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8-10 June 2022

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IMPORTANCE OF SMALL-SCALE AQUACULTURE IN ASIA

By Ben Belton and Austin Stankus

Small-scale aquaculture systems range from small, scattered ponds meant to complement household livelihoods and supply fish for home consumption, right up to intensive systems which form the main economic activity of families as well as provide employment opportunities for others. While there will always be a niche for homestead farming, the trend towards intensification has become noticeable over time, with more small-scale farms now using formulated feeds and more sophisticated technologies. Also, more farmers are adding higher value fish to their stocks of traditional species in response to the better market demand.

CAN CHINA’S FISHING VILLAGES MAKE A COMEBACK?

By Songzi Wang

Though China is one of the biggest producers of marine fish in the world, little is known about its small-scale fisheries (SSF) sector, particularly with regard to the impact of urban development initiatives on communities and livelihoods. Using Hainan Province as a base for research, China Blue Sustainability Institute is gathering information that will be useful for provincial governments and other stakeholders to work towards the sustainable transformation of fisher communities as well as protection of the marine environment. Key in this process are community engagement and respect for traditional knowledge.

INSURANCE SERVICES FOR THE ASIAN SMALL-SCALE FISHERIES SECTOR

By Raymon van Anrooy, Fabiola Espinoza Córdova and Suchitra Upare

A recent FAO review of fisheries and aquaculture insurance found that in Asia the underwriting experiences in both capture fisheries and aquaculture insurance were good over the last decade and seem to have improved in recent years. An estimated 275,000 fishing vessels are insured and at least 32,000 aquaculture farmers in Asia have some stock mortality insurance cover. However, more than 1.8 million fishing vessels, mainly small-scale, still operate without insurance cover in Asia. Insurance coverage can be increased through awareness-raising of fishers about the benefits of insurance, capacity building of insurers about the fishing and aquaculture business, and gradual adoption of compulsory insurance requirements in legislation.

RESTORING FISHERIES IN ASIA: LOOKING AT AREA 57 TO SEE HOW FISHERY ASSESSMENTS ARE ESSENTIAL FOR SUSTAINABLE FISHERIES

By Simon Funge-Smith and Rishi Sharma

FAO Fishing Area 57, stretching from the Bay of Bengal down to western Australia, contains some of the most intensive coastal small-scale fisheries in the world, as well as oceanic tuna fisheries. Building long-term capacity to assess and manage fisheries sustainably in the region would result in strengthened capacity for fishery management in Southeast and South Asia and improve understanding of country-level progress towards relevant Sustainable Development Goals. Some of the preconditions include leveraging of national or international financing, and recognition of the importance of a harmonized regional approach.

ONE HOOK, ONE LINE, ONE FISH AT A TIME

By Emilia Dyer

“One hook, one line, one fish at a time” creates environmental, social and economic benefits which ripple throughout our oceans and the coastal communities connected to them. This article by the International Pole and Line Foundation (IPLF) relates the stories of a few one-by-one fishers in Cape Verde, Azores, and the Canary Islands, but they could just as well represent millions of small-scale fishers and fish workers in other parts of the world whose lives and livelihoods are entwined with the ocean. The International Year of Artisanal Fisheries and Aquaculture (IYAFA 2022) is a timely reminder that the efforts of these men and women must be recognized and supported.
The functionality of a Swiss army knife

A lot of ingenuity is needed to solve the technical problems of our technological society. In the early 20th century, the Swiss army presented Karl Elsener with a challenge that seemed impossible at that time: To create a multi-purpose, small, versatile, tough and functional tool. The inventor shut himself in his workshop at the foot of the Alps and invented one of the most highly valued utensils in history. Today it is a brand that represents values such as quality, functionality and adaptation to the market. In Hermasa we see the story of the Swiss army knife as an example to follow. Behind its simple handling, you can find continuous innovation and functionality. Over the years, Hermasa has also become an example to follow. Because it solves the problems of companies and its “turnkey” service enables us to deliver complete customised production lines and factories anywhere in the world. This is why we say “You supply the fish and we will supply you with the factory.”

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To kickstart celebrations of the International Year for Artisanal Fisheries and Aquaculture (IYFA) 2022, two momentous events took place during 29-31 March 2022. The first was the launching of an e-photobook, with the spotlight on small-scale fisheries and aquaculture in Asia, by the FAO Regional Office for Asia and the Pacific; and the other was the official launch of IYFA 2022 in the Pacific by the FAO Subregional Office for the Pacific. These events, among others, highlighted the pertinent roles played by small-scale fishers in global fisheries and aquaculture, most often than not, unsung heroes. IYFA 2022 is indeed a milestone that deserves global celebration of the sector as aptly heralded by the tagline “Big in value, small in scale”.

As part of INFOFISH’s on-going support towards IYFA 2022, this year the INFOFISH International magazine will consistently feature stories and experiences of small-scale fisheries in the region and beyond. In this current issue, we begin with an article on the importance of small-scale aquaculture in Asia. The write-up focuses on small-scale aquaculture systems ranging from small, scattered ponds meant to complement household livelihoods and supply fish for home consumption, right up to intensive systems which form the main economic activity of families as well as provide employment opportunities for others. I invite you to also have a read on the subject of insurance services for the Asian small-scale fisheries sector, an area that is vital and yet often over-looked. It is estimated that more than 1.8 million fishing vessels, mainly small-scale, still operate without insurance cover in Asia. The article discusses insurance coverage in the sector, or the lack thereof.

On that note, we also present an aspect of the small-scale fisheries (SSF) sector in China of which not much is talked about. This article describes the impact of urban development initiatives on communities and livelihoods focusing on community engagement and respect for traditional knowledge. Another interesting article not to be missed is on Area 57, that stretches from the Bay of Bengal down to western Australia, containing some of the most intensive coastal small-scale fisheries in the world. The article deliberates on the challenges in fishery assessments in the area and proposes ways towards sustainable fisheries. Continuing on the theme of sustainable fisheries, the article by the International Pole and Line Foundation (IPNLF) relates the stories of a few one-by-one fishers in Cape Verde, Azores, and the Canary Islands.

Our May/June 2022 issue also promulgates interviews with two prominent industry leaders, Mr Phil Roberts, Managing Director, Tri Marine International Pte. Ltd; and Ms Chihoko Asada-Miyakawa, Assistant Director-General and Regional Director for Asia and the Pacific, International Labour Organization (ILO).

Last but not the least, if you have not registered for INFOFISH SHRIMP 2022 World Trade Conference and Exhibition, it is not too late to do so. Happening from 8-10 June 2022, a comprehensive programme awaits you on major shrimp markets, innovative solutions, and the recovery pathways towards a resilient and sustainable industry, all brought to you all by top-notch leaders in the industry!

Happy reading!

Shirlene Maria Anthonysamy
Director, INFOFISH
Resúmenes de los principales artículos

Importancia de la acuicultura en pequeña escala en Asia
Por Ben Belton y Austin Stankus

Los sistemas de acuicultura en pequeña escala van desde pequeños estanques dispersos destinados a complementar los medios de subsistencia de los hogares y suministrar pescado para el consumo doméstico, hasta sistemas intensivos que constituyen la principal actividad económica de las familias y brindan oportunidades laborales. Si bien siempre habrá un nicho para la producción familiar, con el tiempo se fue marcando una tendencia hacia la intensificación, con más granjas en pequeña escala que ahora utilizan raciones balanceadas y tecnologías sofisticadas. Además, más piscicultores están agregando valor a sus existencias tradicionales en respuesta a la demanda del mercado.

¿Pueden los pueblos pesqueros de China recuperarse? 
Por Song Zi Wang

Aunque China es uno de los mayores productores de peces marinos del mundo, se sabe poco sobre su sector de pesca en pequeña escala, en particular con respecto al impacto de las iniciativas sobre desarrollo urbano en las comunidades y los medios de vida. Usando la provincia de Hainan como base para la investigación, el Instituto de Sostenibilidad Azul de China está recopilando información que será útil para los gobiernos provinciales y otras partes interesadas en el proceso de trabajar hacia la transformación sostenible de las comunidades pesqueras y la protección del medio ambiente marino. La clave en este camino es la participación de la comunidad y el respeto por el conocimiento tradicional.

Servicios de seguros para el sector pesquero en pequeña escala de Asia
Por Raymon van Anrooy, Fabiola Espinoza Córdova y Suchitra Upare

Una revisión reciente de la FAO sobre los seguros en la pesca y la acuicultura concluye que en Asia hubo buenas experiencias de suscripción a seguros, tanto en la pesca de captura como en la acuicultura, durante la última década, y esto parece haber mejorado en los últimos años. Se estima que hay 275.000 barcos pesqueros asegurados y al menos 32.000 acuicultores tienen algún tipo de cobertura frente a mortalidades de las cosechas. Sin embargo, más de 1,8 millones de embarcaciones pesqueras, principalmente en pequeña escala, aún operan sin cobertura de seguro en Asia. La cobertura puede incrementarse mediante la sensibilización de los pescadores sobre los beneficios de los seguros, el desarrollo de las aseguradoras en el rubro de la pesca y la acuicultura, y la adopción gradual de requisitos de seguros obligatorios en la legislación.

Reconstruir la pesca en Asia: mirando la zona 57 para entender cómo las evaluaciones pesqueras son esenciales para la pesca sostenible
Por Simon Funge-Smith y Rishi Sharma

La Zona de Pesca 57 de la FAO, que se extiende desde la Bahía de Bengala hasta el oeste de Australia, contiene algunas de las pesquerías costeras en pequeña escala más intensivas del mundo, así como pesquerías oceánicas de atún. Es importante la creación de capacidad a largo plazo para evaluar y gestionar la pesca de manera sostenible en la región, y así mejorar la comprensión del progreso a nivel nacional hacia los Objetivos de Desarrollo Sostenible relevantes. Algunas de las condiciones previas incluyen el apalancamiento de financiamiento nacional o internacional y el reconocimiento de la importancia de un enfoque regional armonizado.

Un anzuelo, una línea, un pez a la vez
Por Emilia Dyer

"Un anzuelo, una línea, un pez a la vez" genera beneficios ambientales, sociales y económicos que repercuten en nuestros océanos y en las comunidades costeras adyacentes. Este artículo de la Fundación Internacional de Pesca con Caña y Línea (IPNLF, por sus siglas en inglés) relata las historias individuales de pescadores en Cabo Verde, Azores y las Islas Canarias, pero también podría representar a millones de pescadores artesanales y trabajadores del sector en otras partes del mundo cuyas vidas y medios de subsistencia están entrelazados con el océano. El Año Internacional de la Pesca y la Acuicultura Artesanales (IYAFA 2022) es un oportuno recordatorio de que los esfuerzos de estos hombres y mujeres deben ser reconocidos y apoyados.
Résumés des articles de fond

L’IMPORTANCE DE L’AQUACULTURE ARTISANALE EN ASIE
Par Ben Belton et Austin Stankus...

