakeholder working groups focusing on priority issues. • Assess and support implementation of existing Regional Action Plans and Regional Plan of Actions (*e.g.* Indo-Pacific mackerel). • Identify 3–4 priority transboundary issues and 3–4 cross-cutting issues through sub-regional workshops.	TD	FAO/GEF

Project Title	Lead Department	Funding source
• Review cost and mode of operation of regional fisheries bodies in other similar large marine ecosystems of the world. • Conduct cost/benefit analysis to determine suitable GoT cooperation mechanisms and agree on at least one regional data-sharing and management mechanism. *Outcome 1.2 EAFM development and implementation* • Develop gender-responsive capacity-building programs for stakeholders in EAFM planning. • Facilitate countries' exchange of experience and reviews of national EAFM plans using adaptive management. • Conduct assessments on status of GoT fishery resources, habitats, ETP species, and ecosystem structure (with EwE modelling). • Develop a sub-regional EAFM plan integrating biodiversity connectivity (using outputs from Component 3). • Establish a sub-regional fisheries information system and initiate the implementation of the national EAFM plan. • Support the integration of fisheries data into broader Marine Spatial Planning (MSP) processes across the GoT. **Component 4:** *Outcome 4.1 Knowledge management, communication, and project monitoring* • Operate the Regional Coordination Unit (RCU); prepare project reports and organize PSC meetings. • Develop and implement a Monitoring and Evaluation (M&E) tracking system; conduct regular monitoring, Mid-Term Review, and Final Evaluation. • Prepare the Environmental and Social Safeguards Plan (ESSP). • Develop knowledge management and communication strategies; maintain project website. • Produce at least 10 knowledge products; share lessons learned via IW:LEARN; participate in IW:LEARN meetings. *Outcome 4.2 Stakeholder involvement & gender equity* • Update and implement the GoTFish Gender Strategy. • Update and implement the Stakeholder Engagement Strategy. As for the activities for the subsequent fiscal year, *i.e.* 1 July 2026 to 30 June 2027, these will be further discussed and endorsed by the next PSC to be organized in the second quarter of 2026.		
Strategy 2: Supporting the sustainable growth of aquaculture to complement fisheries and contribute to food security, poverty alleviation and livelihood of people in the region		
13. Promotion of Aquaculture Technologies for Emerging Species through Good Aquaculture Practices (GAqP) *(2025–2029)* With the goal of attaining sustainable aquaculture through good aquaculture practices (GAqP) and creating a new aquaculture industry through the development of aquaculture technology for emerging species in Southeast Asia, this Project has expected outcome for the AMSs to acquire and establish GAqP-based aquaculture technology for emerging and important species. The Project expected outputs are: 1) Development of aquaculture technologies for emerging species in the hatchery, nursery, and grow-out stages; 2) Development of high-quality and stable oyster and seaweed production systems; 3) Capacity enhancement on GAqP through technological training courses; and 4) Proper practice and support of the project. The activities to be implemented in 2026 include: Output 1	AQD	JTF

Project Title	Lead Department	Funding source
• To enhance broodstock management techniques for kawakawa and to document each stage of embryonic development • To identify the basic requirements for shortfin scad, such as appropriate environmental conditions, stocking density, and nutrition needed for optimum growth • To conduct nursery rearing of glass eels fed with diets containing endogenous probiotics to evaluate their effects on survival, growth, intestinal morphology, and other related parameters • To refine the larval rearing protocol of slipper lobsters through the enhancement of feeding methods, stocking density, and water quality management. Output 2 • While continuing hatchery production runs of oysters, a nursery trial using hatchery-produced spat will be conducted. In addition, regular monitoring of water quality will continue at the study site. • Conduct tests on carrageenan-lysing bacterial isolates obtained from seaweeds infected with IID (ice-ice disease) Output 3 • Implementation of online training courses on aquaculture technologies and fish nutrition • Implementation of in-person training courses on commodity- and community-based aquaculture Output 4 • Project coordination and management • Holding of annual progress meeting		
14. Blue Horizon: Ocean Relief through Seaweed Aquaculture *(2024–2028)* The overarching goal of the Project is to create new sustainable seaweed value chains that will deliver ecosystem services and provide socioeconomic benefits to communities, particularly to households whose livelihoods depend on marine ecosystems. To achieve the goal, the Project will be implemented through its four components, namely: 1) Regional capacity building for seaweed aquaculture; 2) Enabling environment for seaweed aquaculture in the Philippines and Viet Nam; 3) Seaweed value chains (production + processing + marketing); and 4) Knowledge Management, M&E, and IW Learn (regional). SEAFDEC will be hosting the Project Management Unit (PMU) and is responsible for Components 1 and 4. For the fiscal year 2026–2027 (1 July 2026–30 June 2027), the activities to be implemented by SEAFDEC include: **Component 1:** <u>Outcome 1.1</u> *Regionally adopted plans and principles to harmonize seaweed aquaculture in Southeast Asia* • Validate the draft Guide to Promoting a Sustainable Seaweed Industry in the Southeast Asian Region • Conduct of Scientific Technical Working Group (S-TWG) meeting on the Principles of Responsible and Safe Seaweed Aquaculture • Engage consultants to produce training modules and information packages for the 'Guide,' Principles and toolkit, and 3 priority subjects **Component 4:** <u>Outcome 4.1</u> *Full participation in IW: LEARN and knowledge management/communication* • Develop lessons learned/experience notes for IWLEARN participation and website posting	SEC in collaboration with AQD	WWF-US/GEF

Project Title	Lead Department	Funding source
• Develop knowledge products identified in KM Plan • Package and disseminate knowledge products • Maintain a website hosted by AQD, to be continuously updated with project information *Outcome 4.2 Monitoring and evaluation system in place* • Project Steering Committee meeting • Produce and deliver 6-monthly project progress reports • Produce and deliver Financial Reports Quarterly • Organize Adaptive Management/Reflection Meeting (annually)		
Strategy 3: Ensuring the food safety and quality of fish and fishery products for the Southeast Asian region		
-		
Strategy 4: Enhancing trade and compliance of the region's fish and fishery products with market requirements		
15. ASEAN-JICA Food Value Chain Development Project *(2025–2028)* This Project commenced in 2025 with four thematic areas: 1) ASEAN Good Agriculture Practice (GAP); 2) Sanitary and Phyto-sanitary (SPS) measures; 3) Fishery value chain; and 4) Coordination and Research on Public-Private Partnership (PPP)-based Food Value Chain. The proposed activities to be implemented by SEAFDEC are under the third thematic area to support the fisheries sector in achieving the expected output, *i.e.* food safety in the fishery sector is improved by the promotion of GAqP and development of ASEAN guidelines and relevant principles on fisheries inspection mechanism. In 2026, the activities to be implemented include: Output 3 *Activity 3.1 Capacity Building for the Regional Instruments on Hygiene Management System (MFRD)* • Wrap-up Workshop (online) *Activity 3.2 Capacity Building for the ASEAN Regional Guidelines on Cold Chain Management (MFRD)* • Wrap-up Workshop (online) *Activity 3.3 Technical input on laboratory testing methods to the inspection guidelines for imported aquaculture fish and fishery products (MFRD)* • Conduct a survey with all AMSs to understand their priorities and capabilities. Recommended scopes are Biotoxins and Organic contaminants • Develop training materials in preparation for the Technical Training Workshop with defined scope • Training workshop in Singapore which will include the Country report presentation by all AMSs and technical training led by SFA NCFS' specialist team • Develop a draft technical input to the inspection guidelines of laboratory testing methods for imported aquaculture fish and fishery products • Interlaboratory comparison/proficiency test (PT) to allow NCFS to gauge the effectiveness of workshop and AMS' laboratory proficiency *Activity 3.4 Conduct training on ASEAN GAqP for extension officers and auditors (AQD)* • Training Course on Good Aquaculture Practices (Extension Officers) (in the Philippines) • Training Course on Good Aquaculture Practices (Auditors) (in the Philippines) • On-site Training Course on Good Aquaculture Practices (Marine and Inland Aquaculture) (Lao PDR) • On-site Training Course on Good Aquaculture Practices (Marine and Inland Aquaculture) (Viet Nam)	SEC in collaboration with AQD and MFRD	JICA

