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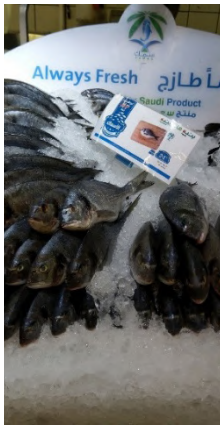
## Thematic Highlights

### Aquaculture

**12**

**INNOVATION IN ARID ENVIRONMENTS: BUILDING RESILIENT AND SUSTAINABLE AQUACULTURE IN SAUDI ARABIA**

*By Benjamin C Young, Saif Algethami, Anwer Abed Alazwari, Faris Alghamdi, and Ali AL Shaikhi*



**53**

**SOFT-SHELL MUD CRAB FARMING IN BANGLADESH: CHALLENGES AND PROSPECTS**

*By Aung Sein and Sujit Krishna Das*



### Feature

**24**

**EMPOWERING WOMEN THROUGH INNOVATIVE DRY FISH PROCESSING TECHNOLOGIES IN CAMBODIA**

*By IM Samruol, MEAS Chanthavy and KONG Tosoth*



### Fisheries

**43**

**STRENGTHENING SMALL-SCALE FISHERY SUPPLY CHAINS IN SOUTHEAST ASIA: PATHWAYS TO INCLUSIVE GROWTH**

*By Jariya Sornkliang, Thanyalak Suasi, Rattana Tiaye and Krittapat Meephol*



### Fishing

**48**

**BLUE ECONOMY ANCHOR: INDIA'S EEZ RULES MARK A NEW ERA FOR SUSTAINABLE FISHERIES**

*By P Krishnan, Rajdeep Mukherjee, Rishi Sharma and M Krishnan*



### Fishbytes

**60**

**AGREEMENT ON MARINE BIOLOGICAL DIVERSITY OF AREAS BEYOND NATIONAL JURISDICTION (BBNJ AGREEMENT)**



### Industry Leader

**17**

**DR ALUE DOHONG**

*Assistant Director-General of the Food and Agriculture Organization of the United Nations (FAO) and Regional Representative for Asia and the Pacific*



### Industry Leader

**21**

**DR AUDUN LEM**

*Chair of the Fisheries Transparency Initiative (FITI); previously Deputy Director of the Fisheries and Aquaculture Division at the Food and Agriculture Organization of the United Nations (FAO)*



### Other Sections

MARKET TRENDS.....	8
COMMODITY MARKET UPDATE (FISHMEAL & FISH OIL).....	10
INDUSTRY NOTES.....	27
EVENT: WORLD SEAFOOD CONGRESS.....	51
FISHINFONETWORK NEWS.....	62
INNOVATIONS.....	64
EQUIPMENT & SUPPLIES.....	66
PUBLICATIONS.....	67
DIARY & INDEX TO ADVERTISERS.....	68



Cover image : Ms. Sokhim, owner of Heng Hort Sokhim Fish Processing Enterprise, drying fish in a solar dryer dome

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## INFOFISH International – Issue 2, 2026

As we move further into 2026, INFOFISH International marks a milestone that invites both reflection and renewal. This issue proudly features the **45th Anniversary of INFOFISH**, celebrating four and a half decades of trusted service to Member Countries and the global fisheries and aquaculture community.

Established in 1981 with the support of FAO and hosted by the Government of Malaysia, INFOFISH has grown into a respected intergovernmental platform providing marketing information, technical advisory services and trade facilitation across the Asia-Pacific region and beyond. Over 45 years, INFOFISH has consistently served as a practical bridge between governments, industry stakeholders and international markets – strengthening competitiveness, advancing sustainability and championing the importance of small-scale producers whose livelihoods form the backbone of the sector.

Our anniversary feature in this issue traces INFOFISH's evolution from its foundational years in the 1980s, through decades of expanding market intelligence and capacity development, to its current role as a future-facing organisation navigating digitalisation, ESG expectations, complex trade regulations and rapidly shifting global markets. It also highlights INFOFISH's core pillars – Trade Promotion, Technical Advisory and Marketing Information – and the enduring partnerships that continue to shape its impact.

This milestone provides a fitting context for the broader themes explored throughout Issue 2/2026. If the past 45 years have demonstrated anything, it is that resilience, cooperation and informed decision-making are essential to sector progress. The conversations featured in this edition reinforce precisely those principles.

In our *INFOFISH speaks to...* interview, Dr Alue Dohong, Assistant Director-General of FAO and Regional Representative for Asia and the Pacific, outlines how FAO's Blue Growth Initiative has evolved into the more comprehensive Blue Transformation agenda. With its three strategic pillars – sustainable aquaculture intensification, strengthened fisheries management, and upgraded aquatic value chains – Blue Transformation provides a roadmap that is particularly relevant for Asia and the Pacific, the world's largest aquatic food-producing region.

Complementing this regional policy perspective, Dr Audun Lem, Chair of the Fisheries Transparency Initiative (FiTI), underscores the growing importance of transparency, data accessibility and stakeholder participation in strengthening fisheries governance. As countries implement the WTO Agreement on Fisheries Subsidies and intensify efforts against IUU fishing, transparency is increasingly recognised not as an administrative burden, but as a driver of credibility, accountability and sustainable resource management. The practical realities of transformation are further illustrated through this issue's feature articles.

Across regions, this issue demonstrates how strategic direction is translating into practical action. In Saudi Arabia, aquaculture development in arid environments shows how innovation, regulatory clarity and environmental stewardship can enable growth under significant resource constraints. In India, the introduction of the "Sustainable Harnessing of Fisheries in the Exclusive Economic Zone of India Rules, 2025" reflects a commitment to strengthening governance while promoting equitable access and responsible utilisation. At the same time, value-chain upgrading remains essential for inclusive development. Experiences from Cambodia and Southeast Asia illustrate how improved post-harvest technologies and capacity development – including support for women in fisheries value chains – enhance product quality, market access and resilience. Regional assessments further emphasise the need to address infrastructure gaps, traceability systems and equitable participation in line with ASEAN's objectives. Bangladesh's soft-shell mud crab sector provides another example of how targeted technical guidance and coordinated value-chain development can unlock export potential while reinforcing sustainability and quality assurance standards.

Collectively, these contributions point to a shared imperative: growth must be accompanied by responsible management, climate adaptation and inclusive participation. Capture fisheries must operate within scientifically defined sustainable limits; aquaculture must improve efficiency while safeguarding ecosystems and biosecurity; and value chains must respond to rising expectations for transparency, traceability and social responsibility. Above all, small-scale fishers and coastal communities must remain central to development pathways and policy frameworks.

As INFOFISH marks 45 years, this anniversary is not merely a celebration of longevity. It is a reaffirmation of purpose. In an era defined by accelerating change and interconnected risks, reliable information, practical solutions and trusted platforms for dialogue are more important than ever. INFOFISH remains committed to supporting Member Countries and partners through knowledge exchange, policy dialogue and market intelligence that strengthen resilience, competitiveness and sustainability.

We extend our sincere appreciation to our Member Countries, partners, contributors and readers who have walked this journey with us. We invite you to explore this anniversary feature and the diverse insights presented in Issue 2/2026 – and to continue shaping, together, a resilient, inclusive and sustainable future for fisheries and aquaculture.

**Thank you for your continued trust and engagement.**

**Gemma Meermans Matainaho**

Director  
INFOFISH

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INFOFISH International is published bimonthly by INFOFISH, INFOPECSA, INFOPECHE, INFOSAMAK, EUROFISH and INFOYOU, the Regional Marketing Information and Advisory Services for Fish Products.  
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## Resúmenes de los principales artículos

### Innovación en entornos áridos: construcción de una acuicultura resiliente y sostenible en Arabia Saudita ..... 8

Por Benjamin C. Young, Saif Algethami, Anwer Abed Alazwari, Faris Alghamdi y Ali AL Shaikhi

A pesar de la limitada disponibilidad de recursos hídricos naturales y de un inicio relativamente tardío, el sector acuícola de Arabia Saudita ha mostrado un desarrollo constante durante las últimas dos décadas. Este crecimiento ha estado respaldado por políticas gubernamentales estratégicas, sólidos sistemas de control de enfermedades, adaptación de especies y orientaciones técnicas para la industria con miras a una transformación estructural. No obstante, para garantizar la sostenibilidad ambiental e industrial a largo plazo, sigue siendo esencial ampliar aún más la producción local de criaderos, fortalecer los marcos de bioseguridad, adaptar los sistemas de cultivo a las especies locales y formar capital humano especializado a nivel nacional.

### Empoderamiento de las mujeres mediante tecnologías innovadoras de procesamiento de pescado seco en Camboya ..... 24

Por IM Samruol, MEAS Chanthavy y KONG Tosoth

El artículo destaca experiencias prácticas y resultados del proyecto CAPFISH-Capture: Desarrollo de la pesca poscaptura en Camboya, con énfasis en cómo las tecnologías mejoradas de procesamiento de pescado seco han contribuido al empoderamiento económico de las mujeres, a la mejora de la calidad del producto y al fortalecimiento del acceso a los mercados en el sector pesquero poscaptura. Asimismo, ofrece aportes relevantes para la formulación de políticas y lecciones basadas en el trabajo de campo que pueden resultar de interés para los lectores, en particular para quienes participan en el desarrollo pesquero, la agregación de valor y el crecimiento inclusivo en la región.

### Fortalecimiento de las cadenas de suministro de la pesca en pequeña escala en el Sudeste Asiático: vías hacia un crecimiento inclusivo ..... 43

Por Jariya Sornkliang, Thanyalak Suasi, Rattana Tiaye y Krittapat Meephol

La pesca en pequeña escala del Sudeste Asiático se ve afectada por la convergencia de desafíos sistémicos, incluidas las asimetrías en el poder de mercado de los intermediarios; los déficits de infraestructura poscaptura; la exclusión financiera y de información; las desigualdades de género persistentes; las crecientes presiones ambientales y climáticas; y las brechas críticas en normas y trazabilidad. Con foco en las cadenas de valor de la pesca en pequeña escala (PPE) de los países miembros del SEAFDEC en el Sudeste Asiático, este artículo subraya la urgencia de una transformación. Esta debe alinearse con la Resolución y el Plan de Acción sobre Pesca Sostenible para la Seguridad Alimentaria en la Región de la ASEAN hacia 2030 (RES y POA-2030), a fin de hacer frente a estos desafíos. También presenta recomendaciones estratégicas para construir sistemas alimentarios acuáticos resilientes, inclusivos y sostenibles que contribuyan a la seguridad alimentaria regional y a medios de vida equitativos.

### Pilar de la economía azul: las Normas sobre la ZEE de la India marcan una nueva era para la pesca sostenible ..... 48

Por P. Krishnan, Rajdeep Mukherjee, Rishi Sharma y M. Krishnan

Con la publicación de las "Normas para el Aprovechamiento Sostenible de la Pesca en la Zona Económica Exclusiva de la India, 2025", India ha subsanado finalmente una brecha regulatoria de larga data en relación con la actividad pesquera en la Zona Económica Exclusiva (ZEE). Se espera que la nueva legislación permita un desarrollo más equitativo de las comunidades pesqueras artesanales y de pequeña escala del país. Los principales desafíos se centran ahora en la aplicación efectiva y la coordinación federal de las normas, así como en la credibilidad frente a los mercados y a los países vecinos.

### Cultivo de cangrejo de manglar de caparazón blando en Bangladesh: desafíos y perspectivas ..... 53

Por Aung Sein y Sujit Krishna Das

Los cangrejos de manglar constituyen la segunda especie de crustáceo de mayor importancia comercial en Bangladesh, debido a su elevada demanda en los mercados internacionales. Los cangrejos de caparazón blando son especialmente apreciados por los consumidores de todo el mundo por su sabor y textura delicados, y por presentar un mayor valor nutricional, con menor contenido calórico y mayor concentración de minerales esenciales en comparación con los de caparazón duro. Durante el ejercicio fiscal 2024-25, el país exportó 1.166,89 toneladas de cangrejo de manglar (incluidos los de caparazón blando), por un valor superior a 14 millones de USD. Este artículo técnico describe los antecedentes, las cadenas de valor comerciales y la importancia socioeconómica del cangrejo de caparazón blando, y presenta directrices paso a paso para su cultivo. Asimismo, incluye un análisis costo-beneficio de una granja de un acre de superficie, que puede servir de orientación para nuevos emprendedores en la toma de decisiones de inversión. Los autores sostienen que, pese a ciertos desafíos, el cultivo de cangrejo de manglar de caparazón blando puede constituir una actividad rentable en la mayoría de los países de Asia y el Pacífico.



Rodrigo Misa

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## Résumés des articles de fond

### Innovation dans les environnements arides : mettre en place une aquaculture résiliente et durable en Arabie saoudite..... 8

Par Benjamin C Young, Saif Algethami, Anwer Abed Alazwari, Faris Alghamdi et Ali AL Shaikhi

Malgré les ressources en eau naturelles limitées et un démarrage relativement tardif, le secteur de l'aquaculture en Arabie saoudite s'est développé de manière constante au cours des deux dernières décennies. Cette croissance a été soutenue par des politiques gouvernementales stratégiques, un contrôle rigoureux des maladies, l'adaptation des espèces et des orientations industrielles visant à une transformation structurelle. Toutefois, afin de garantir la durabilité environnementale et industrielle à long terme, il paraît essentiel d'augmenter encore la production des écloseries locales, de renforcer les cadres de biosécurité, d'adapter les systèmes d'élevage aux espèces locales et de former des talents locaux spécialisés.

### Autonomisation des femmes grâce à des technologies innovantes de transformation du poisson séché au Cambodge .... 24

Par IM Samruol, MEAS Chanthavy et KONG Tosoth

Ce article met en exergue les expériences pratiques et les résultats obtenus du projet- CAPFISH -Capture : Développement de la pêche après la récolte au Cambodge, en mettant l'accent sur la manière dont l'amélioration des technologies de transformation du poisson séché a contribué à l'autonomisation économique des femmes, à l'amélioration de la qualité des produits et au renforcement de l'accès aux marchés dans le secteur de la pêche post-capture. Il offre des informations pertinentes sur les politiques et des enseignements tirés du terrain qui peuvent intéresser les lecteurs, en particulier ceux qui s'occupent du développement de la pêche, de la valeur ajoutée et de la croissance inclusive dans la région.

### Renforcement des chaînes d'approvisionnement de la pêche artisanale en Asie du Sud-Est: vers une croissance inclusive..... 43

Par Jariya Sornkliang, Thanyalak Suasi, Rattana Tiaye et Krittapat Meephol

En Asie du Sud-Est, la pêche artisanale est confrontée à une convergence de défis systémiques, notamment les déséquilibres du pouvoir de marché impliquant les intermédiaires, les déficits en infrastructures post-capture, l'exclusion financière et informationnelle, les inégalités entre les sexes profondément enracinées, les pressions environnementales et climatiques croissantes, ainsi que les lacunes critiques en matière de normes et de traçabilité. En se concentrant sur les chaînes de valeur de la pêche artisanale dans les pays membres du SEAFDEC en Asie du Sud-Est, cet article souligne l'urgence d'une transformation conforme à la résolution et au plan d'action sur la pêche durable pour la sécurité alimentaire dans la région de l'ASEAN à l'horizon 2030 (RES & POA-2030) afin de relever ces défis. Il présente des recommandations stratégiques qui visent à mettre en place des systèmes alimentaires aquatiques résilients, inclusifs et durables pour la sécurité alimentaire régionale et des moyens de subsistance équitables.

### Pilier de l'économie bleue : les règles de la ZEE indienne marquent une nouvelle ère pour la pêche durable ..... 48

Par P Krishnan, Rajdeep Mukherjee, Rishi Sharma et M Krishnan

Grace à la publication des « Règles relatives à l'exploitation durable des pêcheries dans la zone économique exclusive de l'Inde, 2025 », l'Inde a enfin comblé une lacune réglementaire de longue date en matière de pêche dans sa zone économique exclusive (ZEE). La nouvelle législation devrait permettre un développement plus équitable des communautés de pêcheurs artisanaux de l'Inde. Les défis à relever concernent la mise en œuvre et la coordination fédérale des règles, ainsi que la crédibilité auprès des marchés et des pays voisins.

### Élevage de crabes de vase à carapace molle au Bangladesh : Défis et perspectives..... 53

Par Aung Sein et Sujit Krishna Das

Les crabes de vase sont la deuxième espèce de crustacés la plus importante sur le plan commercial au Bangladesh, en raison de leur forte demande sur les marchés internationaux. Les crabes à carapace molle sont particulièrement appréciés par les consommateurs du monde entier en raison de leur saveur et de leurs textures délicates. Ils sont également plus complets sur le plan nutritionnel, moins caloriques et plus riches en minéraux essentiels que les crabes à carapace dure. Au cours de l'année fiscale 2024-2025, le pays a exporté 1 166,89 tonnes de crabes de vase (y compris les crabes à carapace molle), pour une valeur de plus de 14 millions de dollars américains. Cet article scientifique met en lumière le contexte, les chaînes de valeur commerciales et l'importance socio-économique des crabes à carapace molle, et présente des directives, étape par étape pour leur élevage. Il croise également l'analyse coûts-avantages d'une ferme d'une acre, ce qui peut aider les nouveaux entrepreneurs à prendre des décisions d'investissement. Les auteurs affirment que malgré certaines difficultés, l'élevage de crabes de vase à carapace molle peut être une activité lucrative dans la plupart des pays de la région Asie-Pacifique.



DIGRÉ Arriko Calice

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## 文章摘要

### 干旱环境下的创新：在沙特阿拉伯构建韧性、可持续的水产养殖..... 12

By Benjamin C Young, Saif Algethami, Anwer Abed Alazwari, Faris Alghamdi, and Ali AL Shaikhi

沙特阿拉伯水产养殖业在过去的二十年间稳固发展，尽管天然水资源有限、起步较晚。政府战略政策、有力的疫病防控、养殖品种适配以及旨在推动产业结构转型的行业指导，为这一增长提供了支撑。然而，为保障长期环境可持续性与产业可持续发展，仍需进一步扩大本地育苗场产能、强化生物安全体系、适配本土品种优化养殖模式，并培育本地专业人才。

### 柬埔寨创新鱼干加工技术助力妇女赋能 ..... 24

By IM Samruol, MEAS Chanthavy and KONG Tosoth

本文聚焦柬埔寨CAPFISH-Capture：捕捞后渔业发展项目的实践经验与成果，重点阐述改良鱼干加工技术如何在捕捞后渔业领域推动妇女经济赋能、提升产品品质和拓宽市场渠道。文章提出的政策相关见解与实地实践经验可引发读者思考，尤其是该地区从事渔业发展、产品增值及包容性增长工作的相关人士。

### 加强东南亚小规模渔业供应链：包容性增长路径 ..... 43

By Jariya Sornkliang, Thanyalak Suasi, Rattana Tiaye and Krittapat Meechol

东南亚小规模渔业面临一系列系统性挑战，包括涉及中间商的市场权力失衡、捕捞后基础设施的缺乏、金融与信息获取的限制、根深蒂固的性别不平等、日益加剧的环境与气候压力，以及行业标准与溯源体系的严重缺口。本文聚焦东南亚渔业发展中心（SEAFDEC）成员国的小规模渔业价值链，强调依据《东盟区域2030年可持续渔业促进粮食安全决议与行动计划》加快转型应对挑战的紧迫性，并提出战略建议，旨在构建韧性、包容、可持续的水产食品体系，保障区域粮食安全与公平生计。

### 蓝色经济锚点：印度专属经济区法规开启渔业可持续发展新时代..... 48

By P Krishnan, Rajdeep Mukherjee, Rishi Sharma and M Krishnan

随着《2025 年印度专属经济区渔业可持续利用法规》正式出台，印度长期存在的专属经济区渔业监管缺口得以填补。这部新法规有望推动印度小规模及手工渔业实现更公平的发展。未来面临的挑战在于法规执行、联邦协调，以及在市场与周边国家中树立公信力。

### 孟加拉软壳青蟹养殖：挑战与前景 ..... 53

By Aung Sein and Sujit Krishna Das

青蟹因国际市场需求旺盛，成为孟加拉国第二大具有经济价值的甲壳类品种。软壳青蟹口感鲜嫩、质地细腻，深受全球消费者青睐；与硬壳蟹相比，其营养价值更全面，热量更低，且富含必需矿物质。2024—2025 财年，孟加拉国出口青蟹（含软壳青蟹）1166.89吨，出口额超1400万美元。本文重点阐述了软壳青蟹产业背景、贸易价值链与社会经济价值，提供分步养殖指南。同时，文章还开展了一英亩养殖场地的成本收益分析，以帮助新创业者投资决策。作者认为，尽管面临一定挑战，软壳青蟹养殖在多数亚太国家仍具备可观盈利前景。



Liu Ming

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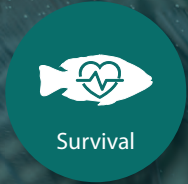
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## FRESH AND CHILLED FISH

Global live, fresh and chilled fisheries and aquaculture markets are entering the first quarter of 2026 with mixed momentum, shaped by shifting supply dynamics, seasonal demand, and continued pricing pressure in several key categories. Prices for fresh farmed salmon softened post-holiday as supply improved (notably from Norway and Chile), offering short-term cost relief for major importers in Europe and the United Kingdom. In contrast, Mediterranean seabass and seabream remain structurally tight, especially for larger sizes, which is keeping prices elevated and supply constrained.

The US market remained mixed. Fresh tuna imports recorded strong growth during January–September 2025, rising 11.76% to 19 241 tonnes, the highest level in five years, supported by sustained demand from sushi, sashimi and broader foodservice segments.

In Europe, prices remained firm into the New Year period, supported by seasonal demand, weather constraints, and structural pressures including quotas, logistics disruptions and ecosystem-related impacts.

Latin American markets were sustained by steady premium demand alongside tightening traceability and quality requirements. Pricing continues to reflect clear premiums by species and size, particularly for shrimp, grouper and tuna, while small pelagics remain comparatively lower-priced.

## FROZEN FISH & FILLETS

Imports of frozen fish into China declined in 2025 after two consecutive years of growth, falling to 2.22 million tonnes from 2.38 million tonnes in 2024. Despite the overall contraction, several categories recorded notable gains. Frozen Alaska pollock remained the country's largest imported species, rebounding to 565 933 tonnes in 2025 from 523 691 tonnes in 2024. Meanwhile, imports of other frozen fish varieties continued their steady upward trend, reaching a five-year high of 524 933 tonnes.

Rapid expansion in pre-processed aquatic products consumption is one of the most dynamic trends in China's aquatic products market. Shifting consumer lifestyles, improvements in cold-chain logistics, and rising demand for convenient yet nutritious meals are driving ready-to-cook products into the mainstream.

Frozen cod fillet exports declined as Northeast Arctic cod quotas tightened. The European market has reopened for imports of Russian Alaska pollock, with processors substituting to make up for the limited supply of other whitefish. Alaska pollock from the United States remains a cornerstone of global whitefish supply, especially for the surimi and frozen fillet markets respectively. Frozen hake products are especially popular, with the US market, benefiting from consumer interest in nutritious options with long shelf lives. The United States is both a producer and importer of hake, balancing domestic catch with imports to meet demand.

China remains Japan's largest supplier of frozen seafood in quantity, while Japan continues to be the leading market for Alaska-origin frozen pollock surimi blocks, with prices traditionally denominated in Yen. Frozen surimi blocks remain the core raw material for Japan's surimi processing industry; most of the supply is sourced from overseas. In 2025, US-origin shipments declined by 11%, while Russian volumes rose by 35%, narrowing the gap between the two suppliers. Meanwhile, Japan's domestic market continues to absorb frozen surimi blocks, indicating steady wholesale surimi prices, month-on-month.

Looking ahead, global trade in 2026 is expected to be reshaped by evolving tariff regimes and tighter groundfish quotas. High-end and value-added products are

gaining traction in urban centres, while untapped demand in inland and rural regions offers long-term growth potential.

## SHRIMP

As of the end of January 2026, overall farmed shrimp supply across South and Southeast Asia remains seasonally low, and this situation is expected to persist through February and March 2026 in several producing countries. The Lunar New Year holiday period (17–18 February) also temporarily constrained aquaculture operations in key producing areas, including China, Vietnam, Malaysia, and southern parts of Thailand, as many shrimp farmers suspended farm activities during the celebrations.

In Latin America, Ecuador continues to expand farmed shrimp production at a stable pace. The country's annual harvest is expected to exceed 1.5 million tonnes in 2025; exports during January–November 2025 had already reached 1.29 million tonnes.

Shrimp markets are supported by seasonal buying across the Asia-Pacific, driven by holiday demand and Lunar New Year procurement. This creates short-term volatility as buyers secure supply ahead of peak consumption.

In 2025, frozen shrimp imports into Vietnam increased sharply, rising 55% compared with 2024 to 85 000 tonnes. The main suppliers were Ecuador and India. This strong import growth indicates lower domestic farmed shrimp production, particularly of *vannamei* shrimp in Vietnam. A similar pattern was observed in Thailand. Frozen shrimp imports into Thailand increased by 42% in 2025 to 22 320 tonnes, with supplies sourced mainly from Ecuador and India.

**Exports:** Estimated global shrimp exports during January–November 2025 reached 3.65 million tonnes, up from 3.48 million tonnes in the same period of 2024, with the leading exporters being Ecuador (1.28 million tonnes; +14.28%), India (741 372 tonnes; +10.76%), Vietnam (307 165 tonnes; +1.32%), Indonesia (180 535 tonnes; -0.51%) and China (180 535 tonnes; +13.92%). Despite the impact of higher tariffs from the United States, exports from India, Vietnam and China continued to grow, supported by stronger value-added processing and market diversification.

**Imports:** Among the major shrimp-importing markets during January–November 2025, imports declined in China, the United States, Japan, Spain, France and the United Kingdom, while import growth was recorded in the Republic of Korea, the Netherlands, Vietnam and Germany, with imports into Vietnam reaching a five-year high, mainly supplied by Ecuador and India.

**China:** Annual data released by China Customs confirmed that shrimp imports in 2025 declined by 1.10% year-on-year to 989 543 tonnes. Supplies from the top exporter, Ecuador, were marginally lower, while imports increased significantly from India, Thailand, Vietnam and Indonesia; at the same time, demand for coldwater shrimp from wild capture remained strong, supported by higher supplies from Canada, Greenland, Argentina and Norway.

## TUNA

### Non-canned tuna

Following long-standing tradition, the Toyosu Fish Market remained closed from 31 December 2025 to 4 January 2026 and resumed trading on 5 January 2026 with the New Year's first fresh tuna auction.

Prices of fresh bigeye, yellowfin, and southern bluefin tuna increased during the first half of January 2026, supported by limited overall supply from Japan's domestic catches, particularly in Hokkaido, Aomori, Miyagi, and other key

fishing grounds. In addition, imports of fresh southern bluefin tuna from the southern hemisphere, notably Australia and New Zealand, remained sporadic since December, further constraining availability. Post-New Year tuna sales in Japan weakened by January, as consumer demand shifted seasonally away from raw tuna products toward cooked dishes, especially *nabe* (hotpot) meals, reducing demand for fresh tuna.

Japan's annual tuna import data for 2025 is yet to be released; however, cumulative imports for January–November 2025 indicate a decline across all fresh and frozen tuna categories, totalling 201 456 tonnes. Imports of fresh tuna fell to a five-year low, marking a 52% decline compared with the same period in 2021. Imports of whole frozen tuna and tuna fillets also weakened, though only marginally on a year-on-year basis.

Thailand's year-on-year imports of fresh and frozen bluefin tuna increased in 2025, reaching 14 197 tonnes for fresh bluefin and 3 120 tonnes for frozen bluefin. Imports of southern bluefin tuna also rose during the year, mainly supplied by Australia. By contrast, imports of lower-priced fresh/chilled bigeye and yellowfin tuna declined marginally in 2025, totalling 23 050 tonnes and 5 609 tonnes, respectively. Frozen bluefin imports more than doubled, increasing from 1 688 tonnes in 2024 to 3 120 tonnes in 2025, while frozen southern bluefin imports remained broadly stable at 9 639 tonnes, compared with 10 413 tonnes in 2024.

Post-New Year demand for non-canned, high-value tuna in Europe remained seasonally weak. In the European Union, imports of fresh tuna declined by 6% year-on-year during January–November 2025 to 7 752 tonnes, while imports of frozen tuna fillets rose sharply to nearly 40 000 tonnes, up from 31 100 tonnes a year earlier, confirming a strong and sustained demand shift toward frozen value-added products.

High tariffs imposed in the United States from late August 2025 began to weigh on tuna imports from October onward. As a result, year-on-year imports of the non-canned tuna category declined by 15.7% during January–October 2025. Frozen tuna fillets, the dominant product in both retail and foodservice channels, recorded a 20.9% decline to 34 838 tonnes, compared with 43 198 tonnes a year earlier. Import volumes fell across all major supplying countries, including Vietnam, Indonesia, Thailand, and Philippines.

### **Raw materials for canning and other uses**

Demand for whole frozen tuna used for reprocessing weakened among Thai tuna canners in 2025, likely reflecting reduced imports of canned tuna into their main export market, the United States. The decline was most pronounced for frozen skipjack. In contrast, canner demand for semi-processed cooked frozen loins remained firm, with annual imports increasing, indicating a continued shift toward higher-efficiency inputs. Meanwhile, delivery prices for frozen skipjack from the Western Pacific to Thailand stayed weak, averaging around USD 1 500/tonne in December 2025 and January 2026.

Consumer demand for sashimi tuna outside Japan increased during the Lunar New Year (17–18 February) celebrations, particularly across key Asian markets.

In Japan, consumer demand for sashimi-grade tuna is expected to remain seasonally low over the next two months, reflecting the traditional winter shift toward *nabe* (hotpot) dishes which favour other species like shrimp, crab, scallop, salmon, and yellowtail. Demand is projected to recover in April–May, supported by the Spring Festival and the Golden Week holiday period.

In the United States, consumption of high-value tuna products (sashimi and related items) is expected to become more marked during the first quarter of 2026, supported by retail and foodservice demand.

### **Canned fish**

Thailand remained the world's leading exporter of processed and canned tuna in 2025, although its total exports declined by 2.07% year-on-year. The decrease was mainly due to a 6.61% reduction in exports to the United States following the introduction of higher tariffs from August 2025, as well as lower shipments to other markets in the Americas, where Ecuador increased its market share.

Export performance was mixed in other regions. Shipments to Libya and Egypt increased, while exports to major Near East and North Africa (NENA) markets, notably Saudi Arabia and the United Arab Emirates, declined. In the Asia-Pacific region, demand for higher-value canned tuna weakened in Japan, Australia and New Zealand, but increased in Southeast Asia, where Thailand remained the leading supplier.