Les systèmes d’aquaculture à petite échelle vont des petits étangs dispersés destinés à compléter les moyens de subsistance des ménages et à fournir du poisson pour la consommation domestique, jusqu’aux systèmes intensifs qui constituent la principale activité économique des familles et offrent des possibilités d’emploi à d’autres individus. Bien qu’il y ait toujours une niche pour l’élevage à domicile, la tendance à l’intensification de la production est devenue perceptible au fil du temps, avec un plus grand nombre de petites exploitations utilisant désormais des aliments formulés et des technologies plus sophistiquées. Par ailleurs, en réponse à la demande accrue du marché, de plus en plus d’éleveurs ajoutent des poissons de plus grande valeur à leurs stocks d’espèces traditionnelles.

LES VILLAGES DE PÊCHEURS CHINOIS PEUVENT-ILS FAIRE LEUR RETOUR?
Par Songzi Wang...

Bien que la Chine soit l’un des plus grands producteurs de poissons marins au monde, on sait peu de choses sur son secteur de la pêche artisanale, notamment en ce qui concerne l’impact des initiatives de développement urbain sur les communautés et les moyens de subsistance. En utilisant la province de Hainan comme base de recherche, le China Blue Sustainability Institute (L’Institut pour la Durabilité Bleue) recueille des informations qui seront utiles aux gouvernements provinciaux et aux autres parties prenantes pour œuvrer à la transformation durable des communautés de pêcheurs et à la protection de l’environnement marin. L’engagement communautaire et le respect des connaissances traditionnelles sont des éléments clés de ce processus.

LES SERVICES D’ASSURANCE POUR LE SECTEUR DE LA PÊCHE ARTISANALE ASIATIQUE
Par Raymon van Anrooy, Fabiola Espinoza Córdova et Suchitra Upare...

Une récente étude conduite par la FAO sur le service d’assurance pour le secteur des pêches et de l’aquaculture a révélé qu’en Asie, les expériences de souscription à ce type de couverture sociale ont été bonnes au cours de la dernière décennie et semblent s’être améliorées ces dernières années. On estime que 275 000 navires de pêche sont assurés et qu’au moins 32 000 aquaculteurs en Asie disposent d’une police d’assurance contre la mortalité des stocks. Cependant, plus de 1,8 millions de navires de pêche, principalement de petite taille, opèrent toujours sans couverture d’assurance en Asie. Il est possible d’augmenter la couverture d’assurance en sensibilisant les pêcheurs aux avantages liés à cette couverture, en renforçant les capacités des assureurs en ce qui concerne les activités de pêche et d’aquaculture et en adoptant progressivement des exigences d’assurance obligatoire dans la législation.

RESTAURATION DES PÊCHES EN ASIE : REGARD SUR LA ZONE 57 POUR VOIR COMMENT L’ÉVALUATION DES PÊCHES EST ESSENTIELLE POUR LEUR DURABILITÉ
Par Simon Funge-Smith et Rishi Sharma...

La zone de pêche 57 de la FAO, qui s’étend du golfe du Bengale jusqu’à l’ouest de l’Australie, abrite certaines des pêches côtières artisanales les plus dynamiques du monde, ainsi que des pêches au thon. La création d’une capacité à long terme pour évaluer et gérer les pêches de manière durable dans la région permettrait de renforcer les capacités de gestion des pêches en Asie du Sud et du Sud-Est et d’améliorer la compréhension des progrès réalisés au niveau des pays pour atteindre les objectifs pertinents de développement durable. Parmi les conditions préalables, il faut citer la mobilisation de financements nationaux ou internationaux et la reconnaissance de l’importance d’une approche régionale harmonisée.

UN HAMEÇON, UNE LIGNE, UN POISSON À LA FOIS
Par Emilia Dyer...

"Un hameçon, une ligne, un poisson à la fois" crée des avantages environnementaux, sociaux et économiques qui se répercutent sur nos océans et les communautés riveraines côtières qui y sont liées. Cet article de l’International Pole and Line Foundation (IPNLF) relate l’histoire de quelques pêcheurs artisans du Cap-Vert, des Açores et des îles Canaries, mais il pourrait tout aussi bien faire allusion à des millions de pêcheurs artisans et de travailleurs du secteur de la pêche dans d’autres parties du monde, dont la vie et les moyens de subsistance sont intimement liés à l’océan. L’Année Internationale de la Pêche Artisanale et de l’Aquaculture (AIPA 2022) vient à point nommé pour rappeler que les efforts de ces hommes et de ces femmes-là doivent être reconnus et soutenus.

Pour plus amples informations et pour la traduction des articles contenus dans cette revue, veuillez vous adresser à INFOPÊCHE, BP 1747 Abidjan 01, Côte d’Ivoire.
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خلاصة لأهم المقالات

8 أهمية تربية الأحياء المائية على نطاق متعدد في آسيا

Ben Belton و Austin Stankus

تبنا أسلوب الاستزراع المائي على نطاق متعدد ما بين الأحواض الصغيرة المنتشرة المصممة لتمكين سبل المعيشة المنزلية وتوفير الأسماك للاستهلاك المنزلي، والأنظمة المتكيفرة التي تنتمي النشاط الاقتصادي الرئيسي للأسر وتتوفر فرص العمل للآخرين. وبالرغم من استمرار وجود مكان صعب للزراعة الأسماك، قد أدى التوجه نحو التكيف متعدد الأطراف، مع انتشار المزيد من الزراعات المتعددة الحجم التي تتمتع حاليًا بالأعمال المصنعة والتحفاضات أكثر تطورًا، فضلاً عن ذلك، يقوم العديد من المزارعين بإضافة أسماك ذات قيمة أعلى إلى مخزونهم من الأنواع التقليدية استجابة لطلب السوق المتزايد.

19 هل تستطيع قرى الصيد الصينية العودة للظهور مجددًا?

Songzi Wang

بالرغم من كون الصين واحدة من أكبر منتجات الأسماك البحرية في العالم، إلا أنه لا يُعرف سوى القليل عن قطع مصايد الأسماك المحدودة الحجم (SSF) ، لا سيما فيما يتعلق بتأثيراتها البيئية المحرجة على المجتمعات وسبل العيش. وتشير التقديرات إلى أن أعمال صيد الحجم المستدام بالأسماك تترك تأثيرًا وفاقدًا تقدر ما يبلغ 775000 فردًا سنويًا وإلى استخدام 2020 على الأقل من مراكز الصيد المحترفة في آسيا. يُعتبر هذا العدد عائشًا فعليًا للعامل نحو التحول المستدام لمجتمعات الصيادين فضلاً عن حماية البيئة البحرية. ويشتمل الهيكل الأساسي لهذه العملية في إشراف المجتمع وحつもりه على المعارف التقليدية.

44 خدمات التأمين لقطاع مصايد الأسماك الآسيوية المحدودة النطاق

Raymon van Anrooy و Fabiola Espinoza Córdova و Suchitra Upare

كشف استعراض أجري من منظمة الأغذية والزراعة للأمم المتحدة مؤخراً عن التأمين على مصايد الأسماك وتربيته الأحياء المائية على أهمية تجهيز ضمانات الإكتتاب في آسيا بناءً على مصايد الأسماك الشامانية والتأمن على تربية الأحياء المائية خلال العقد الماضي وكذا على تحسينها خلال السنوات الأخيرة. وتشير التقديرات إلى أن عدد الأسماك الشامانية يبلغ 750000 فردًا سنويًا وإلى استخدام 2020 على الأقل من مراكز الصيد المحترفة في آسيا. يُعتبر هذا العدد عائشًا فعليًا للعامل نحو التحول المستدام لمجتمعات الصيادين فضلاً عن حماية البيئة البحرية. ويشتمل الهيكل الأساسي لهذه العملية في إشراف المجتمع وحتمزه على المعارف التقليدية.

48 استعادة مصايد الأسماك في آسيا: نظرة على المنطقة 7 لمعرفة أهمية تطبيق مصايد الأسماك بالنسبة لمصايد الأسماك المستدامة

Simon Funge-Smith و Rishi Sharma

تضم تصنيف الصيد رقم 57 57 التابعة لمنظمة الأسماك والزراعة للأمم المتحدة، المنظمة من خلال البحوث وصولًا إلى غرب أستراليا، على بعض من أبرز مصايد الأسماك المحدودة النطاق في آسيا بناءً على مصايد الأسماك والتأمن على تربية الأحياء المائية خلال العقد الماضي وكذا على تحسينها خلال السنوات الأخيرة. وتشير التقديرات إلى أن عدد الأسماك الشامانية يبلغ 750000 فردًا سنويًا وإلى استخدام 2020 على الأقل من مراكز الصيد المحترفة في آسيا. يُعتبر هذا العدد عائشًا فعليًا للعامل نحو التحول المستدام لمجتمعات الصيادين فضلاً عن حماية البيئة البحرية. ويشتمل الهيكل الأساسي لهذه العملية في إشراف المجتمع وحتمزه على المعارف التقليدية.

53 ستارة واحدة، وخط واحد، وسمكة واحدة في كل مرة

Emilia Dyer

يُعتبر "ستارة واحدة، خيط واحد، سمكة واحدة في كل مرة" يُطلق على "الصيد"، يتمثل في جميع أنحاء محطات الصيد والمؤسسات الساحلية المرتبطة بـ "الصيد". تمثل هذه المقالة التي أجريت في إطار القفز والخط التحديثي (IPNLF) الصيد عدد إعلانات الصيادين في أوروبا وجزء من العالم. يشير "الصيد" إلى "الصيد" في العالم الذي يتميز بتنوع خيالهم وسيلي عيشهم والحيوي، ويُعتبر نقطة البداية للمبادرات العالمية. تهدف هذه المقالة إلى تدريس مفهوم "الصيد" وتشجع على الاعتراف به كقوة واعدة في الشرق الأوسط المستدام للحاجز، وتشجع على الاعتراف به كقوة واعدة في الشرق الأوسط المستدام للحاجز.

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INFOFISH International 3/2022 ● www.infofish.org
IMPORTANCE OF SMALL-SCALE AQUACULTURE IN ASIA

By Ben Belton and Austin Stankus

Small-scale aquaculture systems range from small, scattered ponds meant to complement household livelihoods and supply fish for home consumption, right up to intensive systems which form the main economic activity of families as well as provide employment opportunities for others. While there will always be a niche for homestead farming, the trend towards intensification has become noticeable over time, with more small-scale farms now using formulated feeds and more sophisticated technologies. Also, more farmers are adding higher value fish to their stocks of traditional species in response to market demand.

Small scale aquaculture in Asia can be separated into two general, albeit partially overlapping, categories: traditional, and more specialized. Integration with agriculture is common across many different types of small-scale aquaculture. A varied mix of technologies and practices are found throughout the region. When thinking about small-scale aquaculture one must also consider value chains, from upstream input supply to downstream sales. Finally, small-scale aquaculture has important and far reaching implications for sustainable development, from environmental management, social impacts on food security and nutrition, and employment and livelihoods.

Often, when someone hears “small-scale aquaculture”, their first thoughts may turn to very small ponds (Figure 1). Sometimes called rural aquaculture in the past, this traditional
Aquaculture is characterized by a loose organization, with often only a few ponds scattered within a village. The ponds tend to be very small, ranging from less than 0.2 hectares down to a few square metres. They also tend to be multi-use water bodies, often having been constructed for harvesting drinking water, and/or used for washing, bathing, watering livestock, irrigation and so on. As such, aquaculture is not necessarily the primary purpose of having these small ponds.