Project Title	Lead Department	Funding source
• On-site Training Course on Good Aquaculture Practices (Marine and Inland Aquaculture) (Cambodia)		
Strategy 5: Addressing cross-cutting issues, such as labor, gender and climate change, where related to international fisheries		
16. Enhancing Regional Responses to Emerging International Fisheries-related Issues *(2025–2029)* With the goal of ensuring the sustainable utilization of fishery resources by fostering effective and collaborative regional approaches that address international fisheries-related issues while promoting the long-term conservation of inland and marine ecosystems and enhancing the resilience and livelihoods of inland and coastal communities, this Project is implemented by the SEAFDEC Secretariat. The expected outcome is to enhance the capacity of SEAFDEC Member Countries' officials to effectively understand, assess, and respond to emerging international fisheries-related issues and challenges; with three expected outputs, *i.e.* 1) Consolidated views and positions of the countries on the proposal of commercially exploited aquatic species (CEAS) to be listed in the CITES Appendices developed in 2025 and 2028; 2) Regional workshops/consultations provided for sharing information on international/emerging fisheries-related issues; and 3) Participation in international and regional meetings and sharing and delivering the project results. The activities to be undertaken in 2026 include: Output 2 • Regional Workshop on International Fisheries-related Issues Output 3 • SEAFDEC's participation at the 34th Meeting of the Animal Committee or FAO forum • SEAFDEC's participation in event organized within the region addressing international fish-related issues (*e.g.* AWG-CITES and WE)	SEC	JTF
Strategy 6: Empowering SEAFDEC to strengthen its roles in the region and to improve its services to Member Countries		
17. Fisheries Resource Survey & Operational Plan for M.V. SEAFDEC 2 *(since 2004)* The M.V. SEAFDEC 2 was granted by the Government of Japan in 2004 to support fishery resources and marine environmental surveys of the Member Countries. Under the agreed cost-sharing scheme, technical support to the Member Countries has been sustained by TD for monitoring their respective fishery resources and marine environmental conditions and enhancing human resource development. In 2026, SEAFDEC plans to carry out: Cruise surveys • Collaborative research survey on fisheries resources and the environment in the coastal waters of Tanintharyi Region, Myanmar (51 days, during February–March) • 2nd collaborative research survey on marine resources in the Waters of Brunei Darussalam (36 days, during September–October) Shipboard training courses • Shipboard training on scientific hydroacoustic, EK-80 in the Gulf of Thailand (December)	TD	JTF, with cost sharing from the AMSs

Special Project		
18. U.S. Southeast Asia Fisheries Partnership The award for the USAID Southeast Asian Fisheries Partnership (SEAFish) Activity was reinstated by the U.S. Government to SEAFDEC by adjusting the workplan of the for SEAFish Activity in 2025–2026, and came up with a new project to be implemented by SEAFDEC/Training Department (TD) that is aligned with Objective 3 of the SEAFish Activity, *i.e.*, Increase operational and technical capacity among national fisheries agencies and fisheries institutions. Support for this new project will be channeled through the Embassy of the USA in Bangkok, and the project will initially comprise two (2) initiatives designed to enhance regional capacity in fisheries stock assessment using hydroacoustic survey methods. Together, these initiatives represent a strategic investment in regional human resource development, equipping ASEAN Member States and TD with the modern tools, technical expertise, and collaborative capacity necessary to advance science-based, sustainable fisheries management in the region.	TD	U.S. Government

New Project

Project	Lead Department	Funding source
1. Strengthening Regional Capacity to Combat IUU Fishing and Promote Safe, Fair and Sustainable Fisheries in Southeast Asia *(2025–2027)* Aiming to strengthen national and regional responses to combat IUU fishing through digital innovation, capacity building, gender-sensitive approaches, and enhanced cooperation among Southeast Asian countries, the Project has three expected outcomes: 1) Enhanced technical capacity for fisheries officers and AN-IUU focal points of the AMSs, enabling them to conduct effective inspections, enforce regulations, and manage traceability systems; 2) Strengthened collaboration among AMSs through knowledge sharing, exchange of best practices, learning, and alignment of regional strategies in addressing IUU fishing; and 3) Improved implementation of the Port State Measure by AMSs, strengthen monitoring of fisheries resources and enforcement of relevant national regulations to combat IUU Fishing. The activities to be implemented in 2026 include: • Regional Workshop on Information Exchange on Monitoring Control and Surveillance of Combating IUU Fishing (Co-organized with BOBLME II project) • Practical Workshop on Surveillance to Combat IUU Fishing: Focus on Marine Surveillance Activities • Practical Workshop on Monitoring to Combat IUU Fishing: Focus on Monitoring Activities	TD	GIZ

2) Departmental Programs

Program Title	Department	Funding Source
1. Quality Seed for Sustainable Aquaculture (QSSA) *(ongoing)* The QSSA Program has the overall objective to generate, verify, and promote technologies to ensure the sustainable production of quality seed stocks for aquaculture and stock enhancement. The Program is expected to achieve: 1) production of good quality broodstock; 2) increased seed stock production through the availability and adoption of refined and efficient hatchery and nursery protocols; 3) if available, promote genetically selected and improved	AQD	AQD*, DA-NFRDI, JIRCAS

Program Title	Department	Funding Source
stocks and apply techniques to optimize their use to improve on-farm aquaculture production; and 4) enough supply of seeds from major aquaculture commodities through the adoption of technically and economically viable breeding and seed production schemes. In 2026, the Program will continue to undertake the following research: *A. Broodstock development* • Biological study and transport trials of Bali sardinella (*Sardinella lemuru*) *B. Refinement of hatchery and nursery protocols* • Evaluation of various chemical inducers in enhancing settlement and metamorphosis of oyster larvae (*Magallana blineata*) • Optimization of mangrove crab (*Scylla serrata*) larval rearing protocols in a biofloc system • Enhanced production of mangrove crab (*Scylla serrata*) via improved feeding strategies, water management, and thermal manipulation • Integrating tilapia greenwater recirculating water systems in mangrove crab (*Scylla serrata*) hatchery operation • Production of farmed eucheumatoids by micropropagation in the land-based nursery • Sea-based nursery cage production of farmed eucheumatoids • Integrated hatchery and nursery production of sandfish *Holothuria scabra* • Isolation, preservation, and growth kinetics of selected thraustochytrids from natural mangrove areas in Panay Island • Application of advanced photosynthetic metrics to optimize microalgae monitoring and harvesting for enhanced *Epinephelus fuscoguttatus* larval growth and survival • Bioprospecting new microalgal strains as potential aquaculture feed and their cultivation using sugar mill wastewater • Optimization of the culture condition of *Nannochloropsis oculata* and harvest settings • Verification of a simplified high-density culture system of rotifer *Brachionus rotundiformis* with an automated monitoring system *D. Promotion of technically and economically viable breeding and seed production schemes* • Mass production of hatchery-reared single spat oyster (*Magallana bilineata*) • Mass production of donkey's ear abalone (*Haliotis asinina*) seedstocks and demonstration of a modular raft-suspended grow-out culture system • Mass production of giant freshwater prawn (*Macrobrachium rosenbergii*) • Mass production of all-male and mixed-sex tilapia fingerlings and promotion of saline-tolerant tilapia		
2. Healthy and Wholesome Aquaculture (HWA) *(ongoing)* The HWA Program has two main components, namely: 1) Fish Health, and 2) Nutrition and Feed. The "Fish Health Component" aims to improve aquaculture production through innovations in aquaculture nutrition and feeding, and fish health management as well as maintain the environmental integrity of aquaculture systems; while the "Nutrition and Feed Component" aims to: 1) find effective alternative protein sources to fish meal in dietary formulations; 2) determine specific nutrients that enhance growth performances; and 3) promote practices and strategies to improve production. The studies to be undertaken in 2026 include: *Fish Health Component*	AQD	AQD*

Program Title	Department	Funding Source
• Exploiting predatory bacteria: Development of efficient administration technology of marine predatory bacteria as antimicrobial therapy for shrimp vibrio disease management • Control, management and determination of spore activation and infectivity of *Enterocytozoon hepatopenaei* (EHP) in shrimps *Nutrition and Feed Component* • Developing insect-based feed using traditional and molecular approaches for sustainable production of Nile tilapia (*Oreochromis niloticus*) in the Philippines: I. Effect of substrates on the nutritional composition of black soldier fly (BSF) larvae II. Impact of dietary inclusion of BSF larval meal on fish performance, biochemical composition and serum biochemistry • Verification studies on grow-out diets for rabbitfish *Siganus guttatus* farming in floating marine net cages • Development of a cost-effective grow-out diet for snubnose pompano *Trachinotus blochii* farming in floating marine net cages • Optimization of feeding strategy, the use of an intermittent feeding regime to reduce production cost in milkfish culture in cages • Assessing the viability of snails (*Pirenella* sp.) as a potential supplemental feed to snubnose pompano (*Trachinotus blochii*) in brackishwater pond grow-out culture • Efficiency of polychaete phospholipid in promoting *Penaeus monodon* maturation • Refinement of *Scylla serrata* maturation diet • Nursery and grow-out culture of mangrove crab, *Scylla serrata*, in brackishwater ponds and mangrove pens • Intensive culture of whiteleg shrimp *Litopenaeus vannamei* in HDPE-lined brackishwater ponds • Pompano (*Trachinotus blochii*) production in brackishwater ponds using different stocking densities		
3. Maintaining Environmental Integrity through Responsible Aquaculture (MEITRA) *(ongoing)* The overall objective of the MEITRA Program is to develop environment-based aquaculture technology in SEAFDEC/AQD research and development activities and to maintain environmental integrity by promoting responsible aquaculture practices. In 2026, the activities to be undertaken are as follows: • Assessment and development of an Intermediate Culture System for tropical aquaculture species • Assessment of growth traits of *Hypnea* sp. as a potential tropical seaweed species for aquaculture • Co-culture of milkfish and giant freshwater prawn in ponds • Establishing grow-out culture techniques of sea grapes *Caulerpa* in tanks • Resource assessment and refinement of nursery and grow-out culture techniques for spiny lobster, *Panulirus ornatus,* in a sea-based system • Grow-out culture of SEAFDEC/AQD-produced hatchery-bred spat of oysters *Magallana bilineata* in floating bags at different densities and water depths • Development of appropriate grow-out culture systems and operational modalities for the sea cucumber *Holothuria scabra* (sandfish) • Refinements on Nile tilapia (*Oreochromis niloticus*)–giant freshwater prawn (*Machrobrachium rosenbergii*) polyculture in tank-based biofloc system	AQD	AQD*, JIRCAS