### **LIVE, FRESH & FROZEN LOBSTER AND CRAB**

The global crab market in 2025 was premium-driven and supply-constrained. Import demand led by China, the United States, Japan, and the Republic of Korea, reflected strong foodservice and retail consumption. The main exporters were the Russian Federation, Canada, and Norway, leaving the market exposed to seasonality and regulatory risks. Import values remained firm despite limited volume growth, confirming crab's position as a high-value, low-substitution seafood.

Meanwhile, live lobster and crab markets remain highly sensitive to quality, weather-related disruption, and trade policy developments. In particular, shifts linked to Canada-China tariff adjustments anticipated from March, may influence pricing and availability.

### **FROZEN CEPHALOPODS AND MOLLUSCS**

The 2025 global market for cuttlefish, squid, and octopus was demand-driven but supply-constrained. Squid dominated volumes, with strong imports into China and Japan, supporting market stability. China is increasing purchases of frozen and semi-processed squid from multiple suppliers to meet foodservice demand, which is growing by 10.8%.

Octopus remained a premium segment, led by demands in Spain and Italy; its trade is highly sensitive to supply shortages from key exporters such as Morocco and Mauritania. Rising import values and increased cold-storage usage signal tighter supply and risk-managed inventory strategies. Growth prospects are value-led rather than volume-driven.

In Europe, live lobster and oysters showed the strongest upward signals, while fresh bivalves such as clams and scallops remained supported by holiday consumption. Cephalopods also stayed firm, with competitiveness increasingly linked to compliance and supply reliability.

### **PROCESSED AND SEMI-PROCESSED PRODUCTS**

Global trade in HS 1604 (prepared or preserved fish) and HS 1605 (prepared or preserved crustaceans and molluscs) remained resilient in 2025, driven by demand for value-added, shelf-stable products. Imports are led by the United States, Japan, China, and major European Union markets. HS 1604 products mainly comprise tuna and pelagic products, while HS 1605 delivers higher unit values via premium shellfish. Exports were concentrated in Thailand, Vietnam, Ecuador and Morocco. Value growth continues to outpace volume growth.

Source: INFOFISH Trade News (ITN), Issue 1, 2026. For subscription inquiries, contact info@

## Fishmeal and fish oil

### Prices rise despite high production

Catches from reduction fisheries have remained comfortably higher than in 2024, raising supply levels for both fishmeal and fish oil. Peruvian output has reached levels not seen for more than a decade, adding greatly to global supplies. Oil yields in the country also improved in the last quarter of 2025, which together with increased catches in Chile, supported strong global export volumes of fish oil. However, lower anchoveta quotas for late 2025 and early 2026 in the Eastern Pacific, coupled with increasing pressure on certain small pelagic stocks in the Northern Atlantic, will likely tighten supply in 2026. Anticipation of this has led to rising prices for fishmeal, while fish oil prices have settled at an elevated plateau, indicating that higher prices will continue to be the norm for the industry. Chinese fishmeal imports and Norwegian fishmeal and fish oil imports have both seen an uptick in quantities, supported by growth in their aquaculture sectors.

### Production

Peru, which typically accounts for 20 percent of global fishmeal production, saw anchoveta catches of 2.46 million tonnes in the first fishing season held between April and July in the main North-Centre region. This was a good result for the industry, putting production well above 2024 levels and on par with catch levels last seen in the 2012 seasons. However, on 1 November, a provisional catch recommendation of just 500 000 tonnes for the second 2025 season in the North-Centre region was announced. This was revised by the Peruvian Ministry of Production (PRODUCE) to 1.63 million tonnes on 12 November, following new biological surveys of the stocks. The higher revised quota was welcomed by the industry, although many had expected the figure to be around 2 million tonnes. Supplies will not be as abundant in early 2026 as they would have been with a higher quota and will likely fall below levels seen at the beginning of 2025 as 2.42 million tonnes were caught between November 2024 and January 2025.

Global fish oil production rose by 5 percent from January to October 2025; this is despite Peruvian output remaining constrained during the first fishing season of the year by low oil yields due to higher juvenile incidence and environmental stress which reduced the fat content of fish. Yields improved significantly during the second fishing season, Chilean supplies rose on the back of increased landings of jack mackerel and anchoveta, and in addition there was also a marginal increase in the supply of trimmings from salmon processing. While Peru's production fell by 14 000 tonnes in the first ten months of the year, Chile's output increased by 23 000 tonnes, offsetting the fall.

North Atlantic fisheries saw a slight decline in catches of reduction fisheries in the year to October, dropping to just over 2 million tonnes, a 6 percent reduction on the same period of 2024. Mackerel, blue whiting and Atlanto-Scandian herring, key stocks for reduction fisheries in the region, continue to be under pressure from high levels of fishing, with several stocks being fished at levels exceeding scientific advice from the International Council for the Exploration of the Sea (ICES). Feed companies have become increasingly strident in voicing concerns about the future of stocks in the region. ICES recommended a 41 percent reduction in catches of blue whiting in 2026, reflecting the significant pressure on the stock. Any declines to catches in 2026 would pose challenges to the Norwegian salmon sector, which relies heavily on supplies from Iceland and Denmark. While decreases in North Atlantic fishmeal and fish oil production are marginal so far, with Peruvian quotas falling on the low side of expectations, these stocks will come under mounting pressure in 2026 if prices continue to rise.

### Trade

Exports of aquatic ingredients continued to rise in the second quarter of the year, buoyed primarily by higher catches in Peru and Chile.

Peruvian fishmeal exports in the first half of the year increased by 37 percent year-on-year, from 590 000 tonnes in 2024 to 810 000 tonnes in 2025. The increase was dramatic for fish oil, whose exports rose from 29 000 tonnes in the first half of 2024 to 83 000 tonnes in the same period of 2025. China remains the primary market for Peruvian fishmeal, absorbing 90 percent of exports; the country has also emerged as the main consumer of Peruvian fish oil, taking 28 percent of exports in the first half of 2025. During that period, China's total imports of fishmeal increased by 23 percent to over 1 million tonnes, mainly from Peru.

Chile, the second-largest exporter of marine ingredients, saw an impressive 16 percent increase in fishmeal exports to 160 000 tonnes in the first half of 2025. Exports of fish oil meanwhile, increased by 10 percent to 59 000 tonnes. While the increased supply of raw materials certainly contributed, disruption to the national salmon industry as a result of US tariffs provoked a slight fall in the domestic demand for fishmeal, leaving more volume for export. Reports from the Chilean salmon industry indicate that farmers are looking to consolidate volumes rather than pursue expansion for 2026.

Norway, the largest importer of fish oil and the second-largest for fishmeal, saw steady growth in both categories, with imports up by 17 500 tonnes for fishmeal and 16 800 tonnes for fish oil. The main fishmeal suppliers continue to be Iceland and Denmark, both of which have seen increased quotas and catches for their main stocks in 2025. Some 20 000 tonnes of fish oil were imported from Peru in the first half of 2025, accompanied by a reduction of 3 000 tonnes from Denmark and 700 tonnes from the United States of America.

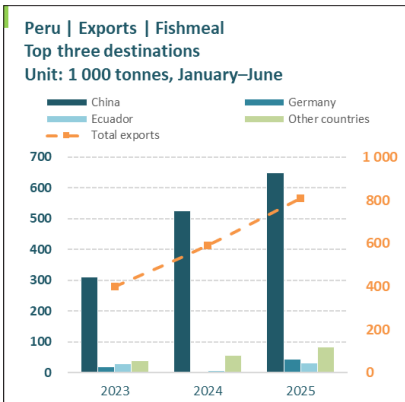
### Prices

Despite an increase in the supply of fishmeal, prices have risen on the expectation of tighter supplies in early 2026. October FOB prices for Peruvian fishmeal stood at USD 1 900 per tonne for super prime fishmeal (minimum 68 percent protein), 25 percent higher than in October 2024.

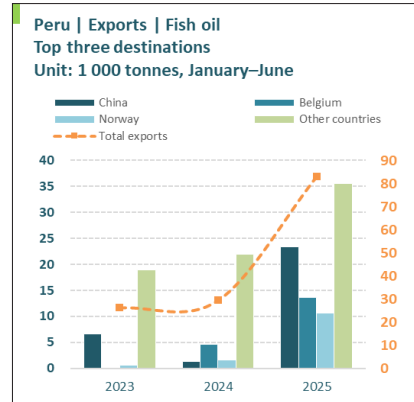
Although Peruvian fish oil production has been constrained throughout 2025 by low yields, prices for the product have continued to decline, with feed-grade product averaging roughly USD 2 600 per tonne, down by about 18 percent from USD 3 200 per tonne in October 2024. High demand for fish oil, especially in the aquaculture industry, continues to support these prices and contribute to the high price inelasticity of demand.

### Outlook

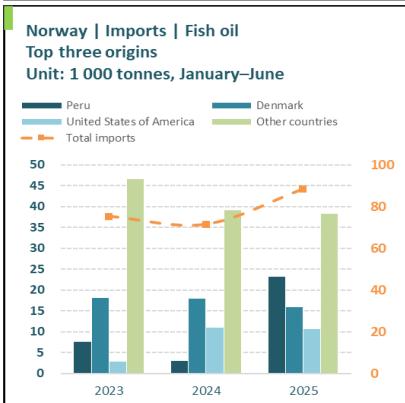
The first ten months of 2025 proved to be productive for reduction fisheries, with supplies of fishmeal and fish oil increasing by 8 percent and 11 percent, respectively. However, a lower quota for Peru's North-Centre region, which will run from late 2025 to early 2026, will slow supply growth. At the same time, demand has strengthened, pushing prices for fishmeal higher even as supplies remain steady. Analysts point to a new normal for fish oil pricing; while prices have fallen by 65 percent since their peak in September 2023, they have remained at around USD 2 600 per tonne since April 2025. Demand from aquaculture remains fundamental in supporting these high prices.



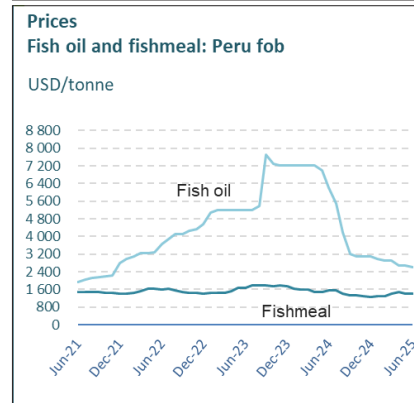
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Source: GLOBEFISH Quarterly species analysis, December 2025

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# INNOVATION IN ARID ENVIRONMENTS: BUILDING RESILIENT AND SUSTAINABLE AQUACULTURE IN SAUDI ARABIA

By Benjamin C Young, Saif Algethami, Anwer Abed Alazwari, Faris Alghamdi, and Ali AL Shaikhi

**Despite limited natural water resources and a relatively late start, Saudi Arabia's aquaculture sector has developed steadily over the past two decades. This growth has been underpinned by strategic government policies, robust disease control, species adaptation, and industry guidance aimed at structural transformation. However, to ensure long-term environmental and industrial sustainability, it remains essential to scale up local hatchery production further, strengthen biosecurity frameworks, adapt farming systems to local species, and cultivate specialised local talent.**



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In contrast to the scarcity of freshwater and arable land, Saudi Arabia has an extensive coastline of 7 572 km, extending from the Red Sea in the west to the Arabian Gulf in the east. Approximately 2 400 km of this undeveloped coastline presents significant potential for aquaculture expansion. Furthermore, these waters host a diverse array of indigenous marine finfish with high commercial potential, including the snubnose pompano (*Trachinotus blochii*), sobaiya seabream (*Sparidentex hasta*), and red mangrove snapper (*Lutjanus argentimaculatus*).

Saudi Arabia's aquaculture journey began in the 1970s, initially mirroring the trajectory of many developing nations by focusing on freshwater species, primarily tilapia (*Oreochromis niloticus*). However, by the mid-1990s, a strategic shift driven by policy planning, market demand, and favourable marine conditions catalysed the rise of shrimp farming, which eventually surpassed freshwater production.

The shrimp sector flourished until 2010, when an outbreak of White Spot Syndrome Virus (WSSV) decimated the then-primary species, the Indian prawn (*Fenneropenaeus indicus*). In a resilient response, the industry transitioned to farming Specific Pathogen-Free (SPF) Pacific white shrimp (*Litopenaeus vannamei*), which has since dominated the sector, accounting for over 70% of total mariculture output.

Aquaculture production in Saudi Arabia increased from 6 004 tonnes in 2000 to 139 949 tonnes in 2023; this annual growth rate of 14.7 percent is higher than the sub-regional, regional, and world averages. In 2023, Saudi Arabia's total aquaculture production reached approximately 139 949 tonnes, with mariculture (shrimp and marine finfish) contributing 92 491 tonnes. Key mariculture species, including Asian seabass (*Lates*

*calcarifer*), gilthead bream (*Sparus aurata*), Sabaki tilapia (*Oreochromis spilurus*), and sobaiya seabream, contributed over 30 000 tonnes collectively. This growth has been particularly evident in the Arabian Gulf region through the establishment of localised hatcheries and integrated farms for shrimp, seabass, sea bream and groupers (*Epinephelus* spp.).

Inland aquaculture remains a pillar of national food security, with tilapia production reaching approximately 45 200 tonnes in 2023, representing nearly 32% of total national output. North African catfish (*Clarias gariepinus*) follows as the second-largest freshwater species at 1 230 tonnes. These inland operations remain essential for rural development and stabilising the domestic food supply.

## Aquaculture challenges in Saudi Arabia

### Environmental and resource constraints

The Saudi aquaculture industry faces significant hurdles, including limited natural resources, a scarcity of high-quality broodstock, inadequate site selection, a shortage of skilled personnel, and biosecurity threats. While Saudi Arabia's interior is often perceived as a barren desert, the reality is that arable land accounts for only 1.8% of the country's total area. The scarcity of surface and groundwater further intensifies this challenge. Currently, the agricultural sector consumes over 80% of the nation's water (primarily from deep aquifers) severely constraining aquaculture expansion. Consequently, tilapia farms are concentrated in Al-Qassim and the regions surrounding Riyadh, where freshwater is more readily available. As illustrated in Figure 1, production volume and farm density decrease progressively toward coastal areas.

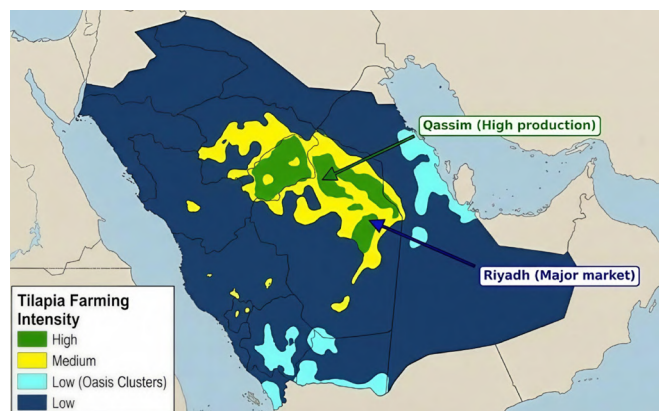


Figure 1. Major tilapia farming hubs in Saudi Arabia

### Salinity and operational barriers

Environmental constraints extend to the coastline, where seawater salinity typically ranges from 42‰ to 45‰, which is significantly higher than the ideal larviculture range of 10‰ to 33.5‰. High water temperatures, fluctuating between 17.5°C and 35°C, further limit species suitability and operational feasibility (Figure 2). Beyond these natural factors, strict government regulations on well drilling and groundwater extraction make freshwater a high-cost component. The combined burden of hypersalinity and water scarcity remains a primary bottleneck for the industry.

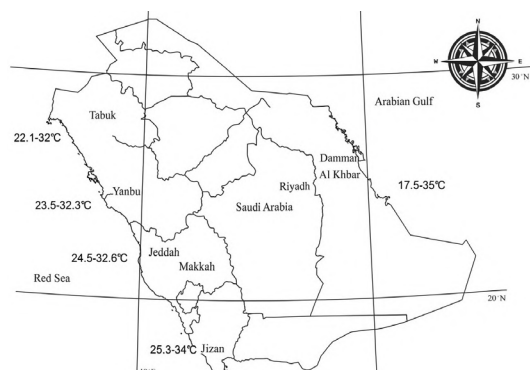


Figure 2. Water temperature range of aquaculture regions in Saudi Arabia.

### Structural and management challenges

The industry structure also presents unique challenges. Unlike the mariculture sector, which is dominated by a few mega-companies, the freshwater sector consists of approximately 350 small-scale, scattered farms. Before the 2010s, the Ministry of Environment, Water, and Agriculture (MEWA) struggled to monitor these operations due to the absence of standardised guidance and the fragmented distribution of facilities. Ineffective farm management often resulted in inconsistent product quality, unreliable production estimates, and compromised disease prevention measures.

### Seedstock and seed dependency

Furthermore, Saudi Arabia's marine finfish sector remains heavily dependent on imports of fingerlings from Bahrain, Türkiye, and Mediterranean countries, thereby limiting species diversification and product development. This reliance on imported eggs and larvae stems from a localised failure to produce sufficient high-quality juveniles. Even in the tilapia sector, the quality and quantity of broodstock remain insufficient for most local hatcheries, leading to a persistent shortage of qualified juveniles on domestic farms.

### Human capital and infrastructure

Due to the industry's relatively short history, there has been a chronic shortage of experienced farm management personnel. In the 1990s and 2000s, recruiting and training local talent was a significant challenge, exacerbated by a lack of specialised vocational training organisations. Coupled with the high capital expenditure required for production facilities in such extreme environments, these factors have historically hindered the sector's competitive growth.

## Strategic frameworks for resilience and sustainable growth

### National policy integration

Since 2018, the Ministry of Environment, Water and Agriculture (MEWA) has accelerated aquaculture development through Saudi Arabia's national transformation programs, specifically Vision 2030 and the Sustainable Rural Agricultural Development Program (REEF). These initiatives are designed to establish robust food security and sustainability strategies across the environment and agriculture sectors. Under these frameworks, MEWA has successfully integrated governmental, private, and academic resources to catalyse improvements in technology transfer, farm management, workforce training, disease prevention, and market access.

### Water management and circularity

To safeguard finite groundwater resources, MEWA has implemented a dual approach: rigorous monitoring and pumping quotas coupled with the active promotion of Integrated Agri-Aquaculture (IAA) and aquaponic systems. Innovative initiatives, such as the cultivation of *Azolla* within aquaculture ponds as organic fertiliser and protein-rich feed, are also underway. Consequently, IAA practices have flourished in Al-Qassim, Al-Ahsa and Riyadh. In these clusters, farmers utilise deep groundwater for tilapia rearing, subsequently repurposing the nutrient-rich effluent for crop irrigation. This synergy optimises water-use efficiency and enhances agricultural circularity.



The Ministry of Environment, Water and Agriculture MEWA is actively promoting Integrated Agri-Aquaculture (IAA) and aquaponic systems.

### Regional models of sustainability

These regions represent two distinct paths toward sustainability: Al-Ahsa exemplifies the 'Ecological Resilience' model, rooted in historical oasis management and natural water discharge; conversely, Al-Qassim embodies the 'Technological Optimization' model, demonstrating how modern IAA practices, supported by stringent regulations, can mitigate

the depletion of fossil aquifers. Together, these cases provide a comprehensive overview of the strategic adaptations within the Saudi aquaculture sector.

**Marine innovation and socio-economic growth**

Regarding coastal operations, MEWA is actively encouraging the adoption of Recirculating Aquaculture Systems (RAS) to maximise water efficiency. The Ministry is also designating specialised aquaculture zones and diversifying cultivated species to streamline production. Along the coastline, new initiatives for seaweed and algae cultivation are being implemented to stimulate regional development. These strategic efforts aim to drive economic growth in coastal communities, fostering local engagement and creating long-term, sustainable employment opportunities.



Young Saudis, including women, are actively involved in seaweed production.

**Seedstock security and native species commercialisation**

The stability of fry sources is fundamental to sustainable development; therefore, prioritising broodstock management is imperative. To address the current shortage of local supply, MEWA is prioritising the expansion of hatchery capacity. While Saudi Arabia has achieved commercial success with white shrimp, tilapia, Asian seabass, and gilthead bream, total output remains influenced by inherent environmental limitations,

necessitating imports to meet high domestic demand. To mitigate disease risks and climate vulnerability, MEWA is pursuing the commercialisation of native species, such as snubnose pompano and sobaity seabream, to strengthen the sector’s long-term resilience.



A fish hatchery in Saudi Arabia.

Recent research provides critical scientific evidence to facilitate this scale-up: for instance, snubnose pompano exhibits higher survival rates at a salinity of 39‰ compared to 42‰, while sobaity seabream maintains comparable growth rates at 28°C as at 24°C. These findings are vital for streamlining production workflows and reducing operational costs in extreme arid environments.

**Knowledge transfer and biosecurity protocols**

MEWA collaborates with local universities, international organisations, and national research centres to improve technology transfer. Through practical workshops and technical training, local professionals are enhancing their expertise to support the ongoing development of the national aquaculture sector. These centres offer technical assistance, consultation, and high-quality fry to farmers to elevate the standards of local operations. On the biosecurity front, MEWA regularly convenes industry leaders for seminars and maintains a rigorous national tracking system for aquatic diseases. Stringent regulations govern the import of live fish, restricting permits to licensed operators to prevent pathogen outbreaks. Furthermore, the Ministry provides farmers with comprehensive biosecurity manuals and conducts regular farm monitoring to ensure compliance.



Capacity-building and technical training for national officials.

**Market development and SAMAQ certification**

Beyond production, MEWA aims to increase annual per capita seafood consumption from the current 9–12 kg to 13 kg by 2030, aligning closer to the global average (20.7 kg). To achieve this, the Ministry organises promotional activities and assists operators in obtaining international certifications such as HACCP, ISO, and Best Aquaculture Practices (BAP). Central to this strategy is the Saudi national aquaculture certification and labeling program (SAMAQ) which guarantees premium quality and food safety. By implementing these rigorous frameworks, the government enhances the competitiveness of local producers, facilitating the expansion of Saudi aquaculture products into international export markets.

**Empowering a new workforce: the evolving role of women in aquaculture**

The transformation of Saudi Arabia’s aquaculture sector is not only a technical achievement but also a landmark for social progress. Historically, women’s participation in this industry was primarily confined to administrative or marketing roles, owing to social norms and limited access to field-based training. However, under the framework of Vision 2030 and the REEF initiative, a profound shift is occurring. Women are increasingly transitioning from “the office to the field,” becoming essential contributors to the operational value chain.

Recent field projects led by MEWA and the Food and Agriculture Organization of the United Nations (FAO) have demonstrated that Saudi women can excel in specialised segments such as seaweed farming and

advanced postharvest processing. In regions like Jeddah and the Farasan Islands, women are now actively engaged in seaweed cultivation, including managing raft systems, tying seedlings, and overseeing postharvest drying. Simultaneously, training programs have empowered local women to modernise traditional artisanal practices, such as tuna canning and salt-drying, with a focus on hygiene, branding, and value recovery. These efforts do more than create jobs; they foster rural livelihoods, enhance community resilience, and ensure that the future of Saudi aquaculture is both inclusive and sustainable. However, sustained participation will depend on continued access to field-based training, safe working environments, and clear career pathways.

## Beyond the farm: impact on society and future vision

The transformation of Saudi Arabia's aquaculture sector is not merely a technical achievement; it is a vital contributor to the country's socio-economic fabric. By reducing reliance on imported seafood, which currently fills the gap in domestic demand, the initiatives led by MEWA ensure that fresher, higher-quality fish reach the local dinner table faster and more sustainably.

A key highlight for the general public is the SAMAQ certification, which serves as a "quality seal". For everyday consumers, this label provides peace of mind, ensuring the fish they buy is raised to the highest international standards for food safety and environmental care. Furthermore, the industry's expansion is opening new opportunities for the national workforce. We are seeing a new generation of Saudi technicians, researchers, and entrepreneurs, including an increasing number of women, taking lead roles in seaweed production and high-tech farm management.

Looking ahead, the vision is to turn the desert's challenges into a global advantage. As technology continues to evolve, Saudi Arabia is positioning itself as a pioneer in "arid-region aquaculture". This means the innovations developed here, such as fish farming with minimal water and adapting species to high temperatures, could eventually be exported to help other dry regions worldwide achieve food security. In this way, a fish farm in the middle of the desert becomes more than just a source of food; it becomes a beacon of innovation for a changing planet.

## Conclusion

The evolution of Saudi Arabia's aquaculture sector from its freshwater origins in the 1970s to a technologically advanced mariculture industry today is a testament to a long-term commitment to food security and economic diversification. However, as this review highlights, the path to a truly resilient and sustainable industry is paved with challenges, ranging from extreme environmental hypersalinity and thermal stress to a historical reliance on imported seedstock.

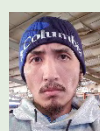
To achieve the ambitious goals set out in Vision 2030, the sector must now move beyond policy-driven demonstration projects. The transition to a fully integrated, commercially viable ecosystem is no longer optional; it is essential.

This requires a steadfast commitment to three strategic pillars:

- **Technological localisation:** Expanding domestic hatchery capacity and commercialising native species such as the snubnose pompano (*Trachinotus blochii*) and sobaity seabream (*Sparidentex hasta*), to reduce external dependencies and bolster biosecurity.
- **Environmental stewardship:** Scaling up circular models like Integrated Agri-Aquaculture (IAA) and Recirculating Aquaculture Systems (RAS) to harmonise production with the country's precious and limited water resources.
- **Human capital empowerment:** Bridging the technical gap through sustained international cooperation (such as the FAO partnership) and specialised vocational training (such as the Taiwan/CDF partnership) to equip a new generation of Saudi aquaculture professionals.
- By synergising scientific research with robust policy frameworks and international expertise, Saudi Arabia is not only securing its own food future but is also establishing a global benchmark for aquaculture innovation in arid regions. Ultimately, the successful maturation of this industry will transform environmental constraints into competitive advantages, ensuring that the national economy remains a resilient pillar of its heritage and future prosperity. 🌱

## Acknowledgments

The authors express their gratitude to the Ministry of Environment, Water, and Agriculture, and the Food and Agriculture Organization of the United Nations for providing photos and materials.



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# الجمعية السعودية للاستزراع المائي SAUDI AQUACULTURE SOCIETY

The Saudi Aquaculture Society was established pursuant to Council of Ministers Resolution No. 73. It was registered according to a registration certificate approved by His Excellency the Minister of Environment, Water and Agriculture. The Saudi Aquaculture Society is a civil society association with a legal personality and independent financial liability. It works under the supervision of the Ministry of Environment, Water and Agriculture, represented by the Agriculture Agency

## Our Vision

Contributing to the development of a globally competitive and sustainable aquaculture industry, providing safe, high-quality, and competitively priced products through environmentally responsible methods.

## Our Mission

Enhancing the role of sustainable aquaculture as a key contributor to the national economy, employment, food security, and investment opportunities, in compliance with Saudi laws and environmental standards.

## Our Objectives



Build strong local & global business networks.



Support Saudi Vision 2030 & national economic growth.

سماق  
SAMAQ



SAMAQ is the logo of the official national aquaculture product certification program. The SAMAQ label indicates that a product complies with requirements of the Saudi Arabian Code for Responsible Aquaculture Practices, and is in accordance to international guidelines and standards. The SAMAQ logo indicates the local origin, freshness and safety of the national aquaculture products.



Offer fresh, safe, high-quality fish products at competitive prices.



Promote investment awareness in aquaculture.

### Contact Info:

Join us in building a sustainable future for aquaculture in Saudi Arabia!



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## INFOFISH speaks to.....

### DR ALUE DOHONG

*Assistant Director-General of the Food and Agriculture Organization of the United Nations (FAO) and Regional Representative for Asia and the Pacific*

*Dr Alue Dohong, the last time we interviewed the head of FAO Regional Office for Asia and the Pacific (FAO RAP) was in 2018, when we featured Dr Kundhavi Kadiresan who had held the position at that time. Now, seven years later, it will be interesting to have an update on several key international and FAO initiatives, and with a specific focus on Asia and the Pacific.*

**Q:** *One of the strategic programmes that we had referenced in the 2018 interview was FAO's Blue Growth Initiative (BGI), which built upon the Code of Conduct for Responsible Fisheries (CCRF). In the period since then, FAO and its Members have developed and endorsed a global initiative for the sustainable development of fisheries, aquaculture and the seafood trade called Blue Transformation. Could you please elaborate on the evolution of Blue Transformation and its relevance to the Asia-Pacific region?*

**A:** The FAO Code of Conduct for Responsible Fisheries (CCRF), adopted after the 1992 Rio Earth Summit, established globally agreed principles for the sustainable use of marine and freshwater resources for food security, decent work and ecosystem health. FAO has built on this since then, through technical guidelines and advice.

Twenty years after Rio, following the United Nations Conference on Sustainable Development (UNCSD or Rio+20) and the adoption of the Sustainable Development Goals (SDGs), FAO developed its Blue Growth Initiative (BGI). In Asia and the Pacific, this was implemented through the Regional Initiative on Blue Growth, to support sustainable practices in capture fisheries, aquaculture, ecosystems, trade, and social protection, with specific attention to Small Island Developing States. FAO's regional fishery body, the Asia-Pacific Fishery Commission (APFIC), helped drive this work through regional coordination and technical guidance.

As global pressures like climate change, biodiversity loss and the rising demand for nutritious aquatic foods continue to intensify, FAO and our Members evolved this agenda into the Blue Transformation. Blue Transformation provides a more comprehensive, results-oriented roadmap focused on three priorities: (i) sustainably intensifying and expanding aquaculture, (ii) strengthening the management of capture fisheries, and (iii) upgrading aquatic value chains to enhance social,

economic and environmental performance. By doing this, we aim to expand aquatic food systems and increase their contribution to better production, better nutrition, better environment and better life, especially for those communities that depend on fisheries and aquaculture, ensuring that no one is left behind.

For Asia and the Pacific, the world's largest aquatic food-producing region, Blue Transformation is highly relevant. It promotes innovation and inclusive growth, ensuring that small-scale fishers, aquaculture producers and vulnerable communities benefit, while safeguarding ecosystems. It builds on, and significantly advances, the principles of Blue Growth and accelerates progress toward sustainable, resilient and equitable aquatic food systems in support of the SDGs.

**Q:** *The Asia-Pacific dominates in global production of fish and fishery products; and yet, food security is not assured across the region. Would you agree with the statement that under the Blue Transformation initiative, the three most important areas of focus for the region should be (i) intensification in aquaculture while ensuring sustainability; (ii) better fisheries management; and (iii) upgrading fish value chains to improve availability, quality and food safety to meet regional and market country requirements?*

**A:** Yes, absolutely, these areas of focus are fully consistent with FAO's Blue Transformation roadmap and are particularly relevant for the region.

Firstly, **sustainably intensifying aquaculture** is essential as the Asia-Pacific accounts for the vast majority of global aquaculture production and is a major contributor to the region's fish supply. Further, sustainable, expansion – supported by innovation, biosecurity, improved feeds and genetics, and responsible environmental management – will be critical to meet regional demand for nutritious aquatic foods while reducing pressure on wild stocks.