Fig 1: Small-scale aquaculture is usually perceived as informally managed small ponds

Small-scale aquaculture encompasses much more than just ponds, and a range of other technologies in different environments are abundant. A few examples include cage culture of finfish such as Pangasius in Cambodian rivers; tilapia cages in rivers, lakes and reservoirs throughout the region; or water spinach produced in peri-urban canals in Thailand. There are examples of coastal small-scale aquaculture too, such as extensive shrimp ponds in Bangladesh or milkfish farming in the Philippines. This highlights that small-scale aquaculture is not only finfish, but includes a wide variety of crustaceans and other species. Wild caught crabs are farmed in Bangladesh and fattened until they shed their shells, further emphasizing the important link to wild seed.

Increasing intensification in small-scale aquaculture

A common characteristic of more specialized small-scale aquaculture systems is the use of pelleted feeds and an increasing level of intensity. Likewise, there is greater diversity of stocked species, and more investment and complexity in the physical construction of the farms such as high dikes and regular pond shapes. These systems, constructed specifically for use in fish culture, have been one of the most rapidly growing segments of Asian aquaculture since the 1990s. There are also more intensive forms of small-scale shrimp aquaculture practiced throughout the region.

In marine aquaculture, small-scale farmers grow high value species such as red snapper in Malaysia; mussels in raft culture in Thailand; and seaweed culture in many countries across the region.

Small-scale aquaculture also includes hatcheries and nurseries, essential components of production systems. Such seed production systems are numerous in aquaculture-rich areas in Viet Nam or India.

In contrast to homestead aquaculture, the fish and other aquatic foods produced in more specialized systems are produced largely for sale in markets. Their growth has been driven primarily by rising demand from domestic markets in Asia. Often these types of farms appear in clusters, with many farms co-located in a particular area. They can be found in both rural areas and peri-urban zones on the outskirts of large cities. The scale of these farms ranges from 0.2 hectares up to perhaps 10 hectares; in other words, from “small” to “medium”.

Though often polycultures, some systems can be monocultures, depending partly on the species farmed. This is more common for species such as air-breathing catfish that are well suited to being raised at high density; and as the value increases, the input use tends to range from intermediate to quite high.
Overall these systems can be considered as between semiintensive to intensive in scale. Agricultural processing by-products such as rice bran are widely used, but formulated feeds are increasingly common. These farms are family owned and operated, but also use hired labour to varying extents (Figure 2). The level of investment and operating costs tends to be moderate to quite high but with consequent economic returns which means that these systems tend to be a major component of the livelihoods of people or households. Most of the production supplies domestic value chains particularly for urban markets, but there are also a number of products sent to export markets.

**Fig 2: Scenes from specialized small-scale aquaculture**

Integrated agriculture-aquaculture (IAA) systems

A common feature of many small-scale aquaculture systems is a degree of integration with agriculture. This includes the classic rice-fish and the common chicken-fish. Other forms of integration include the Vuong Ao Chuong (VAC) system from Viet Nam (Vuong: horticulture; Ao: pond; Chuong: livestock) where livestock manure fertilizes ponds, and pond water is used to irrigate vegetables or fruits grown intensively on the pond dikes. The classic “ditch-dike” system is commonly found in deltaic areas, where crops are grown on elevated beds and fish are raised in channels between them. In addition to fish, crustaceans like freshwater prawns and crayfish are often grown in integrated systems. Likewise, many different fruits, vegetables, and nuts are cultivated.

There is also indirect integration through use of agricultural byproducts and processing wastes from off-farm, such as rice bran, oil cake or chicken manure which can be used as feeds or fertilizers for the pond. This kind of reuse of waste is often described now in terms of a “circular economy”, but these integrated systems have been a crucial part of aquaculture in Asia for a long time. Factors driving integration include the cost of inputs, efficient land use to grow multiple crops, and cycling of nutrients amongst different crops. Integration allows spreading risk across multiple crops where poor production of one crop can be compensated by sales of another. It also smooths seasonal variations in income because different crops can be harvested regularly or at different times of the year.
Employment and marketing opportunities

Many direct and ancillary jobs are created in small-scale aquaculture value chains, both downstream or upstream of the farm. Some of these diverse jobs involve feed production and transport; product processing, collection, distribution and sales; and other kinds of work linked to input suppliers. This illustrates the self-organized nature of some of these dense clusters of small-scale aquaculture farmers, creating an environment with many different economic opportunities and specialized activities (Figure 3).

Small-scale aquaculture has direct links to food and nutrition security. One good example is of small indigenous fish species harvested from rice-fish systems in Bangladesh, eaten directly by the households themselves. Affordable fresh fish originating from small-scale aquaculture are widely available in wet markets, as are cooked and prepared fish such as fried or barbequed tilapia. Or an interesting example: fried prawn heads as illustrated in Fig 3. Freshwater prawn comprise a high value product farmed in southwest Bangladesh. The tail meat is exported to Europe, but the heads are sold locally as a tasty and nutritious snack.

Summary

Small-scale aquaculture in Asia is highly diverse and that diversity reflects local adaptations to the environment and resource base, and to market opportunities in those locations. The situation is changing over time, and there has been a trend towards intensification, with more widespread use of formulated feeds and more sophisticated technologies. At the same time, extensive and semi-intensive farming systems remain effective in many contexts and are not likely to disappear. There is also continual diversification into production of new higher value niche species, as many traditional aquaculture species (e.g., carp, tilapia, and catfish) are produced in such large quantities that they fetch very low prices which is good for consumers but not so for farmers.

Small-scale aquaculture fulfills a wide range of roles in producer livelihoods, ranging from a small but complementary contribution to the other activities of the household, all the way up to being the main economic activity of the family. Viewed in this light, small-scale aquaculture can create a wide range of employment opportunities both on the farm for hired workers and off-farm in the value chains that emerge around the clusters of these specialized farms. And of course, small-scale aquaculture is a very important contributor to food and nutrition security in the region as a source of affordable aquatic food.

Editor’s note: This article was first published in the FAO Aquaculture Newsletter, produced by the FAO Fisheries and Aquaculture Department, Rome, Italy.
Market Trends

**SHRIMP**

**India:** Production has increased in Andhra, however the absence of strong demand from large markets has weakened ex-farm prices. In Orissa, cropping season has already begun and is expected to be good, matching last year’s output. Meanwhile the high freight rate in international trading remains a major concern.

**Indonesia:** Export of breaded shrimp to the US was significantly up by 165% for the month of January 2022 compared to the same month in the previous year. Indonesia remains one of the top five main suppliers of shrimp to the US market. Imports for the month of February 2022 against February 2021 alone were up as high as 45%. For the Japanese market, Indonesia has increased its stake in the supply pie with more exports of processed/value-added products procured in preparation for the Spring festival celebrations in April and May. Meanwhile, shrimp farmers are already preparing their ponds for the next season to start in May.

**Thailand:** Due to continuing issues with diseases, which are affecting the country’s domestic farming efforts, local shrimp producers have had to rely more on the importing of raw materials. The low domestic output has forced producers to increase imports of material for processing, according to the Thai Shrimp Association. Although Thailand remains the sixth-largest shrimp-farming country in the world, with around 280 000 MT annually, the figure is sharply down from the 630 000 MT in 2012.

For 2022, shrimp production in Thailand is expected to reach 300 000 MT, up 7.1% from 2021 and up 11.1% from 2020. The Thai Shrimp Association has estimated that the country’s shrimp export volume will rise by 10% in 2022 from its 2021-estimated level of 160 000 MT.

**Vietnam:** Vietnam was the top supply source but with a falling share in total imports from 25% in 2021 to 21% this year. According to the Vietnam Association of Seafood Exporters and Producers (VASEP), the country boosted its shrimp exports to the European Union in 2021. Shrimp export value increased by nearly 19% at US$ 613 million to main markets the Netherlands (+10%), Germany (+25%), and Belgium (+19%) from 2020. Exports of both *vannamei* and black tiger shrimp were up to meet higher demand in the EU. Export of *vannamei* to Germany increased by 28% year-on-year, while the value of black tiger shrimp exports to the Netherlands jumped to 54% from 2020. Meanwhile, one of Vietnam’s biggest shrimp exporters, Minh Phu Seafood, has suspended its exports of shrimp to Russia amidst the tightening grip of international sanctions.

**Japan:** Consumer demand for shrimp is expected to improve with the Spring festival during April and May. The easing of the COVID-19 measures and restrictions throughout Japan should drive an increase in demand and sales within the food service industry. However, as the war between Russia and Ukraine continues, there is general concern surrounding the possible impacts on the economy, especially with the high costs of fuel and logistics.

**Europe:** Shrimp prices remain high, with shortages being experienced for small sizes. The restaurant trade in Europe has recovered completely, explaining such high demand in a period of the year, which is normally a weak period for shrimp consumption. In January 2022, due to the available data, Spain and UK increased its shrimp imports by 29% and 19% respectively compared to the previous year’s period. Overall, the market is characterized by uncertainty due to the present political situation in Europe (Source: EPR 3/2022).

**Ecuador:** Since late February, more shrimp supplies are available as exports to markets in Russia have been on hold due to the international sanctions in place. Exporters are now diverting shipments meant for Russia and Ukraine to other markets due to port closures as a result of the ongoing conflict. Despite this setback, in general, exports of Ecuadorian shrimp have increased to meet higher demand from the EU market. In January 2022, exports to Europe increased by 58.2% at 73 236 MT from 46 295 MT in the same month last year. Its main markets in the EU were Spain, France and Italy, where imports of Ecuadorian shrimp were up by 45%, 23% and 45% respectively. For the US market, Ecuador remains one of its top five main suppliers with imports during the month of February 2022 showing an increase of 44% as compared to February 2021.

**USA:** As was anticipated, shrimp demand picked up during the Lenten season. Several restaurants offered special shrimp-based dishes, including fried, breaded and grilled.
Shrimp demand during this season increased not only in supermarkets and groceries but also in the HORECA sector. This season of strong shrimp consumption is expected to continue on to the month of May. However, higher prices are also expected due to the sustained rise in freight, labour, and packaging costs.

**TUNA**

**Western, Central and Eastern Pacific:** Slow to moderate fishing efforts in the Western and Central Pacific (WCP) and the Eastern Pacific Ocean continue amidst bad weather conditions. In April the delivery price of frozen skipjack to Thailand (CFR), shot up to US$1 900 per MT. This surge was due to high fuel prices and slow fishing effort. The ex-vessel price in Manta was also reported at this level.

**China:** During the first two months this year, China shipped significant volumes of precooked frozen loins (18 300 MT) to the tuna canning hubs in Asia and Europe. This volume almost tripled compared to that of the same period last year.

**TILAPIA**

**USA:** Total imports of fresh/chilled tilapia fillets during 2021 were up by 3.2% at 22 786 MT, continuing its recovery trend from the low levels in 2016 (23 604 MT) and 19 863 MT in 2019 before increasing in 2020. The decline during those years was due to the preference for frozen fillets of other species coming from Asian countries, such as pangasius, which costs less compared with tilapia.