Program Title	Department	Funding Source
4. Meeting Socio-economic Challenges in Aquaculture (MSECAP) *(ongoing)* The MSECAP program aims to implement socio-economic research and development studies to promote inclusive engagement of fisherfolk communities and small-holder fish farmers in aquaculture and resource enhancement. The studies under MSECAP examine how aquaculture contributes to food production and income by producing seeds for grow-out cultures and stock enhancement. In 2026, the activities to be undertaken are as follows: • Engagement of AQD researchers in MSECAP activities through research, verification, extension, and capacity-building studies across multi-stakeholder engagement and collaboration • Engaging Excellence in Aquaculture Technologies through Empowered Networks and Demonstration (EXTEND) • Ongoing Joint Mission for Accelerated Nationwide Technology Transfer Program (JMANTTP II)–MSECAP Proposals will be continued and enhanced - Grow-out Polyculture of Nile Tilapia (*Oreochromis niloticus*) and Giant Freshwater Prawn (*Macrobrachium rosenbergii*) at Different Stocking Densities in Selected Fishfarms in Mina, Iloilo - Grow-out Polyculture of Nile Tilapia (*Oreochromis niloticus*) and Giant Freshwater Prawn (*Macrobrachium rosenbergii*) in Selected Fishfarms in Bingawan, Iloilo - Polyculture of Tilapia and Ulang in Nanga, Pototan - Seaweed Grow-out Culture using Different Stocking Techniques in IMS and Pandan, Antique	AQD	AQD*
5. Collaborative projects with the Philippine Government *(ongoing)* In order to accelerate fish production and export revenues from the aquaculture sector, AQD is committed to intensifying the techno-transfer of matured aquaculture technologies to stakeholders, which will provide additional and alternative livelihood to fisherfolks through sustainable aquaculture technologies that are economically viable, environment-friendly, and socially equitable. The projects are expected to contribute to the aquaculture development of its host country, which includes: 1) Providing assistance in the development and enhancement of the country's milkfish fry production; 2) Development of cost-efficient aquaculture feeds; 3) Revive the local production of tiger shrimp; 4) Strengthen the linkage between the scientific development of aquaculture technologies and the fish farmers; and 5) Train a pool of aquaculture technicians for better management of hatcheries in the country. In 2026, the activities to be undertaken are as follows: *Legislated Hatcheries* • DA-BFAR CO and SEAFDEC/AQD MOA (2018 and 2022) Monitoring and provision of technical assistance (if needed) • DA-BFAR 6 and SEAFDEC/AQD MOA (2021) Monitoring and provision of technical assistance (if needed) • DA-BFAR CO and SEAFDEC/AQD MOA (2022) Monitoring and provision of technical assistance (if needed) • DA-BFAR 6 and SEAFDEC/AQD MOA (2024) - Creation of the feasibility study report and other relevant documents–for Cauayan, Negros Occidental - Submission of the feasibility study report and other documents–for Cauayan, Negros Occidental	AQD	Philippine Government

Program Title	Department	Funding Source
• DA-BFAR CARAGA and SEAFDEC/AQD MOA (2025) - Creation of the feasibility study report and other relevant documents–for San Miguel, Surigao del Sur (HB 8132) and Carmen, Agusan del Norte (HB 8124) - Submission of the feasibility study report and other documents–for San Miguel, Surigao del Sur (HB 8132) and Carmen, Agusan del Norte (HB 8124) *Revival of Abandoned Hatcheries* • Monitoring the progress of the rehabilitation of the selected hatcheries *Oplan Balik Sugpo* • Produce High-quality *Penaeus monodon* Postlarvae using Enhanced Biosecurity Measures in the hatchery • Conduct the Grow-out Culture of *P. monodon* in Ponds using Enhanced Biosecurity Measures *In-Situ Training Courses* • Conduct training (techno-caravan) nationwide in areas based on the request of BFAR and LGU *Site Assessments* • Assess sites for possible aquaculture operations and their potential species for culture *Field Demonstrations* • Demonstrate SEAFDEC/AQD's technologies in areas where the aquaculture industry has potential *Manpower Development* • Develop a pool of technical experts to operate various aquaculture systems nationwide • Operate aquaculture facilities utilizing SEAFDEC/AQD developed protocol		
6. Promotion on Strengthening of SEAFDEC Visibility and Enhancing Human Capacity Building *(ongoing)* The Program has the overall objective to promote and enhance the role, responsibility, visibility, and image of SEAFDEC among Member Countries, other international institutions, and the public. For Outcome 1: Strengthening of SEAFDEC and the Department's visibility and image, the expected outputs are: 1) Understanding of the role and SEAFDEC/TD's activities; 2) Delivery of fisheries information to stakeholders and the public; and 3) Hub of fishery information and capacity building on the fisheries-related issues in the region. For Outcome 2: Increasing understanding, knowledge, and experience for relevant agencies and stakeholders in fisheries-related issues, the expected output is Building up human capacity on fisheries-related issues. The activities to be conducted in 2026 are: • Promotion and enhancement of SEAFDEC visibility and image via national and international exhibitions and other suitable channels such as TD's website, TD's YouTube channel, TD's Facebook page, and TD repository. • Production of information materials • Human capacity building for SEAFDEC staff, university students, and others through tailor-made training programs.	TD	TD*
7. Collaborative Program with the Government of Thailand *(ongoing)* Since 2025, SEAFDEC/TD and the DOF Thailand have strengthened technical collaboration to support the effective fisheries management of Thailand through projects that include research studies and training activities. This Program has the overall objective to strengthen technical collaboration between	TD	Government of Thailand

Program Title	Department	Funding Source
the DOF Thailand and TD through collaborative training and research activities specifically designed to support the DOF Thailand. The specific objectives are: 1) To conduct research studies that align with the shared interests of both DOF Thailand and TD; and 2) To enhance the capacity of officers from DOF Thailand and TD technical staff, including researchers, instructors, and marine engineers. The projects/activities to be implemented in 2026 are: • Monitoring Carbon Dioxide Emissions from Fishing Vessels at Fishing Ports • Catch Rate and Species Composition of Anchovy Falling Net with Light Luring Fishing in the Coastal Areas of the Eastern Gulf of Thailand • Training Course on Cost Reduction in Local Fishing by Using Solar Cells • Experiment on High-frequency Sound Transmitted Technology to Reduce the Impact on Marine Mammals from Fishing Gear • Study on the Alternative Thai Vessel Monitoring System • Training Program on Basic Knowledge of Inland Fishing Gear and the Fishing Gear Survey • Training Program on the Hydroacoustic Operator for Fish and Biomass Estimation • Valuation of Marine Resources in Rayong Bay, Thailand • Training Program on Gender Equality and Diversity in Fisheries Resource Management • Ecosystem Approach to Fisheries Management in Freshwater Ecosystems • Project to develop skills in writing R commands from user to coder for analyzing fisheries resource data		
8. Water and Sediment Quality Monitoring Network *(ongoing)* In 2025, the mandate of MFRD was sharpened to include food security and safety through sustainable production technologies. In Singapore, the Water and Sediment Quality Monitoring Network, termed as Aquaculture Sensing Network (ASN), is a monitoring network set-up by the Singapore Food Agency (SFA) to monitor the water quality in farming areas of Singapore. ASN comprises real-time monitoring stations, scheduled field sampling and an information management system, with the purpose of safeguarding farm production through tracking changes in water quality across Singapore's farming zones. ASN enables anticipative monitoring against environmental threats such as low dissolved oxygen events and Harmful Algal Blooms (HABs) and ensures sustainable farm operations to minimize impacts on the environment through nutrient and sediment monitoring. Information such as near-real-time updates on water quality, as well as alerts on potential environmental risks, is shared with agencies and industry, allowing timely actions to be taken to safeguard the farms' production and address any food safety concerns. The experience of Singapore will be shared with other SEAFDEC Member Countries through this Program. The activities to be implemented in 2026 are: • Trial Testing of Nutrient Sensors and Real-Time Plankton Monitoring Technologies • Sharing of Water and Sediment Quality Monitoring Network with ASEAN Member Countries through webinar	MFRD	Singapore Food Agency

*Funding from the respective Host Governments

In addition, there are two ***Pipeline Projects*** that could be implemented in 2026 if the funding for these projects could be secured.