Secondly, **strengthening fisheries management**, including preventing IUU fishing, is central to ensuring long-term resource sustainability and securing livelihoods. Effective, evidence-based decision-making on fisheries resources; improved monitoring, control and surveillance and port controls; ecosystem-based approaches; and regional collaboration are key to maintaining healthy stocks and supporting coastal communities. This is particularly important to the Asia-Pacific region which is home to more than 80 percent of the world's small-scale fishers. (<https://www.fao.org/voluntary-guidelines-small-scale-fisheries/ihh/en>)

Third, **upgrading regional and international aquatic value chains** is vital to reduce loss and waste, improve food safety and quality, increase value-addition, and ensure fairer and more inclusive distribution of benefits. More efficient, equitable and climate-resilient value chains can unlock new livelihood opportunities and make nutritious aquatic foods more accessible – crucial for improving food security and nutrition.

These three pillars reflect the core intent of Blue Transformation: to deliver sustainable growth of aquatic food systems while leaving no one behind. Importantly, they reinforce one another: improved management strengthens sustainability; responsible aquaculture expansion increases supply; and value-chain upgrading ensures that production translates into better nutrition and livelihoods. I fully agree that these are indeed the most important focus areas for accelerating Blue Transformation in the Asia-Pacific region.

**Q:** Can you highlight any regional progress in achieving Blue Transformation objectives in aquaculture over the past five years?

**A:** Over 90% of farmed aquatic foods is produced in Asia and the Pacific and the region is expected to continue leading the sector's growth. However, to sustainably meet rising demand, we must ensure sustainable intensification, better resource use, improved governance, resilient value chains, and enhanced collaboration among governments, private sector, and civil society.

Because aquaculture is so important to the region, FAO has worked closely with the Network of Aquaculture Centres in Asia-Pacific (NACA) to develop a [regional roadmap](#) for Aquaculture Transformation in Asia and the Pacific by 2030. Its vision is to develop more efficient, inclusive, resilient, and sustainable aquatic food systems through

innovation, investment, and partnerships especially with private sector investment and venture capital mechanisms. The roadmap focuses on twenty actions areas and priorities for promoting innovation and investment tailored to the Asian and Pacific context, addressing challenges like poor infrastructure, environmental impacts, and social inclusion.

**Q:** What have been the regional Blue Transformation priorities for the capture fishery sector in the region?

**A:** We are working with Member countries to strengthen fishery stock assessments so there is a strong basis for evidence-based management and support for Ecosystem Approach to Fisheries Management (EAFM) decision-making. This is a key element of FAO's updated, [comprehensive global assessment](#) of the state of global marine fisheries resources, which provides an unprecedented understanding of the state of fishery resources in Asia and the Pacific. The assessment shows there are considerable efforts to track the region's resources, but there is mixed news on their status. This underscores the pressing need for more effective management, particularly of coastal stocks in multispecies mixed-gear fisheries in the region.

Many Asian countries are increasingly adopting EAFM in national planning and local fisheries management, improving stock assessments, spatial planning and bycatch/benthic-impact management. This has helped stabilise or rebuild some fish stocks and better balance biodiversity protection with fisheries use. This has been supported by FAO programmes and publications, trainings, case studies, APFIC, and EAF-related projects (including Bay of Bengal/LME partnerships and EAF-Nansen collaborations).

## AQUATIC SYSTEMS ARE A POWERFUL SOLUTION: THE NEED FOR A BLUE TRANSFORMATION



**OBJECTIVE 1**  
Sustainable aquaculture intensification and expansion satisfies global demand for aquatic foods and distributes benefits equitably.

**OUTCOME**  
Sustainable aquaculture production grows by at least 35 percent by 2030, especially in food deficit regions.



**OBJECTIVE 2**  
Effective management of all fisheries delivers healthy stocks and secures equitable livelihoods.

**OUTCOME**  
100 percent of marine and inland fisheries is under effective management and IUU fishing is eradicated.



**OBJECTIVE 3**  
Upgraded value chains ensure the social, economic and environmental viability of aquatic food systems.

**OUTCOME**  
Loss and waste halved by 2030, more transparency and traceability is ensured for more inclusive and equitable returns.

Credit: FAO



FAO led the participatory development of the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty which are grounded in a human-rights-based approach.

**Q:** As reported in a news item on the FAO RAP website in April 2025, small-scale fisheries (SSF) are the backbone of many coastal and inland communities in Asia, supporting the livelihoods of approximately 46 million people. Last year (2025) was the 11th anniversary of the [Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries](#). Would you agree that there remains a critical need to ensure that SSF are effectively integrated into national strategies and regional cooperation frameworks? What have been the major challenges that have held back progress towards this goal?

**A:** Small-scale fisheries play a foundational role in food security, livelihoods and cultural identity across Asia and the Pacific, so it is critical that we ensure that small-scale fisheries (SSF) are effectively integrated into national strategies and regional cooperation frameworks.

Our workshop in March 2025, commemorated the 10-year anniversary of the SSF Guidelines and highlighted that, despite the vital socio-economic and environmental roles SSF play – contributing nearly half of capture fisheries production in Asia and supporting the livelihoods of millions – significant barriers still impede their full and meaningful inclusion in policy and management processes. Many governments and stakeholders lack the technical and financial means to implement the SSF Guidelines effectively. There are also considerable data and knowledge gaps with insufficient information on SSF contributions, needs and vulnerabilities, which in turn restricts evidence-based policymaking and equitable access to investment and social protection. National policies often lack coherence or fail to define

SSF clearly, making it difficult to design targeted interventions. Other issues include weak recognition of customary rights, which leaves SSF communities vulnerable to competing uses of aquatic and coastal space, and the lack of recognition of women's essential contributions across SSF value chains.

Additionally, while SSF are on the frontline of climate impacts, access to early warning systems, safety-at-sea measures and adaptation support remains limited. Building on the findings of the [global study](#) on small-scale fisheries, FAO will work with members to develop specific national plans of action to support their small-scale fisheries (NPOA-SSF).

Addressing these gaps will require collaboration beyond fisheries institutions to include finance, social protection, market development, and stronger national and regional technical support, alongside targeted research and reinforced political commitment, as seen in the National Plans of Action for small-scale fisheries (NPOA-SSFs) in the Philippines and Indonesia.

**Q:** Another major area of concern in the Asia-Pacific is illegal, unreported and unregulated (IUU) fishing. One of the most important initiatives developed by FAO in this regard has been the [Port State Measures Agreement](#) – at last count, 84 countries had become Parties to the Agreement, of which less than 30 are from the Asia-Pacific region. How does FAO work with regional governments to encourage them to become signatories if they have not already done so; and to support countries which are Parties in their national efforts to implement the PSMA?

**A:** FAO has worked closely with governments to strengthen action against IUU fishing, including promoting accession to, and implementation of, the Port State Measures Agreement (PSMA), and improving monitoring, control and surveillance (MCS). This has increasingly reduced opportunities for illegal, unreported and unregulated fishing and improved compliance in parts of the region. These efforts mean countries can better protect legal fishers, safeguard vulnerable stocks, and maintain access to high-value export markets.

Through its global PSMA programme and regional initiatives with partners such as [SEAFDEC](#) and [BOBP-IGO](#), FAO provides technical guidance, capacity-building, and support for risk-based port controls and transshipment oversight. This includes legal assistance, training for inspectors, and strengthening institutional coordination.

In addition, FAO helps countries understand international trade implications, including World Trade Organisation (WTO) fishery subsidies, to ensure that national support policies contribute to sustainability and do not drive overfishing. Progress has also been seen in the wider adoption of food safety systems, which has helped improve market access, reduced trade disruptions and market rejections, and enhanced consumer confidence.

There is a lot of work that remains to be done, but I am quite optimistic that the region is steadily improving the transparency, sustainability, and performance of its aquatic value chains.

**Q:** *On 2 September 2025, FAO and the Secretariat of the Convention on Biological Diversity (CBD) announced the launch of a new global partnership to help countries monitor and report on ecosystem restoration, including in the Asia-Pacific. One of the aims was stated as to boost countries' capacity for monitoring and reporting on Target 2 of the CBD's Kunming-Montreal Global Biodiversity Framework which commits countries to ensure that at least 30% of degraded terrestrial, inland water, coastal and marine ecosystems are under effective restoration by 2030. As at the time of this interview, it may be too early for FAO RAP to go into the details of any initiative or collaboration, but perhaps you could give readers a rough overview of what countries in the Asia-Pacific can expect in terms of possible areas of focus?*

**A:** Yes, it is still early days, and we have yet to see how this programme will develop, but I expect it will complement FAO's work on fisheries biodiversity and conservation.

Coastal and freshwater environments are some of the most vulnerable to human activities, and it is simple common sense that healthy habitats are essential for productive fisheries and aquaculture. Restoration objectives under Target 2 align well with efforts to rebuild fish stocks and the use of aquaculture to rehabilitate and restore degraded ecosystems. Our focus will be on improved methods of operations that not only prevent degradation, but which actively contribute to restoration.

We are already supporting countries on biodiversity conservation through ongoing initiatives related to Target 3, working with partners

such as the International Union for Conservation of Nature (IUCN), Malaysia's Department of Fisheries, the University of Queensland and Indonesia's Ministry of Marine Affairs and Fisheries (MMAF) under Global Environment Facility (GEF)-funded programmes. These efforts focus on improving the effectiveness of marine protected areas and other effective conservation measures (OECMs); and addressing freshwater biodiversity and conservation issues.

We are also developing, with The Nature Conservancy, regional case studies and advice on how aquaculture sites can contribute to biodiversity conservation at local and larger scales. This is an exciting new area for the region which is home to some of the largest expanses of open-water aquaculture, where farms can support in-situ conservation of aquatic biodiversity.

Looking ahead, the focus will be on better integrating biodiversity goals with sustainable food production. This is particularly relevant with regard to the Global Biodiversity Framework's Target 10 on sustainable fishery management and the improved footprint of capture fisheries through ecosystem approaches; and Target 5 on impacts on wild species. This requires a balanced framework and tools to assess impacts, cost-benefits, and trade-offs between food production and ecosystem integrity. We also need a better understanding of fishery management and stock assessments that accounts for multi-gear and multi-species interactions and the inevitable trade-offs from managing such complex fishery systems.

**Q:** *And finally, on a personal note, what do you hope to achieve during your tenure as FAO Regional Representative for Asia and the Pacific?*

**A:** As you can imagine, I have responsibilities across the entire agriculture sector spanning crops, livestock, forestry, fisheries and aquaculture. Let me focus on what I hope to do with the fishery and aquaculture sectors. Coming from Indonesia, a country that is defined by its archipelagic nature and huge dependence upon its marine and freshwater resources, the challenges of Blue Transformation for our region is very close to my heart. So too is the knowledge that our region is home to the highest proportion of people dependent upon small-scale fisheries for their livelihoods and food security. The region is also home to the highest global levels of fish consumption, and fish play an iconic role in our diets and food culture.

My goal is to ensure a steady supply of safe, nutritious fish without compromising future resources. Up until now we have benefited from increasing productivity as we developed new technology and expanded the scale of aquaculture and capture fisheries. But we now realise that we are reaching the limits of supply from wild capture fisheries, and that aquaculture operations must improve their resource-use footprint if we want to continue enjoying fish on our plates. We also need to cut waste and improve efficiency across the value chain.

The good news is we have the means to do this, and increasingly there is political will and public support for the innovations and reforms that are needed. My role is to ensure that FAO is there to help countries rise to this challenge by providing the technical advice and capacity-building they need to transform their ideas into action.



## INFOFISH speaks to.....

### DR AUDUN LEM

*Chair of the Fisheries Transparency Initiative (FiTI); previously Deputy Director of the Fisheries and Aquaculture Division at the Food and Agriculture Organization of the United Nations (FAO)*

*the Organization, and from which you retired recently after having held the position of Deputy Director of the Fisheries and Aquaculture Division for more than ten years.*

*FiTI is stated as being a global partnership that increases transparency and participation for a more sustainable management of marine fisheries. Could you provide some background on the organisation for the benefit of readers?*

**A:** Access to reliable data is key for making informed decisions in any sector and FiTI is certainly inspired by transparency initiatives in other extractive industries. The fisheries sector has of course several characteristics that set us apart; for example, the fact that fisheries resources are renewable, that they often are shared, that stocks migrate across borders and that a lot of fishing takes place on the high seas. In addition, fishing is particularly important for many developing countries that rely on fisheries both for livelihoods and export revenues. Last year we celebrated our 10-year anniversary and we now have 13 countries that are part of FiTI and actively implementing the FiTI Standard<sup>1</sup> for more transparency and sustainable fisheries.

**Q:** *Why was it considered necessary for FiTI to be set up, and what makes the organisation unique?*

**A:** The rationale for creating FiTI back in 2015 builds on experience from other sectors which shows that improving access to data leads to better decisions. In addition, increasing stakeholder representation enables more effective implementation of government policy. There are of course, many organisations and institutions that work towards more sustainable marine fisheries but FiTI is the only one focusing on transparency as such, and improved access to data and information for better management. In addition, we are a multi-stakeholder organisation with equal representation from our three stakeholder groups: governments, the business sector with equal participation from small-scale and industrial fisheries, and civil society. Meanwhile, the FiTI Standard sets clear requirements for what a government has to divulge in terms of data and the need to create an enabling environment with broad participation from the sector. We are also fortunate to have observers from both the World Bank, FAO and the Open Government Partnership on our board.

<sup>1</sup> <https://fiti.global/fiti-standard>

**Q:** *Promoting transparency to achieve more sustainable management of marine fisheries requires the compilation of detailed, timely, and accurate information from countries. But as INFOFISH also knows, some countries may be hesitant or reluctant to share data on fisheries harvests. It could be that this simply is not a priority or, for example, that there is not a shared understanding of terms such as subsidies which may be labelled in national programmes as "assistance". How does FiTI help countries to manage and present information while ensuring transparency?*

**A:** The lack of information about fisheries does not necessarily stem from a lack of stakeholder demand or regulatory requirements. Many of the elements included in demands for transparency in the fisheries sector are already established in international agreements or policy papers on fisheries reforms, such as FAO's landmark Code of Conduct on Responsible Fisheries or its Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries.

For example, countries are already required to share their catch data with other organisations such as FAO for statistical purposes and also when reporting on progress towards the targets under SDG14. In addition, the new WTO Agreement requires reporting of stock status in order to use any kind of subsidies for the targeted species; and for reporting on the support given to the sector. So, this requirement in the FiTI Standard is not something that countries have to be afraid of; we are not asking for breakdowns per vessel but aggregate data per species, vessel category and gear. It is more worrying if the government doesn't have the data (which unfortunately is sometimes the case) due to lack of resources or institutional capacity. But being transparent about this is also the first step towards improving the situation.

**Q:** *Specific to illegal fishing, how does using the FiTI Standard help in reducing its scale? How does the Standard complement other global legal frameworks related to IUU fishing?*

**A:** There is no silver bullet in the fight against IUU fishing but the toolbox available to policymakers is steadily becoming better equipped. With the PSMA Agreement, the Global Record, catch documentation schemes, and the WTO Agreement complemented by market-based instruments, we have entered a new area in which civil society and consumers as well as importers, processors and distributors have come to expect that the fish that reach consumers have been caught sustainably and legally. But all these instruments only become effective through a data-driven and stakeholder-inclusive approach. This is where FiTI provides the foundation, by requesting, for example, national authorities to publish information on their legal framework, vessel registries, access agreements or catch data, to name just a few.

**Q:** Recently, FiTI announced the launch of a new web-based tool called Fisheries Information System (FIS), stating that it would be of “particular interest for low- and lower-middle income countries and Small Island Developing States (SIDS), which often lack financial, human and technical resources to provide information to the general public online”. Is it correct to say that the FIS is a simpler version of the FiTI Standard? What are some key distinctions or advantages, and to date, how many countries have committed to using the FIS?

**A:** The FiTI Standard emphasises the need for national authorities to develop and strengthen their own systems for collecting and publishing information online in a complete, accessible and understandable manner. The FIS facilitates this by providing a web-based tool for organising information and for public reporting. So, it is not really a “lighter” or simpler version. It is a new and groundbreaking tool for interested FiTI countries, through which they can make fisheries data publicly accessible. The data reported through the FIS belongs to the government, is inserted by them, remains under the control of the government, but is shared publicly. The FIS is brand new and we are excited by its potential. It is currently being rolled out in two FiTI countries (i.e. São Tomé and Príncipe, and Cabo Verde) and we are already preparing the roll-out of the FIS to Madagascar and Ghana, with other FiTI countries already expressing interest. However, FiTI countries do not need to use the FIS to achieve compliance with the FiTI Standard. It is a voluntary offering to our member countries.

**Q:** But since participation is voluntary, why would countries allocate resources in order to implement the FiTI Standard and FIS? In other words, how do countries and their coastal fisheries sector benefit?

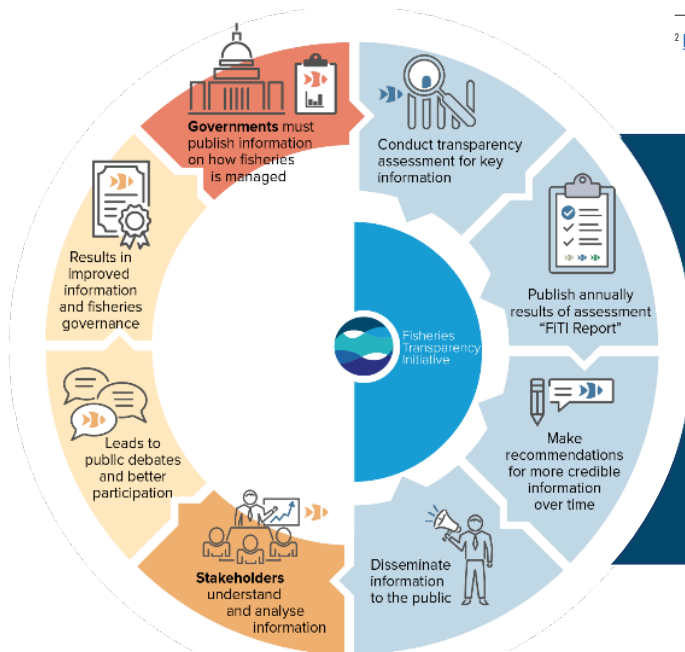
**A:** The ultimate objective of FiTI is, through improved transparency, to increase country benefits from their aquatic resources, improve fisheries management and stakeholder engagement. Much of the

information required by the FiTI Standard already exists within the public sector but it remains spread among various ministries and is frequently not accessible to the public. Improving access to data also makes the sector more transparent, thereby reducing risks and uncertainty for investors and financial institutions. Therefore, it is not really a question of allocating resources, but rather of making a public commitment to improve transparency and access to data in the sector by joining FiTI. The FIS facilitates this by providing a dedicated web-based tool.

**Q:** On a final note, if you recall, we had two prior interviews with you while you were at FAO, the most recent being in June 2025 shortly before your retirement<sup>2</sup>. You had said that as someone who has been providing technical input in the development of the WTO Agreement on Fisheries Subsidies for more than 25 years, you looked forward to continuing to support the implementation of the agreement. Will this be one of your key priorities as the Chair of FiTI during your three-year term, and how do you see FiTI's role evolve in this regard?

**A:** Certainly, promoting transparency on fisheries issues also includes openness about public financial support to the sector and about subsidy payments. In fact, transparency on subsidy payments is a key requirement under the WTO Agreement on Fisheries Subsidies, and with this in mind, the new FiTI Standard as well as the FIS are aligned with the reporting obligations of the WTO Agreement. The WTO itself recognises how useful this is as a reporting mechanism; it has already approved several country requests for financial support from the WTO Fish Fund with regard to implementing the parts of the Agreement that make specific reference to FiTI and the FIS. One should not forget though, that negotiations on other issues mandated under the WTO Agreement such as subsidies causing overcapacity and overfishing, remain to be settled. In this context, FiTI's role in improving transparency and access to data on vessel registries, licences, access agreements, stock status and others, remains as important and relevant as ever.

<sup>2</sup> <https://pdfinlink.to/7142d442/>



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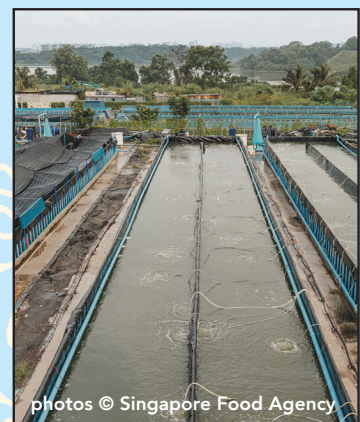
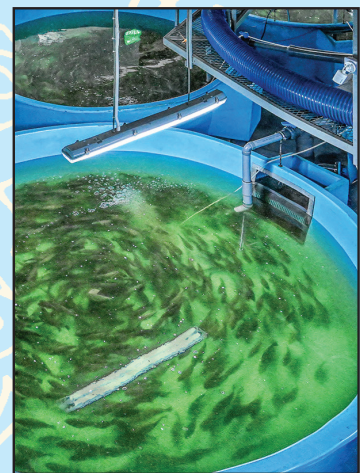
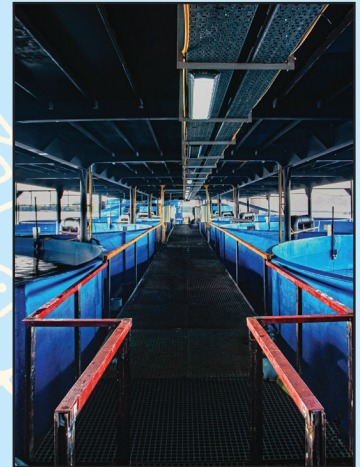
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# EMPOWERING WOMEN THROUGH INNOVATIVE DRY FISH PROCESSING TECHNOLOGIES IN CAMBODIA

By IM Samruol, MEAS Chanthavy and KONG Tosoth

**The article highlights practical experiences and outcomes from the CAPFISH-Capture: Post-harvest Fisheries Development project in Cambodia, focusing on how improved dry fish processing technologies have contributed to women's economic empowerment, enhanced product quality, and strengthened market access in the post-harvest fisheries sector. It offers policy-relevant insights and field-based lessons that may be of interest to readers, particularly those engaged in fisheries development, value-addition, and inclusive growth in the region.**



Credit: CAPFISH-Capture: Post-harvest Fisheries Development project, Cambodia

*Fish sauce production line at an enterprise supported by the UNIDO's CAPFISH-Capture project*

Fisheries are a cornerstone of Cambodia's socio-economic development. They provide employment opportunities, generate income, and contribute significantly to food security and nutrition in rural communities, while boosting national GDP. Women are central to this sector, making up around 70% of the post-harvest workforce. They clean, process, package, and market dried fish products, ensuring that fish and fishery products reach consumers across the country.

Yet, despite their essential contributions, women remain at the bottom of the value chain. Many fish processing enterprises are micro- or small-scale, often informal, and women face persistent gender inequalities that limit their opportunities for advancement. Their work is vital, but their voices are often unheard.

## The challenge: Traditional practices and barriers

Most women-led enterprises rely on traditional methods such as open sun-drying. These practices are labour-intensive, weather-dependent, and prone to contamination and post-harvest losses. Productivity is low, quality is inconsistent, and market access is limited.

Beyond technical barriers, women face structural challenges. Unpaid care responsibilities restrict mobility and access to resources, while gender inequalities limit opportunities for training and leadership. The 2021 Gender Analysis Study highlighted these gaps and recommended strategies to promote gender equality and empowerment.

This study revealed that women's contributions were undervalued, despite their majority presence in the sector. It emphasized the need for tailored

interventions to address gender disparities, improve working conditions, and create pathways for women to move up the value chain.

## Introducing CAPFISH-Capture

The CAPFISH-Capture: Post-harvest Fisheries Development project, co-funded by the European Union (EU) and implemented by the United Nations Industrial Development Organization (UNIDO) in collaboration with Cambodia's Fisheries Administration (FiA), private sector stakeholders, universities, and support institutions (2019-2025), aims to enhance the competitiveness of post-harvest fisheries operators and foster sustainable, inclusive growth.

The project envisions a sector where both women and men equally lead, participate in, and benefit from inclusive and sustainable industrial development. Its goal is to improve regulatory systems, promote better practices, and enhance market access, ensuring that women make up at least 40% of beneficiaries at all levels. CAPFISH embedded gender equality and women's economic empowerment into its value-chain development approach, ensuring that sector competitiveness is aligned with inclusive and sustainable growth.

## Innovative technologies: A game-changer

UNIDO introduced innovative dry fish processing technologies and green solutions such as solar dryer domes, chillers, refrigerators, and vacuum machines. These reduce contamination, improve hygiene, alleviate physical strain, and minimize post-harvest losses.



Credit: CAPFISH-Capture: Post-harvest Fisheries Development project, Cambodia

*A woman fish processor and her husband drying fish in a solar dryer dome*

By modernizing facilities and introducing simple yet effective tools, 73% women-led enterprises are now better-positioned to meet food safety standards, increase productivity, and access new markets. The adoption of solar dryer domes, for example, has transformed the way fish is processed. Unlike open sun-drying, which is vulnerable to weather and contamination, solar dryers provide controlled conditions that ensure consistent quality and safety.

## Empowering women: Skills, voices, and leadership

Capacity-building programmes were central to the project. A pool of Business Development Service (BDS) providers was developed (45% of them women), and training was provided to the women entrepreneurs on food safety, business planning, record-keeping, labeling, and marketing. These interventions not only enhanced technical skills but also built confidence and leadership capacity.

Importantly, Gender Equality and Women's Empowerment (GEWE) were integrated into policies, including the Cambodia Quality Seal (CQS) food safety certification. Impressively, 68% of the enterprises certified under CQS are women-led, and 64% of these women-led enterprises are implementing a traceability system in their operations. This achievement demonstrates that women are not only participants but leaders in ensuring food safety and quality standards.

The project also supported women in accessing resources and networks. By linking them to cooperatives, markets, and support institutions, women gained visibility and recognition as entrepreneurs.



Credit: CAPFISH-Capture: Post-harvest Fisheries Development project, Cambodia

Cambodian Minister of Agriculture, Forestry, and Fisheries presenting the CQS certificate to the representative of a qualified fish processing enterprise

## Community impact: Beyond individual gains

The project's ripple effects extend to households and communities. Women-led enterprises under the Value Chain Investment Support (VCIS) schemes have received USD 1.86 million in direct support. The grants are often blended with collateral-free loans from financial institutions under the framework of an Investment Support Facility (ISF). This funding has leveraged USD 4.18 million in additional investments from the enterprises themselves and others, strengthening resilience, upgrading business operations, and creating role models for inclusive growth.

Marketing support such as logos, labels, and promotional materials, helped 72% of women-led enterprises expand visibility and sales. Collectively, these efforts have improved household incomes, strengthened cooperatives, and enhanced food security.

The impact is not only economic but also social. Women who once struggled with informal, low-income activities now stand as respected business leaders. Their success inspires younger generations and challenges traditional norms about gender roles in fisheries.



Credit: CAPFISH-Capture: Post-harvest Fisheries Development project, Cambodia

A woman enterprise owner provided a media interview during a CAPFISH-Capture roadshow

Beyond enterprise support, women researchers have played a pivotal role in research and development. Out of 33 supported research projects, 13 are led by women, and women comprise more than half of the core research teams (36 out of 68 members). Their leadership has already resulted in seven women-led enterprises accessing critical services for product development and the successful commercialization of nine products. These achievements highlight women's growing influence not only in processing, but also in innovation and scientific advancement.



Credit: CAPFISH-Capture: Post-harvest Fisheries Development project, Cambodia

New products: instant soup and green mussel sauce, resulting from the project's R&D support, are being successfully commercialized

## Market access and sustainability

Women-owned enterprises now access both local and international markets. Twelve enterprises participate in "One Village One Product" initiatives and weekend markets in Phnom Penh and Siem Reap, while two have successfully exported fish products to New Zealand and Australia.

Sustainability is embedded in the project's design: eco-friendly technologies reduce waste, while regulatory frameworks integrate gender-responsive safeguards. By promoting green technologies and embedding gender considerations into food safety systems, the project ensures that progress is both inclusive and sustainable.

## Voices from the field

Behind the statistics are transformative human stories which illustrate empowerment not only in economic terms but also in dignity, recognition, and leadership. Women processors describe how new equipment reduced physical strain, improved product quality, and opened doors to new customers. Women scientists lead research projects, contributing innovations such as fish-based baby supplements and premium green mussel sauces registered with the Ministry of Industry, Science, Technology, and Innovation (MISTI).



Credit: CAPFISH-Capture: Post-harvest Fisheries Development project, Cambodia

Ms. Sokhim, owner of Heng Hort Sokhim Fish Processing Enterprise, drying fish in a solar dryer dome

“Before, we relied on sun-drying, and our products often spoiled. With the solar dryer dome, I can produce clean, high-quality fish consistently. Customers trust my products now, and my income has doubled.” — Ms. Sokhim, Heng Hort Sokhim Fish Processing Enterprise.

## Partnerships and policy support

The project’s success reflects strong collaboration among UNIDO, EU, FiA, academia, and private sector partners. Gender mainstreaming guidelines were integrated into project outputs and activities, contributing to the FiA Gender Action Plan (2024–2030). Among 27 food safety auditors, 22% are women playing an essential role in technical support.



Credit: CAPFISH-Capture: Post-harvest Fisheries Development project, Cambodia

Cambodian women Inspectors performing their duties at a fish sauce company

Policies such as the Environmental and Social Management Plan (ESMP) embed gender equality safeguards, ensuring compliance across value-chain investments. These frameworks institutionalize gender equality, making it a permanent feature of fisheries development.

## Looking ahead: scaling and replication

With over 17 800 jobs created or retained (52% held by women) the CAPFish project demonstrates scalable impact. Lessons learned emphasize the importance of baseline gender analyses, capacity-building, and embedding gender requirements into regulatory frameworks.

Future initiatives can replicate this model across other provinces and sectors, advancing inclusive industrial development and empowering women entrepreneurs. The success of women-led enterprises in accessing international markets shows that Cambodian fisheries can compete globally when supported with innovation and gender-sensitive approaches.

## Conclusion: a story of transformation


The CAPFISH-Capture: Post-harvest Fisheries Development project showcases how innovation and gender-sensitive approaches can transform Cambodia’s fisheries sector. By modernizing dried fish processing, empowering women, and strengthening market access, the project has created a foundation for sustainable, inclusive growth.

Women are no longer confined to the bottom of the value chain — they are leaders, innovators, and role models driving progress in Cambodia’s fisheries. Their stories of resilience and success demonstrate that when women are empowered with knowledge, technology, and recognition, entire communities thrive.

The lessons learned from this project highlight the importance of integrating gender considerations into every stage of development. From policy frameworks to practical tools, from training programs to market access, gender equality must remain at the heart of fisheries modernization.

As Cambodia looks to the future, the empowerment of women in fisheries stands as a powerful example of how inclusive development can drive economic growth, social transformation, and sustainable progress.