**MACKEREL**

**Norway:** Norwegian exports of frozen mackerel grew by an impressive 30% in value during 2021 compared to 2020, reaching US$ 639 million while 370 000 MT were shipped in volume. The main importers were China, Japan and South Korea with around 50 000 MT each. Meanwhile, Egyptian imports of frozen mackerel from Norway increased considerably, from 8 000 MT in 2020 to 38 000 MT in 2021 (Source: EPR 2/2022).

Source: GLOBEFISH Highlights Issue 4/2022

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### Market Barometer

#### Price Trends

**FROZEN SHRIMP, C&F JAPAN (US$/Kg)**

- Vietnam: B/Flrger, H/L, 16/20
- India: PUD, 300/500

**FROZEN SHRIMP, USA (ex-warehouse NY, US$/lb)**

- Asia: B/Flrger, H/L, 21/25
- Central/South America: Vannamei, H/L, 41/50

**FROZEN SHRIMP, EUROPE (CFR, US$/kg)**

- Bangladesh: B/Flrger, H/L, 16/20
- India: Vannamei, H/L, 16/20

**FROZEN TUNA (US$/MT)**

- S.W. Pacific: Yellowfin, 10 kg up, Auction Shimizu, Japan
- A/rd, 10 kg up, Wholesale Japan
- Albacore, 10 kg up, Wholesale, Japan

**Price Trends • Cold storage holdings • import trends**

**FROZEN WHITEFISH**

- Vietnam: Pangasius fillet, 20% glaze, 170 gpc up, IQF/cfr, Europe (US$/kg)

**FISHMEAL/FISHOIL (US$/MT)**

- China: Tilapia fillet, 5-7 oz, Wholesale, USA (US$/lb)
- China: Alaska pollock, fillet, Wholesale, USA, (US$/lb)
Vacancy Announcement

TRADE PROMOTION OFFICER

Working under the overall supervision of the Director, INFOFISH, the Trade Promotion Officer shall be responsible for the following:

- Monitor and review fishery trade in the Asia Pacific region and beyond;
- Collect and analyse price and market information on specific fishery products for the 'INFOFISH Trade News', a fortnightly bulletin;
- Attend to queries on supply, marketing and trade of fishery products worldwide;
- Work on identification and export promotion of fishery products from the region;
- Maintain regular contact with institutions, market news correspondents and organisations relevant to the fish marketing information network;
- Write and review articles pertaining to marketing and international trade of fishery products for the INFOFISH International magazine and other publications;
- Undertake other activities as assigned by the Supervisor or the Acting Director/Director

**Duty station**
This position is based in Kuala Lumpur, Malaysia. Applicants must be prepared to travel if required to do so. Age limit 40 years

**Emoluments**
Salary will commensurate with qualifications/experience. Applications stating the position applied for and containing full curriculum vitae and recent passport size photograph should be sent to the following, preferably through the INFOFISH National Liaison Office in each Member Country* of INFOFISH.

**The Director**
INFOFISH, 1st Floor, Wisma LKIM, Jalan Desaria, Pulau Meranti, 47100 Puchong, Selangor Darul Ehsan, Malaysia
Email: info@infofish.org

**Closing date: 13 June 2022**
For the receipt of applications at INFOFISH. Only short-listed candidates will be notified

*Bangladesh, Cambodia, Fiji, Iran, Malaysia, Maldives, Pakistan, Papua New Guinea, Philippines, Solomon Islands, Sri Lanka and Thailand.

Please visit our website www.infofish.org for contact details of INFOFISH National Liaison Officers in the respective Member countries.
SHRIMP

Shrimp prices up due to high freight rates

Strong demand in the United States of America and the European Union kept international shrimp trade firm at stable prices during the first nine months of the year. The trend is likely to continue for the rest of 2021.

Supply

Raw material supplies in Asia were unpredictable during July-September of 2021. In India, production was adequate for export processing, although there were reports of disease occurrence in some areas. Supplies remained moderate in Indonesia. In Viet Nam, farm shrimp production as well as exports have been seriously disrupted by the COVID-19 outbreak and subsequent restrictive measures. Production in Thailand was also low and resulted in a 165 percent rise in frozen shrimp imports (25 000 tonnes) for export processing. Farmed shrimp production in Ecuador remained stable with increasing exports. After good catches during June-August 2021, shrimp fishing in Argentina started to slow down from September due to severe logistical challenges in the supply chain (a shortage of containers for shipments to the European Union). As a result, cold-storage holdings in Europe remained limited. In the United States of America, shrimp landings in the Gulf of Mexico during January-June 2021 were 11 611 tonnes, the lowest level recorded in the last 20 years.

Meanwhile, a shortage of containers for exports remains a major challenge worldwide.

International trade

Since early 2021, international freight costs from Asia to North America for 20-foot and 40-foot containers shot up by 500-700 percent (at USD 13 000 and USD 20 000 respectively) due to persistent shortages of frozen food containers. To meet year-end demand, exporters were forced to pay for increased shipping costs, with some paying USD 25 000 per container or even higher to get their space for shipping confirmed.

Nonetheless, international shrimp trade remained steady with increased imports, particularly in the western markets.

Shrimp exports increased from most countries including China, but slowed down from Viet Nam and declined in Thailand due to raw material shortage and restrictive measures in both countries to combat the COVID-19 outbreak.

Ecuador, the top exporter, sustained positive sales growth during the first half of 2021. Increased exports to the United States of America and the European Union significantly compensated for export shortfalls to China, its top market. Shrimp exports also increased from India, Indonesia and Argentina.

For the first time in many years, China reported increased shrimp exports during the first half of 2021.

Steady retail demand and the reopening of the foodservice sector in the United States of America and European Union kept the international shrimp market strong during the second and third quarter of 2021. Imports increased in most large and medium markets, except for China.

From April 2021, demand in European markets has remained strong for popular fisheries and aquaculture products including shrimp, while stocks in many markets were limited. Business in the HORECA sector resumed across the European continent as people were extremely eager to eat out again after staying indoors for over a year. The main tourist countries, Italy, Spain and Greece, reported very good demand with reservations in the HORECA sector exceeding those of pre-COVID-19 years. The reopening of restaurants combined with a variety of other foodservice activity has boosted summer demand, in particular for high-end fisheries and aquaculture products such as shrimp.

In response to this strong demand, shrimp imports during January-June 2021 in the European Union reached a 5-year high at 367 300 tonnes, an increase of 16 percent compared to the same period of last year. Imports increased in every market except Austria and Malta.

Supplies from non-EU sources had a 78 percent share in total imports at 254 830 tonnes during this period. Frozen raw shrimp imports (shell-on and peeled) increased significantly at 220 390 tonnes (+14 percent), whereas the growth was small for processed shrimp (+2.4 percent; 34 625 tonnes). Among the top sources, Ecuador had a 24 percent market share in total extra-EU imports followed by India (12 percent), Greenland (12 percent), Viet Nam (10 percent) and Argentina (8.7 percent).

Shrimp demand was equally strong in the Russian Federation where imports increased by 74 percent at 41 690 tonnes during the review period. Among others, the United Kingdom of Great Britain and Northern Ireland reported a rise in imports (+8.6 percent; 32 855 tonnes) but the trend in the high-end Swiss market remained flat (+0.90 percent; 3 455 tonnes) against the same period in 2020. In Ukraine, imports increased by 97 percent at nearly 10 000 tonnes compared with 4 800 tonnes a year ago.

The world’s single largest market for shrimp, the United States of America, remained strong during the first three quarters of 2021. Continuity in the robust retail trade and full reopening of the foodservice sector generated good sales from spring to summer (April to August).

To ensure enough supply in the total distribution chain, an additional 100 000 tonnes of shrimp were imported into the United States of America during January-June 2021 compared with the same period of 2020. Cumulative imports during January-June 2021 were 30.6 percent higher at 404 360 tonnes worth USD 3.4 billion. Peeled shrimp had the highest share (44 percent; 180 000 tonnes) in total imports followed by shell-on (31.6 percent; 127 700 tonnes), cooked shrimp and other processed preparations (15 percent; 61 345 tonnes) and breaded shrimp (7.17 percent; 29 160 tonnes). Small head-on, cooked peeled tail-on, and ready-to-eat products have been the most demanded items in the retail trade. Penaeus vannamei shrimp from Latin America and Asia dominated supplies in the market. Imports of black tiger shrimp are largely supplied by Bangladesh, Indonesia, and Viet Nam and have increased in recent months along with improved business in the restaurant trade.

Imports from the top four exporters, namely India, Ecuador, Indonesia, and Viet Nam, increased by two-digits. India increased supply by 28 percent but lost market share compared with 2019 and 2020.

Ecuador had the highest export growth (+86 percent) to the US market and increased market share from 13 percent in 2019 to 22.4 percent in 2021. There were significant increases in exports of the
main product groups (shell-on by 70 percent, peeled by 122 percent, and breaded by 110 percent).

In general, increases in imports strengthen the foodservice sector but the actual concerns are the skyrocketing freight costs, logistical challenges and seasonal low supplies in Asia. So far large importers/distributors have been shouldering the high freight rates. However, in future the additional costs will likely to be transferred to end-users.

For the first time in three years, shrimp imports slowed down in China during January-June of 2021. The average monthly imports during this period declined from 53 000 tonnes in 2020 to 48 000 tonnes in 2021, suggesting slow domestic consumption and high stocks in the market. Since September, overall demand started to improve in the HORECA sector due to the mid-autumn festival in September and the weeklong National Day celebration or Golden Week Holiday from 1-7 October (the longest public holiday in China besides the Chinese New Year). Reported, trade inquiries for Ecuadorean shrimp have increased from September following reduced local stocks.

Unlike the western markets, summer demand for shrimp in Japan was disappointing this year due to the COVID-19 restrictions. Compared with 2020, imports increased marginally (+4.4 percent; 94 000 tonnes) during January-June 2021 associated with better demand for processed shrimp. The top exporters to the market were Viet Nam, Indonesia, India and Thailand. Since early October, the catering trade has started to procure supplies in preparation of better business opportunities during the year-end high consumption season.

With improvements in the pandemic situation and easing of restrictions in the restaurant trade, overall demand improved in most of the Asia Pacific regional markets. Imports increased in the Republic of Korea, Taiwan, Hong Kong, Malaysia, and Singapore. Interesting to note was the rise in exports from Ecuador to these markets during the review period. Imports in Australia were 30 percent higher in January-June 2021 against the same period the previous year. Viet Nam was the top supplier.

Prices
Ex-farm prices of shrimp remained stable until July in the producing countries but started to rise from August in view of lower supplies in Asia. In the international trade, the high freight costs have added USD 0.70 - USD 0.80 per kg (import prices) for products going from Asia to North America and Europe.

In Ecuador, the average export prices have risen to around USD 6.00 per kg, the highest level recorded since December 2018 amid strong demand from European and US markets.