Project Title	Lead Department	Funding source
1. Workshop on strengthening regional fisheries governance and technology integration to combat illegal, unreported and unregulated (IUU) fishing in the Indo-Pacific This Project is aimed at organizing a workshop that brings together fisheries officials from ASEAN Member States (AMSs) and technical experts with objectives of: 1) sharing information on regional implementation of combating IUU fishing; 2) introducing and promoting the adoption of innovative MCS technologies for combating IUU fishing; and 3) strengthening institutional cooperation on implementation for combating IUU fishing in the regional MCS implementation.	TD	Government of Canada
2. Toward the Sustainable Utilization of Commercially Exploited Tropical Sharks and Rays, Eels in Southeast Asia Noting an increasing trend in the inclusion of commercially exploited aquatic species (CEASs), such as sharks and rays, anguillid eels, etc., in the CITES Appendices, the necessity for SEAFDEC to implement the project on the sustainable utilization of these CEASs in Southeast Asia was raised. The Project Proposal is being developed by SEAFDEC for submission to the ASEAN Secretariat and the Mission of Japan to ASEAN.	IFRDMD and MFRDMD	JAIF

COOPERATION WITH DONORS AND OTHER ORGANIZATIONS IN 2025

1. Collaboration with International/Regional Organizations, Non-member Governments, and Donors

- **Association of Southeast Asian Nations**

Cooperation between the Association of Southeast Asian Nations (ASEAN) and SEAFDEC has been sustained since 1998, following the establishment of the Fisheries Consultative Group (FCG) Mechanism. The cooperation was formalized in 2007 with the signing of the Letter of Understanding for the ASEAN-SEAFDEC Strategic Partnership (ASSP), in which SEAFDEC serves as the technical arm to implement fisheries programs/projects for the benefit of the ASEAN Member States (AMSs). In 2025, SEAFDEC continued to support the AMSs in implementing activities in line with the "Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2030 (RES&POA-2030)," which was adopted by the ASEAN-SEAFDEC Ministers and Senior Officials in 2020. In 2025, SEAFDEC implemented 18 projects under the FCG/ASSP mechanism. The progress and achievements of these projects were reported to the Twenty-eighth Meeting of the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) on 6–7 November 2025 in Langkawi, Malaysia.

For five projects under the FCG/ASSP Mechanism, fundings were channeled through the ASEAN mechanism, namely:

- Japan-ASEAN Integration Fund (JAIF)
  1) Implementation and Assessment of the ASEAN Regional Plan of Action for the Management of Fishing Capacity *(2024–2026)*
  2) Regional Collaborative Research and Capacity Building for Monitoring and Reduction of Marine Debris from Fisheries in Southeast Asia *(2024–2026)*
  3) Development of Stock Assessment Methods and Strengthening of Resources Management Measures for Tropical Anguillid Eel in Southeast Asia *(2020–January 2026, with no-cost extension until 31 May 2026)*
- ASEAN-Japan International Cooperation Agency (ASEAN-JICA)
  4) ASEAN-JICA Food Value Chain Development Project *(2025–2028)*
  5) ASEAN-JICA Cooperation for Capacity Building on IUU Fishing Countermeasures in Southeast Asia *(2024–2027)*

In 2025, SEAFDEC sent representatives to participate in the events organized by ASEAN, namely:

- 2nd Taskforce Meeting Advancing the Strategic Framework for Food, Agriculture, and Forestry (FAF) in ASEAN (22-24 April 2025, Langkawi, Malaysia)
- 5th Meeting of the ASEAN Network for Combating IUU Fishing (9 July 2025, Online)
- 17th Meeting of the ASEAN Fisheries Consultative Forum (AFCF) (22–23 July 2025, Yangon, Myanmar)
- 33rd Meeting of the ASEAN Sectoral Working Group on Fisheries (ASWGFi) (24–25 July 2025, Yangon, Myanmar)
- 20th Meeting of the ASEAN Working Group on the Convention on International Trade in Endangered Species of Wild Fauna and Flora and Wildlife Enforcement (20th AWG-CITES and WE) (31 July 2025, online)
- Special Senior Officials Meeting of the 46th Meeting of the ASEAN Ministers on Agriculture and Forestry (Special SOM-46th AMAF) (19 August 2025, Myanmar via Videoconference)
- Interface Between the AD HOC Working Group to Develop the ASCC Strategic Plan (AHWG) and Think Tank and Research Organizations on the ASCC Strategic Plan (17 September 2025, online)

- **Food and Agriculture Organization of the United Nations**

During 2025, SEAFDEC continued the collaboration with the Food and Agriculture Organization of the United Nations (FAO) in implementing activities under ongoing collaborative arrangements, namely:

- Operational Partners Agreement for the Implementation of the Project "Sustainable Management of Fisheries, Marine Living Resources and their Habitats in the Bay of Bengal Region for the Benefit of Coastal States and Communities (BOBLME Phase II): The project duration is from 2024 to 2028.
- Letter of Agreement between FAO and SEAFDEC for provision of Regional Workshop in Asia to commemorate 10 years of the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication: The "Regional Small-scale Fisheries (SSF) Workshop in Asia: Building on a Decade of the SSF Guidelines for a Sustainable Future" was successfully organized on 26–27 March 2025.

SEAFDEC has maintained cooperation with the FAO Aquatic Science and Fisheries Abstract (ASFA), established in 2013 under the new **Terms of Reference (TOR) for Cooperation in the Preparation and Publication of the Aquatic Sciences and Fisheries Abstracts (ASFA) Partnership**, effective 1 January 2025. Under this new TOR, the SEAFDEC Secretariat shall continue to serve as an ASFA Partner, while SEAFDEC/AQD shall also continue as a Collaborating Centre, contributing bibliographic records to the ASFA database. It is envisaged that SEAFDEC's continued partnership with ASFA would benefit the SEAFDEC Secretariat and all SEAFDEC Departments by enhancing the dissemination of bibliographic records through the ASFA database, thereby increasing SEAFDEC's visibility, especially to the international scientific community.

In September 2025, SEAFDEC also updated **Annex 2 to the Partnership Agreement between SEAFDEC and the FAO Fisheries and Resources Monitoring System (FIRMS)**, which was established in 2004. The updated Annex 2 outlines SEAFDEC's potential contributions to FIRMS in three key areas: 1) fishery statistics of Southeast Asia, 2) geospatial information on fishing subareas based on the regional statistics framework, and 3) results from stock and risk assessment for selected species undertaken by SEAFDEC projects.

As for new collaborative arrangements, on 7 July 2025, SEAFDEC signed the **Letter of Agreement between FAO and SEAFDEC for provision of funds in support of a "Regional Capacity Building Workshop for strengthening SEAFDEC and its Members' capacity in responding to SoSI-FIRMS & SDG 14.4.1 Data Calls**." The purpose of this LOA is for SEAFDEC to co-organize with FAO a regional capacity building workshop on "Strengthening Regional Representation in Global Stock Status Reporting—preparing SEAFDEC and its Member Countries for the SoSI-FIRMS & SDG 14.4.1 Data Calls" with funding from FAO. The duration of this LOA was from 30 June 2025 to 15 October 2025.

On 18 July 2025, SEAFDEC signed the **Operational Partnership Agreement with FAO for the Implementation of the Project "Promoting the Blue Economy and Strengthening Fisheries Governance of the Gulf of Thailand through the Ecosystem Approach to Fisheries (GoTFish Project)."** With the duration from 2025 to 2030, the Project aims to achieve "Improved natural resource governance in the GoT through the implementation of the ecosystem approach to fisheries (EAF), contributing to the broader, regional fisheries objectives of the South China Sea Strategic Action Programme (SCS-SAP)." To achieve this, the GoTFish Project will work on four main components: 1) Regional transboundary fisheries governance and management strengthened; 2) Alignment of incentive mechanisms; 3) Ecological Corridor of Critical and Important Habitat for Aquatic Resources in the Gulf of Thailand (with focus on Malaysia); and 4) Stakeholder engagement, communication, monitoring, and evaluation. SEAFDEC will be the Executing Agency responsible for Project Components 1 and 4, with the four project participating countries, namely Cambodia, Malaysia, Thailand, and Viet Nam.

On 19 December 2025, SEAFDEC signed the **Letter of Agreement between FAO and SEAFDEC for Provision of Mixed Stock Fisheries in the Asia Pacific: Identifying key technical limitations and providing practical solutions for management**. The Project aims to develop a technical report, present a tool developed by Amoroso *et. al*. to understand trade-offs between societal objectives and multispecies yield and build the regional capacity by organizing a regional workshop aimed at strengthening multispecies management approaches in the Asia Pacific Region. The duration of the Project is from the signing date until 31 July 2026.

In 2025, SEAFDEC participated in regional and international events organized by FAO to ensure that SEAFDEC's activities and initiatives are harmonized with relevant international instruments and initiatives. These include:

- 14th Steering Committee Meeting of Fisheries and Resources Monitoring System (FIRMS) (FSC14) (30 June, 1 July, and 4 July 2025, online)
- 28th Session of the Coordinating Working Party on Fishery Statistics (CWP-28) (2-4 July 2025, online)
- Regional Coordination Meeting for (Asia) on the Agreement on Port States Measures (PSM) (21–25 July 2025, Davao, Philippines)
- 20th Session of the COFI Sub-Committee on Fish Trade (8–12 September 2025, online)

- **Intergovernmental Organization for Marketing Information and Technical Advisory Services for Fishery Products in the Asia and Pacific Region**

On 2 October 2025, SEAFDEC signed an **Extension of the Memorandum of Understanding between SEAFDEC and the Intergovernmental Organization for Marketing Information and Technical Advisory Services for Fishery Products in the Asia and Pacific Region (INFOFISH)** to cooperate in the scopes of: 1) Exchange of information including publications, subscriptions and library materials; 2) Joint research and capacity building activities of mutual interest as agreed by the Parties; 3) Participation of their respective officers and those of the Member Countries in technical training sessions organized by either Party, as relevant and appropriate, and agreed by the Parties; 4) Participation and contribution of resource person(s) from one Party in the event(s) organized by the other Party, upon mutual agreement, with complementary registration and the possibility of recognition as a supporter of the event; and 5) Other activities or form of cooperation as may be mutually determined by the duly authorized representatives of the Parties. The MOU is effective starting from the signing date for a period of five years.