## Acknowledgements

This article is prepared under the CAPFish programme with the funding support from the European Union. The authors gratefully acknowledge the continued guidance and support of Dr. Shetty Seetharama Thombathu, Senior Technical Adviser, whose leadership and technical insights were instrumental in advancing gender empowerment initiatives under the project. Sincere appreciation is also extended to the Fisheries Administration for their close collaboration, institutional support, and commitment to promoting inclusive and sustainable development in the sector. 

**Disclaimer:** The contents of this article are the sole responsibility of the CAPFISH-Capture project and the authors and do not necessarily reflect the views of the European Union and UNIDO.



**IM Samruol** brings over 14 years of expertise in communications and advocacy. He dedicated more than 7 years to UNDP and nearly 3 years to UNIDO’s CAPFish project, as Communication and Visibility Expert. Under his role, the CAPFish project achieved remarkable outreach reaching more than 18 million people through social media and video campaigns, and generating over 1,800 news articles across both online and traditional media platforms.



**MEAS Chanthavy** has 27 years of experience in gender equality, women’s economic empowerment, and livelihood development. Throughout her professional career, she has worked with the private sector, NGOs, UN agencies, and the Asian Development Bank. Over the last 10 years, her focus has primarily been on gender issues. She served as the Gender Expert for the CAPFish Project for 5 years, achieving outstanding results. In 2023, the project was honored with the Gender Equality Mobilization Award by UNIDO.



**KONG Tosoht** has 19 years of experience in monitoring and evaluation. She has spent approximately 11 years with non-governmental organizations (NGOs) and 8 years with United Nations agencies, including UNDP and UNIDO. In her role as the National M & E Expert for the CAPFish project, she developed a digital M & E database as part of the results-based management system. This project was awarded a Certificate of Excellence in RBM by UNIDO in 2025.

## AQUACULTURE

### Climate strategy for seaweed sector



Credit: GlobalSeaweed-PROTECT

**Malaysia/UK**— Malaysian and UK scientists, including experts from the Scottish Association for Marine Science (SAMS), Natural History Museum (NHM), and Universiti Malaya, have launched a mission to protect the Malaysian seaweed industry from climate change-induced pests, disease, and warming waters. The collaborative project, which held a 2.5-day workshop in Sabah in October 2025, aims to implement a “Progressive Management Pathway for Improving Biosecurity in the Seaweed Industry” (PMP/AB-Seaweed) to secure the livelihoods of over 6 million farmers worldwide.

The workshop is part of an international GlobalSeaweed-PROTECT three-year programme (February 2025–February 2028) funded by the UKRI Biotechnology and Biological Sciences Research Council (BBSRC) under the Sustainable and Resilient Aquaculture Systems in Southeast Asia programme.

Project lead Prof Juliet Brodie based at the Natural History Museum, London said: “Seaweeds are vital for the functioning of the marine ecosystem and there are more than six million seaweed farmers who rely on seaweed for their livelihoods. The vast majority of farmers are in Asia, which accounts for more than 95% of global seaweed farming. Yet, commercial seaweeds are threatened by outbreaks of pests and diseases, as a result of climate-induced increases in seawater temperatures, which is limiting an already fragile production in a very competitive global market. It is hoped that the PMP/AB-Seaweed will provide a practical road map to help the seaweed industry in Malaysia increase its resilience to climate change”.

### First harvest of farmed yellowfin

**China** – In August 2025, Hainan Province harvested its first large-scale, deep-sea farmed yellowfin tuna in Lingshui Li Autonomous County, with over 4 000 fish reaching about 50kg after 30 months.

Work on this project had begun as far back as 2016. In 2022, researchers from the South China Sea Fisheries Research Institute of the Chinese Academy of Fishery Sciences announced that

they had successfully domesticated wild fry in 2022, achieving a breakthrough in net cage farming technology. In August 2023, selected wild yellowfin tuna fry from the South China Sea were introduced into four large 90-metre circumference gravity cages sited 3.6 kilometres off the coast of Xincun for this purpose.

Some of the challenges in this process included how to keep the fry alive during transport and stocking, disease prevention, and also the fact that wild tuna are picky eaters. The harvest

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of the adult tuna was therefore considered a success. Furthermore, the researchers said that they had mastered artificial spawning and feeding in deep-water net boxes, achieving an 83.1% hatching rate. This breakthrough has ignited new hope for breeding of tuna fry in China.

### Aquaculture reforms attract investment interest

**Morocco** – Reforms in Morocco’s aquaculture sector opened more than USD 1 billion (EUR 854 million) in investment opportunities in 2025, according to the World Bank. The Bank said the country is making steady progress towards its targets of producing 300 000 tonnes of farmed seafood and creating 30 000 jobs over the next decade. This progress has been supported by improved regulations, the identification of suitable farming zones and incentives aimed at attracting private investors. Interest has consequently increased among companies and lenders seeking to finance aquaculture farms, hatcheries and fish feed facilities, particularly along Morocco’s coastline.

The World Bank highlighted several projects with strong investment potential, including SETEXAM, a family-owned seaweed producer expanding market access through digital sales channels. Seaweed has become a key part of Morocco’s bio-innovation agenda, with uses extending beyond food into cosmetics, fertilisers, pharmaceuticals, bioenergy and climate-related applications. The report also cited VitaminSea Morocco, a pilot shrimp-farming venture under the World Bank-supported Blue Economy Program for Results, which currently produces around 60 tonnes annually and aims to scale up to 300 tonnes per year with investment support. While challenges remain, including limited hatchery capacity and processing infrastructure, the Bank said reforms are progressing and sector partnerships continue to strengthen.

### Fishermen encouraged to diversify into aquaculture

**Malaysia** – The Fisheries Development Authority of Malaysia (LKIM) has urged Area and State Fishermen’s Associations to venture into aquaculture as part of efforts to strengthen national food security and improve income sustainability within fishing communities.

LKIM Chairman Muhammad Faiz Fadzil said the initiative responds to declining marine fish stocks and reduced catches, particularly among coastal fishermen affected by development pressures. He added that reliance solely on capture fisheries is becoming increasingly unsustainable, with the Ministry of Agriculture and Food Security targeting aquaculture to contribute 40% of national fish production by 2030.

Under the “One Association One Business (IPIP)” programme, the number of fishermen’s associations participating in aquaculture activities has increased from 13 to 20 over the past two years. Projects include shrimp farming in Johor, cockle farming in Lawas (Sarawak), as well as initiatives in the State of Melaka. LKIM is also developing new aquaculture programmes in Pantai Merdeka (Kedah) and Badung (Pahang), in collaboration with experienced private-sector operators. These partnerships aim to equip fishermen with technical and business skills, with the long-term objective of enabling associations to independently manage aquaculture ventures within five years.

## FISHING

### BBNJ Agreement finally enters into force



*The International Maritime Organization was one of the many parties which welcomed the adoption of the BBNJ Agreement*

**World** – The United Nations Agreement on Marine Biological Diversity of Areas beyond National Jurisdiction (BBNJ Agreement), also widely known as the High Seas Treaty, came into force on 17 January 2026. The Treaty addresses:

- Marine genetic resources, including the fair and equitable sharing of benefits;
- Measures such as area-based management tools, including marine protected areas;
- Environmental impact assessments; and
- Capacity-building and the transfer of marine technology.

It becomes the third implementing agreement to the United Nations Convention on the Law of the Sea. The Agreement does not apply to national waters (i.e., a country’s 200 nm Exclusive Economic Zone, its continental shelf or its extended continental shelf). Instead, it applies to the management of the marine biological resources, i.e. marine biodiversity, of both water column and the seabed in areas beyond national jurisdiction, which makes up nearly half of the Earth’s surface.

To coordinate its implementation, the Agreement calls for a Conference of the Parties (COP) to be held soon, which will have to decide on issues regarding rules of procedure and finance, as well as the sharing of benefits from the sustainable use of biological resources; setting up a regime for genetic resources; financing the Agreement; innovative and sustainable finance for tools or measures to manage human activities such as Area-based Management Tools such as MPAs; international collaboration as well as cooperation arrangements with relevant legal instruments and frameworks; relevant global, regional and subregional bodies; and setting up a Clearing House Mechanism.

### Sustainable fisheries partnership agreement signed

**EU/Cook Islands** – The European Union and the Cook Islands have signed a new protocol to a sustainable fisheries partnership agreement for a duration of 7 years (2025–2032). This renewed protocol will grant the European Union fleet operating in the Pacific Ocean access to some of the richest and healthiest tuna stocks worldwide, for a total of 40 fishing days per year.

The EU contribution over 7 years will amount to €3.22 million of which €295 000 will be dedicated every year to support Cook Islands sustainable fisheries management, control and surveillance capacities, and blue economy development. In addition to EU funding, EU shipowners will pay €90 000 for the authorisation giving them the right to fish for 10 fishing days in the country’s waters.

Both parties being active actors within the Western and Central Pacific Fisheries Commission (WCPFC), the European Commission said that the protocol strikes a fair balance between environmental sustainability and economic viability, ensuring significant fishing opportunities for the EU fleet while respecting the ecosystem’s needs.

## Project to modernise fisheries sector in Somalia

**Japan/Somalia** - In December 2025, Japan and FAO officially launched their partnership with Somalia to modernise the fisheries sector and empower valuable coastal communities. According to FAO, the project will use a staggered approach to address the gap faced by the fishing community in terms of accessing modern infrastructure, technical expertise and modern technology, allowing access to international trade markets and receive financial capital. It will mostly benefit the fishing community in Mogadishu/Banadir Region, who will be enabled to improve the quality of fish landed and traded locally and internationally. A central part of the initiative is the renovation and extension of Lido Fish Market, the main fish landing site in Mogadishu. It will become a model facility that supports the livelihoods of fisherfolk, enhances food safety, and contributes to a more sustainable and productive fisheries sector.

Illegal, Unreported and Unregulated (IUU) fishing threatens the ecological and economic sustainability of fisheries resources in Somalia's waters, reducing income and job opportunities for legitimate fishers, and undermining social and economic growth for fishing communities and the Somali population. A key aspect of the project is to tackle IUU fishing by putting resources aside to improve safety levels and promote responsible fishing practices.

Japan's Ambassador to Somalia said that "with the growing domestic demand for fish, its fisheries sector holds significant potential for development. Japan hopes to contribute to improving the livelihoods of Somali fishers through support for the fisheries industry as well as efforts to curb IUU fishing".

## New multi-partner project for the Gulf of Thailand

**Thailand** - A new 5-year, FAO-led initiative "Promoting the Blue Economy and Strengthening Fisheries Governance of the Gulf of Thailand through the Ecosystem Approach to Fisheries" has been launched. Called GoTFish, the project aims to coordinate efforts in Cambodia, Malaysia, Thailand, and Viet Nam to address the growing threats facing the Gulf, one of the world's most productive marine ecosystems. Among others, it will strengthen natural resource governance

across the Gulf to protect marine biodiversity, rebuild fish stocks, and contribute directly to the objectives of the South China Sea Strategic Action Programme (SCS-SAP).

The project has four central components:

- Strengthening regional transboundary fisheries governance and institutional capacity;
- Aligning market and behavioural incentives to support sustainable fisheries;
- Conserving critical aquatic habitats through the identification of ecological corridors; and

- Enhancing stakeholder engagement, communication and monitoring to ensure inclusive participation and effective knowledge-sharing.

The GoTFish Project seeks to reverse the decline of overexploited marine fisheries, bringing 75% of these depleted stocks - around 315 000 tonnes - back to sustainable levels. The project will focus on three key fisheries in the Gulf: the demersal trawl fishery, the pelagic purse seine fishery, and the small-scale artisanal coastal fishery. Partners in the project include the Sustainable Fisheries Partnership (SFP), the Southeast Asian Fisheries Development Center

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(SEAFDEC) and the University of Queensland, Australia.

### IPHC sets historic low halibut harvest amid sanctions threats

**Canada/USA** - The International Pacific Halibut Commission (IPHC) has approved a historic low harvest level for the 2026 Pacific halibut fishery. After four days of tense negotiations, the coastwide total allowable catch was set at about 29.3 million pounds for commercial, recreational and subsistence fisheries with the commercial allocation at 19.3 million pounds, the lowest in more than a century. Canada agreed to cut its 2026 allocation by 7.2%, while U.S. quotas were left unchanged.

The decision comes amid ongoing stock declines: scientists reported that halibut abundance and average size have dropped sharply since the early 2000s, with spawning biomass estimates down significantly from late-1990s levels. Although models suggest the stock remains above critical thresholds, future productivity is uncertain, keeping pressure on managers to support conservation while balancing economic interests on both sides of the border.

## MARKETS/MARKETING

### New digital CATCH certificate comes into effect

**European Union** - A new system which introduces a digital catch certificate for all fishery products entering the European Union came into force on 10 January 2026. The European Commission said that the system, known as CATCH, will support global efforts to

tackle illegal, unreported and unregulated (IUU) fishing, help protect marine biodiversity and contribute to the EU's broader simplification efforts.

It replaces the previous paper-based process and makes import controls for fishery products more effective and harmonised across the EU. By streamlining the exchange of information between EU traders and control authorities, the new system should make it easier to ensure that all products entering the EU are legal and meet the EU's regulatory standards.

CATCH is a key deliverable of the Ocean Pact, the EU's strategy to better protect the ocean, promote a thriving blue economy and support the well-being of people living in coastal areas, and reflects the EU's long-stated commitment to combatting IUU fishing.

### Trade deal extension will boost salmon exports

**UK/Rep Korea** - Salmon producers in Scotland heaved a sigh of relief due to the extension of a trade deal (set to expire in January 2026) between the United Kingdom and the Republic of Korea. According to the UK Department for Business and Trade, the country's trading relationship with the Republic of Korea (the 12th largest economy in the world) has increased by 32 percent over the last decade, reaching GBP 15.8 billion (USD 21.2 billion, EUR 18 billion) in 2024.

Specific to salmon, exports to the Republic of Korea soared more than tenfold from GBP 214 000 (USD 286 934; EUR 244 009) in 2015 to GBP 2.25 million (USD 3 million; EUR 2.6 billion) in 2019 before the trade was hit by the

global pandemic. With export levels rising to GBP 366 000 (USD 490 723; EUR 417 368) in 2025, the new trade deal is expected to help Scottish producers get back toward all-time highs.

### Tariffs eliminated for lobster and crab

**Canada/China** - A January 2026 meeting between Canadian Prime Minister Mark Carney and Chinese President Xi Jinping resulted in the announcement that China would cut tariffs on key seafood imports from Canada like lobster and crab. The agreement, which lasts through the end of 2026, will restore market access for Canadian exporters, though it will be a steep climb in the face of intensified competition from other suppliers to the Chinese market such as Viet Nam and the Russian Federation. There is also some uncertainty with regard to possible upcoming tariffs from the United States, the biggest market for Canadian seafood.



Canadian lobster exports to China are expected to rise with the elimination of tariffs

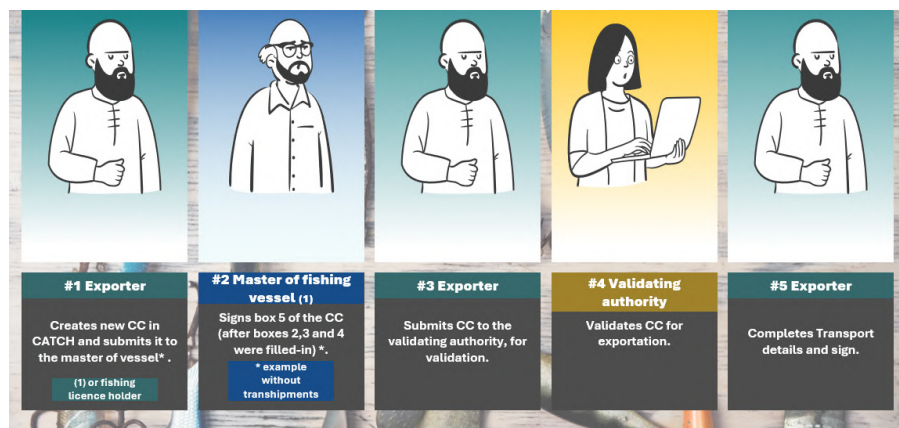
Credit: FAO

Still, for now, exporters in Nova Scotia, New Brunswick, British Columbia and other provinces welcomed the news. A spokesperson from the British Columbia Crab Fishermen's Association said that industry profits had dropped by more than CAD 6 million since the higher tariffs came into effect last March, which is comparable to losses during the COVID-19 pandemic. However, coldwater shrimp exporters said that their product seemed to have been excluded from the deal.

Canada has faced an additional 25 percent tariff in China on a range of seafood products including halibut, crabs, lobster, clams, and shrimp since 20 March 2025. The tariffs were made in response to a 100 percent Canadian tariff on Chinese electric vehicles and a 25 percent tariff on steel and aluminium.

### Tilapia: a success story in Brazil

**Brazil** - According to the Brazilian Aquaculture Association (Peixe BR), tilapia production in



Credit: The European Commission

the country has maintained an average annual growth rate of 10.3% over the last 11 years. Previously located along the coast, production sites are now thriving in States like Paraná, São Paulo, Mato Grosso do Sul, and Bahia. Tilapia is in fact, increasingly viewed as a national brand representing the success of Brazilian technology. Recent figures released by the Ministry of Fisheries and Aquaculture (MPA) in the 2024 Aquaculture Bulletin for Federal Waters highlight the following statistics:

- 20% Increase: Growth in national aquaculture production compared to 2023.
- 148 500 tonnes: Total fish farmed in Federal waters.
- R\$ 1.26 billion (about USD 242 million): Gross Production Value (GPV) of the sector.
- Traceability: For the first time, authorities can trace the origin of fingerlings used in net pens.

Peixe BR projects a steady growth rate for the next decade supported by strong domestic and international demand. However, the industry is expected to face significant economic pressure in 2025–2026, according to a newly released strategic outlook from the Center for Advanced Studies in Applied Economics (Cepea), a research centre linked to the University of São Paulo. The report stated that declining farmgate prices have directly reduced producers' incomes and indirectly affected export performance. The imposition of US tariffs has also reduced the international competitiveness of Brazilian tilapia; and at the same time, there has been an increase in tilapia imports from Viet Nam (see following note).

### Brazilian State places restriction on Vietnamese tilapia

**Brazil/Viet Nam** – On 15 February 2024, Brazil's Agriculture Ministry had halted all tilapia imports from Viet Nam, pending a review of health protocols and concern over introduction of the TiLV virus into its domestic aquaculture industry. In April 2025, this ban was lifted by the Brazilian Ministry of Agriculture, Livestock and Food Supply (MAPA). However, on 17 December, the State of Santa Catarina issued a ban on the sale and consumption of imported tilapia, including fresh and frozen products, citing the risk of tilapia lake virus (TiLV) based on technical

opinions. The State ban was announced as the first of 32 shipments of Vietnamese tilapia to Brazil in over a year was due to arrive in the country. Reportedly, a total of 700 tonnes had been ordered by large Brazilian importer JBS Group.

Reflecting the complexity of the situation, in January 2026, the Santa Catarina State Court of Justice decided to allow the entry of shipments that were contracted, paid for, and shipped before 17 December 2025. However, the Court maintained that the ban on sales of the fish within the State will remain in force until further evaluation by health authorities.

### Export record set in 2025

**Viet Nam** – Viet Nam's seafood industry achieved a historic milestone in 2025, with exports surpassing USD 11.3 billion, a 12.4% increase over 2024. According to the Vietnam Association of Seafood Exporters and Producers (VASEP), this was the first time the industry has crossed the USD 11 billion mark. Despite trade barriers and increasingly stringent health import regulations in several countries, these exports were driven by strong demand and increased growth in several key markets: the CPTPP bloc, especially Japan (see following note), Canada and Australia (USD 3 billion; +20.8% year-on-year); China (USD 2.4 billion; +28.5%); and the European Union (USD 1.1 billion, +12.1%). The leading export commodity was shrimp (USD 4.65 billion; +20% year-on-year), followed by pangasius (USD 2.1 billion) and other marine fish (USD 2.16 billion). Lobster exports more than doubled to USD 817 million.

December saw a surge as exporters targeting the US market shipped their products before import restrictions under the Marine Mammal Protection Act (MMPA) came into effect from 1 January 2026 on species linked to 12 fisheries, as well as the anticipated announcement of POR19 anti-dumping duties on shrimp, expected in late February 2026. In the same month, shipments also increased to Asian markets in readiness for the Lunar New Year celebrations in February 2026.

VASEP said that the success of Vietnamese seafood enterprises in 2025 stemmed from their effective utilisation of FTAs and timely market shifts: "When the US market faced headwinds from reciprocal tariffs implemented

in August 2025, exporters swiftly pivoted toward the CPTPP bloc and China". The Association also stated that sustaining growth momentum in 2026 will largely depend on the industry's ability to ensure supply chain transparency and optimise production costs amidst the volatile fluctuations of international trade policies.

### Record exports to Japan

**Viet Nam/Japan** – Viet Nam's seafood exports to Japan are poised for a record year in 2025, with January–November turnover reaching nearly USD 1.6 billion, an 11% year-on-year increase. Supported by the CPTPP trade agreement, this growth highlights a successful, stable recovery in the market. The main imports in that period were whiteleg shrimp (USD 324.1 million; +15.1% year-on-year), salmon (USD 224 million; +9.45%), squid, octopus, mackerel (USD 116.6; +35.6%), crab (USD 100 million; +24.2%) and pangasius (which saw a surge of 70% year-on-year).

"Alongside weaker purchasing power, Japanese consumers favour reasonably priced, reliable products that are convenient for family meals or industrial catering. This explains the rise of common marine species such as mackerel, sardines, and chub mackerel", said VASEP.

According to Japan Customs, Viet Nam is currently Japan's third-largest seafood supplier, accounting for 7.4 per cent of total import volume. Viet Nam has benefited from relatively stable prices in the Japanese market as compared to the US and China where some of the challenges include logistics costs and policy changes.

### 2025: Record year in value terms

**Norway** – Norway exported a total of 2.8 million tonnes of seafood worth NOK 181.5 billion in 2025, representing an increase of NOK 6.4 billion, or 4%, compared with the previous year. "2025 was a demanding year for seafood, with lower quotas and catches at record prices for all our most important wild-caught species. The year was also characterised by strong volume growth for salmon. Despite a significantly lower salmon price, it was a record year for Norwegian seafood exports in terms of value," said Christian Chramer, CEO of the Norwegian Seafood Council (NSC).



Despite a significantly lower salmon price, it was a record year for Norwegian seafood exports in terms of value.

Credit: Norwegian Seafood Council

The largest markets for Norwegian seafood exports in 2025 were Poland, the United States and China. In April and August, the US increased its tariffs on Norwegian seafood, which are now 15% or higher on all products. Nevertheless, 9% went to the US, the highest share since 1989. China had the highest value growth in 2025, with an increase in export value of NOK 2.9 billion, or 31%, compared with the previous year. From being Norway's sixth largest market in 2024, China rose to third place in 2025. The NSC attributes this growth to increased e-commerce, better distribution channels and strong growth in salmon consumption. In the European Union, Poland was the largest market, but the total value share fell from 67% to 63%.

### Pakistan-China trade valued at USD 255 million

**Pakistan/China** – Pakistan's seafood exports to China reached nearly USD 255 million in 2025, continuing a strong upward trend in bilateral seafood trade, according to official data. Growth was driven by key product categories including frozen fish, cephalopods and processed seafood, reflecting sustained demand from Chinese markets and expanding export capacity among Pakistani producers. This development underscores the importance of China as a major destination for Pakistan's seafood supply chain and the role of preferential trade arrangements in supporting export performance.

Industry sources noted that tariff reductions and enhanced market access under frameworks like the China-Pakistan Free Trade Agreement have helped strengthen competitiveness for Pakistani seafood exporters in China, particularly for high-value and value-added products. As trade continues to expand, stakeholders are focusing on meeting quality, certification and logistical requirements to consolidate gains in the Chinese market while exploring opportunities for product

diversification and deeper integration of export standards.

### Republic of Korea sets seafood export target for 2030

**Republic of Korea** – The Ministry of Oceans and Fisheries has set a national target of USD 4.2 billion in annual seafood exports by 2030 as part of its broader fisheries development plan. The goal was announced alongside strategies to expand production capacity and global market reach, reflecting rising global demand for Korean seafood products and cuisine. The Ministry reported that seafood exports reached a record USD 3.33 billion in 2025, up nearly 10% from the previous year, driven in part by strong overseas demand for dried seaweed and other key items. Targets also include increasing domestic seafood production to 4 million tonnes annually by 2030, reinforcing supply foundations for export growth.

To further boost export competitiveness, the Government plans to focus on expanding into emerging markets such as Latin America and the Middle East, and to introduce quality grading systems and international trading platforms for high-value products such as dried seaweed (gim). These measures are part of a wider suite of policy initiatives aimed at strengthening market linkages, enhancing product quality and supporting sustainable industry expansion in both capture and aquaculture sectors.

### Indonesia secures zero-tariff access for tuna exports to Japan

**Indonesia/Japan** – The Indonesian Ministry of Marine Affairs and Fisheries is facilitating zero percent export tariffs for tuna, including skipjack and mackerel tuna (*Euthynnus affinis*) products shipped to Japan under changes to the Indonesia-Japan Economic Partnership Agreement (IJEPA), aimed at strengthening the competitiveness of Indonesian seafood in Japan. Before the amendment, exports of canned and processed skipjack and other tuna faced tariffs of about 9.6 per cent. The revised agreement eliminates four tariff lines on these processed products, and the Ministry is preparing a Circular to guide fish processing units on how to obtain the zero-tariff registration. Indonesia is currently ranked among the top exporters to Japan, with processed tuna shipments valued at over USD 30 million. Authorities expect the

tariff incentive to enhance competitiveness and expand market share.

Processing units wishing to benefit from the preferential tariff must be registered with the Ministry and submit required documentation, including business licences, HACCP certification, standard operating procedures and traceability records. The initial registration window for zero-tariff status has been opened by the Ministry as part of the ratification process.

### Rising prices push Japan's seafood import value to record level

**Japan** – Japan's seafood import value reached a record JPY 1.96 trillion (approximately USD 13.1 billion) in 2025, despite a continued decline in import volumes, according to preliminary data from the Ministry of Finance. The increase was driven largely by higher unit prices across major imported species, amplified by the prolonged weakness of the Yen. Key contributors included salmon, shrimp, crab and tuna products, with import costs rising sharply due to tighter global supply, higher feed and energy costs in producing countries, as well as currency-driven inflation on dollar-denominated contracts. As a result, average import prices exceeded JPY 1 000 per kilogram for the first time, reshaping purchasing patterns among Japanese buyers.

Salmon remained one of the most significant drivers of import value growth, supported by strong demand and elevated prices from major suppliers such as Norway and Chile. Crab and shrimp imports also recorded higher average prices, reflecting reduced availability from traditional suppliers and increased competition in global markets, particularly from China and the United States. Tuna imports, especially frozen and value-added products, continued to face upward price pressure due to fuel costs and constrained catches. Analysts noted that while Japan imported less seafood by volume, higher prices more than offset the decline, reinforcing Japan's position as one of the world's highest-value seafood import markets. However, sustained price inflation is expected to influence sourcing strategies in 2026, with importers likely to seek alternative species, diversified suppliers and greater reliance on value-engineered products to manage cost pressures.



## “SHAPING SUSTAINABLE BLUE FUTURES”

### INFOFISH at 45 – Celebrating our past. Shaping our future.

In 1981, with the support of the Food and Agriculture Organization of the United Nations (FAO), INFOFISH was established to provide marketing information and technical advisory services for the Asia-Pacific region and beyond. Headquartered in Kuala Lumpur and hosted by the Government of Malaysia, INFOFISH has, for 45 years, supported its Member Countries in navigating an ever-changing global market landscape for fisheries and aquaculture products.

Throughout its journey, INFOFISH has served as a trusted and practical bridge between governments, industry stakeholders and international markets. INFOFISH has worked consistently to deliver timely and reliable market intelligence, technical advice and capacity-building programmes that strengthen the competitiveness of its Member Countries and support sustainable sector development.

At the heart of this work has always been a firm commitment to people. INFOFISH has consistently sought to shine a light on small-scale fishing and aquaculture communities and enterprises that form the backbone of the sector, guided by a strong belief that their livelihoods, knowledge and contributions truly matter.

This path has not always been an easy one. Over four and a half decades, INFOFISH has continuously adapted to profound changes in global trade and market policies, an increasingly complex and regulated business environment, rapid technological advances – including digitalisation, artificial intelligence and data-driven decision-making – and major shifts in global dialogue on sustainability. Through all these changes, INFOFISH has, and continues to remain, firmly focused in supporting and contributing to a sector that is resilient, inclusive and sustainable for both people and planet.

As INFOFISH marks this important milestone, we extend our sincere gratitude to all those who have helped shape INFOFISH into the organisation it is today. Your dedication, professionalism and generosity in sharing your skills, time and expertise have strengthened the foundation upon which INFOFISH stands today.

We also pause to remember, with deep respect, some of our pioneers who are no longer with us – in particular members of the founding INFOFISH



*Two of the INFOFISH pioneers: Erik Hempel and Jochen Nierentz*

team: Dr Wolfgang Krone, Erik Hempel and Hinko Lisac – whose vision and commitment continue to guide our work.

To our newer colleagues, we warmly welcome you to an organisation with a rich legacy and a clear purpose. INFOFISH will continue to build on the achievements of the past while embracing innovation, partnership and excellence to meet the challenges and opportunities of the future.

As INFOFISH enters its next chapter, it does so with confidence, renewed energy and a shared determination to continue serving our Member Countries and the wider fisheries and aquaculture community with relevance, integrity and impact.

**Gemma Meermans Matainaho**  
*Director, INFOFISH*



## 45 years of trusted service and regional leadership

Since its establishment in 1981 under the Food and Agriculture Organization of the United Nations (FAO), INFOFISH has grown into a respected intergovernmental platform supporting fisheries and aquaculture development across the Asia-Pacific and beyond. Over the past 45 years, INFOFISH has strengthened its role in market intelligence, trade facilitation and technical advisory support, evolving alongside the changing needs of Member Countries and the wider global seafood sector.

### Building the foundations of trust

From the very beginning, INFOFISH was founded on the belief that timely, credible and practical information is essential for building stronger, more resilient fisheries and aquaculture industries. In the **1980s**, INFOFISH laid the foundations of what would become a trusted and independent regional institution, demonstrating the lasting value of cooperation, shared knowledge and a collective commitment to sustainable development.

In the **1990s**, INFOFISH matured into a regional knowledge engine, providing market intelligence that governments and industry stakeholders could act on quickly. As regional aquatic products trade expanded, INFOFISH played an increasingly important role in strengthening visibility, supporting competitiveness and helping industries respond to emerging market demands.

### Strengthening standards and competitiveness

The **2000s** marked a period of deeper engagement in capacity-building, quality assurance and international standards support. INFOFISH expanded its technical advisory work, helping developing country exporters improve compliance readiness, enhance value-addition and strengthen access to international markets.