Outlook
Farmed shrimp harvests in Indonesia were predicted to be good in October/November 2021. But for the rest of Asia, October 2021-February/March 2022 will be, as usual, the low production season. In Latin America, farming will be in full swing until early March in favour of Ecuador, the largest producer/exporter.

US production of domestic wild-caught shrimp that generally contributes 5-10 percent to the total shrimp supply in the market, will be lower this year affected by Hurricane Ida in September. The increase in fuel prices will also make production costs rise for sea-caught shrimp.

In the international trade, import contracts for year-end sales will be completed by late November 2021. Ecuador has a greater chance to move more products to many markets for year-end sales because of steady supply and closeness to the western markets compared with Asian shrimp suppliers.

High freight costs, transportation disruptions (bottlenecks at seaports, shortages of lorry drivers in some countries of Europe and the United States of America) are likely to cause a steady rise in shrimp prices at the wholesale level. Shipping prices will remain high possibly until the summer of 2022.

However, overall shrimp demand was expected to be good in most markets during the year-end holiday season. In East Asia the two New Year celebrations (Gregorian and Lunar) will keep regional demand strong until February 2022.
INFOFISH SHRIMP 2022 Prelude

In about a few weeks from now, SHRIMP 2022, the 6th INFOFISH World Shrimp Trade Conference and Exhibition 2022, will kick-off. In the run up to the Conference, INFOFISH spoke with Dr Audun Lem, Deputy Director, FAO Fisheries and Aquaculture Department, FAO, Italy who will be delivering the Keynote Address at the Conference. Some of the key talking points will include:

INFOFISH: In your opinion, what were the key drivers for resilience in the aquaculture sector over the last two years during COVID-19?

Dr Audun Lem: The entire seafood sector showed a remarkable degree of resilience and ability to adapt quickly. To some extent it is in the DNA of the sector; there has always been volatility, whether related to natural phenomena, weather conditions, production challenges, or changes in import requirements. In this case, certainly market diversification was one factor; another was increased digitalization of processes. It must also be mentioned that official support programmes were crucial for the survival of many businesses.

INFOFISH: During the ‘Sustainable Aquaculture Technologies’ webinar organized by INFOFISH in 2021, you mentioned that ‘Innovation is fundamental and the aquaculture sector is continuously taking on the new technologies. Sharing of the information and spreading the efficient, cost-effective and innovative solutions is important. From your standpoint, what are the major challenges in spreading innovative technologies?

Dr Audun Lem: For the sector to grow and provide food to a growing population, innovation is key. This means the capacity for uptake of new technology which is related both to human capacity as well as availability of finance. But also policies must be put in place to allow the sector to thrive. This is not always the case.

INFOFISH: How can partnerships and investments help the aquaculture sector (specifically in the shrimp industry) in achieving post-pandemic recovery?

Dr Audun Lem: Investments are necessary, so access to finance and insurance are just as important as access to water and sites. Collaboration is important both to ensure cohesion and communication of the many incredible achievements of the sector but also for learning from each other and transmitting best practice. Fairs and commodity conferences are important in this regard so INFOFISH is doing an excellent job also here, in addition to the technical capacity building you are doing in the region. I would also like to mention that one of the SDGs mentions cooperation and partnerships as a specific goal and it is clear that without that, we will not reach the ambitious goals set in the UN Agenda 2030.

We are delighted to announce that the Fisheries Development Authority of Malaysia (LKIM) is hosting the venue for SHRIMP 2022 at The Everly Putrajaya Hotel, Malaysia, making it the first hybrid SHRIMP Conference.

SHRIMP 2022 is jointly organised by INFOFISH; the Fisheries Development Authority of Malaysia (LKIM); Department of Fisheries, Thailand; Network of Aquaculture Centres in Asia-Pacific (NACA); and China Aquatic Products Processing and Marketing Alliance (CAPPMA), with media partners Aquaculture Asia Pacific; Aquafeed.com; HATCHERY FEED & MANAGEMENT; and World Aquaculture Society (WAS) and supported by The Vietnam Association of Seafood Exporters and Producers (VASEP) and Indonesian Aquaculture Society (IAS).

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CAN CHINA’S FISHING VILLAGES MAKE A COMEBACK?

By Songzi Wang

Though China is one of the biggest producers of marine fish in the world, little is known about its small-scale fisheries (SSF) sector, particularly with regard to the impact of urban development initiatives on communities and livelihoods. Using Hainan Province as a base for research, China Blue Sustainability Institute is gathering information that will be useful for provincial governments and other stakeholders to work towards the sustainable transformation of fisher communities as well as protection of the marine environment. Key in this process are community engagement and respect for traditional knowledge.

Not long after 1 a.m., the fishers of Rongshanliao in Hainan Province push their way out to sea in 8 metre-long fiberglass boats from the coastline under cover of darkness. They set off for somewhere around two nautical miles offshore to retrieve the nets they had placed a few days ago. Often, two men operate a boat, and they do all the work onboard together, from casting to bringing in nets weighing two to three hundred pounds with their bare hands. The wives of these fishers usually wait on the wharf. Once the boats dock, the women wade to the boats to collect the heavy boxes of fresh fish and carry them to the beach; they then sort, weigh, and record the catches before loading them onto trucks and driving away. Within hours, the seafood will be displayed in various farmers’ markets and restaurant kitchens in Haikou, the capital city of Hainan.

Fishers can earn a few hundred RMB by a good catch, in contrast to not even a hundred RMB by a poor catch. Due to unstable income, fishers sometimes cannot afford fish workers’ day-end wages of 200-250 yuan.

Such fishery production patterns like those in Rongshanliao can be found everywhere along Chinese coastal marine areas. Despite slight differences in the boats’ length, fishing
methods and nets, these forms of production have similar features: a low number of workers (often around 2-6 people); boat owners are also involved in the daily labour; production that only guarantees the livelihoods of boat owners and their hired workers; and limited capacity for expansion. It should be noted that China does not yet have an official definition of small-scale fishing, but the FAO describes the practice as a “sub-sector of fisheries employing labour-intensive harvesting, processing, and distribution technologies to exploit marine and inland water fishery resources”, and notes that it is not appropriate to develop a universal definition of “small-scale fisheries (SSF)”, given its complexity and dynamics. The form of fishery production in Rongshanliao and other coastal fishing areas can therefore, for all intents and purposes, be categorised as “small-scale fisheries”. In this article, small-scale fisheries is broadly characterised as “subsistence fishing close to shore using vessels around 12 metres in length”.

Looking at it in isolation, “small-scale fisheries” implies mainly low-level production. Globally, however, around 200 million people depend on small-scale fisheries and their industrial chains to make a living. According to statistics from 2021, there were nearly 300 000 small-scale fishing boats based in China, accounting for 79% of the national fishing fleet. With such an industry size but with little attention given to them, the invisible small-scale fisheries sector has a direct and far-reaching impact on marine product supply, sustainable fishery resource utilisation, the aquatic environment, and other issues.

**Challenges faced by small-scale fisheries in China**

Workers and communities involved in small-scale fishing are currently facing unprecedented challenges in recent years. Behind these changes lie complex reasons that are intimately linked to the decline of fishery resources, unequal development between urban and rural areas, and other economic, social, and ecological problems.

The widespread use of highly efficient fishing tools in commercial fishing leaves small-scale fisheries little access to fishery resources. Compounded by climate change, marine pollution, etc., there is an obvious decline in the population size and types of species being caught, according to fishers, which has turned many common species of fish into rare goods. Due to the financial strain, fishers have switched their nets for ones with finer mesh size. However, the increased fishing of juveniles prevents more fish from being sexually mature enough to reproduce. This in turn results in catches of smaller sizes of the species, causing a continuing decrease in the germplasm resources.

The fishery resources depletion has driven many fishers out of the business and they have no choice but to leave in search of new opportunities in the city. The younger generations are often encouraged to study and work outside the village by their families as fishing is considered to be limited in scope, needing only so-called “general skills” and heavily reliance on physical strength, as well as being a poorly paid occupation. In the process, the real value of these fishing skills is largely ignored.

**More fishers abandoning traditional lifestyles**

Nanbianhai, in the city of Sanya located in the southern part of Hainan Island, has been home to the water-dwelling Tanka people for generations. Here, international tourism island construction and urban development has cast a shadow over the community, even faster than the fishery resources crisis. In 2016, Sanya port, where Tankas used to dock, fish, and trade, was transformed into a yacht marina while a new large fishing port was built at Yazhou. As the Yazhou Central Fishing Port is far away from Nanbianhai, coupled with local tourism development in the area, fishers started to go ashore to find alternate livelihoods. For young Tanka people, they can only imagine traditional lives through folk songs.
Moreover, to save the collapse of fish stocks, governments have imposed moratoriums on fishing from May to September, as the period is vital to the survival of marine life, with most fishing vessels banned from venturing out to sea. Still, fishers must take on short-term jobs ashore to support their families during this time. It’s common for them to take manual heavy jobs with low wages like construction workers or carriers.

An important question to ask is whether it is possible to develop sustainable fisheries so that local fishers can earn a living without being forced to leave their hometown.

“Go ashore, go farther out to sea, and go recreational fishing”

More recently, the Hainan government has called on fishers to “go ashore, go farther out to sea, and go recreational fishing.” “Going ashore” refers to encouraging fishers to move into aquaculture, specifically fish farms that can be centrally managed to minimise environmental damage. “Going farther out to sea” means developing deep-sea farming and fishing. However, moving into aquaculture and deep-sea fishing requires capital to rent ponds and buy equipment, as well as skills and know-how, which often deters small-scale fishers.

In 2001, recreational fishing, defined as “transforming fishery resources, space, and culture into tourism experiences”, was first officially proposed by the Chinese government. In 2011, what is now China’s Ministry of Agriculture and Rural Affairs, included recreational fishing in its development plan for the first time, recognising it as one of the country’s five modern fishery sectors.

As the transformation of fishers’ livelihoods has become increasingly urgent recently, coastal governments at all levels are exploring new ways to develop recreational fishing. In July 2020, Hainan Province issued Guidelines on Pushing Forward the Recreational Fisheries Pilot Establishment for Healthy Development of Recreational Fisheries. It is advised by the government that “recreational fishing boats should be over 24 metres in length”, presumably out of consideration for security and safety, management, as well as capital and technical engagement. But of Hainan’s more than 20 000 registered fishing vessels, nearly 80% are under 12 metres in length, which means only a small number of the island’s fishers can get involved in the recreational fishing industry.

In 2021, after a year of deliberations, a few municipal and county governments tailored previous measures to local conditions based on trials. For example, according to the Wenchang government, recreational fishing boats involved in a trial can comprise 15 types, the minimum of which is no less than 12.05 metres in length; while two pilot recreational fishing boats approved by the Ministry of Agriculture and Rural Affairs of Qionghai for the “wusuoguizhi” fishing cooperative are both less than 12 metres in length. Predictably, governments will issue more flexible policies that can include a growing number of small-scale fishers in recreational fishing. The recreational fishery in China is entering a phase of development and testing, during which complementary rules are constantly being refined and improved by relevant sectors.