- **Minister of Fisheries and Oceans, the Government of Canada**

On 11 December 2025, SEAFDEC and the Minister of Fisheries and Oceans (DFO) of the Government of Canada entered into the Contribution Agreement to organize a "Workshop on Strengthening Regional Fisheries Governance and Technology Integration to Combat IUU Fishing in the Indo-Pacific," which is tentatively scheduled in February 2026 and will be participated in by the representatives from the ASEAN Member States. The Workshop was aimed at: 1) sharing information on the regional implementation of combating IUU fishing; 2) introducing and promoting the adoption of innovative MCS technologies for combating IUU fishing; and 3) strengthening institutional cooperation on implementation for combating IUU fishing in the region. The duration of the Agreement is until 31 March 2026.

- **Deutsche Gesellschaft für Internationale Zusammenarbeit**

On 4 November 2025, SEAFDEC signed the Grant Agreement with the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) to implement the project **Strengthening Regional Capacity to Combat IUU Fishing and Promote Safe, Fair and Sustainable Fisheries in Southeast Asia.** The project duration is from 1 December 2025 to 30 November 2027, with the objectives to enhance national and regional responses through digital innovation, target capacity building in monitoring, control, and

surveillance (MCS) systems, and foster transparency and enhance regional cooperation and networks with other relevant institutions. With the grant provided by the GIZ, SEAFDEC will organize a regional workshop and practical workshops that will facilitate exchange of information, lessons learned, and experiences on the implementation of components to combat IUU fishing in the region; promote harmonization of port State controls, national fisheries laws/regulations, and traceability of fish and fishery products; and build institutional capacities for policy development, enforcement, and data management through regional collaboration and technical assistance.

- **Institute of Marine Research, Norway**

Under the ongoing Collaboration Agreement between SEAFDEC and the Institute of Marine Research (IMR) for the **Ghost Fishing in the Global South, Demonstration Project** signed in September 2024, the project was implemented with a duration from 2024 to 2025 with the goal of reducing ghost fishing and marine pollution in the Southeast Asian region. The expected outputs are: 1) carry out an abandoned, lost, or otherwise discarded fishing gear (ALDFG) retrieval demonstration in Thailand; 2) identify reasons for gear loss and potential measures to reduce future gear loss and mortality; 3) evaluate the feasibility of carrying out this type of ALDFG retrieval within the Southeast Asian region; and 4) identify local partners that can collaborate with IMR after the demonstration project.

In 2025, TD, in partnership with IMR, conducted field trials to locate and retrieve ALDFG using remotely operated vehicles (ROVs) aboard the M.V. Plalung from 4 to 6 February 2025 near Samet Island in Rayong Province, Thailand. The field trials demonstrated that ROVs effectively located and retrieved ALDFG, significantly minimizing environmental disruption and aiding in the restoration of marine ecosystems.

- **United States Agency for International Development/Regional Development Mission for Asia**

Under the **Public International Organization (PIO) Grant Agreement** signed by SEAFDEC and the United States Agency for International Development/Regional Development Mission for Asia (USAID/RDMA), SEAFDEC started in 2024 to implement the USAID Southeast Asia Fisheries Partnership (SEAFish) Activity as a part of the Sustainable Fish Asia (SuFiA) project funded by the USAID/RDMA. The SEAFish Activity has the overarching goal of "fisheries and aquaculture practices and productions improved and managed sustainably" with three objectives, namely: 1) Fishery policies, programs, and plans supported by SEAFDEC are adopted and implemented by national fisheries agencies; 2) Commercial and small-scale fishers have appropriate financial and human resources, capacity, and good governance to adopt sustainable fishing and aquaculture practices, and 3) Increase operational and technical capacity among national fisheries agencies and fisheries institutions. The duration of the PIO Grant Agreement is from 1 October 2023 to 30 September 2028; however, it was terminated on 25 March 2025 due to the policy adjustment by the U.S. Government.

- **Embassy of the United States of America, Bangkok**

In August 2025, the U.S. Department of State to notify SEAFDEC of the U.S. Government's intent to reinstate the award granted from the USAID/RDMA to the Southeast Asia Fisheries Partnership (SEAFish) Activity, which was earlier terminated in March 2025. In this connection, SEAFDEC adjusted the Activity workplan for 2025–2026, and came up with a project to be implemented by SEAFDEC/Training Department (TD) that is aligned with Objective 3 of the SEAFish Activity, *i.e.*, Increase operational and technical capacity among national fisheries agencies and fisheries institutions. Support for this new project will be channeled through the Embassy of the USA in Bangkok, and the project will initially comprise two (2) initiatives designed to enhance regional capacity in fisheries stock assessment using hydroacoustic survey methods. Together, these initiatives represent a strategic investment in regional human resource development, equipping ASEAN Member States and TD with the modern tools, technical expertise, and collaborative capacity necessary to advance science-based, sustainable fisheries management in the region.

- **United States Department of the Interior**

Under the **Amendment 1 to Annex 1 of the MOU between the U.S. Department of the Interior (U.S. DOI) and SEAFDEC Concerning Supporting Participation in Sustainable Fish Asia (SuFiA)**, activities were implemented with the objective of enhancing the capacity of SEAFDEC staff in fisheries management and resilience in the context of climate change and in conducting fishery resources and marine environmental research surveys. There were three scopes of activities, namely: 1) fisheries resilience and management; 2) climate change and fisheries stock assessments; and 3) marine fishery resources and marine environment research survey. The duration of this Amendment 1 to Annex 1 of the MOU was extended until 30 September 2025; however, this arrangement between SEAFDEC and the U.S. DOI was suspended in 2025 due to the policy adjustment by the U.S. Government.

- **World Wildlife Fund, Inc., U.S.**

Under the Global Environmental Facility (GEF) Project Grant Agreement for the Project "**Blue Horizon: Ocean Relief through Seaweed Aquaculture**," signed in April 2024, with a duration from 1 July 2024 to 30 June 2028, SEAFDEC continues to serve as the Regional Executing Agency and work with the World Wildlife Fund, Inc. (WWF) as the GEF Agency, and BFAR Philippines and DFiS of Viet Nam as the National Executing Agencies. The overarching goal of the Project is to create new sustainable seaweed value chains that will deliver ecosystem services and provide socioeconomic benefits to communities, particularly to households whose livelihoods depend on marine ecosystems. The four components of the Project are: 1) Regional capacity building for seaweed aquaculture focusing on strengthening regional capacity and developing strategic plans for seaweed aquaculture as well as participation in global seaweed coalitions to enhance regional collaboration; 2) Enabling Environment for Seaweed Aquaculture in Philippines and Viet Nam; 3) Seaweed Value Chains (production + processing + marketing); and 4) Knowledge Management, M&E, and IW Learn (regional). The regional activities of this Project are to be undertaken by the SEAFDEC Secretariat and SEAFDEC Aquaculture Department.

In 2025, the Project Management Unit (PMU) at SEAFDEC Secretariat held an online Project Inception Workshop on 14 August 2025. The First Meeting of the Seaweed Technical Working Group (STWG) was subsequently organized on 25–26 November 2025, back-to-back with the First Meeting of the Project Steering Committee (PSC) on 27–28 November 2025 in Bangkok, Thailand.

2. Cooperation with Agencies of SEAFDEC Member Countries

- **Faculty of Fisheries and Marine, Universitas Airlangga, Indonesia**

On 4 June 2025, SEAFDEC signed the "**Memorandum of Understanding (MOU) between SEAFDEC and the Faculty of Fisheries and Marine, Universitas Airlangga (FPK-UNAIR)**" in Surabaya, Indonesia. The MOU aims to promote collaboration between SEAFDEC and FPK-UNAIR toward sustainable fisheries and aquaculture on the basis of equality and mutual benefit. The areas of cooperation include: 1) exchange of academic staff, administrative staff, and students; 2) joint research in the field of mutual interests; 3) sharing of research and academic information and publications; 4) community services, *i.e.* faculty members serving as speakers to share knowledge and experience with the local community; and 5) any other research and academic activities to which both Parties agree. This MOU is valid from the date of signature for a period of five years.

- **Faculty of Fisheries and Marine Sciences, Diponegoro University, Indonesia**

On 5 June 2025, SEAFDEC signed the "**Memorandum of Understanding (MOU) between SEAFDEC and the Faculty of Fisheries and Marine Science, University of Diponegoro (FPIK UNDIP)**" in Semarang, Indonesia. The MOU aims to promote collaboration between SEAFDEC and FPIK UNDIP toward sustainable fisheries and aquaculture on the basis of equality and mutual benefit.

The areas of cooperation include: 1) exchange of academic staff, administrative staff, and students; 2) joint research in the field of mutual interests; 3) sharing of research and academic information and publications; and 4) other research and academic activities to which both Parties agree. This MOU is valid from the date of signature for a period of five years.