By the **2010s**, INFOFISH was widely valued not only for its information services, but also for its ability to connect partners, convene dialogue and provide trusted leadership across the seafood trade community. It became recognised as a platform where governments, industry leaders, technical experts and development partners could exchange knowledge, foster collaboration and address shared challenges together.

In the **2020s**, INFOFISH continues to modernise its platforms and services while maintaining the

authority, professionalism and trust built over decades. As the sector faces rapid technological change, growing sustainability expectations and increasingly dynamic global markets, INFOFISH remains firmly future-facing, committed to innovation, resilience and inclusive development across the seafood value chain.

### 45 years on: Celebrating the legacy; shaping the future

As INFOFISH celebrates its 45th anniversary, it does so with pride in the legacy it has built, gratitude for the partnerships that have shaped its journey, and confidence in the road ahead. With renewed energy and purpose, INFOFISH will continue to serve as a trusted regional and international partner, working alongside its Member Countries and stakeholders to shape a stronger, more sustainable and more connected seafood future for generations to come.

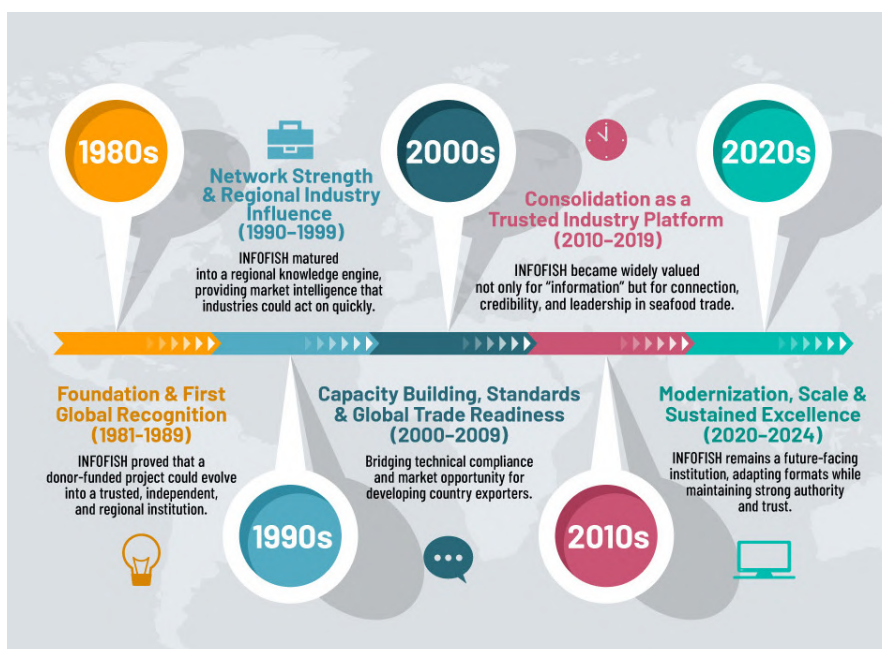
## What INFOFISH offers

INFOFISH is far more than a convenor of events. It is a trusted intergovernmental platform positioned at the intersection of markets, policy and industry practice, supporting fisheries and aquaculture development across the Asia-Pacific region and beyond.

At the heart of INFOFISH's mandate are three closely linked pillars: Trade Promotion, Technical Advisory and Marketing Information. Together, they reflect INFOFISH's founding purpose, delivering the intelligence to understand markets, the expertise to meet international standards, and the connections that open pathways for trade, partnership and sustainable growth.

INFOFISH provides authoritative market and trade intelligence, enabling Member Countries and fisheries and aquaculture businesses to respond effectively to evolving global dynamics and strengthen competitiveness.

Through technical advisory and value chain support, INFOFISH assists stakeholders in post-harvest improvement, processing development,

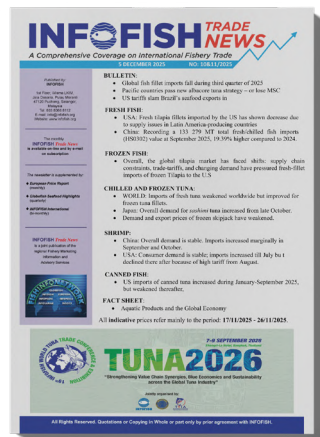




food safety, quality assurance, compliance readiness and value-addition, helping industries meet increasingly complex international market expectations.

INFOFISH also advances sustainability, traceability and responsible practices aligned with ESG considerations, while supporting policy readiness and regulatory capacity across the region. Capacity development remains central to INFOFISH's impact, delivered through trainings, workshops, webinars, study visits and knowledge exchange platforms tailored to industry needs.

INFOFISH further implements projects and consultancies with Member States, FAO, development partners and the private sector, translating expertise into practical solutions that strengthen industries on the ground.



Through its internationally recognised publications, including INFOFISH International and INFOFISH Trade News, alongside technical expertise and proven project experience, INFOFISH continues to shape a modern, competitive and sustainable future for fisheries and aquaculture products within the region and beyond.

## INFOFISH at a Glance

- **Established:** 1981 (with FAO assistance)
- **Headquarters:** Kuala Lumpur, Malaysia
- **Host Country:** Government of Malaysia
- **Type:** Intergovernmental organisation
- **Core Focus:** Fisheries and aquaculture markets, trade intelligence, technical advisory, and capacity development
- **Flagship platforms:**
  - ❖ INFOFISH World Tuna Trade Conference (TUNA)
  - ❖ Pacific Tuna Forum (PTF)
  - ❖ World Tilapia Conference (TILAPIA)
- **Member States:** Bangladesh, Cambodia, Fiji, Kiribati, Malaysia, Maldives, Papua New Guinea, Philippines, Thailand

## INFOFISH and its Member Countries: Strategic partnerships and shared goals

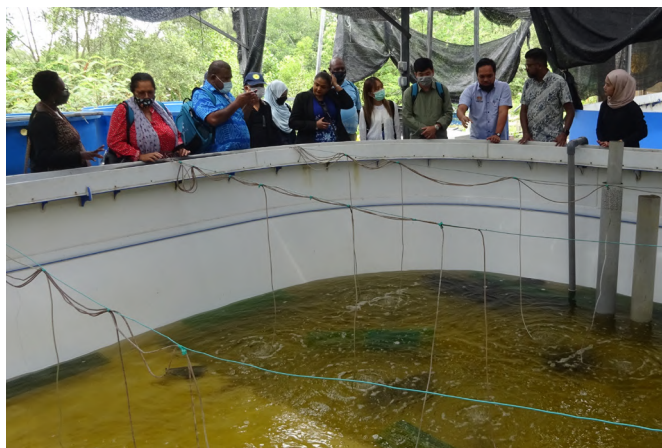
For 45 years, INFOFISH has had the privilege of working in close partnership with its Member Countries across Asia and the Pacific, united by a shared commitment to advancing sustainable, resilient and inclusive fisheries and aquaculture sectors.

Through tailored capacity-building programmes, post-harvest and processing support, assistance with quality and market standards, and the exchange of technical and trade expertise, INFOFISH works directly with its Member Countries to strengthen national capabilities and improve access to regional and international markets.

Backed by a strong and trusted network of international partners built over decades, INFOFISH also supports Member Countries through buyer-seller networking initiatives and facilitated participation in major international trade fairs and exhibitions, helping national industries connect with new markets and commercial opportunities.



At the same time, INFOFISH convenes flagship platforms, including the INFOFISH World Tuna Trade Conference, the Pacific Tuna Forum (PTF) and the World Tilapia Conference, fostering dialogue, innovation, collaboration and business networking across value chains.



Membership further provides access to specialised market intelligence and technical publications, including *INFOFISH International*, *INFOFISH Trade News* and *The Fish Inspector*, ensuring that governments and industry stakeholders remain informed of emerging trends, regulatory developments and global market dynamics.

INFOFISH's current Member Countries comprise **Bangladesh, Cambodia, Fiji, Kiribati, Malaysia, Maldives, Papua New Guinea, the Philippines and Thailand**. INFOFISH warmly welcomes additional countries to join this growing family of nations. Together, we can build stronger, more sustainable, transparent and modern fisheries and aquaculture industries across the Asia-Pacific region and beyond.



## A global network of shared expertise: the FISHINFONetwork (FIN)

In the late 1970s, the Food and Agriculture Organization of the United Nations (FAO) initiated a series of projects to establish a global network of market intelligence, trade promotion and technical advisory services aimed at strengthening fisheries and aquaculture trade among and from developing countries.

Today, the FISHINFONetwork consists of INFOFISH and five other independent intergovernmental and governmental organisations, together with FAO GLOBEFISH based in Rome. Collectively, the Network provides specialised services to both governments and the private sector worldwide.

The FISHINFONetwork is widely recognised for its authoritative publications and periodicals, as well as for convening major international conferences, workshops and training events on seafood commodities, market developments and emerging sector challenges. These platforms enable policymakers, industry leaders and technical experts to exchange knowledge, share practical solutions and foster long-term collaboration.



As a member of the FISHINFONetwork, INFOFISH is able to draw on a unique pool of global expertise, data and partnerships. This strengthens its role as a leading regional and international partner in fisheries and aquaculture market intelligence, trade facilitation and technical advisory services, in support of Member Countries throughout the Asia-Pacific region and globally.

## INFOFISH Associate Membership

In addition to its Member Countries, INFOFISH offers an **Associate Membership programme** for private companies, industry associations, institutions and other organisations active in fisheries and aquaculture across the region and beyond.

Associate membership strengthens the link between INFOFISH and the wider seafood industry by providing Members with direct access to INFOFISH's market intelligence, technical knowledge and professional networks. Associate Members benefit from preferential access to INFOFISH publications, events and conferences, and opportunities to participate in networking and business development activities facilitated by INFOFISH and its partners.

Through this programme, INFOFISH fosters closer collaboration between governments, industry and development partners, creating a practical platform for dialogue, innovation and partnership across the fisheries and aquaculture value chain.

The Associate Membership programme reflects INFOFISH's long-standing commitment to inclusive engagement and public-private cooperation, and plays an important role in supporting modern, competitive and sustainable fisheries and aquaculture industries throughout the Asia-Pacific region.

## INFOFISH - The next chapter

As INFOFISH enters its next chapter, it does so with confidence, renewed energy and a continued commitment to its Member Countries and partners. Grounded in 45 years of trust and cooperation, INFOFISH will remain strategically forward-looking, supporting sustainable growth, stronger market opportunities and resilient fisheries and aquaculture industries. With a shared determination to serve with relevance, integrity and impact, INFOFISH looks ahead to shaping a modern and connected aquatic products future for generations to come. 🌐

# MALAYSIA: Trade resilience, structural reform and the Blue Economy transition

## A four-decade institutional anchor in ASEAN fisheries

Malaysia's relationship with INFOFISH is more than symbolic; it reflects sustained institutional cooperation embedded within ASEAN's fisheries trade architecture. Formalised through the 1988 Headquarters Agreement, Kuala Lumpur was designated as the site of INFOFISH's headquarters, with the Fisheries Development Authority of Malaysia (LKIM) serving as host agency. This arrangement has provided operational continuity for regional market intelligence, trade facilitation and technical cooperation for over four decades.

## Maritime geography: Strategic location, strategic exposure

Malaysia's geography shapes both opportunity and vulnerability. Straddling the Straits of Malacca and bordering the South China Sea, Sulu Sea and Celebes Sea, the country sits at the intersection of major global shipping lanes and biodiverse fishing grounds. This positioning enhances export logistics but also exposes fisheries resources to intense regional competition.

Aquatic products remain central to national food security, contributing a substantial share of animal protein intake. At the same time, the sector generates employment across coastal harvesting communities, aquaculture farms, landing complexes, processing plants and export channels. Malaysia's fisheries economy therefore operates simultaneously as a social safety net and a trade-oriented industry.

## Structural evolution: From capture expansion to aquaculture strategy

Malaysia's fisheries trajectory mirrors broader ASEAN patterns: rapid post-independence expansion of capture fisheries followed by policy recalibration toward sustainability and aquaculture-led growth. Following independence in 1957, mechanisation, improved gear technology and the establishment of LKIM in 1971 accelerated production growth. By the 1980s, Malaysia had become a significant regional fishing nation. However, rising fishing effort revealed resource constraints, prompting stricter licensing and management measures.

Aquaculture has since emerged as the principal growth engine. Development began in the 1970s with brackishwater shrimp and cockle culture in Perak and Johor, expanding in the 1980s and 1990s into marine finfish cage farming (notably seabass and grouper) particularly in Sabah and Johor. Freshwater tilapia and catfish production strengthened domestic supply, while ornamental fish breeding positioned Malaysia within niche export markets.

Today, aquaculture contributes approximately 30 percent of total fisheries production value, with national policy targeting 40 percent by 2030. This reflects a deliberate strategy to stabilise supply, mitigate capture fisheries pressure and enhance export competitiveness.

From a trade perspective, aquaculture provides product consistency, traceability and scale – attributes which are increasingly required in high-value markets.

## Governance architecture: Balancing sustainability and livelihoods

Malaysia's fisheries governance operates under a dual-institutional framework designed to separate regulatory oversight from development functions. The Department of Fisheries (DOF), operating under the Fisheries Act 1985, is responsible for licensing, conservation and stock assessment. LKIM functions as the development agency, focusing on infrastructure, fisher welfare programmes, market stabilisation and credit support.

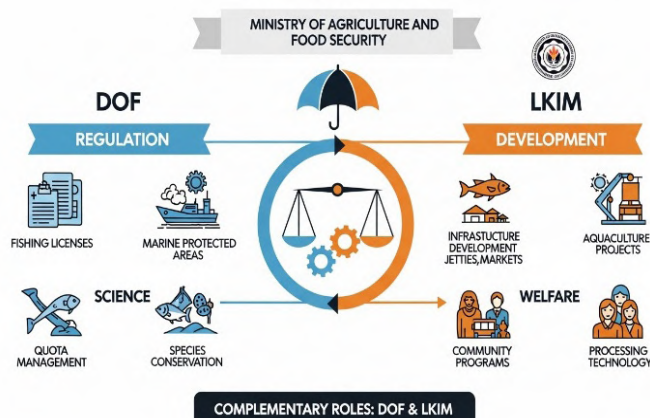
This institutional structure enables resource management objectives to coexist with socio-economic priorities. Artificial reef deployment, licensing controls and enforcement actions against illegal, unreported and unregulated (IUU) fishing are complemented by landing complexes, ice plants and marketing facilities that enhance value retention at community level.

Policy direction is articulated through the National Agrofood Policy 2.0 (2021-2030) and Malaysia's Twelfth and forthcoming Thirteenth Malaysia Plans (RMK12 and RMK13), which embed fisheries within broader economic transformation strategies. Alignment with Sustainable Development Goal 14 underscores Malaysia's commitment to sustainable marine governance.

The Malaysian Maritime Enforcement Agency plays a visible role in safeguarding maritime resources and maintaining compliance – essential for continued access to markets such as the European Union, where IUU-related regulations are stringent.

## Trade structure: Domestic stability and export performance

Malaysia's fisheries trade profile reflects a dual-market orientation. Domestically, pelagic species such as mackerel remain staples, distributed through traditional wet markets and modern retail chains. Imports, particularly frozen fish, supplement domestic supply and support reprocessing industries, smoothing seasonal volatility.



On the export front, shrimp and prawn products are the leading earners, serving Japan, the United States and the European Union. Tuna exports, including frozen loins and canned products, and surimi-based items further diversify Malaysia's trade portfolio across ASEAN, the Middle East and North America.

The processing sector underpins this performance. Operations range from traditional drying and salting to technologically advanced facilities producing breaded shrimp and ready-to-eat seafood. However, structural pressures are evident: labour shortages, rising energy costs and compliance expenditures linked to traceability and labour standards.

Industry responses include automation in peeling and filleting lines, energy-efficient cold chain systems and workforce upskilling initiatives. The shift toward higher value-added production reflects a strategic response to margin compression in commodity segments.

## Compliance, traceability and market access

Increasingly, Malaysia's fisheries competitiveness depends on regulatory alignment. Export-oriented subsectors are strengthening product traceability and chain-of-custody systems to meet import market requirements. Fisheries Improvement Projects (FIPs) and certification pathways are gaining traction as tools to demonstrate sustainability performance.

Digitalisation is emerging as a policy priority, including IoT-based farm monitoring and blockchain-enabled traceability systems. These initiatives aim to enhance transparency, reduce transaction costs and build buyer confidence.

In a region where regulatory scrutiny continues to intensify, Malaysia's ability to align domestic management with international standards will determine long-term export resilience.

## Social dimensions and inclusive development

Beyond trade metrics, fisheries remain a socio-economic cornerstone. While offshore capture fisheries are male-dominated, women play critical roles in post-harvest handling, processing, marketing and small-scale enterprise development. National initiatives increasingly focus on microfinance access, entrepreneurship training and skills upgrading.

Safety-at-sea measures and social protection schemes are also gaining policy attention, recognising the vulnerability of small-scale fishing communities to climate variability, fuel price fluctuations and market shocks.

## The Blue Economy horizon

Malaysia's forthcoming Thirteenth Malaysia Plan (2026–2030) is expected to consolidate fisheries within a broader national Blue Economy framework. Strategic priorities include:

- Expansion of offshore and recirculating aquaculture systems
- Technology-driven productivity enhancement
- Strengthened traceability and compliance systems
- Improved fisher welfare and coastal resilience

For Malaysia, the challenge is not production growth alone, but competitiveness under tightening sustainability standards and evolving consumer expectations.

Positioned between mature markets and dynamic ASEAN trade flows, Malaysia's fisheries sector illustrates the region's broader transition: from volume expansion toward value optimisation, regulatory alignment and long-term resource stewardship. 🌊

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# TUNA2026

*"Strengthening Value Chain Synergies, Blue Economies and Sustainability across the Global Tuna Industry"*

**14-16 SEPTEMBER 2026**  
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### Others

- US\$ 1150 (Before 31 March 2026)
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*Delegates attending TUNA 2026 will receive full access to all Conference sessions and the Exhibition, as well as Conference materials and presentations. In addition, TUNA 2026 offers an unparalleled opportunity for delegates to network with industry leaders and pursue business interests.*

## TUNA 2026: Shaping a Competitive, Sustainable Future for the Global Tuna Industry

TUNA 2026 will be a forward-looking, industry-driven forum that responds directly to lessons from TUNA 2024 and the evolving commercial realities of the global tuna industry. With a strong focus on value chain synergies, blue economy opportunities and sustainability, the Conference aims to help shape practical, profitable and inclusive pathways for the industry's future.

The event will deliver a high-quality professional platform that balances strategic dialogue, market intelligence and innovation with real business opportunities. Through a combination of executive-level discussions, market insights, technology showcases and structured networking, the Conference is designed to deliver tangible value for participants across the global tuna value chain.

## THE CONFERENCE

Under the theme *"Strengthening Value Chain Synergies, Blue Economies and Sustainability across the Global Tuna Industry"*, the 19th INFOFISH World Tuna Trade Conference & Exhibition (TUNA 2026) will convene senior industry leaders and decision-makers from across the global tuna value chain to address the commercial realities, strategic priorities and enabling policy frameworks shaping the industry's future competitiveness.

Building on the outcomes, insights and feedback from TUNA 2024, the 2026 Conference responds directly to industry calls for stronger alignment between sustainability initiatives and market realities;

deeper coverage of global and regional tuna markets; enhanced focus on trade, pricing and investment; and greater representation of industry-led perspectives across fishing, processing, logistics and branding.

TUNA 2026 will bring together executives from fishing companies, processors, traders and brand owners alongside policymakers, Regional Fisheries Management Organisations (RFMOs), technological service providers, financial institutions, research organisations and development partners. Together, participants will examine how value chain synergies can be strengthened to improve resilience, manage risk and support long-term commercial performance in an increasingly complex global operating environment.

As the global blue economy continues to expand, the tuna industry remains one of its most commercially significant pillars. Tuna fisheries contribute substantially to food security, employment, export earnings and economic development in many coastal and island nations, while supplying affordable, nutritious protein to markets worldwide. At the same time, the industry is operating in a rapidly evolving context characterised by climate variability, shifting fish stocks, regulatory reforms, digitalisation, heightened consumer scrutiny and geopolitical uncertainty.

TUNA 2026 provides a timely platform for the industry to examine how these challenges can be addressed collectively and strategically. By strengthening coordination across harvesting, processing, trade, logistics and marketing, the industry can improve efficiency, enhance transparency, reduce volatility and create greater value at every stage of the supply chain. This integrated approach is increasingly essential to ensure sustainability outcomes that are not only environmentally and socially credible, but also economically viable.

A central focus of TUNA 2026 will be the role of innovation and technology as **commercial enablers** of stronger value chain synergies.

Advances in digital traceability, artificial intelligence, electronic monitoring, data interoperability and smart fishing technologies are reshaping how tuna is caught, processed, traded and marketed. The Conference will examine how these tools can be deployed effectively and at scale, supporting both large commercial operations and smaller producers, while enhancing efficiency, compliance and market access.

In parallel, TUNA 2026 will address the evolving dynamics of global tuna markets. Dedicated sessions will examine regional demand trends, price formation and volatility, trade flows, tariff regimes and investment patterns across major consuming and producing regions. By linking market intelligence with sustainability and innovation discussions, the Conference will provide participants with clearer insight into how commercial decisions intersect with policy, certification and consumer expectations.

The Conference will also address the human dimension of the tuna industry. Labour standards, crew welfare, gender inclusion and equitable benefit-sharing are increasingly central to operational continuity, reputation management and market access. TUNA 2026 will explore practical, industry-led approaches to strengthening social accountability across the value chain, recognising that people are fundamental to productivity, resilience and long-term value creation.

TUNA 2026 will provide an open, timely and commercially relevant forum for dialogue, knowledge exchange and partnership-building. With strong participation anticipated from the Asia-Pacific, Europe, the Americas, Africa and the Middle East, the Conference offers a unique opportunity for stakeholders to engage directly with decision-makers and shape collective responses to shared challenges and opportunities.

## THE INDUSTRY

The global tuna industry is one of the most valuable, traded and commercially significant sectors within international seafood markets. Tuna remains a cornerstone of food security, nutrition and livelihoods for millions of people worldwide, while playing a critical role in national development, employment generation and foreign exchange earnings across producing and processing economies.

At the same time, the tuna industry operates within one of the most complex fisheries management environments globally. Highly migratory stocks span multiple jurisdictions and are governed through Regional Fisheries Management Organisations (RFMOs). Effective cooperation between States, industry and institutions is therefore essential to ensure sustainable resource use, regulatory predictability and long-term commercial viability.

Within the expanding Blue Economy framework, the tuna industry is uniquely positioned to demonstrate how sustainable management, innovation and value creation can be mutually reinforcing. Strengthening value chain synergies is central to this ambition, enabling greater efficiency, reduced waste, improved traceability and more equitable distribution of economic benefits.



Global tuna supply chains have become increasingly integrated, linking fishing operations, processing hubs, logistics networks and retail markets across continents. While this integration has supported scale and market reach, it has also increased exposure to disruption. Climate impacts, fuel costs, labour availability, regulatory change and geopolitical tensions have underscored the need for more resilient and adaptive value chains.

TUNA 2026 will explore how enhanced coordination, commercial alignment and information-sharing across the value chain can mitigate these risks while improving margins, market access and operational resilience. Aligning fisheries management measures with processing capacity, logistics planning and market demand will be central to managing volatility while maintaining sustainability commitments.

Market dynamics remain a key driver for decision-making. Consumer demand for sustainably sourced, transparently labelled and responsibly produced tuna continues to grow, while price sensitivity and competition from alternative proteins remain significant. Understanding these dynamics is essential for businesses seeking to position products effectively across diverse markets.

Investment will also be a defining factor in shaping the future competitiveness of the industry, especially in the downstream processing. Capital is increasingly directed towards operations demonstrating strong environmental, social and governance performance alongside financial returns. TUNA 2026 will examine how sustainability-linked finance, blended finance mechanisms and public-private partnerships can support fleet modernisation, innovation and value addition, particularly in developing economies.

The industry's workforce remains central to productivity, reliability and long-term commercial performance. Ensuring safe working conditions, fair treatment and skills development is both a social responsibility and a business imperative. The Conference will highlight initiatives that strengthen labour standards while supporting efficiency and operational continuity.



## \*PROGRAMME HIGHLIGHTS

*\*All sessions at TUNA 2026 will be conducted in English.*

### DAY 1 – INDUSTRY STRATEGY, GOVERNANCE & VALUE CHAIN ALIGNMENT

Setting the commercial and policy context for the global tuna industry, including blue economy frameworks, fisheries governance and value chain coordination.

#### Session 1: Global Tuna Industry Outlook & Blue Economy Integration

- Global production, supply and demand outlook
- Blue Economy strategies and implications for tuna
- Role of RFMOs, governments and industry leadership

#### Session 2: Strengthening Value Chain Synergies

- Fisheries-processing-trade-market alignment
- Public-private partnerships
- Regional value-addition and benefit-sharing

### DAY 2 – MARKETS, TRADE & VALUE CREATION

Focused on global and regional market trends, price volatility, trade flows, investment dynamics and the role of technology, AI and data in improving competitiveness.

#### Session 3: Global Tuna Markets, Trade & Price Dynamics

- Key regional markets (EU, US, Asia, Middle East, Latin America)
- Pricing mechanisms and volatility
- Trade policies, tariffs and market access

#### Session 4: Innovation, Technology & AI across the Value Chain

- Smart fishing and monitoring
- AI in grading, quality control and forecasting
- Digital traceability, interoperability and data trust

#### Session 5: Investment, Finance & Blue Growth Opportunities

- Financing sustainable tuna operations
- Risk management and ESG-linked investment
- Innovation funding through R&D for scalable solutions

### DAY 3 – SUSTAINABILITY, PEOPLE & THE FUTURE

Addressing certification, labour standards, climate risk, consumer expectations in terms of food safety, food fraud and long-term business resilience.

#### Session 6: Sustainability, Certification & Social Accountability

- Certification evolution and market relevance
- Crew welfare, labour standards and transparency
- Aligning sustainability with competitiveness

#### Session 7: The Future of the Global Tuna Industry

- Climate adaptation and resilience
- Consumer expectations and communication
- Strategic pathways to 2030 and beyond

## WHO SHOULD ATTEND

- Tuna fishing companies and vessel operators
- Processors, traders and brand owners
- Policymakers and regulators
- RFMOs and international organisations
- Technology and service providers
- Investors and financial institutions
- NGOs, researchers and consultants

## WHY ATTEND – BUSINESS VALUE

- Gain actionable insight into global tuna **price formation, volatility and margin management**;
- Understand how **policy, RFMO measures and sustainability requirements impact market access**;
- Identify technologies and AI solutions that **reduce cost, improve yield and enhance traceability**;
- Connect directly and network with leading global **buyers, suppliers, investors and service providers** across the value chain; and
- Position your business for growth within the **evolving blue economy and ESG investment landscape**.

## VENUE & ACCOMMODATION

The 5-star luxury Shangri-La Hotel will again be the venue of TUNA 2026. Ideally located on the bank of the Chao Phraya River and adjacent to the sky train, it takes about 30 minutes to arrive at the hotel from the Suvarnabhumi International Airport. Rooms at reduced rates have been blocked at the Shangri-La Hotel in Bangkok.

**Shangri-La Hotel, Bangkok, Thailand** - [www.shangri-la.com](http://www.shangri-la.com)



A world-class venue offering excellent accessibility, facilities and networking environment, continuing the strong legacy of previous INFOFISH tuna conferences. The Shangri-La Hotel, Bangkok, offers a premium setting for the Conference and Exhibition, with modern facilities, excellent accessibility and a proven track record of hosting major international industry events. Reduced accommodation rates will be available for delegates.

For further hotel information or reservation arrangements, delegates may contact Ms. Farisha via email at [farisha@infofish.org](mailto:farisha@infofish.org).

## THE EXHIBITION

An exhibition will also be held concurrently at the same venue. A total of 44 booths are available for companies and organisations to display and promote their products, equipment, machineries and services related to the industry. The TUNA 2026 [international exhibition](#) will showcase:

- Fishing and monitoring technology
- Processing equipment and innovation
- Traceability, AI and digital solutions
- Certification, testing and sustainability services

The Exhibition provides exhibitors with direct access to senior decision-makers across the global tuna value chain. Exhibitors will benefit from high visibility, targeted networking opportunities and the ability to demonstrate solutions within a dedicated industry-focused environment. Space is allocated on a **first-come, first-served basis**.

## SPONSORSHIP

Companies and organisations are invited to be a partner of this prestigious event by signing up for the sponsorship packages – Platinum, Gold, Silver or Bronze – which offer attractive and real benefits to sponsors ([Sponsorship Packages](#)).

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# STRENGTHENING SMALL-SCALE FISHERY SUPPLY CHAINS IN SOUTHEAST ASIA: PATHWAYS TO INCLUSIVE GROWTH

By Jariya Sornkliang, Thanyalak Suasi, Rattana Tiaye and Krittapat Meechol

**Southeast Asia's small-scale fisheries are impacted by a confluence of systemic challenges, including market power imbalances involving middlemen; post-harvest infrastructure deficits; financial and informational exclusion; entrenched gender inequality, mounting environmental and climate pressures; and critical gaps in standards and traceability. Focusing on small-scale fisheries (SSF) value chains across SEAFDEC Member Countries in Southeast Asia, this article highlights the urgency of transformation aligned with the Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2030 (RES & POA-2030) in dealing with such challenges. It presents strategic recommendations to build resilient, inclusive, and sustainable aquatic food systems for regional food security and equitable livelihoods.**



Credit: SEAFDEC

Small-scale fisheries (SSF) are essential for food security, poverty reduction, and sustainable livelihoods across Southeast Asia. Characterised by low capital investment, labour-intensive operations, and strong family involvement, SSF contribute significantly to regional fish production and employment (FAO, 2022<sup>1</sup>). In countries such as Indonesia, the Philippines, Thailand, and Viet Nam, SSF underpin both the national food supply and the socio-economic resilience of coastal and rural communities (SEAFDEC, 2023<sup>2</sup>). However, their true contribution is often underestimated due to informal practices and limited data (Pomeroy, 2011<sup>3</sup>).

SSF supply chains spanning harvesting, processing, distribution and marketing are complex and culturally embedded. These chains rely on a diverse network of fishers, traders, processors, middle agents, and retailers who operate with uneven access to information, capital, and markets (Kawarazuka et al., 2010<sup>4</sup>). Despite providing critical employment, SSF supply chains face persistent constraints, including limited infrastructure, inadequate cold chain systems, and weak market

integration, making them vulnerable to environmental and economic shocks (FAO, 2022; Bush et al., 2019<sup>5</sup>). With increasing pressures from climate change, resource competition, and shifting market demands, strengthening SSF supply chains has become urgent. Improved supply chain systems can enhance livelihoods, reduce post-harvest losses, support value-addition, and promote greater equity, particularly when women, youth, and marginalised groups are fully included (Béné et al., 2016; Tilley et al., 2021<sup>6</sup>).