Creating a renewed sense of community

In addition to top-down policy promotion, community engagement is key to the transformation of fishing villages. Fishers underestimate the value of fishing expertise and traditional wisdom they already possess; they also tend to have a low sense of self-worth; and the common loss of cultural identity among fishers is a major obstacle to local community development. Thus, it is important to help villagers rebuild their self-confidence and a shared identity, the basis of their involvement in community public affairs. A shared identity can encourage fishing villagers to actively connect with their neighbours, care about common interests, and look for opportunities together for community development.
A scrapped wooden boat is turned into a playhouse

What is also worth noting is that the relevant policies and channeling of resources like investments should also consider the traditional rituals and cultural practices of the residents, so the first step is to learn about the cultural traditions in fishing villages. External stakeholders such as the public, government officials, and investors usually have no access to knowledge about fishing culture and have tended to see all Hainan fishing villages as essentially interchangeable. This only makes capturing and sharing each village’s unique elements even more important.

“Bring Fish to Table, Bring Fisher Home”

In 2019, China Blue, as a third-party organisation caring for fisheries, fishing villages and fishers, launched the project “Bring Fish to Table, Bring Fisher Home” that documents and shares the cultures, traditional rituals, living conditions, and fishing practices of more than forty traditional fishing communities across Hainan. In addition, China Blue has held photo exhibitions in a few villages, guiding viewers to rediscover the unique value of traditional fishing culture. China Blue also helps fishers to preserve and protect Tanka culture and communities through compiling oral Tanka songs into words and recording their singing performances.

The organisation hopes to continue to explore the traditions and cultures of fishing communities and promote two-way interaction within and outside local villages through images, writing, and other means of communication.

With a deeper understanding of the local fishing community, the project “Bring Fish to Table, Bring Fisher Home” will proceed to the operational practices stage. In the near future, China Blue will work with a fishing cooperative in Qionghai to explore how to involve local communities in the transformation towards recreational fisheries. Starting by identifying each community’s needs, China Blue, along with the fishing cooperative, will then search for a recreational fishery development path in order to promote the sustainable development of the fishing community and protection of the ecological environment. This process will provide experience for the transformation of fisher communities in other areas as well as for policy formulation by the relevant government departments.

In this “International Year of Artisanal Fisheries and Aquaculture 2022” declared by the UN, China will continue in-depth study and practices, as well as gain experience and build up a systematic knowledge system based on Chinese small fisheries, which is hoped to be a reference for peers worldwide.

Songzi Wang is a project manager and researcher at China Blue Sustainability Institute (https://www.chinabluesustainability.org/), and is actively involved in the project “Bring Fish to Table, Bring Fisher Home”. She is interested in studying the inheritance of fishery culture and the sustainable development of fishing communities. She has published a few articles featuring small-scale fisheries in China.
In addition to the tragic loss of human lives, what are the lessons of the COVID-19 pandemic related to social protection and justice?

Despite progress in recent years in extending social protection in many parts of the world, when the COVID-19 pandemic hit, a lot of countries were still facing significant challenges in making the human right to social security a reality for all.

For example, as of 2020, only 44 percent of the population of Asia and the Pacific were effectively covered by at least one social protection benefit such as health care, old age pension or unemployment benefit. Meanwhile, according to a report issued by the ILO in December 2021, an estimated 1.6 billion people in Asia and the Pacific lack effective access to social health protection.

The crisis exposed the vulnerability of billions of people who seemed to be getting by relatively well but were not adequately protected from the socio-economic shock waves it has emitted.

Gaps in coverage also disproportionately affect women and men with unstable or irregular employment and incomes such as the self-employed, informal economy workers as well as migrant workers and their families. We can be certain that workers in fisheries and seafood processing rank high amongst those hardest hit.

There are no easy answers but extending coverage and enhancing institutional capacities would help societies move towards an inclusive recovery, one which addresses the deep structural inequalities that have obstructed progress for too long.

Delegates at the 109th International Labour Conference in June 2021 adopted a “Global Call to Action for a human-centred COVID-19 recovery that prioritises the creation of decent jobs for all and addresses the inequalities caused by the crisis”. Could you elaborate on the key areas of focus in this Global Call to Action, and how will the ILO support countries in their specific endeavours?

We often hear the need to ‘build back better’ from COVID-19, however the effectiveness and resilience of any recovery will depend heavily on how socially inclusive it is. As mentioned previously, it is vital that we specifically address the inequalities that have deepened during this crisis otherwise there is a very real risk that the economic and social consequences will cause long-term scarring. Certain groups such as young people and women, migrant workers and small businesses have been hardest hit by the pandemic. We have to ensure that recovery does not pass them by.

The Global Call to Action for a human-centred COVID-19 recovery prioritizes the creation of decent jobs for all and addresses the inequalities caused by the crisis. It outlines a comprehensive agenda and commits countries to ensuring that their economic and social recovery from the crisis is “fully inclusive, sustainable and resilient”.

The Call covers two sets of actions. The first are measures to be taken by national governments and their employer and trade union “social partners”, to achieve a job-rich recovery that substantially strengthens worker and social protections and supports sustainable enterprises. A second area covers international cooperation and the role of multilateral institutions, including the ILO, with the aim of increasing the level and coherence of their support for national “human-centred” pandemic recovery strategies.

It calls on the ILO – with its mandate for social justice and decent work – to play a leadership role and use all means of action to support the design and implementation of recovery strategies that leave no one behind, including by reinforcing cooperation with other institutions of the multilateral system.

Delegates at the 109th International Labour Conference in June 2021 adopted a “Global Call to Action for a human-centred COVID-19 recovery that prioritises the creation of decent jobs for all and addresses the inequalities caused by the crisis”. Could you elaborate on the key areas of focus in this Global Call to Action, and how will the ILO support countries in their specific endeavours?


In September 2021, the media reported another important global initiative that was launched by the United Nations, called the ‘Global Accelerator for Jobs and Social Protection’. Sustainable recovery appears to be a major theme, linked to
MEETING THE LABOUR RIGHTS CHALLENGE FOR FISHERS AND SEAFOOD PROCESSING WORKERS IN SOUTH EAST ASIA

By Mi Zhou

Despite contributing significantly to the fishing and seafood processing sectors in South East Asia, migrant workers face many challenges relating to their labour rights and working conditions. Ship to Shore Rights South East Asia is a multi-country initiative of the European Union (EU) and the United Nations, implemented by the International Labour Organization (ILO) in collaboration with International Organization for Migration and United Nations Development Programme. Its overriding objective is to promote regular and safe labour migration and decent work for all migrant workers in the fishing and seafood processing sectors in South East Asia.

Migrant workers in South East Asia’s fisheries and seafood processing industries face many challenges. These include wage theft or the underpayment of wages, health and safety issues as well as challenges related to fraudulent and illegal recruitment practices. Retention of documents is another big problem - many fishers have no control over their documents, which can be a form of coercion that leads to forced labour. Most still lack clear written contracts in their own language, that they can understand as well, while outright physical violence still takes place on fishing fleets.

Many fishers have little idea who has recruited them or where they will be working. While fisheries may not have been a specific topic of discussion, the nature and importance of the industry means that it could and should be impacted by many of the steps taken by both the ILO Global Call to Action and the Global Accelerator. For example, enhanced social protection as well as investment and skills needed for the transition to a low carbon future.

In the short run, a call for urgent investment for sustainable and socially inclusive recovery will support the fisheries industry in Asia and the Pacific to bounce back from its sharp declines in activity, working hours and jobs evidenced during the pandemic. The region is home to over 29 million fishers, of whom many are migrant workers. The Global Accelerator will hopefully highlight the disproportionate impact of COVID-19 on their working and living conditions and help implement social security policies that include them.

Looking ahead, Asia and the Pacific’s fishing and seafood processing industry still has strides to make in regard to sustainability. The Global Accelerator encourages sustainable recovery that not only promotes decent work and job creation, but also collaboration towards achieving a just transition. This is particularly important in the fishing and seafood processing sector as one of the Sustainable Development Goals is ‘Goal 14: Life Below Water’, where healthy oceans and seas are vital for our existence.

Specifically on the issue of forced labour in fishing, what is the estimated scale of the problem in the Asia-Pacific, and what does the ILO consider to be priority areas for action by governments?
There are many forms of labour exploitation and forced labour in the fishing industry. They include wage theft, poor living conditions on board vessels as well as extremely limited safety provisions on board vessels that lead to accidents, including fatal ones. Fishers are isolated from help by the nature of being on a vessel, and forms of coercion are often applied including retention of documents from workers, withheld payment of wages, and even outright physical violence on fishing fleets. Many fishers lack clear written contracts in their language so they can understand it. Many may have no contract at all. The range of contractual or semi-contractual agreements means workers often are not paid a regular salary or end up working under false promises from a recruiter. It's difficult to grasp the scale of forced labour in the sector due to under-reporting and lack of regulation from a labour perspective. Migrant workers are often caught in the middle as they are more vulnerable to exploitation and have their immigration status at risk.

The ILO works with governments to strengthen regulatory frameworks related to labour migration, employment, and working conditions in the fishing and seafood processing sectors. We liaise with countries to develop roadmaps towards ratifications of International Labour Standards, such as the Work in Fishing Convention, 2007 (No. 188) and to put in place labour migration governance frameworks and promote fair recruitment practices. At the same time, we work with the private sector to implement best business practices, and provide information and rights-based education to workers so they are empowered to protect themselves. ILO also works with government, industry, and workers to improve labour rights and decent working conditions for all workers in the fishing and seafood processing sectors.

An article by the ILO that was published in the INFOFISH International last year focused on the Ship to Shore Rights South East Asia programme, with its overriding objective of promoting regular and safe labour migration and decent work for all migrant workers in the fishing and seafood processing sectors in South East Asia. For our readers, could you briefly describe what this programme is all about, and provide the relevant information links?

The new Ship to Shore Rights South East Asia programme started in August 2020. It builds on an earlier initiative that focused on Thailand and widens the scope to Cambodia, Lao PDR, Myanmar, Indonesia, Viet Nam, and the Philippines.

The programme takes a three-pronged approach. Firstly, it supports regulatory and policy frameworks in countries that need them. It advocates for, and supports countries to follow the example of Thailand to ratify and implement the Work in Fishing Convention, Protocol 29 and other relevant conventions that set minimum standards, and to initiate national legislative design and reform. Secondly, it supports the implementation and enforcement of labour laws and to support a culture of compliance. The programme also works with government authorities to enforce labour laws where there are violations. And thirdly, it looks at how to drive and support the empowerment of workers so that the power imbalance between a worker and his or her employer can be reduced.

Ship to Shore Rights South East Asia is supported by the European Union, and implemented by the ILO in collaboration with the International Organization for Migration (IOM) and United Nations Development Programme (UNDP).

More information on the Ship to Shore Rights South East Asia programme can be found at https://shiptoshorerights.org/
There is much to learn from the progress made in Thailand. The ILO was able to leverage international attention and promote international labour standards, as well as support the Thai government towards national legislative reform and eventual ratification of ILO’s Protocol on Forced Labour (No. 29) in 2018 and Work in Fisheries Convention (No. 188) in 2019. By working with civil society organizations and trade unions, ILO was able to support migrant workers’ organization and empowerment, despite legal barriers that prevent migrant workers from unionizing. ILO also worked closely with the private sector to develop good labour practice standards that both educate the industry and establish an industry-based review system to improve business practices for the benefit of migrant workers.