- **Japan Fisheries Research and Education Agency (FRA)**

Under the framework of the "**Extension of Arrangement for Scientific and Educational Cooperation between FRA and SEAFDEC**" signed in July 2023, covering five years until 6 July 2028, SEAFDEC continues to cooperate with FRA under the objectives of: 1) development of scientific and technical cooperation in various fields that are of interest to the two relevant organizations under mutual understanding and interrelationship; 2) development of academic and educational cooperation in various fields that are of interest to the two relevant organizations under mutual understanding and interrelationship; and 3) detailed discussions between FRA and SEAFDEC if required in the case of each practical matter.

Under the framework of this Arrangement, FRA sent experts to support SEAFDEC activities in 2025, namely:
- *Dr. Sayaka Ito* as the Deputy Chief of AQD *(until 31 March 2025)*
- *Dr. Takahiro Sajiki* as the Deputy Chief of AQD *(since 1 April 2025)*
- *Dr. Masahito Hirota* as the Deputy Chief of MFRDMD
- *Mr. Toru Shimoda* as the Deputy Chief of IFRDMD
- *Dr. Koki Abe* as the Senior Expert on Fisheries Acoustics at TD

- **Japan International Cooperation Agency**

On 23 January 2025, SEAFDEC signed with JICA the Project Cooperation Agreement (PCA) for "**ASEAN-JICA Food Value Chain Development Project**" under ASEAN-JICA Technical Cooperation. Under this PCA, JICA shall serve as the Project Implementing Agency, with SEAFDEC as the Project Executing Partner. The main objective of the Project is to improve food safety in the fishery sector by promotion of GAqP and development of ASEAN guidelines and relevant principles on fisheries inspection mechanism. This Project has four thematic areas: 1) ASEAN Good Agriculture Practice (GAP); 2) Sanitary and Phyto-sanitary (SPS) measures; 3) Fishery value chain; and 4) Coordination and Research on Public-Private Partnership (PPP)-based Food Value Chain. The proposed activities to be implemented by SEAFDEC are under the **third thematic area** to support the fisheries sector in achieving the expected output, *i.e.* food safety in the fishery sector is improved by the promotion of GAqP and development of ASEAN guidelines and relevant principles on fisheries inspection mechanism. The PCA runs from 23 January 2025 to 31 May 2027.

Another ongoing project implemented under the ASEAN-JICA Technical Cooperation was the "**ASEAN-JICA Capacity Building Project on IUU Fishing Countermeasures in Southeast Asia**," the PCA of which was signed in 2024 with a Project duration from 2024 to 2027.

- **Japan Agency for Marine-Earth Science and Technology**

On 26 March 2025, SEAFDEC signed the "**Implementing Agreement (IA) for Tropical Ocean Climate and Fisheries Resources Study between SEAFDEC and Japan Agency for Marine-Earth Science and Technology (JAMSTEC)**." The objective of the IA is to conduct a Joint Research Program to study climate variability and its impacts on fisheries resources. Activities under the Joint Research Program will include data collection, analysis, and interpretation, as well as conducting cruise activities in the eastern Indian Ocean using the M.V. SEAFDEC and other necessary equipment. The two cruises are tentatively planned for November–December 2025 and May–June 2027, subject to adjustments based on operational or environmental conditions. The costs and responsibilities related to

the chartering and operation of the M.V. SEAFDEC shall be charged to JAMSTEC. The IA entered into effect on 1 April 2025 and remains valid until 31 March 2028.

- **Tokyo University of Marine Science and Technology, Japan**

On 16 May 2025, SEAFDEC and Tokyo University of Marine Science and Technology (TUMSAT), Japan, signed the **Extension of Arrangement for Academic and Educational Cooperation between SEAFDEC and TUMSAT**." The original "Arrangement for Academic and Educational Cooperation Between TUMSAT and SEAFDEC" was established in June 2004 and was subsequently extended every five years. This latest Extension of the Arrangement will enable cooperation in the forms of: 1) collaboration of faculty and staff members for research, symposia and other academic pursuits; 2) exchange of staff and students for education, training, and research; and 3) exchange of data, documentation, and research materials in the fields of mutual interest, taking cognizance of existing policies of both institutions. This Arrangement is valid from the date of signature for a period of five years.

- **Kyoto Prefectural University, Japan**

On 12 June 2025, SEAFDEC signed the "**Memorandum of Understanding for Scientific and Educational Cooperation between SEAFDEC and Kyoto Prefectural University, Japan**." The objectives of the MOU are: 1) to develop scientific and technical cooperation on fisheries sciences and food culture studies that are of interest to the two organizations through mutual understanding and interrelationship; 2) to develop academic and educational cooperation on fisheries sciences and food culture studies that are of interest to the two organizations through mutual understanding and interrelationship; and 3) to conduct detailed discussions between Kyoto Prefectural University and SEAFDEC if required, in cases of relevant and practical matters that may arise. This MOU is valid from the date of signature for a period of five years.

- **Bureau of Fisheries and Aquatic Resources Caraga (BFAR Caraga), Philippines**

On 28 May 2025, SEAFDEC/AQD and the Bureau of Fisheries and Aquatic Resources Caraga (BFAR Caraga), Philippines, signed a **Memorandum of Agreement**. BRAR Caraga would allocate and transfer funds to AQD to provide services in the conduct and preparation of feasibility studies and related documents for two (2) multi-species marine hatchery projects, *i.e*. 1) San Miguel, Surigao del Sur, and 2) Carmen, Agusan del Norte; and provide support to AQD experts in the conduct of required on-site activities. AQD will provide services to BFAR and produce outputs: 1) Feasibility Studies; 2) Aquaculture Development Plans; and 3) Detailed Engineering Design, as well as technical assistance during bidding and construction of the hatcheries. This MOA takes effect upon the parties' signing and will terminate on 29 November 2025.

- **BFAR RFO 11 and CBlue Aquafarm Ventures Inc., Philippines**

On 16 June 2025, SEAFDEC/AQD, the Philippine "Bureau of Fisheries and Aquatic Resources, Regional Fisheries Office 11 (BFAR RFO11)," and "CBlue Aquafarm Ventures Inc. (CBLUE)" signed the Renewal of the **Tripartite Memorandum of Agreement**, which extends the original MOA that is valid from 25 April 2024 to 25 April 2025 for one more year. This collaboration aims to 1) Build the capacities of CBLUE personnel by increasing their knowledge, skills, and competencies within the various areas of high-value fish production; 2) Institute high-quality infrastructure maintenance and management systems and practices as a means to support sustainable high-value fish production; and 3) Pursue local research and development initiatives which support the sustainability of aquaculture industry and food security. The Terms of this renewed MOA would be until 25 April 2026.

- **Local Government of the Municipality of New Washington Aklan, Philippines**

On 29 August 2025, SEAFDEC/AQD and the Local Government of the Municipality of New Washington Aklan (NW Aklan LGU), Philippines, signed a **Memorandum of Agreement** to collaobrate under the project "Development of a more reliable production system for high-quality oyster" with the aims to: 1) create environmental profiles of potential oyster farm sites and assess suitability and carrying capacity; 2) produce good quality spat from the hatchery to minimize dependence on wild spat as a source for grow-out culture stocks; 3) evaluate growth and survival rates of hatchery-reared (HR) spat during the nursery phase under varying stock densities and tumbling frequencies in two different environments; earthen pond and riverine grow-out culture area; 4) compare growth parameters and survival of HR single oyster spat nursed in different environments in grow-out culture using pouches and bags; and 5) evaluate microbial and chemical safety of oysters. This MOA takes effect upon the parties' signing and will terminate on 31 December 2028.

- **Local Government of the Municipality of Nueva Valencia, Guimaras, Philippines**

On 20 June 2025, SEAFDEC/AQD and the Local Government of the Municipality of Nueva Valencia, Guimaras (NUEVA VALENCIA LGU), Philippines signed the **Memorandum of Agreement** to collaobrate under the project "Panobolon Sea Cucumber Projct, which generally aims to: 1) determine the status of sea cucumber industry around Nueva Valencia, Guimaras; 2) identify potential aquaculture sites for the sea cucumber *Holothuria scabra* or sandfish, locally known as balat, kurtido, or kiskisan; 3) produce sea cucumber juveniles from local broodstock using hatchery and nursery protocols by SEAFDEC/AQD; 4) determine appropriate farming modalities for identified sites; 5) demonstrate and monitor grow-out farming, together with local partners. The duration of the MOA is from 1 March 2025 to 31 December 2027.

- **National Fisheries Research and Development Institute, Philippines**

On 13 August 2025, SEAFDEC/AQD and the National Fisheries Research and Development Institute (NFRDI), Philippines, signed a **Memorandum of Agreement** with the purpose of collaborating in the area of sustainable aquaculture through the Tamban Hatchery Program, towards the development of aquaculture techniques for Bali Sardinela or Tamban (*Sardinella lemuru*). The project entitled "Biological study and transport trials of Bali Sardinella (Sardinella lemuru)" would be implemented from 1 June 2025 to 31 May 2026. The fund for this project, totaling PHP 2,866,000.00, was provided by NFRDI for implementation. The duration of the MOA is from 1 June 2025 to 31 May 2026.