These improvements align with the ASEAN Resolution and Plan of Action Towards 2030 (RES & POA-2030), which provides the overarching policy framework for this endeavour. It mandates that fisheries must contribute decisively to food security and livelihoods while ensuring sustainable resource use. Crucially, it calls for the explicit support of small-scale fisheries within an ecosystem-based and participatory management framework. In this context, the Japanese Trust Fund Program VII (JTF 7) on improving fishers' livelihoods and co-management in small-scale fisheries includes targeted activities to enhance SSF supply chains,

<sup>1</sup> Food and Agriculture Organization of the United Nations. (2022). *The state of world fisheries and aquaculture 2022*. FAO. <https://doi.org/10.4060/cc0461en>

<sup>2</sup> SEAFDEC. (2023). *Report of the Monitoring and Evaluation of the Implementation of the Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2030 (2021 Baseline Information)*. Southeast Asian Fisheries Development Center.

<sup>3</sup> Pomeroy, R. S., & Andrew, N. L. (2011). *Small-scale fisheries management: Frameworks and approaches for the developing world*. CABI.

<sup>4</sup> Kawarazuka, N., & Béné, C. (2010). *Linking small-scale fisheries and aquaculture to household nutritional security: An overview*. *Food Security*, 2(4), 343-357.

<sup>5</sup> Food and Agriculture Organization of the United Nations. (2022). *The state of world fisheries and aquaculture 2022*. FAO. <https://doi.org/10.4060/cc0461en>. Bush, S. R., Belton, B., Little, D. C., & Islam, M. S. (2019). Emerging trends in aquaculture value chain research. *Aquaculture*, 498, 428-434. <https://doi.org/10.1016/j.aquaculture.2018.08.077>

<sup>6</sup> Béné, C. (2016). *Small-scale fisheries: Assessing their contribution to rural livelihoods in developing countries* (FAO Fisheries and Aquaculture Circular No. 1008). Food and Agriculture Organization of the United Nations. Tilley, A., Burgos, A., Duarte, A., dos Reis Lopes, J., Eriksson, H., & Mills, D. (2021). Contribution of women's fisheries substantial, but overlooked, in Timor-Leste. *Ambio*, 50(1), 113-124. <https://doi.org/10.1007/s13280-020-01335-7>

aiming to increase incomes, improve product quality, expand market access, and strengthen community resilience in the community through improvement of the supply chain.



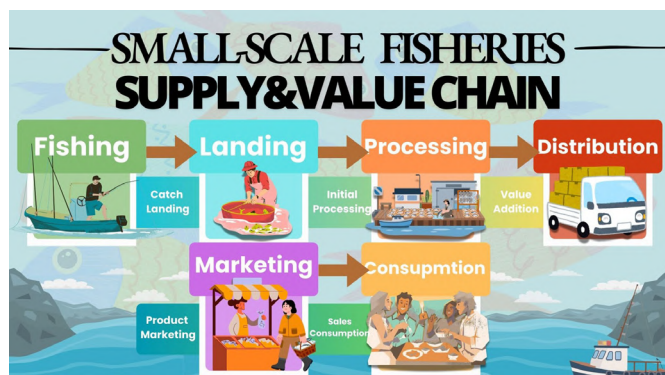
Small-scale fishery supply chain (clockwise), from fishing to the consumer at a restaurant

## Understanding the supply chain and value chain

A foundational step is distinguishing between two key concepts often used interchangeably:

- **The supply chain** refers to the physical flow of the product from inputs and production through processing, distribution, and finally to the consumer. The primary goal here is **efficiency**: reducing losses, optimising logistics, and cutting costs.
- **The value chain** analyses the sequence of activities within that flow to identify where and how **value is added** at each step. The goal shifts to enhancing profitability, competitiveness, and stakeholder benefit.

In essence, the supply chain maps the journey of the fish while the value chain seeks to make that journey more rewarding for everyone involved, especially the primary producers. Fisheries officers should be equipped with this analytical lens to drive meaningful interventions.



## National snapshots and key concerns

In September 2025, the Southeast Asian Fisheries Development Center (SEAFDEC) organised a consultation workshop on the small-scale fisheries supply chain to gather the status and key concerns from six Member Countries. A country-by-country analysis reveals diverse small-scale fisheries (SSF) contexts across Southeast Asia; yet, all share common vulnerabilities linked to resource pressures, market limitations, and socio-economic inequities.

- In Indonesia, SSF remain a major employer and food source, supported by initiatives like the KUSUKA card<sup>7</sup> but face severe overfishing, dependence on middlemen, gender inequality, aging labour, and weak infrastructure;
- Lao PDR relies heavily on inland fisheries and aquaculture, constrained by outdated practices, small-scale production, dependence on imported feed, climate-induced water insecurity, and poorly integrated supply chains;
- In Malaysia, the Coastal Zone A (five nautical miles from the shore) fishers anchor SSF production, with promising community enterprises emerging, though the sector struggles with resource degradation, strong middlemen influence, inadequate cold chain systems, limited gender inclusion, and low value-added processing;
- The Philippines supports millions of municipal fishers through subsidies and livelihood programs, yet continues to face high post-harvest losses, insufficient cold chains, technical gaps, price suppression by middlemen, and unclear supply chains in remote regions;
- Thailand's SSF, reliant on family labour and short supply chains, is hindered by low bargaining power, rising fuel costs, seasonal fluctuations, and limited access to online and export markets; and
- Viet Nam, with its strong aquaculture base, contends with weak value chain linkages, middlemen dominance over 90% of trade, traceability issues hindering EU exports, insufficient processing capacity, and high climate vulnerability.



Participants in the Regional Consultation Workshop on Small-Scale Fisheries Supply Chains on 24-24 September 2025

<sup>7</sup> Kartu Pelaku Usaha Kelautan dan Perikanan: An official identity card issued by Indonesia's Ministry of Marine Affairs and Fisheries (KKP) for fishermen, fish cultivators, processors, and marketers to enable easier access to government programs, including insurance for accidents, fuel subsidies, and financial loans from partner banks.

**Table 1: Status and key concerns in SEAFDEC Member Countries**

Country	Status overview	Key concerns/challenges
<b>Indonesia</b>	SSF sector employs millions; major export species such as swimming crab; government initiatives like KUSUKA card support fisher formalisation and finance.	<ul style="list-style-type: none"> <li>• Overfishing and declining stocks (e.g., 60% drop in swimming crab in 10 years)</li> <li>• Dependence on middlemen limits bargaining power</li> <li>• Restricted financial access</li> <li>• Gender gaps in leadership and decision-making</li> <li>• Insufficient infrastructure in remote areas</li> </ul>
<b>Lao PDR</b>	Inland fisheries and aquaculture play a major role in rural nutrition and livelihoods.	<ul style="list-style-type: none"> <li>• Outdated fishing, transport, and packing methods</li> <li>• Reliance on imported aquaculture feed</li> <li>• Weak supply chain linkages</li> <li>• Water insecurity driven by climate variability</li> </ul>
<b>Malaysia</b>	Coastal SSF communities significantly contribute to food supply and cultural identity; community enterprises (e.g., myKP Merchang <sup>8</sup> ) showcase strong local models.	<ul style="list-style-type: none"> <li>• Overfishing and habitat degradation</li> <li>• High dependence on middlemen</li> <li>• Limited cold chain infrastructure</li> <li>• Gender and digital literacy gaps</li> <li>• Need for improved packaging and branding</li> </ul>
<b>Philippines</b>	SSF supports municipal fishers, Indigenous groups, and varied local markets.	<ul style="list-style-type: none"> <li>• High post-harvest losses</li> <li>• Lack of cold chain systems, especially in remote islands</li> <li>• Middlemen-controlled pricing</li> <li>• Incomplete fisher registration</li> <li>• Spoilage during periods of surplus</li> </ul>
<b>Thailand</b>	SSF relies on family labour, simple gears, and short supply chains.	<ul style="list-style-type: none"> <li>• Low bargaining power</li> <li>• High operational costs (especially fuel)</li> <li>• Seasonal instability and resource decline</li> <li>• Limited use of e-commerce and direct export channels</li> </ul>
<b>Viet Nam</b>	SSF includes both aquaculture and marine capture; over 90% of products are handled by middlemen.	<ul style="list-style-type: none"> <li>• Weak value chain linkages</li> <li>• Traceability gaps limiting export market access</li> <li>• Insufficient cold storage and processing facilities</li> <li>• High vulnerability to climate impacts</li> </ul>

## A synthesis of cross-cutting regional concerns

From these national profiles, interconnected challenges emerge as a common regional issue.

- **Market power imbalance:** Overwhelming dependence on middlemen, leading to low bargaining power and reduced income for fishers;
- **Post-harvest deficits:** Weak cold chain and processing infrastructure, resulting in significant physical and quality losses;
- **Financial and informational exclusion:** Limited access to credit, insurance, and real-time market information for fishers;

<sup>8</sup>Merchang Fisheries Community: established in 2018 to promote the sustainability of fishery resources and improve the economic status of fishers in Merchang, Terengganu State.

- **Gender inequality:** The critical role of women in processing and trade is often undervalued, with limited participation in decision-making;
- **Environmental and climate pressures:** Stock declines, overfishing, pollution, and climate change-induced fluctuations threaten resource sustainability; and
- **Standards and traceability gaps:** Difficulties in meeting certification requirements for premium export markets, linked to opaque supply chains.

## Case studies in value chain innovation

Amidst these challenges, successful models point the way forward. These case studies demonstrate that improvement is possible through focused intervention.

- **“Fisherman Shop” (Thailand):** A government-led initiative that strengthens value chains by ensuring quality, facilitating certification, and creating direct market access for fishers, bypassing traditional intermediaries.
- **“Pla Organic Social Enterprise” (Thailand):** A model aimed at empowering small-scale fishing communities through ownership of a seafood supply chain, as well as building their capacity on post-harvest management up to organic certificate level. Participating communities also have the opportunity to operate a retail seafood outlet in Bangkok, while educating consumers on sustainable fishery resources utilisation.
- **“Smart Fisheries Village” (Indonesia):** Piloted in Mariana, South Sumatra, this model leverages a community-based approach to modern fish processing, innovative packaging, and digital marketing, directly increasing local incomes and market reach.

From these examples, five distinct categories of good practice emerge. First is a focus on quality and certification through improved hygiene and sustainability labels. Second, producers are engaging in value-added processing to diversify their products. Third, they are securing improved market access via cooperatives and digital tools. Fourth, inclusive, community-based approaches are empowering women and strengthening collective action. Finally, strategic investments in governance and infrastructure, such as cold storage and market systems, underline these advancements.

## Recommendations for action

To address cross-cutting challenges and scale good practices, a coordinated strategy for SEAFDEC stakeholders should focus on three strategic pillars:

### A. Empower producers and improve efficiency

- **Strengthening cooperatives:** Aggregate produce and bargaining power.
- **Upgrade infrastructure:** Invest in cold storage and processing to reduce post-harvest losses.



Credit: Department of Fisheries Thailand



Kementerian Kelautan dan Perikanan (Ministry of Marine Affairs and Fisheries), Indonesia

Fish produced at a Smart Fisheries Village

- Add value locally: Support training for product diversification (e.g., fillets, ready-to-cook items).

### B. Enhance market integration and value

- Build trust and brand: Promote group certifications and affordable digital traceability for “SEAFDEC-region SSF” brands.
- Expand market access: Develop digital marketplaces and direct sales channels to retailers and exporters.
- Increase financial access: Create tailored credit/insurance and sustainability-linked incentives.

### C. Ensure supportive and equitable systems

- Mainstream gender equity: Integrate gender analysis and create targeted opportunities for women.
- Align policy and governance: Harmonise national policies with the RES & POA-2030 and foster multi-stakeholder partnerships.
- Scale success: Systematically document and facilitate the exchange of proven models for regional adaptation.

## Conclusion

The sustainable future of Southeast Asia’s small-scale fisheries hinges on transforming its supply chain from systems of vulnerability to engines of resilience and equity. This requires moving beyond isolated projects to an integrated regional strategy that is grounded in the RES & POA-2030, informed by robust gender and socio-economic analysis, and committed to participatory, community-led development. By investing in infrastructure, market access, financial inclusion, and, most importantly, in the people who depend on these waters, SEAFDEC and its Member Countries can secure a future where aquatic food value chains are not only strong and efficient but also just, inclusive, and sustainable for generations to come. 🌱

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The authors gratefully acknowledge the participation by representatives from SEAFDEC Member Countries (Indonesia, Lao PDR, Malaysia, Philippines, Thailand, and Viet Nam); and partners from the Food and Agriculture Organization of the United Nations (FAO), the Department of Fisheries, Thailand (DOF), Too Big To Ignore (TBTI), the Research Institute for Inland Fisheries and Extension (RIIFE) Indonesia, and Pla Organic Enterprise Company Limited. Insights from resource persons at the Japan Fisheries Research and Education Agency (FRA), Kasetsart University, and Mahidol University during the Regional Consultation Workshop on Small-Scale Fisheries Supply Chains are also sincerely appreciated.



**Jariya Sornkliang** is a Fisheries Management Scientist at SEAFDEC specialising in the socioeconomic dimensions of fisheries and gender integration. Her work focuses on small-scale fisheries supply chains, with the aim of improving livelihoods for women, men, and all marginalised and excluded groups through inclusive, equitable, and sustainable fisheries management.



**Thanyalak Suasi** is the Head of the Fisheries Management Section at SEAFDEC and a specialist in small-scale fisheries and socioeconomic analysis. Her work focuses on enhancing livelihoods through co-management and Community-Based Fisheries Management (CBFM), applying the Ecosystem Approach to Fisheries Management (EAFM) to balance conservation and economic sustainability. She also leads economic studies, particularly cost and return analyses, to support the well-being of fishing communities.



**Rattana Tiaye** is a Fisheries Management Scientist at SEAFDEC specialising in fisheries management, with a strong focus on small-scale fisheries co-management and the Ecosystem Approach to Fisheries Management (EAFM), promoting sustainable resource use, participatory governance, and improved livelihoods in fishing communities.



**Krittapat Meephol** is a Fisheries Management Scientist who recently graduated with a Bachelor’s degree in Fisheries from Kasetsart University. He is motivated to promote sustainable fisheries with a focus on community engagement.



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# BLUE ECONOMY ANCHOR: INDIA'S EEZ RULES MARK A NEW ERA FOR SUSTAINABLE FISHERIES

By P Krishnan, Rajdeep Mukherjee, Rishi Sharma and M Krishnan

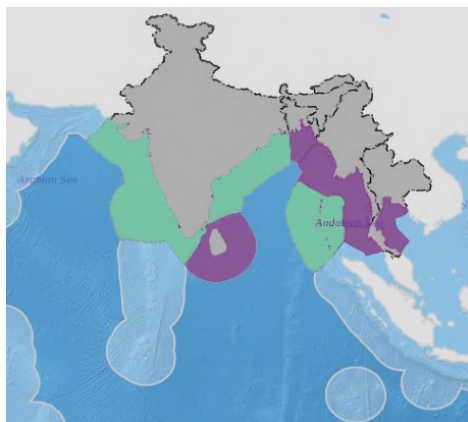
**With the release of the “Sustainable Harnessing of Fisheries in the Exclusive Economic Zone of India Rules, 2025”, India has finally filled a long-standing regulatory gap with regard to fishing in the Exclusive Economic Zone (EEZ). The new legislation is expected to enable more equitable development of India’s small-scale and artisanal fishing communities. The challenges ahead lie in the implementation and Federal coordination of the Rules, as well as credibility with markets and neighbours alike.**



Photo credit: BOBP-IGO

The Government of India marked a significant milestone on November 4, 2025, by notifying the “Sustainable Harnessing of Fisheries in the Exclusive Economic Zone of India Rules, 2025”. These Rules, enacted under the power vested by the Territorial Waters, Continental Shelf, Exclusive Economic Zone and Other Maritime Zones Act, 1976, establishes a formal regime for the exploration, exploitation, conservation, and management of fishery resources within India’s Exclusive Economic Zone (EEZ), which is the area spanning 12 to 200 nautical miles from the coast. The new legislation applies to all fishing and fishing-related activities in the Indian EEZ (Figure 1) and, crucially, resolves the long-standing question of who manages the zone.

**Figure 1: EEZ of India (in green shading)**



Source: Authors' own representation. Map is indicative, not to scale, and does not represent political boundaries.

As per the Constitution of India, fisheries management in the territorial waters (up to 12 nautical miles) comes under the purview of coastal States and islands which each has its own Marine Fishing Regulation Act (MFRA) covering fishing activities within that area of sea. In the absence of any other binding law, fishing activities in the EEZ (the area extending beyond the territorial waters up to 200 nautical miles outwards) have in the past, been largely guided by the limitations set under the MFRA of the corresponding State where the fishing vessel is registered and licensed, thus creating a *de facto* legal vacuum.

These Rules introduced several key innovations, most notably the transformation of EEZ fisheries from a *de facto* open-access system to a strictly regulated framework. This was achieved through a mandatory access pass for all mechanised vessels, as well as motorised vessels exceeding 24 metres or those engaged in targeted tuna fishing.

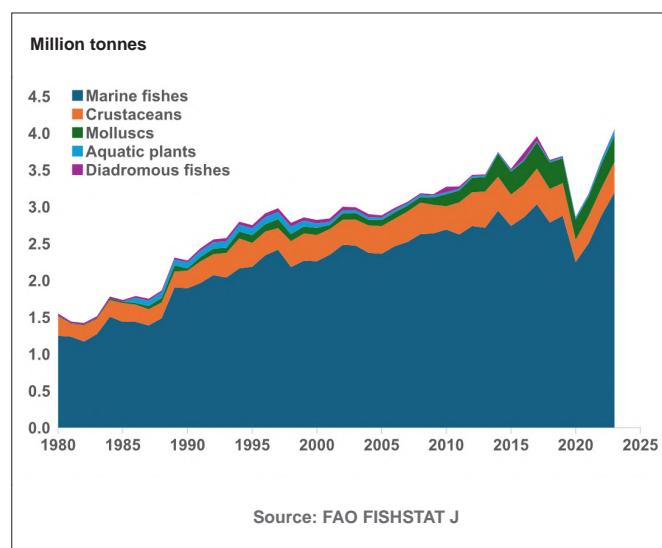
Additionally, the Rules mandate the development of Fisheries Management Plans (FMPs) rooted in an ecosystem approach. This ensures that harvesting levels remain consistent with the Maximum Sustainable Yield (MSY) of the EEZ.

The Rules also resolve long-standing industry debates, specifically regarding LED light fishing. Although the use of LEDs gained popularity over the last decade, it faced significant opposition from environmental groups and traditional fishers, leading to multiple legal challenges. By codifying the existing ban, the Central Government has moved beyond temporary notifications to establish a definitive legal stance.

## Overview of the marine fisheries sector of India

India is the fifth largest country in global marine capture fisheries with a reported production of 3.98 million tonnes in 2023. The production seems to be plateauing with reported output hovering between 3–4 million tonnes per annum (Figure 2).

**Figure 2. Marine fisheries production from India during 1990–2023**



Traditionally, India is a coastal fishing nation and fishing is concentrated on the territorial seas. The fishing fleet is dominated by motorised non-mechanical craft, which accounts for about 56 percent of the total fleet (Table 1). This is followed by motorised mechanical vessels, constituting about 27 percent of all fishing craft. Non-motorised vessels form a significant but smaller segment accounting for roughly 17 percent of the fleet and reflecting the continued presence of traditional and artisanal fishing practices. Deep-sea fishing vessels represent a very small and specialised segment, with only 133 vessels, together accounting for less than one percent of the total fleet. Overall, the fleet structure is heavily skewed towards small- and medium-sized motorised craft operating in coastal waters, with relatively limited participation of large, ocean-going vessels.

**Table 1. Vessels by category: Totals and shares**

Category	Registered	Licensed
Deep-sea fishing vessel	133	95
Motorised non-mechanical	134 175	112 924
Motorised mechanical	64 255	53 319
Non-motorised	40 740	24 540
<b>Total</b>	<b>239 303</b>	<b>190 878</b>

Source: ReALCraft, GOI

While most of the fish stocks assessed in India have been found to be sustainable (Kumar *et al.* 2024)<sup>1</sup>, the Government has long been concerned about the concentration of fishing effort in the near-shore waters. The National Policy on Marine Fisheries, 2017 (NPMF 2017) explicitly calls for development of deep-sea/offshore fisheries (especially oceanic tuna and allied resources) while reducing excessive pressure in inshore waters. NITI Aayog's report "India's Blue Economy: Strategy for Harnessing Deep-Sea and Offshore Fisheries"<sup>2</sup> frames deep-sea fisheries as a key growth area, highlighting potential in the broader Central Arabian Sea and other offshore grounds for tuna, seerfish, billfish and deep-water resources. Subsequently, various government initiatives such as the Blue Revolution Scheme, Pradhan Mantri Matsya Sampada Yojana (PMMSY) and the Fisheries and Aquaculture Infrastructure Development Fund (FIDF) have supported development of fishing in offshore waters.

## Significance of the new legislation

This regulatory move is timely and critical. During the last seven decades, India has catapulted from an artisanal coastal fishery to one of the top five marine fishing nations in the world. This transformation, while attributed to technological innovation, was also fueled by gaining access to the EEZ through the United Nations Convention on Law of the Sea of 1982 (UNCLOS), pursuant to the 1976 Act. UNCLOS came with both rights and responsibilities for all countries involved in the treaty. However, in India, the management regime remained confined to the territorial waters (baseline to 12 nautical miles) primarily aimed at conflict resolution between different gear groups.

Further, while fisheries come under the purview of both State (for territorial waters) and Union (for the EEZ) Governments, the latter's Fisheries Division has historically played a passive role. Though some may argue that the fishery sector is mostly limited to the territorial waters, India is also party to various global sustainability conventions, making it imperative for the country to take comprehensive measures relevant to areas beyond coastal territories.

The gradual expansion of domestic fishing into the EEZ, growing international concerns over sustainability and IUU fishing, and the transformation of the Fisheries Division into a full-fledged Department of Fisheries under its own Ministry, made this issue a higher priority. Further, India's strategic thrust on the Blue Economy, which prioritises harnessing the ocean economy while maintaining ecosystem health, created the necessary political and policy push for this regulatory regime, resulting in the "Sustainable Harnessing of Fisheries in the Exclusive Economic Zone of India Rules, 2025" legislation.

The Rules could ensure that India as a coastal State better meets its commitments to international conventions, including UNCLOS. Furthermore, these Rules also provide a mechanism for India to work with the neighbouring countries and regional fisheries bodies [such as the Indian Ocean Tuna Commission (IOTC) and the Bay of Bengal Programme

<sup>1</sup> Kumar, R., Dash, G., Muktha, M., Sasikumar, G., Ganga, U., Kizhakudan, S. J., ... & Gopalakrishnan, A. (2024). Assessment of marine fish stocks within India's Exclusive Economic Zone: Status report 2022. *Indian Journal of Fisheries*, 71(1), 1-11.

<sup>2</sup> NITI Aayog. (2025). *India's blue economy: Strategy for harnessing deep-sea and offshore fisheries*. Government of India. Accessed from <https://niti.gov.in/sites/default/files/2025-10/Indias-Blue-Economy-Strategy-For-Harnessing-Deep-Sea-And-Offshore-Fisheries.pdf>.



A motorised mechanical fishing vessel (trawler) in Kerala port near Kochi

Inter-Governmental Organisation (BOBP-IGO)] to better manage shared fish stocks like tuna and mackerel, and emerging squid fisheries which are the prime candidates for future growth in India's fisheries sector.

Apart from resource conservation, proper implementation of the new Rules can also empower the small-scale fishers of the country. The ecosystem principles contained therein particularly emphasise co-management by all stakeholder groups and thus, the interests of marginalised groups are taken into account.

Secondly, recognising that India's presence in high-seas fishing is minimal, the Rules are crucial for boosting deep-sea fishing investment. They provide investors with regulatory certainty, functioning as a vital risk-mitigation and value-creation mechanism essential for accessing premium export markets and fostering stability for major capital expenditure, thus providing expanding opportunities for the fisheries sector in India. The commitment to science-based management and the move towards a limited entry model unlike the *de facto* open access of the past, would assure investors of long-term returns and potential future opportunities like trading licences, and ITQ systems for individual quotas in the open ocean sector beyond 12 nautical miles. By stipulating a high threshold of compliance, the Rules will effectively promote the building of larger fishing vessels (24 metres and above) while filtering out unregulated, high-risk operators (and foreign fleets) that compromise long-term sustainability.

## The way forward

With the adoption of the EEZ Rules, New Delhi's Blue Economy goals have become legally enforceable. To genuinely exercise India's sovereignty, the way forward requires a systemic shift. Furthermore, the implementation process necessitates revising fisheries-related legislation to standardise regulations across the country. A critical next step involves close coordination between the Union Department of Fisheries and the fisheries departments in coastal States. This is to ensure that local enforcement

agencies are trained and equipped to monitor compliance effectively, especially at the interface between territorial waters and the EEZ; and to monitor landings between these sectors to understand the dynamics of the fishing fleets and the resource sustainability.

Finally, as global fisheries move toward an evidence-based 100 percent compliance model for trade, these Rules demonstrate India's determination to be globally responsible. This is essential for ensuring that Indian exports come from

sustainably harvested landings and avoid future disruptions. The new Rules allow India to speak with one consistent and authoritative voice offshore and at the port gate. 🗣️



**Dr P Krishnan**, (Director, BOBP-IGO, Chennai, India). Dr P Krishnan leads the Bay of Bengal Programme Inter-Governmental Organisation (BOBP-IGO), a regional body supporting fisheries and coastal livelihoods across the Bay of Bengal. His work typically focuses on strengthening governance, promoting responsible and sustainable fisheries, improving fisher safety and wellbeing.



**Mr Rajdeep Mukherjee**, (Policy Analyst, BOBP-IGO, Chennai, India). Mr Rajdeep Mukherjee serves as a Policy Analyst at BOBP-IGO, contributing to research, analysis, and programme support on fisheries governance and development. His role commonly includes undertaking policy research, preparing policy briefs and technical notes, supporting stakeholder consultations, assisting in project design, implementation and monitoring.



**Dr Rishi Sharma**, (Senior Fishery Resource Officer, FAO Fisheries & Aquaculture Division, Rome, Italy). Dr Rishi Sharma serves as a Senior Fishery Resource Officer in the Fisheries and Aquaculture Division of Food and Agriculture Organization of United Nations (FAO). He assists with international fisheries management by providing technical guidance, policy advice, and capacity-building support to FAO members. His work includes training on stock assessment and management methods, data collection and monitoring systems, responsible fishing frameworks, and institutional strengthening to achieve sustainability and compliance at both national and regional levels.



**Dr M Krishnan**, [Adviser (Fisheries) Infinite Sum Modeling Inc., Seattle, USA]. Dr M Krishnan is now Adviser (Fisheries) Infinite Sum Modeling Inc., Seattle, USA. Previously, he was Project Adviser for Marine Resources, Andhra Pradesh, India. He was also Head, Fisheries Economics, Extension and Statistics Division at the Central Institute of Fisheries Education (deemed University), Mumbai, and retired as Principal Scientist & Head, Education Systems Management., National Academy of Agricultural Research Management (NAARM), Hyderabad.

Note: Views are personal.

## World Seafood Congress 2026, Chennai: A milestone moment for the Indian seafood industry



Group photo of the delegates at WSC 2026.

Credit: PDA Ventures.



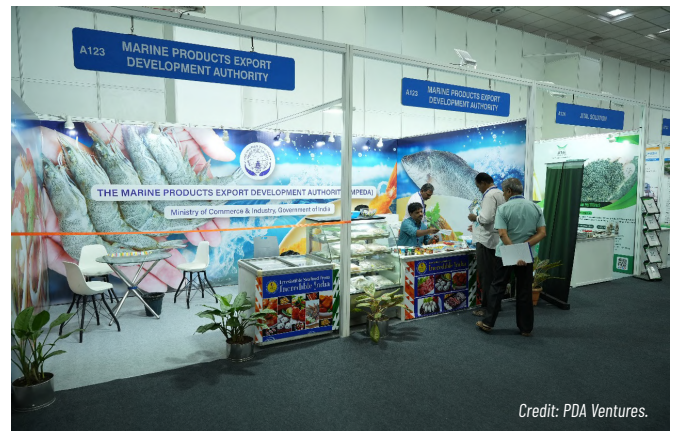
India marked a defining moment on the global seafood map as Chennai hosted the **World Seafood Congress 2026 (WSC 2026)** from 9-11 February 2026, bringing together key decision-makers focused on advancing international trade in fisheries and aquaculture. Following previous editions in Canada, the Netherlands, Australia, Ireland, Morocco, the United States, the United Kingdom, Iceland, Malaysia, and Portugal, the biennial Congress made its historic debut in India, underscoring the nation's growing influence in global seafood trade and technology. The Congress welcomed more than 200 delegates from over 20 countries.

WSC 2026 was jointly organised by the International Association of Fish Inspectors (IAFI), PDA Ventures, and the National Fisheries Development Board, and co-organised by the Department of Fisheries with high-level support from the Ministry of Food Processing Industries, the Ministry of Earth Sciences, and NITI Aayog. Technical leadership was provided by the Indian Council of Agricultural Research (ICAR), with further support from international partners including the Food and Agriculture Organization of the United Nations (FAO), the United Nations Industrial Development Organization (UNIDO), WorldFish and INFOFISH. As a strategic partner, the Tamil Nadu Fisheries Development Corporation played a key role in promoting the Congress.

Following a pre-conference session on 8 February, the Congress featured a dynamic agenda of plenary sessions, expert panels, and technical workshops. These thematic discussions centered on sustainable seafood trade, inspection standards, market access, and inclusive growth. Through cross-sector dialogue on policy, technology, and sustainability, participants gained in-depth insights and strengthened professional networks.

The exhibition served as a vibrant trade platform, showcasing cutting-edge technologies and services across the seafood supply and value chains. Exhibitors presented innovations in processing, packaging, quality control, and cold-chain solutions, bringing together leading global and Indian enterprises to foster business engagement and strategic partnerships. The Congress featured over 50 exhibitors and attracted approximately 700 visitors.

The Congress hosted the 2026 Peter Howgate Award recipients, Ms Harini Ravi (India) and Ms Riza Jane Banicod (Philippines). This prestigious grant, honouring the late Peter Howgate's contributions to fish technology, enabled these young technologists to engage with industry leaders.



Credit: PDA Ventures.

MPEDA stand (A 123) at the WSC 2026 Trade Show.