Similarly, the new regional phase aims to work with stakeholders and governments to strengthen legal and policy frameworks in the sub-region. In March 2021, ILO and Indonesia’s Ministry of Foreign Affairs agreed on developing a roadmap towards the ratification of the Work in Fisheries Convention, signaling a key step towards better labour standards in the sector. In Viet Nam, ILO contributed technical assistance to legislative reform in favour of migrant workers and will be supporting the legislative education of stakeholders in 2022 to ensure that new legislation is understood and implemented at provincial levels. In Thailand, we continue to work with the Ministry of Labour and other authorities to develop more targeted multi-disciplinary inspections of fishing vessels to increase enforcement actions. We will share and promote the adoption of best in practices from the region, including improved worker interviews and train interpreters who are crucial to interact with migrant fishers during inspections. We will also support other countries in the region to develop MOUs on joint inspection in the fishing sector. The lessons learned and tools developed in Thailand are highly applicable to other countries in Southeast Asia.

Another enabling factor for improved protection is our collaboration with the private sector. Industry associations implement Good Labour Practices designed for, and with, the sector. Simultaneously, the first phase made steps to strengthen workers’ organizations and raise awareness amongst fishers to know and advocate for their rights. Encouraging workers, civil society and trade unions to be agents of change plays a crucial role in exposing exploitation and staying connected to migrant communities. By liaising with different stakeholders – governments, employers and workers – concurrent steps can be made to cultivate a safer, better and more sustainable sector in the sub-region.

How does the ILO reach out to the migrant workers themselves so that they are fully equipped with knowledge on their rights, as well as information on where to go and what to do should their rights be violated at-shore and at-sea?

The ILO has built and operationalized Migrant Worker Resource (MRC) centres where migrants can build a network and learn about their rights. This includes services and information sessions to support safe migration as well as sustainable return and reintegration for migrants. These services have been particularly important during the COVID-19 pandemic as migrant workers have been stranded in destination countries or have returned in large numbers to their home countries, sometimes without receiving their wages. In some cases, migrant workers expecting to leave for work have not been able to travel and work abroad, despite having already paid recruitment, travel, and documentation costs.

During the pandemic, to address the challenges faced by migrant workers, Ship to Shore Rights South East Asia has provided urgent funding in Lao PDR, Thailand, and Myanmar through MRC partners and Civil Society Organizations to provide food and hygiene packs, as well as support and information on migration, travel restrictions, and local employment. Another tool we leverage is social media. Using digital campaigns to spread information and awareness has proved effective in reaching migrant workers across countries.

A Thai fisheries inspector takes a digital record of a fisher.
For the benefit of our readers, could you provide some background on Tri Marine International: its area of business, product forms, latest trade figures, and what it hopes to achieve this year?

This year is Tri Marine’s 50th anniversary. We were founded at Singapore in 1972, and have since expanded around the world, with trading and representative offices, fishing fleets and processing plants in North and South America, Europe, Asia, and Oceania. Last year we traded over 500 000 tonnes of tuna and tuna products. We have evolved from being a trader of whole tuna to a supplier of whole tuna and processed tuna products to processors, brands, and retailers around the world. In 2022 we expect to continue our steady growth, supplying responsibly sourced tuna to customers globally.

Of the total commercial tuna catch worldwide between September 2021 and March 2022, Indian Ocean albacore, bigeye and yellowfin as well as Pacific bluefin are considered “subject to overfishing”, according to the International Seafood Sustainability Foundation (ISSF). What does Tri Marine, as one of the biggest tuna companies in the world, see as its role in promoting sustainability of tuna stocks, ethical labour practices, and supporting fishing communities?

Tri Marine handled over 10% of global tuna supply in 2021. We have a shared responsibility for promoting the resource sustainability upon which our business, and the livelihoods of millions, depends. As an integrated tuna supply company we believe that sustainability means not only protecting fisheries resources, but also communities, and a commitment to provide a growing population with one of the healthiest forms of protein.

To tackle the environmental and social challenges of our industry, we emphasize collaboration with best actors in the private, public, and non-profit sectors. Our multi-stakeholder approach starts with a commitment to provide Marine Stewardship Council (MSC)-certified sustainable tuna, and driving fisheries improvement projects (FIPs) for fisheries that do not meet MSC standards. In 2021, over 80% of Tri Marine’s sourcing came from MSC-certified fisheries, fisheries under MSC full assessment, or those in a FIP. As a founding member of the International Seafood Sustainability Foundation (ISSF), we support conservation measures throughout our supply chains. In support of these activities, we participate in Regional Fisheries Management Organization (RFMO) advocacy through national delegation membership. Tri Marine is a prominent member of the Seafood Task Force (STF) and leads its tuna work, including the development of the STF Code of Conduct and Vessel Auditable Standards. These have been endorsed by a broad range of industry, government and NGO stakeholders as providing effective human rights protections for workers when effectively implemented. Our emphasis has been the application of these principles in the challenging environment of the fishing sector.

Recently, Tri Marine was recognized as the first tuna trading company in the world to obtain ISO 22005:2007 certification from Det Norske Veritas (DNV). What are some of the company’s key achievements over the past decade that have helped pave the way toward DNV certification?

We also achieved ISO 9001 certification. ISO certifications would not have been possible without the information and data processing systems that we have built up over many years. In particular, full traceability of the tuna we trade has been a work in progress for many years. Neither could we have achieved certifications without the knowledge and support of our staff globally, whose experience and diligence are vital components of our traceability systems.

This is a somewhat provocative question, and specific to the Asia Pacific: if you could sit the Western and Central Pacific Fisheries Commission (WCPFC) and Indian Ocean Tuna Commission (IOTC) together in one room, what would your messages be?

There would be lots of them! But the priorities would be capacity restrictions, 100% human observer coverage on
purse seiners, and 100% observer coverage on longliners – human or electronic, and the establishment of sound Harvest Control Strategies (HCS). For us at Tri Marine, those are the fundamentals of any effective fishery management regime, equally applicable to all tuna RFMOs.

Can the global marketplace improve fisheries management?

Most definitely. Consumers, retailers and brands are already driving change for the better in fishery management and with social issues. One example: customers increasingly demand tuna that is either MSC-certified or in a robust FIP. This is driving the growth of both MSC certifications and FIPs. Those customers also require tuna that has been caught and processed in accordance with international labour standards.

In your capacity as Chairman of the 16th INFOFISH World Tuna Trade Conference and Exhibition (“Trailblazing through tough times”) in May 2021, you summarized the salient points from the discussions at that time, among them being that the pandemic probably worsened labour rights at sea because on-board monitoring was no longer possible to monitor crew welfare and fishing methods. A full year has now passed. In your opinion, have there been any major developments pertaining to those points that you mentioned?

One year on, and two years into the pandemic, we have seen more much-needed crew changes, as COVID-related restrictions are gradually eased. Observer programmes remain suspended in the WCPFC, but hopefully they will be reinstated soon. The pandemic forced us all to focus even more on the welfare of our workforces.

And in the forthcoming 17th INFOFISH World Tuna Trade Conference and Exhibition (“Strengthening resilience, adaptability and sustainable growth”) which will be held this October, what do you foresee will be the most discussed topics?

I think that the logistics crisis: soaring freight rates and shortages of containers, will be a major topic. The impacts of soaring prices for fuel, and essential inputs for our industry, e.g. sunflower oils and tin plate, will be another. The situation in Ukraine, and its impact on the global trading system and economy will surely be a talking point, whatever the situation will be in October. Climate change, and its impact on our industry and indeed all of us on this planet, and the economic costs of meeting emissions targets will also feature in discussions, I’m sure. In the face of COVID and the situation in Europe, climate change may have slipped somewhat from the headlines, but the clock is still ticking – just read the latest report of the Intergovernmental Panel on Climate Change (IPCC). Amidst all our troubles, Climate Change is still the elephant in our room.

And our last question: The biggest global happening in the past two years has of course been the COVID-19 pandemic; even now we are still seeing waves of infections in many countries. Commentators have said that the tuna trade has been remarkably resilient but there remain concerns such as the monitoring of fishing activities. Overall, what would you say have been the main lessons for the tuna industry?

Well, we also need to add the recent events in Ukraine. Those events will impact national economies, global trade, and commodity prices significantly, and our industry is already feeling the impacts. As for COVID, at the onset of the pandemic, we were very concerned for our workforces on the front lines: onboard ships and in processing plants. On the whole, our industry managed those problems reasonably well. The tuna wheel kept turning. The need for better and more electronic observer coverage and reporting has been amplified. Many of the lessons (which we continue to learn) affect many industries, not only tuna. Among them: the vulnerability of what are often very long supply chains, and the risks associated with rising commodity prices. Yes – we have been resilient, but we continue to be challenged, and we will need all the ingenuity we can muster to emerge from these crises stronger and prepared for what will likely be a changed business environment.

Tri Marine is one of the world’s largest suppliers of tuna raw material (canning grade to sashimi quality) to brands and processors around the world.

Tri Marine has processing plants worldwide. This SolTuna facility in Noro, Solomon Islands produces frozen tuna loins for the US and EU markets and canned products for the local and regional markets.
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Strengthening Resilience, Adaptability and Sustainable Growth in the Global Tuna Industry

TUNA 2022, the premier convention of the world tuna industry is back this year and is set to take shape as a first-ever hybrid event with options for attendees to either join virtually or to be in-person at the prestigious Shangri-La Hotel, Bangkok. The TUNA 2022 hybrid event offers a timely and significant opportunity for major tuna industry players and stakeholders to connect, network, reflect and share from both within the venue site, as well as from beyond it as well. This will be a unique and dynamic experience for attendees both online and in person, with opportunities also for differentiated sponsorship.

Don’t miss this great opportunity to reconnect with world tuna leaders and professionals to discuss a wide range of issues, challenges and opportunities in support of the sector’s continuing vitality, viability and sustainable growth in what has been and continues to be a disruptive operating environment for all industry players. Following on from TUNA 2021 (The Global Tuna Industry: Trailblazing through tough times), this meeting of the industry will continue to provide a very opportune moment for further reflections and conversations on high level developments and practical approaches to ‘Strengthening Resilience, Adaptability and Sustainable Growth in the Global Tuna Industry’.

TUNA 2022 will be chaired by renowned industry expert Ms. Jan Tharp, President and CEO of The Bumble Bee Seafood Co., USA. Joining Ms. Tharp as co-chair will be Dr. Chanintr Chalisarapong, President, Thai Tuna Industry Association (TTIA). We are also pleased to announce that Mr. Juan Corrales, CEO of Tri Marine International, USA, will be delivering the Keynote Address.