- **Department of Fisheries, Thailand, and the PPTEP**

On 19 December 2025, the SEAFDEC Training Department (TD) signed a "**Memorandum of Understanding for a Research Project on Rehabilitation of Fisheries Habitats in the Oil Rig Platform in the Gulf of Thailand**." The MOU establishes a collaborative project involving the Department of Fisheries of Thailand (DOF Thailand), PTT Exploration and Production Public Company Limited (PTTEP), Kasetsart University (Thailand), Prince of Songkla University (Thailand), and SEAFDEC/TD. With DOF Thailand serving as the lead institution for project administration and implementation, SEAFDEC/TD will contribute to the study on the development of a model for fisheries marine habitats based on petroleum oil rigs. SEAFDEC/TD will also support activities related to surveys, monitoring, and marine environmental and oceanographic studies, as well as the dissemination of study results to local communities, in collaboration with DOF Thailand. The original MOU for this research project was signed on 19 December 2022, and this MOU will extend the original MOU for a period of three more years.

- **Faculty of Natural Resources, Prince of Songkla University, Thailand**

On 1 May 2025, SEAFDEC signed the "**Memorandum of Understanding (MOU) between SEAFDEC and Faculty of Natural Resources, Prince of Songkla University (FNR-PSU)**." The purpose of the MOU is for SEAFDEC and FNR-PSU to engage in cooperative research and educational activities related to fisheries science and aquatic resources management. The areas of cooperation are: 1) joint research and education in the field of mutual interests of both Parties; 2) development of training program for university students and staff, including internship program at SEAFDEC; 3) sharing of research and educational information and publications; and 4) any other research and educational activities to which both Parties agree. This MOU is valid from the date of signature for a period of five years.

- **Faculty of International Maritime Studies, Kasetsart University, Sriracha Campus, Thailand**

On 14 July 2025, SEAFDEC signed the "**Memorandum of Understanding (MOU) for Academic Cooperation between SEAFDEC and the Faculty of International Maritime Studies, Kasetsart University, Sriracha Campus**." The objectives of the cooperation are to: 1) cooperate in academic research and development through collaborative research; 2) exchange technical information and promote other technical cooperation as mutually agreed; 3) exchange knowledge through seminars, workshops, and training; 4) promote human capacity building through the exchange of academics, researchers, and university students. This MOU is valid from the date of signature for a period of five years.

PROGRESS IN THE IMPLEMENTATION OF INFORMATION STRATEGIES FOR ENHANCING SEAFDEC VISIBILITY AND COMMUNICATION IN 2025

Since its establishment, SEAFDEC has implemented fisheries-related programs/projects that cover a wide range of research, training, and information activities. In 2007, the SEAFDEC Secretariat and Departments developed "Information Strategies for Enhancing SEAFDEC Visibility and Communication" as a policy framework for formulating and implementing information-related activities to enhance the Center's image and visibility. The Information Strategies have also enhanced the effectiveness of implementing, monitoring, and reporting on the progress of SEAFDEC information-related activities.

In 2025, SEAFDEC's progress and achievements in implementing the Information Strategies were monitored and discussed during the 26th Meeting of the Information Staff Program (ISP), held from 28 to 30 October 2025 in Singapore, and were subsequently updated to cover the period from 1 January to 31 December 2025. Summary of the progress corresponding to the five Information Strategies is as follows:

Strategy 1. Production of relevant, timely, and useful information material to meet the requirements of the target audience

- Technical/scientific materials: 109 titles/issues produced: 11,040 copies published, with 5,987 hard-copies and 323,318 e-copies distributed
- Technical videos: 1 title produced, with 1,212 online views
- Technical/scientific articles: 68 titles produced: 37 titles published in SEAFDEC publications and 31 titles published in non-SEAFDEC publications
- Inquiries for information through the SEAFDEC libraries recorded and replied: 4,263 queries recorded (including 130 from e-mail, 606 from social media, 467 from website, 1,377 from repository, and 110 from library), and 1,573 materials sold
- Number of citations: 4,032 articles with a total of 114,635 citations (including 902 articles with 32,996 citations from Scopus and 3,130 articles with 81,639 citations from Google Scholar)

Strategy 2. Raising SEAFDEC image at national, regional, and international levels

- Promotional materials: 207 titles/issues produced: 21,121 copies published, with 12,674 hard-copies and 3,049,138 e-copies distributed
- Promotional SEAFDEC eNews: 5 issues of SEAFDEC eNews disseminated
- Promotional souvenirs: 23,582 items produced, and 22,460 items distributed
- SEAFDEC websites established: SEAFDEC Secretariat and Departmental websites had a total of 154,691 users
- Project websites: 3,243 users
- Social media administered by SEAFDEC: 24,761 net followers, 156,440 interactions, and 2,061,112 annual reaches
- Participation in exhibitions and related events: joined 8 exhibitions with 238,605 visitors recorded at SEAFDEC exhibition booths and displays
- Official press statements released: 17 press statements released and 178 appearances of SEAFDEC in public media and websites recorded

Strategy 3. Enhancing communication and information sharing both within SEAFDEC and with Member and non-Member Countries, other international/regional organizations, and public

- Management of libraries of SEAFDEC Secretariat and Departments: SEAFDEC Secretariat and Department libraries continued to provide library services
- Additional acquisitions of SEAFDEC libraries: a total of 762 issues of newsletters/serial publications and 163 titles of technical publications from other organizations acquired
- Cooperation and exchange of materials: sustained cooperation with 578 network libraries within and outside the region
- Dissemination of technical and promotional materials: 78 titles (with 10,866 copies) of technical materials, and 105 titles (with 13,648 copies) of promotional materials disseminated to target groups
- Accessibility of information materials: 6,317 downloadable materials, 1,064,150 downloads during the reporting year, and 6 databases made accessible in SEAFDEC websites
- Institutional Repository: 3,448,449 access, 3,357,207 users; 381 titles of materials uploaded during the reporting year, 10,189 accumulated titles, and 1,209,054 downloads during the reporting year
- Usage of e-mail systems (including e-groups) to facilitate communications both among SEAFDEC staff and with other concerned personalities had been enhanced
- Direct visitors to SEAFDEC Secretariat and Departments: recorded a total number of 11,247 visitors
- Participation of SEAFDEC officials in events organized by other organizations: 345 SEAFDEC officials participated in 196 events: 152 officials in 81 events at regional/international levels *(63 physical events and 18 virtual events),* and 193 officials in 122 events at national/local levels *(112 physical events and 10 virtual events)*
- Number of presentations made by SEAFDEC Staff at non-SEAFDEC events: 28 oral and 1 poster presentations in events at regional/international levels; 46 oral and 4 poster presentations in events at national/local levels
- SEAFDEC events organized:
  - International/regional meetings, seminars, workshops: 51 meetings with 1,861 participants *46 physical events with 1,670 participants, and 5 virtual events with 191 participants*)
  - National/local meetings, seminars, workshops, consultations: 16 physical meetings with 340 participants
  - International/regional training courses: 28 courses with 476 trainees *(26 physical training courses with 445 trainees, and 2 online training courses with 31 trainees)*
  - National, on-site training courses: 22 physical training courses with 495 trainees
  - Study tours: 1 group with 5 trainees
  - Internships: 1 group with 3 interns
  - On-the-job training: 6 colleges with 288 students
  - Internal meetings: 22 physical meetings with 1,074 participants
- Participation of officials from Member Countries in events organized by SEAFDEC:
  - International/regional meetings, seminars, workshops (964 participants)
  - National/local meetings, seminars, workshops, consultations (281 participants)
  - International/regional training courses (323 trainees)
  - National on-site training courses (568 trainees)
  - Internships (1 person)
  - On-the-job trainings (285 students)
- Network and cooperation mechanisms established (now with 72 fisheries-related organizations) for the implementation of collaborative activities at national, regional and international levels
- Support from other organizations and donor agencies for relevant activities solicited: total support received in 2025: USD 4,591,515, representing non-regular sources of funds for the activities of SEAFDEC *(USD 3,814,584 from agencies/institutions in the region and USD 776,931 from agencies/institutions outside the region)*

Strategy 4. Strengthening SEAFDEC capability in information-related activities

- SEAFDEC staff enhanced their writing articles knowledge (through Online Workshops)
- SEAFDEC staff enhanced their knowledge of Basic Website Development (through the Workshop)
- Financial sustainability of SEAFDEC institutional publications and information activities boosted (through intensified sale of technical publications and souvenir items on a cost-recovery basis)

Strategy 5. Regular monitoring and evaluation of information activities

- Feedback on materials produced by SEAFDEC obtained (developed for training, research, and information transfer through communication channels, *e.g.* dedicated e-mail, etc.)
- Twenty-sixth Meeting of the SEAFDEC Information Staff Program (ISP) organized to monitor the implementation of information-related activities, in accordance with the Information Strategies for Enhancing SEAFDEC Visibility and Communication (convened on 28–30 October 2025 in Singapore)

Table 1. Participation of Member Countries in SEAFDEC Events in 2025

Category	Participants from Member Countries (persons)										
	Brunei Darussalam	Cambodia	Indonesia	Japan	Lao PDR	Malaysia	Myanmar	Philippines	Singapore	Thailand	Viet Nam
SEAFDEC regional/international meetings, seminars, workshops	30	44	344	45	43	155	46	57	21	142	37
SEAFDEC national/local meetings, seminars, workshops, consultations	0	0	34	1	0	16	0	0	0	230	0
International/regional training courses	23	16	35	20	14	52	22	65	9	51	16
National, on-site training courses	0	0	172	4	66	10	0	109	0	207	0
Study tours	0	0	0	0	0	0	0	5	0	0	0
Internships	0	0	0	0	0	0	0	1	0	0	0
On-the-job trainings	0	0	0	0	0	0	0	276	0	9	0
SEAFDEC internal events	0	0	8	0	0	0	1	371	0	0	0
TOTAL	**53**	**60**	**593**	**70**	**123**	**233**	**69**	**884**	**30**	**639**	**53**