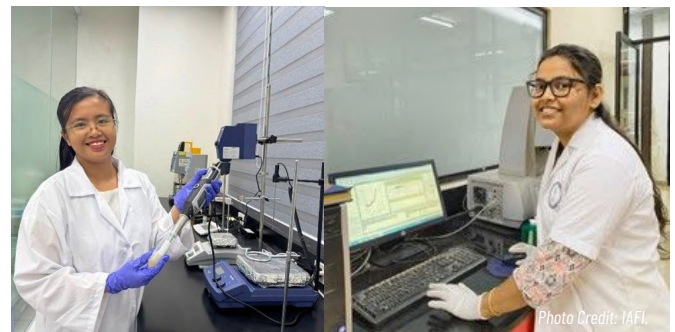


Photo Credit: IAFI.

Ms Riza Jane Banicod, Philippines (Left) and Ms Harini Ravi, India (Right), recipients of the 2026 Peter Howgate Award.

The World Seafood Congress 2026 concluded on 11 February after three engaging days of insightful sessions and a vibrant exhibition that brought together global leaders to advance the seafood sector. The event ended with a ceremony attended by senior dignitaries and industry representatives, featuring the valedictory address by the Joint Secretary of the Department of Fisheries, Government of India. Closing remarks were delivered by Ms Jayne Gallagher (incoming) and Dr Ian Goulding (outgoing), President of IAFI, formally marking the conclusion of the 2026 edition.

The WSC continues its legacy of being the most influential global forum for advancing sustainable growth in the seafood sector, reinforcing its vital role in ensuring global food security and industry resilience. The 14th edition of World Seafood Congress, WSC 2028 will take place in Hangzhou, China. Please visit: <https://iafi.net> for more information.

## World Aquaculture Singapore 2026

Singapore EXPO Convention and Exhibition Centre, Singapore, 2-5 June 2026

### World Aquaculture Singapore to Spotlight Innovation and Sustainable Aquaculture Development



**Singapore** - World Aquaculture Singapore (WA2026) will bring the global aquaculture community to Singapore from 2-5 June 2026 at the Singapore EXPO Convention and Exhibition Centre, reaffirming the city-state's position as a leading hub for aquaculture innovation, technology, and knowledge exchange in Asia and beyond.

The event is expected to attract international scientists, researchers, and industry stakeholders to discuss the future of sustainable aquatic food production.

### Aquaculture Development in Singapore

#### Aqua Polis Launches Asian Seabass R&D programme

#### Uniting Industry and Research to Strengthen Singapore's Food Resilience

The Singapore Food Agency has awarded SGD 18.5 million to the AquaPolis Asian Seabass R&D Programme. Announced in November 2025, the Programme brings together eight research institutions and 19 industry collaborators to lower production costs and enhance the quality of locally farmed Asian seabass.

The R&D programme is anchored on three core pillars: selective breeding, nutrition optimisation and disease management. Building on advances in previous genomic selection programmes for Asian seabass, the team will develop next-generation, parasite-resistant fingerlings with improved robustness and lower mortality. These breeding efforts will be complemented by advanced feeding strategies and a comprehensive disease management framework to improve growth performance and fillet quality. Together, these innovations aim to strengthen the competitiveness of locally produced Asian seabass against imports.

The AquaPolis Asian Seabass R&D Programme is a national initiative, co-established by SFA, NUS and TLL. It sits within the broader Singapore Food Story (SFS) R&D Programme and supports the national goal of building a resilient, productive local food supply. The AquaPolis Programme is focused on advancing sustainable tropical marine aquaculture through farm-relevant innovation and research.

For more information on the SFS R&D Programme, visit <https://www.sfa.gov.sg/recognition-programmes/grants/grants/singapore-food-story-rd-grant-call>

For more information on AquaPolis, visit <https://aqp.sg>

### A Global Platform for Collaboration

World Aquaculture Singapore 2026 will feature plenary and keynote sessions, technical presentations, industry exhibitions and extensive networking opportunities designed to address both global challenges

and regional opportunities in aquaculture. The event theme, **"High Yield Production Through Nutrition, Health, Genetics, and Resources,"** reflects the sector's shift towards integrated, science-based solutions for sustainable growth.

A key highlight on the first morning of 3 June will be the keynote session delivered by Richard Barry, Senior Market Analyst and Director of Programs at the National Fisheries Institute in the United States. His presentation, **"U.S. Seafood Market – Sourcing Dynamics and Consumer Behaviours in a Tariff Trade Environment,"** will examine global aquaculture trends and the strategic importance of sustainable aquatic food systems, setting the stage for in-depth discussions on food security, climate resilience, and technological transformation across the aquaculture value chain.



**Richard Barry** is Senior Market Analyst and Director of Programs at the National Fisheries Institute, a trade association representing the U.S. seafood industry. His work includes the NFI Sushi Council, industry education initiatives such as sensory workshops and the NFI Seafood School, and the planning and programming of NFI's annual event, the Global Seafood Market Conference. He is an NFI Future Leader alumnus (class of 2016). He graduated from James Madison University in 2010 and spent a year in the Jesuit Volunteer Corps Northwest in Omak, WA, working in legal aid.

**Abstract Submission Deadline:** The abstract submission deadline for World Aquaculture Singapore 2026 has been extended to 1 April 2026 to provide additional time for researchers, industry professionals, and students to prepare and submit their latest findings and innovations in aquaculture. The abstracts will be reviewed by the programme committee.

Participants are encouraged to complete their submissions via the official conference website before the revised deadline. Late submissions may not be considered.

Hotel bookings at special rates are available online via the conference website.

**Further details on registration, abstract submission, sponsorship and exhibition opportunities are available at** <https://was.org/meeting/code/WA2026>

For Conference Management, contact Mr. John Cooksey, email: [worldaqua@was.org](mailto:worldaqua@was.org) and Mr. Noah Cooksey at [worldaqua11@was.org](mailto:worldaqua11@was.org)

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# SOFT-SHELL MUD CRAB FARMING IN BANGLADESH: CHALLENGES AND PROSPECTS

By Aung Sein and Sujit Krishna Das

**Mud crabs are the second most commercially important crustacean species in Bangladesh, due to its high demand in international markets. Soft-shell crabs are especially favoured among consumers worldwide, as they have a delicate flavour and texture; and are more nutritionally complete, lower in calories and richer in essential minerals than hard-shell ones. During the 2024–25 fiscal year, the country exported 1 166.89 tonnes of mud crabs (including soft-shell crabs), worth over USD 14 million. This technical article highlights the background, trade value chains, and socio-economic importance of soft-shell crabs; and presents step-by-step guidelines for farming. It also intersects the cost-benefit analysis of a one-acre farm which may help new entrepreneurs to make investment decisions. The authors assert that despite some challenges, soft-shell mud crab farming can be a lucrative business in most Asia-Pacific countries.**



Photo credit: Aung Sein

Soft-shell crab is farmed in perforated plastic boxes, Cox's Bazar, Bangladesh.

The fisheries and aquaculture sector in Bangladesh contributes significantly to the national GDP (2.53% in national GDP; 22.26% in agricultural GDP) and accounts for 60% of the country's animal protein supply. It also generates about 20 million full- and part-time jobs, of which 1.4 million are held by women. The 2024 FAO flagship report, The State of World Fisheries and Aquaculture (FAO 2024)<sup>1</sup> recognised Bangladesh as the world's fifth-largest aquaculture-producing nation (5 million tonnes) and the second-largest inland fisheries producer (1.3 million tonnes). In addition, Bangladesh is the world's largest producer of hilsa shad and the third-largest producer of tilapia (DOF 2024<sup>2</sup>).

Unlike in many Asian countries, mud crabs<sup>3</sup> (*Scylla olivacea*, previously known as *S. serrata*), also known as mangrove crabs, became a popular commercial aquaculture species in Bangladesh due to their high demand in international markets and relatively easy culture. Crab fattening and

<sup>1</sup> FAO. 2024. The State of World Fisheries and Aquaculture 2024 – Blue Transformation in action. Rome. <https://doi.org/10.4060/cd0683en>

<sup>2</sup> DOF 2024. 2024 Yearbook of Fisheries Statistics of Bangladesh, 2023–24. Fisheries Resources Survey System (FRSS). Department of Fisheries; Ministry of Fisheries and Livestock, 2024. Volume 4; 140p. [4c64d1e387d446ec97430228bcc06ddc.pdf](https://doi.org/10.4060/cd0683en)

<sup>3</sup> Rouf, M.A., I.M., Shahriar, S.I.M., Sarower, M.G., and Ahsan, M.N., 2016. Taxonomic Clarification of Mud Crab Species of Genus *Scylla* (Brachyura: Portunidae) Available in the Coastal Regions of Bangladesh. *Asian Fisheries Science* 29 (2016):124–136. <https://doi.org/10.33997/j.afs.2016.29.3.001>

soft-shell crab farming activities are carried out on a wider scale as compared to grow-out farming.

Soft-shell crabs are delicacies for many seafood consumers. Unlike regular crab harvesting, soft-shell crab farming involves rearing of hard-shell crabs in controlled brackish water conditions and monitoring them closely so that they can be harvested at the right moment, i.e. immediately after they moult and lose their hard shells. At that point, their new shells are still soft. This stage lasts only a few hours, and it is when the crabs attract higher prices in export markets than hard-shell crabs because of their delicate texture and juicy flavour.

## The beginnings of the industry

Soft-shell crab culture started in November 2011 when many shrimp farmers were looking for alternatives due to severe disease outbreaks, price volatility and environmental pressures. In addition, soft-shell crab farming was relatively easy compared to shrimp farming. Commercial production started in February 2012 at Khurushkul Union of Cox's Bazar Sadar Upazila, Cox's Bazar District. This two-acre site, belonging to Irawan Trading, continues to farm mud crabs in 40 000 perforated plastic boxes. Technical know-how was received through training provided by soft-shell crab farmers from Ranong province, Thailand.



Photo credit: Aung Sein

Soft-shell crab acclimatisation before stocking.

Due to the strong international demand, this non-traditional aquaculture commodity expanded rapidly along the southwest coast of Bangladesh (Satkhira, Bagerhat and Khulna), where hard-shell mud crabs are more abundant in the wild around the vast areas of the Sundarbans (one of the largest mangrove forests in the world, which lies on the delta of the Ganges, Brahmaputra and Meghna rivers, is rich in wide range of biodiversity, and is listed as a UNESCO World Heritage Site<sup>4</sup> and Ramsar Site<sup>5</sup>).

### The shift towards soft-shell crab farming

Coastal communities used to be almost wholly dependent on small-scale fishing, traditional shrimp farming, gleaning of crabs, collection of honey and mangrove wood from the Sundarbans, and fattening of hard-shell crabs seasonally. However, these livelihood options are sometimes impacted by animal attacks (for example, tigers and crocodiles), fishing bans and disease outbreaks. Soft-shell crab farming offers a more predictable source of cash income which is attractive for unemployed and under-employed people in coastal communities, especially women and youth. Consequently, many small-scale holders have converted their traditional shrimp farms and hard-shell crab fattening activities to soft-shell crab farms due to higher profits, shorter culture periods and lower susceptibility to diseases.



Photo credit: Aung Sein

Soft-shell crab farming at a large coastal farm in Bangladesh.

### Present status and geographic coverage

Previously, soft-shell crab farming was concentrated around Cox’s Bazar (southeast region) but for the last five years it has become more prevalent in Shyamnagar, Munshiganj Upazila, in Satkhira District (southwest region). This is due to the natural abundance of crablets, juveniles and sub-adults in the adjacent Sundarbans mangrove areas. This region has now become the national hub for soft-shell crab production and is home to thousands of small-scale soft-shell mud crab farms, together with some larger farms.

<sup>4</sup> The Sundarbans, *The Sundarbans - UNESCO World Heritage Centre*  
<sup>5</sup> The Sundarbans Reserved Forest, <https://rsis.ramsar.org/rsis/560>

### Economic importance

Local consumption of hard-shell crabs is restricted mainly to the tribal and minority communities. Consequently, Bangladesh is a significant exporter of hard-shell crabs, with the soft-shell variety constituting a new addition to the country’s wide range of aquaculture commodities. According to the Export Promotion Bureau, Bangladesh exported frozen crab worth USD 12.3 million in 2020–21, destined for China, the United States, and parts of Asia and Australia. In subsequent fiscal years, mud crab shipments from Bangladesh rose significantly from 644.77 tonnes in 2023–24, to about 1 166.89 tonnes in 2024–25. Meanwhile, export value increased from about USD 8 million to over USD 14 million, showing strong international demand<sup>6</sup>. However, it is important to mention that the available data does not distinguish between hard-shell and soft-shell mud crab exports. The major markets for soft-shell crabs are Japan, the Democratic People’s Republic of Korea, Europe, the United States, and ASEAN countries.



Photo credit: Ibrahim Khalil Ullah Shaibal

Frozen (IQF) soft-shell crabs packed and ready for export.

### Employment generation and socio-economic significance

Soft-shell crab farming contributes significantly to foreign exchange earnings and employment. Currently, the sector directly supports about 10 000 people, offering employment in farming, processing, and supply chain operations. Women and youth contribute to daily monitoring activities at the farm level and in the factories through handling and processing activities.



Photo credit: Ibrahim Khalil Ullah Shaibal

A soft-shell crab processing facility in Bangladesh.

<sup>6</sup> Export Promotion Bureau, Bangladesh.

## Soft-shell crab farming: Step-by-step guidelines

Medium-size adult hard-shell crabs (60g–90g) are usually stocked in perforated plastic boxes. Larger crabs (100g–120g) are also accepted, where fattening is done up to the next moulting stage, as per buyers' requirement. The culture duration for each batch of soft-shell crab production is about 20–30 days, and approximately eight production cycles can be accomplished each year. After the crabs are sourced, they are placed in individual boxes, positioned in the brackish water ponds, and monitored until the next moult. Intensive monitoring throughout the moulting period (often checked every four hours) is required to harvest crabs at the perfect soft-shell stage. The moulted crabs are then transferred to clean freshwater to slow down the shell-hardening process.

Step-by-step guidelines (1–7) for soft-shell crab farming up to the market-ready stage are given below.

### 1. Preparation of the farming area

**Pond preparation:** Small or medium size (1 acre = 4000 m<sup>2</sup> = approximately 80m X 50m) earthen ponds are established close to the nearest source of brackish water intake. The ponds should also have dykes to maintain a water depth of at least 3–4 feet, and have water inlet and outlet gates (wooden or made of PVC).

Ponds are cleaned and dried naturally in the sun until the pond bottom visibly cracks. Usually, this is done during the winter months (November–December) when it is off-season for farming. If the soil is acidic, the pond bottom is treated with calcium oxide (CaO) which is subsequently washed out by tidal water. Finally, the pond is filled with tidal brackish water up to the desired water level.



Pond drying, where the bottom is exposed to direct sunlight.

**Pontoon bridges for monitoring:** Small-scale farmers monitor the moulting process easily by wading into the ponds, while medium-scale farms usually install pontoon bridges. These structures are generally made of wood or bamboo (approximately 50 metres in length and 1–1.5 metres wide, with or without shed) and are placed about one foot above the pond water level.



Shaded pontoon bridge.

**Raft-making:** To hold the individual perforated plastic boxes, a floating raft (35 metres long and 1.5 metres wide) is built using PVC pipes tied together. Each raft can carry about 700 boxes, and each acre of pond area can accommodate 22 000–23 000 individual boxes.



Floating raft made from PVC pipes upon which the perforated plastic boxes are placed.

### 2. Stocking of crabs

**Sourcing and selection of crabs:** Farmers generally collect hard-shell crabs from natural sources such as rivers, creeks and mangrove areas, or they may purchase these crabs from wild crab collectors or gleaners. Currently, there is no alternative source of hard-shell crabs in the country. Furthermore, in 2024, the Department of Fisheries reported that hard-shell mud crab production from natural sources had declined slightly over the previous six years, from 12 084 tonnes in 2018–19 to 10 782 tonnes in 2023–24.



Healthy and intact hard-shelled crabs are collected for stocking.

**Size and quality:** The crabs should be healthy and active, each weighing between 60–90g. Farmers usually wash the crabs with pond water to acclimatize them before stocking; they also disinfect the crabs with low doses of chlorine and place them in aerated water before stocking them into the boxes.



Photo credit: Aung Sein

Hard-shell crabs put in aerated water before stocking.

**Perforated plastic boxes:** Each crab is kept in an individual plastic box (25 cm in length, 21 cm in width and 15 cm in height). This “one crab-one box” method aims to prevent cannibalism and stress. The boxes are then placed on floating PVC structures or rafts in the pond or enclosure. As each box contains one crab, monitoring is easy and the crab can be removed after moulting occurs. This design is helpful during crab feeding as well.



Photo credit: Aung Sein



Photo credit: Aung Sein

(Top): Perforated plastic box used for soft-shell crab farming; (bottom): Individual crab being placed in a perforated plastic box.

### 3. Water parameters

- Salinity: Coastal tidal water with a salinity reading of 15–30 ppt is suitable for soft-shell crab farming.
- Temperature (°C): As the farming is done in outdoor ponds, temperature depends on natural seasonal changes. Experience shows that extremely high temperatures in summer lead to higher mortality. However, the moulting rates are lower in the winter season.
- Water quality management: The pond water is regularly exchanged with tidal water to maintain optimum brackish water conditions. Generally, no additives are applied to the

pond water; however, lime (calcium carbonate and dolomite) is useful to optimise pH and mineral content during the rainy season.

### 4. Feeding practices

Unlike the large volume of feed used in hard-shell crab fattening, minimal feed is required in soft-shell crab farming. Minced small trash fish (e.g. tilapia) and shellfish (e.g. freshwater snails) are provided on alternate days to reduce uneaten food and water pollution. Roughly, the feeding rate is 5–8% of crab biomass every two days, adjusted subject to physical monitoring and weather conditions.



Photo credit: Ibrahim Khalil Ullah Shaibal

Workers putting the minced tilapia/snails into the perforated plastic boxes as feed.

### 5. Monitoring the moulted crabs

Frequent monitoring is crucial in soft-shell crab production. The crabs are typically checked every 3–4 hours to catch the moment they moult. Upon moulting, the crabs rapidly absorb water to expand their new, larger shell, increasing their weight by approximately 25–30% compared to the initial stocking size. As the crab shells remain soft only for a short while (hours), harvesting must begin immediately.



Photo credit: Ibrahim Khalil Ullah Shaibal

Workers have to frequently monitor the moulting process.

### 6. Post-harvest handling

Once the crabs have moulted, they are quickly transferred to a plastic bowl filled with clean freshwater to slow down the shell-hardening process. Later, they are placed in plastic trays covered by wet towels and transported for processing.



Photo credit: Aung Sein

Moulted crabs are placed in fresh water to prevent the shell-hardening process before being transported to the processing facility.

Upon reaching the processing facility, the crabs are cleaned, graded by size (A/B/C grades), blast-frozen (IQF) and packed according to buyers' requirements.



Photo credit: Ibrahim Khalil Ullah Shaibal



Photo credit: Ibrahim Khalil Ullah Shaibal

Photo credit: Ibrahim Khalil Ullah Shaibal

Post-harvest soft-shell crab processing (IQF) and packing

## 7. Marketing of soft-shell crab

There is little demand for soft-shell crabs in the domestic market. Generally, farmers sell the C-grade crabs (missing most of the legs and comprising about 5% of supply) to local suppliers who sometimes sell these to local consumers. A-grade (with complete legs; 70%) and B-grade (missing some legs; 25%) products are sold to processing factories for export. The price of soft-shell crabs is higher than hard-shell crabs<sup>7</sup> and the value chain is relatively shorter.

<sup>7</sup> Tavares, C. P. S., U. A. T. Silva, L. Â. Pereira, and A. Ostrensky. 2021. Evaluation of Different Induced Molting Methods in *Callinectes ornatus* (Crustacea, decapoda, portunidae) as a Tool for the Commercial Production of Soft-Shell Crabs. *Anais Da Academia Brasileira De Ciencias* 93, no.2: 1-14. <http://doi.org/10.1590/0001-376520210190580>

Many farmers sell soft-shell crabs to nearby processing factories, where they are prepared for export markets in line with international food safety standards and compliance. Major markets include the Republic of Korea, Japan, Europe, the United States and ASEAN countries where soft-shell crabs are considered premium seafood items. Soft-shell crabs are widely consumed as stir-fried, mixed with fried rice, and in sandwiches and noodles.



Photo credit: Aung Sein

Photo credit: Aung Sein

Raw soft-shell crab being graded at a processing facility.



Photo credit: Ibrahim Khalil Ullah Shaibal

Final product (master carton) of frozen (IQF) soft-shell crab.

## Challenges and constraints

Although soft-shell crab farming has huge prospects and rising global demand, the sector faces some of the following key issues:

- **Dependency on wild crab stock**

There is no fully operational and commercial mud crab hatchery in the country to produce megalopa larvae or crablets. Currently, crablets, juveniles and sub-adult crabs are being collected from the wild. This has put immense pressure on wild crab stock, creating challenges for long-term environmental sustainability and consistent supply chains.

- **Regulatory issues and seasonal fishing bans**

A 65-day marine fishing ban (April-June) imposed by the Department of Fisheries, and a two-month ban on crab harvesting by the Department of Forestry (generally January and February, which is considered the peak breeding season for crabs) hamper the livelihoods of the coastal communities who are dependent on these fisheries. On the other hand, over-exploitation of wild crabs and declining natural stocks are also threats to the biodiversity and sustainability of the aquaculture sector.

- **Technical and quality issues**

Soft-shell crab farming requires careful monitoring and handling, as even a small oversight in timing leads can disrupt moulting cycles. Poor water quality can lead to mortality, and small-scale holders often lack knowledge of proper handling and processing. Hence, factories face major difficulties if quality and standards are not maintained as per export requirements.

- **Market access and price fluctuation**

Although export markets are lucrative, volatility in export prices and barriers to market access (e.g. buyers preferring large quantities with consistent supplies) can reduce farmers' profit margins. As soft-shell crabs have little demand in the domestic market, farmers are highly dependent upon international buyers and export markets.

- **Natural calamities and climate-induced risks**

Intensified cyclones, tidal surges, flooding and erosion threaten coastal livelihoods every now and then, and present economic risks to farmers through damage to pond dykes, cages and infrastructure.

## Prospects and specific recommendations

- With targeted investment in the establishment of commercial crab hatcheries, soft-shell crab farming will emerge as a sustainable alternative for the aquaculture sector.
- Enabling policies for the development of hatchery infrastructure and farms will minimise dependency on wild crab stocks, restore natural populations, and maximise production through a sustainable supply of crablets, juveniles and sub-adult crabs.
- Capacity-building of technical staff and farmers through training could improve the quality and safety of soft-shell crabs, as well as boost production.
- Strengthening investment through public-private partnerships could add value to supply chains including improvements in farming, processing and packaging. It will also help in meeting international quality and safety standards, thus ensuring wider market access.
- The National Framework and Action Plan for Locally-Led Adaptation (LLA) launched recently in Bangladesh should include fisheries and aquaculture to boost climate resilience and mitigate climate-induced risks.

## Conclusion

Soft-shell crabs have a savoury flavour as compared to hard-shell crabs as they contain more salts in their bodies and present a nutritionally complete profile ([Nutrient Contents in 100g Soft-shell Crab](#)). They are best suited for farming along the coastal and brackish water areas of Bangladesh. The sustainability of soft-shell crab farming relies on

the advancement of hatching technology; consistent and responsible supply of crablets, juveniles and sub-adult crabs for fattening; capacity-building through technical training; strengthening investment; and development of infrastructure through enhanced public-private partnerships. Although commercial soft-shell crab farming is relatively new in Bangladesh, it is a viable, high-value, export-oriented, and profitable industry ([Cost Benefit Analysis \(CBA\) of 1 Acre Soft-Shell Crab Farm](#)) within the context of blue economy. 🌊

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**Aung Sein** ([awua91@hotmail.com](mailto:awua91@hotmail.com)) is an international crustacean expert and has specialised skills in commercial and large-scale black tiger shrimp hatchery operations, reproduction and intensive shrimp farming, including RAS and biofloc systems, since 1993. A pioneer in soft-shell mud crab production, he introduced soft-shell mud crab farming in Bangladesh in 2011. Currently, he is heavily engaged in mud crab trading, soft-shell crab farming and crablet fattening, being the proprietor of Irawan Trading in Cox's Bazar, Bangladesh. Mr Aung is the recipient of the "National Fisheries Award 2016" given by the Department of Fisheries for his success in crab reproduction and soft-shell crab farming in Bangladesh. He holds a Master's degree (M.Sc.) in Marine Science from the Institute of Marine Science and Fisheries, University of Chittagong, Bangladesh.

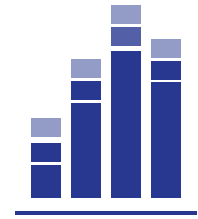


**Sujit Krishna Das** ([sujit@infofish.org](mailto:sujit@infofish.org)) has more than 18 years of solid experience in fisheries and aquaculture development at regional and international levels. His areas of expertise include commercial breeding of major tropical aquaculture species, intensive nursing and farming protocols, formulated species-specific feed, managed nutrition, and biosecurity of aquatic animal health. Following completion of his postgraduate degree in Aquaculture, he worked closely with the private sector and DFID-UK funded SUFER project. Being the Technical Officer at INFOFISH, Malaysia, since 2019, he is responsible for providing Technical and Policy Advisory Support to the INFOFISH Member Countries, while keeping abreast of technological developments. He passionately advocates responsible blue food production and circular economies to achieve the SDGs.

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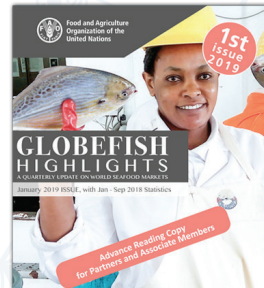
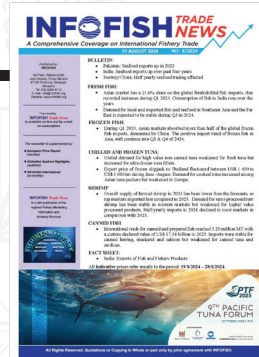
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# Agreement on Marine Biological Diversity of Areas Beyond National Jurisdiction (BBNJ Agreement)



*The BBNJ Agreement provides a shared framework to strengthen cooperation on the conservation and sustainable use of marine biodiversity in ABNJ. ©FAO/Kurt Arrigo*

The Agreement under the United Nations Convention on the Law of the Sea on the Conservation and Sustainable Use of Marine Biological Diversity of Areas beyond National Jurisdiction (BBNJ Agreement) was adopted on 19 June 2023 by the Intergovernmental Conference on Marine Biodiversity of Areas Beyond National Jurisdiction convened under the auspices of the United Nations, and entered into force on 17 January 2026. The BBNJ Agreement becomes the third implementing agreement to the United Nations Convention on the Law of the Sea.

Under the overall objective of the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction, for the present and in the long-term, through effective implementation of the relevant provisions of the Convention and further international cooperation and coordination, the Agreement addresses four main issues:

- Marine genetic resources, including the fair and equitable sharing of benefits;
- Measures such as area-based management tools, including marine protected areas;
- Environmental impact assessments; and
- Capacity-building and the transfer of marine technology.

The Agreement also addresses a number of “cross-cutting issues”, establishes a funding mechanism and sets up institutional arrangements, including a Conference of the Parties and various subsidiary bodies, a Clearing-House Mechanism and a secretariat.

## Oceans beyond borders matter for people, planet and prosperity



**By Manuel Barange**  
Assistant Director-General  
and Director of the Fisheries  
and Aquaculture Division at  
FAO

Before ending up on a dinner plate or sealed in a supermarket can, tuna spend much of their lives far from any coastline, moving through parts of the ocean that belong to no single country. These waters, known as Areas Beyond National Jurisdiction (ABNJ), are outside of any one country's jurisdiction, extending from surface waters through the deep sea and down to the ocean floor. What happens there shapes marine ecosystems, economic development, livelihood opportunities and nutrition outcomes in countries thousands of kilometres apart.

ABNJ are often perceived as distant or abstract. In reality, they are among the most important parts of the ocean. They cover roughly two-thirds of its surface and include the vast majority of the total living space of the planet. Their water columns and seabed contain significant genetic and mineral resources that play a central role in sustaining global biodiversity.

Highly migratory species such as tuna, as well as many other known and even unknown species, depend on ABNJ for much of their life cycle. This links the health of these areas to national economies, development opportunities and diets in many regions. Furthermore, for many Small Island Developing States, ABNJ are not remote spaces. What happens in those waters affects their food security, employment and economic stability directly.

However, Areas Beyond National Jurisdiction are under growing pressure. Rising ocean temperatures are altering currents and species distributions. Pollution reaches even deep-sea environments. Unsustainable practices can weaken their capacity to respond to pressures, including fragile seabed habitats that recover slowly. When this happens, the impacts do not remain offshore. Fish stocks decline, ecosystems lose resilience, and coastal communities feel the consequences through reduced income, lost jobs and diminished access to nutritious aquatic foods.

Managing ABNJ is inherently complex. No single country has authority, yet many have activities and legitimate interests there. While rules for these areas have existed for decades, their implementation is spread across different sectors and bodies, often with limited coordination and effectiveness.

The [Agreement on the Conservation and Sustainable Use of Marine Biodiversity of Areas Beyond National Jurisdiction \(BBNJ Agreement\)](#) responds directly to this challenge. As an implementing agreement under the United Nations Convention on the Law of the Sea, it provides a shared framework to strengthen cooperation on the conservation and sustainable use of marine biodiversity in ABNJ. Its entry into force on 17 January marks a new chapter in ocean governance, introducing new management requirements and tools to cover regulatory gaps, and offering improved cooperation across existing sectors and bodies.

The BBNJ Agreement establishes rules for access to marine genetic resources and the fair sharing of benefits arising from their use. It creates a global framework to develop and coordinate area-based management tools and sets out obligations for environmental impact assessments of activities that may harm marine biodiversity. It also commits countries to capacity-building and the transfer of marine technology, particularly to support developing states.

### Fisheries and BBNJ

From 17 January, when the Agreement enters into force, the BBNJ framework becomes legally binding for its Parties. Yet, it cannot be treated as a system that starts from zero. Human activities, such as fishing, shipping, research, and bioprospecting, already take place throughout ABNJ. These uses are long established and governed through an existing global network of arrangements and bodies. The BBNJ Agreement does not replace these bodies, it is designed to work alongside them, filling gaps and improving coherence.

Fisheries sit at the centre of this relationship. As highlighted in the [1995 FAO Code of Conduct for Responsible Fisheries](#), fish are a core component of marine biodiversity, and their health depends on their ecosystems. When ecosystems are stressed, fish populations decline. At the same time, fisheries are fundamentally about people. Aquatic foods support livelihoods, incomes and nutrition for millions, meaning decisions taken in international waters have direct consequences for people and planet.

Over decades, countries have developed cooperative systems to manage fisheries in international waters through science-based rules and regional fisheries management organizations (RFMOs). These systems set catch limits, define spatial and temporal closures, and apply monitoring measures that ensure sustainable use of marine resources in ABNJ. Crucially, they have built practical experience directly relevant to implementing the BBNJ Agreement. Some of these systems have proven their effectiveness; almost 90 percent of the major tuna stocks are currently classified as sustainable exploited, reversing past depletions.