PROGRESS IN THE IMPLEMENTATION OF SEAFDEC GENDER STRATEGY IN 2025

The SEAFDEC Gender Strategy was approved by the 51st Meeting of the SEAFDEC Council in 2019 for implementation by the SEAFDEC Secretariat and Departments with the goal of "SEAFDEC as gender-responsive and gender-sensitive in pursuing sustainable development and management of fisheries and aquaculture in Southeast Asia." The Progress in the implementation of the Gender Strategy by SEAFDEC during the year 2025 could be summarized as follows:

Strategy 1. Mainstreaming gender at all levels of the organization

- Policies and regulations for the staff: generally applied equally to males and females, with some specific gender-related policies, *e.g*. maternity/paternity leave, special leave benefits for women
- Gender-related facilities: provided as and when necessary, *e.g*. breastfeeding areas, childcare facilities, Muslim prayer room for men/women, and women's parking area.
- Number of staff in HR system: a total of 448 staff (210 females (46.9 %) and 238 males (53.1 %)) at the SEAFDEC Secretariat and five Departments
- Two (2) training courses on program and activity results reporting and communication, including gender sensitivity, were organized
- SEAFDEC staff participated in two (2) gender-related training events organized by other organizations

Strategy 2. Integrating gender in SEAFDEC programs and projects

- Gender-sensitive programs/projects: 18 regional projects (out of 19) are gender-sensitive
- Stakeholders and participants involved in programs/projects of SEAFDEC: 1,935 stakeholders/ participants (702 females (36.3 %) and 1,233 males (63.7 %)) involved
- Gender-related events organized by SEAFDEC: 3 events, with a total of 38 participants (18 females (47.4 %) and 20 males (52.6 %)) attending
- SEAFDEC collaborated with the Commonwealth of Australia to organize the Women in Fisheries Workshop

Strategy 3. Incorporating gender perspectives in all events organized by SEAFDEC

- Equal opportunities given for the participation of male and female representatives in all events organized by SEAFDEC
- Sex disaggregated number of participants in events organized by SEAFDEC:
    - Regional/international meetings, seminars, workshops: 51 events, with 1,801 participants (789 female (43.8 %) and 1,012 male (56.2 %))
    - SEAFDEC national/local meetings, seminars, workshops, consultations, etc.: 16 events, with 354 participants (114 female (32.2 %) and 240 male (67.8 %))
    - International/ regional training courses: 28 courses, with 476 trainees (188 female (39.5 %) and 288 male (60.5 %))
    - National, on-site training courses: 22 courses, with 585 participants (242 female (41.4 %) and 343 male (58.6 %))
    - Study tours: 1 group, with 5 trainees (2 female (40 %) and 3 male (60 %))
    - Internships (group/persons): 1 group, with 3 interns (3 female)
    - On-the-job training (students): 3 colleges, with 288 students (127 female (44.1 %) and 161 male (55.9 %))
    - SEAFDEC Internal Events: 22 events, with 1,074 participants (579 female (53.9 %) and 495 male (46.1 %))

Strategy 4. Boosting the visibility of SEAFDEC as a gender-responsive and gender-sensitive organization

- Articles/papers/reports published and distributed: 4 titles, with 2,701 hard-copies produced and 2,385 e-copies downloaded.
- Presentation on gender-related subjects at events organized by other organizations: 7 oral presentations
- Organized 3 gender-related commemorative events

Strategy 5. Strengthening further the cooperation and collaboration with Member Countries and other organizations on gender aspects

- Collaboration with 3 organizations by participating in events and providing input during the sessions

SEAFDEC REVENUES AND EXPENDITURES IN 2025

Unaudited Abridged Consolidated Financial Statements
As at December 31, 2025 and 2024 (in US$)

	2025 (Unaudited)		2024 (Audited)	
REVENUES				
Contributions from: -				
Member governments	10,688,069		9,992,785	
Other sources	284,291		484,643	
Other income	696,129		1,501,605	
TOTAL REVENUES	**11,668,489**		**11,979,033**	
EXPENDITURES				
Operating and Capital Expenditures: -				
Research	5,303,002		4,012,025	
Training	1,075,066		776,203	
Information	493,976		484,637	
Collaborative	351,831		283,244	
Others	130,899		4,767	
Administrative	5,201,124		5,955,766	
TOTAL EXPENDITURES	**12,555,898**		**11,516,582**	
	-887,409		462,451	
SURPLUS (DEFICIT), For the year				
FUND BALANCE, Beginning of year	21,095,795	1/	19,629,848	
FUND ADJUSTMENT	21,022		23,997	
FUND BALANCE, End of year	**20,229,408**		**20,116,296**	1/
REPRESENTED BY:				
ASSETS				
Current assets				
Cash and cash equivalents	19,724,854		19,457,249	
Short Term Investments	1,420,994		1,375,802	
Current Portion of LT Investments	0		0	
Receivables and other receivables	337,443		270,779	
Advance and deposits	41,087		48,241	
Materials and supplies inventory	16,552		43,954	
Fuel oil for vessels	147,108		235,686	
Prepayments	11,152		8,505	
Other current assets	6,915		2,151	
Total Current assets	**21,706,105**		**21,442,367**	
Noncurrent assets				
Reserved budget for vessel periodic maintenance	116,821		8	
Restricted bank deposit	5,913		5,470	
Termination indemnity fund	2,203,299		2,242,101	
Long-term investments	394,543		400,000	
Other noncurrent assets	37,826		111,804	
Total Noncurrent assets	**2,758,402**		**2,759,383**	
TOTAL ASSETS	**24,464,507**		**24,201,750**	
Less: Liabilities				
Accrued payable	1,022,132		939,721	
Contribution received in advance	866,456		802,439	
Fund held in trust	26,479		101,193	
Reserved budget for vessel periodic maintenance for M.V. SEAFDEC 2	116,733		0	
Total Current Liabilities	**2,031,800**		**1,843,353**	
Provision for termination indemnity	2,203,299		2,242,101	
TOTAL LIABILITIES	**4,235,099**		**4,085,454**	
NET ASSETS	**20,229,408**		**20,116,296**	

Remark: 1/ The Difference of US$ 979,499 (US$ 21,095,795 – US$ 20,116,296) is a resulted of change of rate in US$ translation.

Unaudited Contribution Received by SEAFDEC from Member Countries and Other Sources for the Year 2025 (in US$)

SOURCES	SEC	TD	MFRD	AQD	MFRDMD	IFRDMD	TOTAL	%
Brunei Darussalam	7,000	-	-	-	-	-	7,000	0.06
Cambodia	12,000	-	-	-	-	-	12,000	0.10
Indonesia	52,000	-	-	-	-	639,715	691,715	5.93
Japan	280,000	-	-	-	-	-	280,000	2.40
Lao PDR	6,500	-	-	-	-	-	6,500	0.06
Malaysia	21,500	-	-	-	815,164	-	836,664	7.17
Myanmar	22,500	-	-	-	-	-	22,500	0.19
Philippines	25,000	-	-	5,953,394	-	-	5,978,394	51.24
Singapore	13,500	-	-	-	-	-	13,500	0.12
Thailand	33,000	2,780,796	-	-	-	-	2,813,796	24.11
Viet Nam	26,000	-	-	-	-	-	26,000	0.22
Sub-total	**499,000**	**2,780,796**	**-**	**5,953,394**	**815,164**	**639,715**	**10,688,069**	**91.60**
Other sources/grant [2/]	-	8,314	-	275,977	-	-	284,291	2.44
Other income	-59,044	233,387	-	521,786	-	-	696,129	5.96
Total	**439,956**	**3,022,497**	**-**	**6,751,157**	**815,164**	**639,715**	**11,668,489** [3/]	**100%**

Remarks: [2/] Including contributions from non-member governments, international organizations/agencies, and miscellaneous receipts.

[3/] Excluded contribution received for the year 2025, which was supported by the Fisheries Agency-Japan for the Japanese Trust Fund, for the amount US$ 1,054,712 (Excluded Japan-MRC = US$ 280,000)

Unaudited Other Contributions Received by SEAFDEC in 2025 (in US$)

Other Contributions	Amount [4/]
Japanese Trust Fund (excluded: Japan MRC = US$ 280,000)	1,054,712
USAID Southeast Asia Fisheries Partnership	100,330
Sustainable Management of Fisheries, Marine Living Resources and Their Habitats in the Bay of Bengal Region for the Benefit of Coastal States and Communities (BOBLME II Project)	331,375
ASEAN-JICA Capacity Building Project on IUU Fishing Countermeasures in Southeast Asia	198,076
ASEAN-JICA Food Value Chain Development Project	291,665
Promoting the Blue Economy and Strengthening Fisheries Governance of the Gulf of Thailand through the Ecosystem Approach to Fisheries (GoTFish Project)	97,680
Total	**2,073,838**

Remark: [4/] Other sources of contribution are not reported in the SEAFDEC Financial Statements.

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