The BBNJ Agreement promises to connect conservation and sustainable use across the ocean, and the systems that regulate their uses. If implementation builds on existing governance and draws on sustainable practices already in place, the Agreement stands a far stronger chance of success, helping ensure healthy marine ecosystems offshore and secure agrifood systems for people on land.

*Source: Fisheries and Aquaculture Digest, 03 February 2026/Issue #81*

## INFOFISH

### FAO AND INFOFESCA VISIT MARINE RESEARCH LABORATORY IN PERU TO STRENGTHEN SUSTAINABLE AQUATIC FOOD SYSTEMS



*Credit: Universidad Científica del Sur, Peru*

On 5-6 February, the Marine Aquaculture Research Laboratory (LICMA) of the Universidad Científica del Sur in Peru hosted a technical visit by representatives from the Food and Agriculture Organization of the United Nations (FAO) and INFOFESCA. The visit aimed to strengthen collaboration on sustainable food systems, aquaculture innovation, and inclusive Blue Economy development.

The programme combined institutional dialogue, field engagement and laboratory presentations, linking public management, academic research and small-scale fisheries. Discussions focused on sustainable resource use, innovation in marine cultivation, and opportunities for value-addition within coastal communities.

Activities included meetings at the Paracas National Reserve to explore potential cooperation in conservation and sustainable resource management, as well as exchanges with women leaders in artisanal fisheries organizations, highlighting the growing role of women in governance and value chain development. The delegation also visited local aquaculture and processing initiatives, including seaweed-based product development supported by university research.

On the second day, discussions addressed cooperative models in marine production and entrepreneurship in coastal communities. The programme concluded with a presentation of gastronomic initiatives incorporating seaweed products, demonstrating their potential to diversify aquatic products offerings and contribute to national food security objectives.

The visit underscored the importance of science-based innovation, institutional partnerships and community empowerment in advancing resilient aquatic food systems in Latin America. It also reinforced cooperation between FAO, INFOFESCA and academic institutions in promoting sustainable Blue Growth.

*Source: Adapted from Científica Divulga, Universidad Científica del Sur (Peru).*

## INFOFISH

### INFOFISH ENGAGES WITH LKIM BOARD ON REGIONAL FISHERIES OUTLOOK: CHARTING A SUSTAINABLE FUTURE



INFOFISH actively contributed to the recent Board Meeting of the Fisheries Development Authority of Malaysia (LKIM), with a delegation led by its Director. During the session, the INFOFISH Technical Officer delivered a presentation to the Chairman, Board of Directors, and senior management, sharing key findings from a 2023 regional study on small pelagic fisheries in the Asia-Pacific.

The study offered a comprehensive overview of emerging trends and management developments across the region, providing valuable context for understanding shifting supply patterns and supporting evidence-based planning among INFOFISH Member States.

Building on these insights, the INFOFISH Director led discussions on Malaysia's positioning within the evolving regional fisheries landscape. Attention was given to several key areas such as strengthening the country's long-term fisheries outlook, with a focus on sustainability, competitiveness, and alignment with national development priorities.

As INFOFISH commemorates its 45th anniversary, it reaffirms its commitment to advancing Malaysia's fisheries and aquaculture sector through targeted collaboration, market intelligence, and capacity-building initiatives.



## GLOBEFISH

## FAO GLOBEFISH AT THE 31ST AQUACULTURE BIOSECURITY WORKSHOP



Credit: Saudi Aquaculture Society



On 7 December 2025, the Saudi Aquaculture Society (SAS), in collaboration with the Ministry of Environment, Water and Agriculture (MEWA) of Saudi Arabia, hosted the 31st Aquaculture Biosecurity Workshop in Jeddah. The event brought together producers, processors, regulators, and researchers to tackle pressing biosecurity challenges and explore market opportunities for aquaculture across Saudi Arabia.

FAO GLOBEFISH was invited to deliver two technical presentations and participate in a panel discussion. The presentation on “Global trends in fisheries and aquaculture products – positioning Saudi Arabia”, highlighted the country’s growing role in exports of frozen shrimps and prawns, stressing that future market access will depend on robust biosecurity measures and adherence to international standards.

The second presentation on “Global market dynamics in fisheries and aquaculture” examined the diversification of global trade, focusing on key species such as shrimp, tuna, salmon, tilapia and pangasius, alongside the rapidly growing Asian markets. These trends were presented as opportunities for Saudi producers to boost the competitiveness of national aquaculture products through improved quality, branding and certification.

The panel discussion provided an opportunity for follow-up questions on FAO GLOBEFISH’s presentations, including the role of biosecurity measures as an essential requirement for safeguarding production and ensuring market access.

Following the workshop sessions, FAO GLOBEFISH representatives visited supermarkets in Jeddah to observe how fish and aquaculture products are sold. The field visit provided insights into product diversity, packaging, labelling, price positioning and the balance between imported and locally produced products on retail shelves.

The workshop reaffirmed Saudi Arabia’s commitment to building a competitive and resilient aquaculture sector that supports national food security and economic diversification, while aligning with international standards and sustainability goals.

The video material about the event is available [here](#).



# FISH INFOnetwork NEWS

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<https://www.fao.org/in-action/globefish/background/fishinfonetwork/en/>



## Bubble curtains keep jellyfish away

Aquaculture and fisheries species in several regions of the world are impacted by injuries caused by jellyfish in addition to toxic algal blooms. Examples include farmed salmon in northwest Europe as well as seabass and seabream in cages in the Mediterranean.

The Chilean company Low O2, a subsidiary of the PSP Group specialising in environmental solutions, has launched a project in South Uist (Scotland) which features the use of a “bubble curtain” aimed at keeping jellyfish and algal blooms away from fish in cages and pens. In what the company calls a Tight Microbubbles Screen (TMS) system, the curtain is created by releasing compressed air from a perforated tube at about 25 metres depth, forming a vertical plume of bubbles. Mowi Scotland, which started trialling this technology in 2024, says that the bubble curtain has also proven to be effective against micro-jellyfish (*Muggiaea atlantica*).



Credit: Atlas Copco Group

Bubble curtain helps to protect marine life

In Australia, the Adelaide region attracts thousands of giant cuttlefish (*Sepia apama*), which gather in the Upper Spencer Gulf to reproduce. Last year (2025) when a record-breaking toxic algal bloom was forming along the rocky shoreline at Cuttlefish Coast, up to 80 000 giant cuttlefish eggs were declared to be under threat. The South Australian Department of Environment and Water (DEW) quickly partnered with the Swedish company Atlas Copco Specialty Rental and Canadian Pond to set up a bubble curtain to divert the algae away from the site. According to Atlas Copco Group, the technology uses involves a perforated tubing system which diffuses oil-free compressed air along its length, creating a continuous bubble barrier. The entire installation protects 20 000 m<sup>2</sup> of rocky shoreline and ready for use in about 10 days.

## FAI launches Shrimp Hub welfare tool

**Global** – The Food Animal Initiative (FAI) has launched the Shrimp Hub, a new digital platform aimed at helping shrimp farmers and supply chain stakeholders integrate animal welfare into

production practices. The online tool provides practical guidance, training resources and technical information to support improved farm management, productivity and sustainability, as welfare considerations gain increasing attention from buyers, certification schemes and regulators.

The Shrimp Hub features structured training pathways and a two-level welfare badge system, enabling companies to demonstrate progress in welfare knowledge and on-farm assessment. Training modules cover key indicators such as nutrition, water quality, health and behaviour, and are available in multiple languages to support adoption across major shrimp-producing regions. FAI said the initiative is intended to support producers strengthen operational performance while preparing for evolving market and certification requirements related to animal welfare.

## Microalga has potential as a pain reliever

A microalga (*Alexandrium pacificum*) which is best known for its part in harmful algal bloom toxins, is the focus of an international project aimed at producing a non-addictive alternative to opioids for long-term pain relief. The project, which started in 2022, is led by the Cawthron Institute in New Zealand, in collaboration with Boston Children’s Hospital, Harvard Medical School, and the biotechnology company AlgavitaBio, all in the United States.

*Alexandrium pacificum* was chosen because of its ability to produce neosaxitoxin, which works by blocking pain signals in sensory neurons. Research indicates that, when combined with commonly used agents such as adrenaline and the approved anaesthetic bupivacaine, this synergistic combination may have the potential to provide rapid onset, regional anaesthesia for surgery and extended analgesia for up to 72 hours of pain relief, said the Cawthron Institute.

Efforts to develop a neosaxitoxin-based local anaesthetic are not new, having begun about two decades ago. The main challenge has been the lack of commercially pure neosaxitoxin at scale. The Cawthron team has found a solution: instead of isolating neosaxitoxin directly, they are extracting and isolating a more abundant compound called gonyautoxin 1&4 (GTX-1&4) from *Alexandrium pacificum* and converting it into neosaxitoxin in a single targeted step. They are also growing the algae in an in-house custom artificial seawater solution.

The Institute says that neosaxitoxin is intended solely for hospital use and must be administered by injection alongside other compounds. The team is also looking at the possibility of other applications, such as a range of applications developed for Botox beyond cosmetics, as well as veterinary medicine and animal health.

## Solar lights for nets

Lighted nets can reduce bycatch of sea turtles and sharks, but there have been several challenges that have made the idea difficult to implement such as short-lived batteries which are expensive to replace. The lights have also tended to be too heavy and prone to snagging nets.



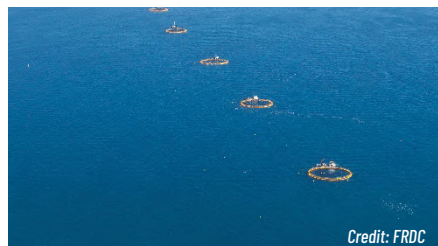
Credit: ASU News/Arizona State University

In a study published in *Conservation Letters*, a team from Arizona State University (ASU) reported that they had developed solar-powered LED lights that function as buoys and which can be fixed onto nets. The LED lights flash on and off to conserve energy and can stay active for over five days with no sunlight. ASU marine biologist Jesse Senko and colleagues said that this net-illuminating gear is highly effective at preventing sea turtles from entanglement in gillnets. The idea for integrating solar-powered LED lights into buoys came from fishermen in Mexico, brothers Juan Pablo Cuevas Amador and Felipe Cuevas Amador, who are co-authors of the new study.

In controlled experiments in Mexico’s Gulf of California, sea turtle bycatch rates were 63% lower in the solar-powered illuminated nets compared to unlit control nets. The researchers also recorded higher catch rates of targeted yellowtail fish in the illuminated nets, although the difference was not statistically significant. Senko said the study is the first to show the effectiveness of harnessing solar energy and flashing light to deter sea turtles from fishing nets. The team is now working with a manufacturer, Fishtek Marine, to produce commercially available solar-powered lighted buoys for fishing nets.

## Satellite technology supports tuna detection

A pilot project supported by the Fisheries Research and Development Corporation (FRDC), Australia's national fisheries research agency, has demonstrated how satellite remote sensing and emerging artificial intelligence tools could help improve the detection of southern bluefin tuna (*Thunnus maccoyii*) schools for the tuna ranching sector.



Aerial view of tuna ranching cages used in South Australia  
Credit: FRDC

In southern Australia, tuna ranching operations depend on locating wild schools efficiently during the fishing season. This search process currently relies heavily on spotter aircraft and vessel-based observations, which can require substantial time, fuel and operational costs. Improving the ability to identify likely tuna presence could therefore deliver both economic and environmental benefits.

The FRDC-funded project, carried out under Project 2022-102, explored whether satellite imagery could be used to detect surface cues linked to tuna feeding activity. Researchers assessed two image-based analytical tools, known as DarkChess and TunaChess, which are designed to highlight areas of interest and distinguish tuna-related signals from other ocean surface features.

While limited training data prevented full deployment of artificial intelligence models at this stage, DarkChess showed promising capability in supporting decision-making by narrowing down potential search zones. FRDC noted that the effectiveness of such approaches is expected to increase as satellite coverage improves, with more frequent passes and greater availability of high-resolution imagery.

According to FRDC, the initiative illustrates how digital technologies and smart analytics could complement existing monitoring methods, reduce fuel use and strengthen the operational efficiency of tuna ranching activities as the sector adapts to evolving sustainability expectations.

## Blue mussels as a new ingredient in salmon feed

Researchers at the Institute of Marine Research (IMR), Norway's national marine science agency, are testing whether blue mussels (*Mytilus edulis*) can be used as a sustainable ingredient in feed for Atlantic salmon (*Salmo salar*).

The work forms part of the Mussel Up project, which is examining the potential of locally produced shellfish to contribute to more resilient aquaculture feed supply chains. As global salmon farming continues to expand, the sector faces growing pressure to reduce reliance on imported feed ingredients and to identify alternatives with lower environmental impact.

In experimental trials, scientists are incorporating blue mussel meat and processed mussel products into salmon diets in order to assess effects on growth performance, health and welfare. Researchers will also evaluate how mussel-based ingredients compare nutritionally with conventional raw materials used in salmon feed.



Mussel-derived powder is being evaluated as a sustainable feed ingredient for salmon aquaculture.  
Credit: Pauline Paalantonacci / IMR

Blue mussels are considered a low-trophic species that can be cultivated with minimal external inputs. As filter feeders, they absorb naturally occurring nutrients from the marine environment, and their production has been highlighted as a potential way to support nutrient recycling in coastal waters.

"Blue mussels are easy to farm, require no advanced technology, take up little space, and naturally remove excess nitrogen, phosphorus and carbon from the water," said project leader Ikram Belghit (IMR). "We will study how it affects growth, health and welfare in the fish. This is essential in determining whether blue mussels can be used commercially."

IMR notes that further research is needed to determine whether blue mussels can be

incorporated at commercial scale, including questions of processing efficiency, cost effectiveness and consistent product quality. If successful, mussel-based feed ingredients could represent an important step towards more circular and sustainable salmon aquaculture.

## Hybrid approach advances whole-cut cultivated seafood

Atlantic Fish Co, a United States-based food technology company, and Austrian start-up Revo Foods are exploring a hybrid production pathway to overcome technical barriers in creating whole-cut, cell-cultivated seafood products.

Rather than relying solely on cell growth to provide both biomass and texture, the collaboration combines Atlantic Fish Co's proprietary whitefish cell lines and tissue engineering expertise with Revo Foods' industrial 3D structuring platform and mycoprotein matrices. The hybrid model uses mycoprotein, a fungi-derived protein already produced at industrial scale, as the primary structural carrier to support the integration of cultivated whitefish cells into recognisable fillet-like formats.

Developing scalable whole-cut seafood products remains one of the most persistent challenges facing the cell-cultivated seafood sector. Fully cultivated fillets require complex scaffolding, high cell densities and long maturation times, which can impede commercial viability. By embedding cultivated cells within a structured mycoprotein matrix, developers aim to reduce production cost and complexity while retaining sensory characteristics closer to conventional whole-cut fish.

Revo Foods has previously demonstrated industrial use of its 3D food extrusion platform to create layered protein structures that mimic the texture of conventional fish products. Within the hybrid collaboration, this platform is being evaluated for technical compatibility, economic feasibility and sensory performance when integrated with cultivated whitefish cells.

According to the partners, the hybrid strategy offers a pragmatic pathway to bring structured cultivated seafood to market sooner by combining scalable structuring technology with species-specific cell material. The approach reflects ongoing efforts across the industry to balance production efficiency, sustainability and consumer expectations.

## Robotic packaging

Marel is marketing its RoboBatcher Box as being the first and only robotic packing machine using intelligent batching technology. It automatically packs and styles up to 24 boxes simultaneously, with up to 12 different predefined jobs, into polystyrene and cardboard boxes. This level of automation significantly decreases labour costs, improves food safety and virtually eliminates human error.



Packing fillets using the RoboBatcher

Credit: Marel

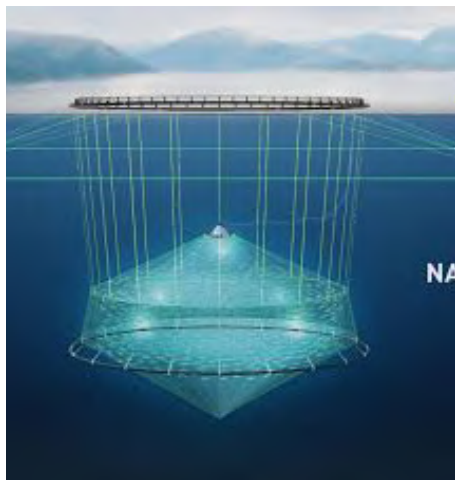
In order to anticipate the fillets entering the RoboBatcher Box, the fish fillet is weighed by a standard weighing unit and scanned once it enters the system. Knowing the fish's precise measurements entering on a moving conveyor belt, the RoboBatcher's robotic arms pick up the product and gently place it into one of the boxes. Fillets or loins are packed according to catch-weight or fixed-weight requirements and a predefined styling pattern. The fully automated dispatch process ensures that once a box reaches the set target weight, it is immediately conveyed out of the robot and swiftly replaced by a new box to pack.

Further information: Marel, Iceland (<https://marel.com/en/>)

## Keeping sea lice away from salmon

Submersible fish farm facilities are not a new invention but it has never been developed for salmon. Because the species has an open swim bladder with a channel between the swim bladder and the mouth, the fish have a natural need to fill their swim bladders approximately once a day. In an open pen it goes up to the surface for some air but this is not possible in a submerged pen and the salmon must therefore be offered access to an air pocket in the depths.

AKVA Group's solution is the Nautilus system, which combines a submerged net with a floating collar, and with an air dome located at the top. Keeping the fish at depths also reduces/eliminates the risk of sea lice infection as well as being impacted by toxic algae.



Feed is mixed with water on a barge and transported out to the pen and down into the depths of the air dome. The feed is distributed to the fish directly under the dome and this area is lit so that the fish can see the feed and the air pocket.

According to the company, the key benefits are:

- The fish can grow in an environment with significantly less or no contact with sea lice, jellyfish, and algae
- Up to 100% reduction in sea lice treatments
- Improved fish health, welfare, and growth
- Stable production environment in the deep
- Energy-efficient feeding and full monitoring

Further information: AKVA Group, Norway ([post@akvagroup.com](mailto:post@akvagroup.com))



The Nautilus system consists of a submerged net with an air dome (left). Sea lice monitoring is done using a camera under the dome (right).

## Gentle harvesting of scallops

C Robotics offers a range of sustainable yet effective and least destructive methods for large-scale harvesting of bivalves and shellfish like wild or farmed scallops, sea urchins, sea cucumber, oysters, mussels, seagrass, seaweed, starfish etc. Their equipment is useful for commercial fisheries, in the battle against invasive aquatic species, or other tasks such as removal of dead fish inside fish cages.



Credit: C Robotics

The C Bud (top); the C Disc (bottom)

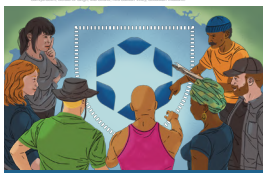
The ROV C Bud consists of a belt-driven main unit controlled by an operator who is able to watch movements on monitors. The C Bud drives itself over the seafloor using the belt mechanism while suction is used to gently extract the scallops from the seabed. It leaves a small footprint and results from tests shows minimal or no damage to the seabed or the organisms on the seabed. Approximately 75% of the harvested area is untouched by the C Bud due to this contactless harvesting method.

The company has also designed the C Disc, which increases catch rates of species on the seabed, compared to traditional hand-picking by divers. It can easily be deployed and powered from small boats to remove species such as sea urchin from the seabed. A diver operates a suction hose with a nozzle to collect the urchins at an average recorded catch rate of 1.5 urchins per second.

Further information: C Robotics, Norway (<https://crobotics.no/>)



Guidebook for assessing and improving social equity in marine conservation

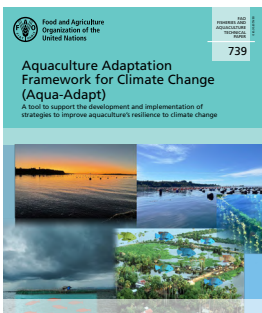


## GUIDEBOOK FOR ASSESSING AND IMPROVING SOCIAL EQUITY IN MARINE CONSERVATION

Andrachuk, M., Bennett, N.J., Blythe, J., Claudet, J., Dawson, N., Finkbeiner, E., Fitzpatrick, J., Franks, P., Gill, D.A., Gurney, G.G., Jack-Kadioglu, T., Jupiter, S., Lau, J., Lopes, P.F.M., Mahajan, S., Muhl, E-K., Naggea, J., Roumbedakis, K., Selim, S., Singh, G.G., Strand, M., Sullivan-Wiley, K. and Villasante, S. (2025). *Guidebook for assessing and improving social equity in marine conservation. Version 1.0. Commission on Environmental, Economic and Social Policy, IUCN, Gland, Switzerland. 105p.*

Assessing social equity in marine conservation is a fundamental action to enable governments, institutions, managers, communities, rightsholders, and other stakeholders to reflect on and improve governance and management practices. This guidebook is based on an understanding that social equity refers to fairness and justice with respect to the ways that people are recognised, treated, or impacted by conservation initiatives. It is also grounded on a common framework for assessing equity that includes six dimensions: recognitional, procedural, management, environmental, distributional, and contextual and structural equity.

This publication can be accessed at: <https://portals.iucn.org/library/node/52587>



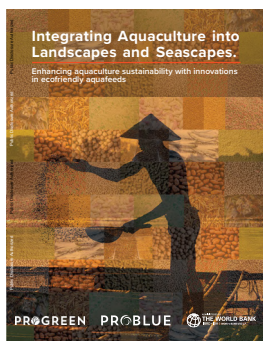
## AQUACULTURE ADAPTATION FRAMEWORK FOR CLIMATE CHANGE (AQUA-ADAPT)

Soto, D. & Garcia Sampaio, F., eds. 2025. *Aquaculture Adaptation Framework for Climate Change (Aqua-Adapt) – A tool to support the development and implementation of strategies to improve aquaculture's resilience to climate change. FAO Fisheries and Aquaculture Technical Papers, No. 739. Rome, FAO.*

Aquaculture's vulnerability to climate change demands urgent, practical adaptation strategies. To address this, FAO developed the Aquaculture Adaptation Framework for Climate Change (Aqua-Adapt). This tool supports the design and implementation of strategies to enhance resilience. Two case studies (salmon and mussel farming) helped refine the framework by testing adaptation technologies and improving its practical relevance.

Aqua-Adapt is based on definitions from the IPCC's Fifth and Sixth Assessment Reports and focuses on reducing risks while creating new opportunities. It outlines a six-step process involving stakeholder participation and evidence-based planning. The first step is to establish the unit of adaptation, which may range from individual farmers to the minimum geographical and/or geopolitical unit of adaptation. The second step is to identify and choose the most appropriate climate projection pathways and models. The third step is to perform a risk and vulnerability assessment on the defined unit. The fourth step is to design an adaptation work plan to reduce the identified exposure and sensitivity and increase adaptive capacity in the adaptation unit. The fifth step involves implementing the strategy in accordance with the work plan. The sixth involves conducting ongoing monitoring and evaluation to enhance the efficiency and effectiveness of the implemented measures, costs, and/or technical difficulties.

This publication can be accessed at: <https://doi.org/10.4060/cd6476en>



## ECO-FRIENDLY AQUAFEDS: REDUCING THE CARBON FOOTPRINT OF AQUACULTURE INGREDIENTS THROUGH INNOVATION

World Bank. 2025. *Eco-Friendly Aquafeeds: Reducing the Carbon Footprint of Aquaculture Ingredients through Innovation. Integrating Aquaculture into Landscapes and Seascapes.*

This report brings together a set of case studies and analyses designed to give World Bank task team leaders (TTLs) practical examples of the economic value, societal benefits, and ecosystem services associated with restorative aquaculture (practices that enhance ecosystem functions), extractive aquaculture (practices that remove excess nutrients, for example, using seaweed, shellfish, or sea cucumbers), and non-fed aquaculture (the farming of species that do not require external feed inputs, like filter-feeding mollusks) integrated into landscapes and seascapes. The goal is to help TTLs make informed decisions, develop effective project strategies, and contribute to the improvement of food security, nutrition, job creation, climate change mitigation, biodiversity enhancement, and other objectives in their respective aquaculture projects.

This report can be accessed at: <https://hdl.handle.net/10986/43488>

## 2026

### MARCH

18-20

#### VIETSHRIMP Asia & Aquaculture

Vietnam

Ho Chi Minh, Vietnam

<https://www.aquafisheriesexpo.com/en/>

15-17

#### Seafood Expo North America

Boston, USA

<https://www.seafoodexpo.com/north-america/>

### APRIL

21-23

#### Seafood Expo Global

Barcelona, Spain

<https://www.seafoodexpo.com/global/>

### MAY

6-8

#### Aquaculture Taiwan

Tainan, Taiwan

<https://www.aquaculturetaiwan.com/>

19-21

#### Seagriculture World 2026

Bangkok, Thailand

<https://www.eaba-association.org/en/events/seagriculture-world-2026>

19-21

#### 21st Korea Seafood Show

Seoul, Korea

<https://kseafoodshow.com/index.html>

### JUNE

2-5

#### World Aquaculture Singapore (WAS)

Singapore

<https://www.was.org/Meeting/Code/WA2026>

### AUGUST

19-21

#### 28th Japan International Seafood & Technology Expo

Tokyo, Japan

<https://seafoodshow-japan.com/tokyo/>

19-21

#### Vietfish 2026

Ho Chi Minh City, Vietnam

<https://vietfish.com.vn/>

### SEPTEMBER

2-4

#### Seafood Expo Asia

Singapore

<https://www.seafoodexpo.com/asia/>

14-16

#### 19th INFOFISH World Tuna Trade Conference & Exhibition (TUNA 2026)

Bangkok, Thailand

[www.tuna.infofish.org](http://www.tuna.infofish.org)

29-30

#### 13th International Conference on Fisheries and Aquaculture (ICFA 2026)

Sarawak, Malaysia

<https://aquaconference.tiikm.com/>

### OCTOBER

28-30

#### China Fisheries & Seafood Expo

Qingdao, China

<https://chinaseafoodexpo.com/>

NATIONAL FISHERIES AUTHORITY Papua New Guinea .....	Inside Front Cover
U.S Soybean Seafood Council (USSEC) .....	2
GenoMar .....	7
Saudi Aquaculture Society .....	16
World Aquaculture Singapore 2026 .....	23
Gregor Jonsson Inc.....	27
BIRO Manufacturing .....	29
VIETSHRIMP Asia & Aquaculture Vietnam.....	47
INFOFISH Media Kit 2026 .....	52
INFOFISH Trade News (ITN).....	59
Editorial Plan 2026.....	Inside Back Cover
TUNA 2026.....	Back Cover

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# EDITORIAL PLAN 2026

ISSUE	FISHERIES & AQUACULTURE	PROCESSING & MARKETING	EQUIPMENT & TECHNOLOGY	SUSTAINABLE DEVELOPMENT GOALS
<b>1/2026</b> (Jan/Feb)  <b>Deadline:</b> <b>15 November 2025</b>	<ul style="list-style-type: none"> <li>Fisheries must become more selective and sustainable</li> </ul>	<ul style="list-style-type: none"> <li>The next global epicentre for sustainable tilapia fillet production and export</li> <li>Edible seaweed food guide: focus on China</li> </ul>	<ul style="list-style-type: none"> <li>Innovative seaweed product developments in India</li> </ul>	<ul style="list-style-type: none"> <li>Empowering women through innovative dry fish processing in Cambodia</li> </ul>
<b>2/2026</b> (Mar/Apr)  <b>Deadline:</b> <b>15 January 2026</b>	<ul style="list-style-type: none"> <li>Aquaculture in desert and arid regions</li> <li>Soft shell crab farming in Bangladesh: Prospects and challenges</li> </ul>	<ul style="list-style-type: none"> <li>Women's role in dry fish processing and marketing in Bangladesh, India and Myanmar</li> </ul>	<ul style="list-style-type: none"> <li>Transforming tilapia stocks through breeding technologies</li> </ul>	<ul style="list-style-type: none"> <li>Collaborating for impact in aquaculture: Partnerships in innovation and investment</li> <li>Regulations on the High Seas and EEZ in South Asia</li> </ul>
<b>3/2026</b> (May/June)  <b>Deadline:</b> <b>15 March 2026</b>	<ul style="list-style-type: none"> <li>Strengthening farmed fish welfare initiatives in Asia</li> <li>Mariculture development in the Maldives</li> </ul>	<ul style="list-style-type: none"> <li>Utilisation and processing of tilapia by-products and co-products</li> </ul>	<ul style="list-style-type: none"> <li>Alternative feeds for sustainable aquaculture</li> </ul>	<ul style="list-style-type: none"> <li>Nutrition-sensitive national policies and inclusion of aquatic foods: Lessons from the Philippines to the world</li> <li>Institutional and economic perspectives on distant-water fisheries access arrangements</li> </ul>
<b>4/2026</b> (July/Aug)  <b>Deadline:</b> <b>15 May 2026</b>	<ul style="list-style-type: none"> <li>Regenerative aquaculture: Restoration and sustainable use of marine ecosystems</li> </ul>	<ul style="list-style-type: none"> <li>Fish utilisation: working towards a "mouth to tail" approach</li> <li>Processing tuna in the Pacific for domestic and international markets</li> </ul>	<ul style="list-style-type: none"> <li>Satellite technology for sustainable and safe oceans</li> </ul>	<ul style="list-style-type: none"> <li>Women in fisheries and aquaculture: Empowered women, resilient communities</li> <li>Financing the future of aquaculture in emerging markets</li> </ul>
<b>5/2026</b> (Sep/Oct)  <b>Deadline:</b> <b>15 July 2026</b>	<ul style="list-style-type: none"> <li>Land-based salmon farming in Saudi Arabia</li> <li>Zero waste and super intensive shrimp farming in a RAS facility</li> </ul>	<ul style="list-style-type: none"> <li>The rising demand for value-added tuna products in Asian markets</li> <li>Socio-economic importance of aquatic food value chains in Asia</li> </ul>	<ul style="list-style-type: none"> <li>Technologies for sustainable seafood traceability</li> </ul>	<ul style="list-style-type: none"> <li>International management of tuna fisheries - progress and challenges</li> </ul>
<b>6/2026</b> (Nov/Dec)  <b>Deadline:</b> <b>15 September 2026</b>	<ul style="list-style-type: none"> <li>A future for inland fisheries</li> <li>FlipFarm oyster farming in New Zealand</li> </ul>	<ul style="list-style-type: none"> <li>Evolving tariff policies and their impact on global production and trade</li> <li>PNG's evidence-based insights for sandfish market growth in the Pacific</li> <li>Seafood products targeting the domestic market in Thailand</li> </ul>	<ul style="list-style-type: none"> <li>Valorisation of byproducts using 4.0 technologies</li> <li>The F3 Challenge: Accelerating industry solutions</li> </ul>	<ul style="list-style-type: none"> <li>Women in fisheries and aquaculture: Designing gender-transformative programmes for the small-scale sector</li> </ul>

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