Ms. Jan Tharp, President and CEO of The Bumble Bee Seafood Co., USA and Chair of TUNA 2022, in keen anticipation of the event expressed that, “Tuna is experiencing unprecedented demand as more people in areas that had previously not been high seafood consumption markets, are seeking to consume more seafood. This increased demand for seafood, coupled with growing governmental requirements around fair and sustainable fishing practices, the increased need for transparency and overall supply chain challenges, are forcing the industry to re-evaluate and re-engineer many historical practices. This conference will focus on the nature of these changes and what we need to do, as an industry, to adapt and grow”.

Dr. Chanintr Chalisarapong, President of the Thai Tuna Industry Association (TTIA) and co-chair of TUNA 2022 expressed his excitement at finally having the event reconvene in Bangkok on a hybrid modality following the last physical hosting of the INFOFISH TUNA Conference and Exhibition in 2018. He further reiterated that with travel restrictions eased throughout Thailand beginning of February 2022, and with the return of Test & Go for fully vaccinated travelers, Bangkok remains the most suitable of venues to accommodate this large tuna industry event, being home to many major global tuna industry players in addition to its excellent meeting facilities and good services.
Over the years, this event has been able to attract a global audience of almost 600 delegates from nearly 70 countries, comprising distinguished representatives from prominent fishing companies, exporters, importers, canned tuna packers, agents, brokers, retailers, equipment suppliers, researchers and analysts, consultants, financiers, international spokespersons, and governmental as well as non-governmental organizations. The TUNA 2022 hybrid event, aside from its unique setting/configuration, will provide two and a half days of interactive and insightful programmes that are very relevant to our current disruptive and ever-changing global market dynamics.

Early bird registration ends 15 August 2022. An exhibition will also be taking place concurrently with 40 booths made available, of which 30 are already taken up. Companies wishing to be part of this prestigious event can sign up for Sponsorship Packages – Platinum, Gold, Silver and Bronze – which will come with generous and attractive benefits.

In complying with the Shangri-La Hotel’s COVID-19 protocols, onsite participation is limited and will be offered on a first-come-first-served basis confirmation. Therefore, please register soon to secure your place.

Last but not the least, do not miss out on the special rates made available for your stay at the Shangri-La Hotel and other Satellite hotels.

For further details on TUNA 2022, please visit: http://tuna.infofish.org

Looking forward to seeing you soon in Bangkok as well as bringing you live feeds through our first-ever hybrid interactive online virtual platform!
Award for innovative pearl tissue culture

India - An independent scientist Dr Ajai Kumar Sonkar, received India’s fourth-highest civilian award, the ‘Padma Shri’ in the field of science and technology, from the President of India, Shri Ram Nath Kovind on 16 March 2022.

He is the author of an article entitled “Pearls through tissue culture – the promise” which was published in the November/December 2021 issue of the INFOFISH International. In his article, he explained that in traditional pearl culture operations, a live graft tissue fragment prepared from the mantle of a donor oyster is implanted into the gonad region of a recipient pearl oyster of the same species, together with a spherical shell bead nucleus in contact with the graft piece. However through his research while based on the Andaman and Nicobar Islands, Dr Sonkar had discovered an innovative in-vitro pearl tissue culture technique to produce black pearls. “Andaman has a great potential to produce rare black pearls from a species of marine oysters known as Pinctada margaritifera,” he said.

Dr Sonkar is continuing his research in a new laboratory facility that he set up in Prayagraj in the state of Uttar Pradesh, having successfully brought in black-lip pearl oysters from the Andaman and

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Nicobar Islands some 2 000 km away. He is the chairman of the Pearl Aquaculture Research Foundation.

Conservation of coral and turtles

Malaysia - The Ornamental Fish Centre in Port Dickson, located in the state of Negeri Sembilan, Malaysia is more than an aquarium open for public viewing. Run by the Department of Fisheries, a large part of its importance lies in its marine conservation initiatives, mainly related to endangered turtles (Hawksbills, Leatherbacks, and Green) and a wide range of coral species. The head of the Centre, Doreen Wei Siew Leen, said a total of 540 baby green and hawksbill turtles were released from its nursery facilities into the sea at several beaches around Port Dickson from January until July last year.

In addition, the Fisheries Department says that there are 46 coral reef species in the state, with five of them categorised as vulnerable. Among the coral reef species are Astreopora myriophthalma; Ctenactis echinata; Cycloseris cyclolites; Cyphastrea myriophthalma; Ctenactis echinata; Goniastrea edwardsi; Goniopora fungites; Galaxea astreata; Echinopora gemmacea; Favites abdita; Fungia fungites; Galaxea astreata; Goniastrea edwardsi; Goniodora columna and Leptastrea purpurea. Last October the Department had deployed 25 artificial reefs to encourage coral growth and fish collection. The area has been gazetted under the Fisheries (Prohibited Areas) Regulations 1994, Fisheries Act 1985, which stipulates that any fishing activities within one nautical mile of the beach are strictly prohibited.

New seaweed farming project for communities

India – A non-profit organization called Grow-Trees has launched a new seaweed farming project in Tamil Nadu to provide fishing communities with alternative, sustainable livelihoods. “We are providing equipment and expertise to fishing communities via a seaweed cultivation project in Munaikkadu, Mandapam Camp, Ramnad District, Tamil Nadu. This is being done to increase the income and self-sufficiency of the coastal community and subsequently, these women can train more marginalized communities to augment their earnings. We will of course fund the training and equipment and will leverage this experience to expand this module to other marginalized communities along the coast of India,” said Bikrant Tiwary, CEO of Grow-Trees, in a press release. Over 750 people are set to benefit from the project.

“These livelihood issues can be solved very simply. A single bamboo raft priced at Rs 2000 can be used to plant over 70 kg of seaweed seedlings and after 45 days, almost 230 kg of seaweed can be harvested and sold for Rs.65 to 70 per kg. Hence if a family has 40 to 45 such bamboo rafts, it can earn over Rs.800 per day and become self-sufficient. We call this scheme, the ‘Blue Revolution’ as it can help fishing communities to earn even when the fishing output becomes sporadic and unreliable. It can also help communities in need to supply much-in-demand raw material to industries manufacturing agar, agarose, carrageenan and alginates,” said Tiwary.

Bill to support offshore aquaculture research

Tasmania – The “Living Marine Resources Management Amendment (Aquaculture Research) Bill 2021” has been passed, a move which will generate offshore marine aquaculture research in Commonwealth waters off the coast of Tasmania. “This is a key step in supporting sustainable growth of Tasmania’s world-leading salmon industry through the 10-year Salmon Plan, to be in place by January 1, 2023,” the government wrote in a press release. “A core principle of this plan is to develop new research and innovation programs and to focus on offshore salmon farming. Importantly, it is intended that any marine aquaculture research would only be for fixed-term, limited-scale activities and in a defined research area.”

Meanwhile both the Tasmanian and Australian Governments have joined with other stakeholders to invest in the Blue Economy Cooperative Research Centre to conduct research and development into future offshore industries.

Harnessing the potential of seaweed

Bangladesh – This past February, the Fisheries and Livestock Minister addressed a workshop on the production and popularisation of seaweed products, organised by the Bangladesh Fisheries Research Institute (BFRI). “The government will take all possible steps to harness the potential of seaweed and other marine resources for the development of the blue economy”, said the Minister. “There is a huge potential for multifaceted use of seaweed in medicine, cosmetics and herbal products and making nutritious food,” he added. In addition to conventional marine fisheries, training needs to be provided for those involved in seaweed farming. “The versatile uses of seaweed should be given special importance and we need to increase seafood consumption”, the minister concluded.
Enhancing fish populations in Tonle Sap Lake

Cambodia — Mongabay reports that struggling freshwater fish populations in the Mekong River catchment received a boost in March when 1,500 captive-reared juvenile fish were released into Tonle Sap Lake in Cambodia. Experts say the release is the first step in rejuvenating the Mekong’s depleted fish populations and fisheries, which have been suffering in recent years due to overfishing, drought, habitat destruction, and the impacts of upstream dams on the Mekong River’s natural flow.

The fish, including critically endangered Mekong giant catfish and giant barb, and endangered striped river catfish, were released into a series of fish sanctuaries and community conservation areas that protect crucial fish nursery habitat in Tonle Sap Lake, the world’s most productive inland fishery. Long-term survival of the Mekong’s threatened fish species will also depend on protection of migration corridors and upstream spawning grounds, and on maintenance of free-flowing and connected watercourses, say experts.

Shrimp industry continues to struggle with diseases

Thailand — Due to continuing issues with diseases which is affecting the country’s domestic output of shrimp, local processors are increasingly relying on imported raw materials, according to the Thailand Shrimp Association. Although Thailand remains the 6th biggest shrimp farming country in the world with around 280,000 MT produced annually, the figure is sharply down from the 630,000 MT in 2012.

The reduction in local production has resulted in a USD 3.1 billion loss in annual export value over the past decade. Diseases have caused production costs to rise to around USD 5.00/kg, which is close to sale price. In 2022, shrimp production in Thailand is expected to reach 300,000 MT, up 7.1% from 2021 and up 11.1% from 2020.

Fishing Industry Association (PNG) goes for FISH Standard for Crew certification

Papua New Guinea — In a further move to ensure that their activities are in line with the ‘Social Responsibility and Human Rights’ pillar within the Responsible Sourcing Policy (RSP) framework, members of the Fishing Industry Association (PNG) are seeking the FISH Standard for Crew certification.
Industry Association (PNG) Inc., (FIA-PNG) have agreed to apply for the FISH Standard certification. FISH (Fairness, Integrity, Safety, and Health) is a third-party labour certification programme for crew on fishing vessels developed to provide assurance that commitments to crew treatment, compensation, and onboard conditions are being met. In coordination with FIA PNG fishing companies, the FIA PNG office (FIAO) has carried out webinars, capability building, and internal audit assessments.

A total of 32 tuna purse seiners are getting ready for the certification audit on site that will take place in Papua New Guinea in the first week of April 2022. The tuna fleets that will be audited are:

- Frabelle Fishing Group - 14 Tuna Purse seiners
- Bluecatch - 2 Tuna Purse seiners
- TPK Trans-Pacific Journey - 8 Tuna Purse seiners
- IFC International Food Corporation - 2 Tuna Purse seiners
- TSP Marine Industry - 6 Tuna Purse seiners

With an average of 28 crew onboard each tuna purse seiner, this certification process will assess almost 900 crew working onboard FIA PNG tuna purse seiners operating inside PNG’s Archipelagic Waters and its EEZ fishing area with an MSC tuna availability of 129 000 tonnes.

**Fishing gear recovery and reuse project launched by SATLINK, ORP and IPNLF**

The Maldives – Spanish company Satlink has partnered with the Olive Ridley Project (ORP) and the International Pole & Line Foundation (IPNLF) to establish a programme for the removal and reuse of abandoned, lost, or discarded fishing nets and other fishing gear (known as ALDFG) in the Maldives. Both organizations have ties to the coastal communities of Noonu Atoll, where the project will be developed together with local stakeholders. The initiative also includes the use of removed nets in pre-existing circular economy initiatives, whether for reuse or recycling, through the artisanal industry, small and mid-size enterprises (SMEs), and/or local artists.

Fishermen, citizen scientists and other local stakeholders in Noonu Atoll will participate in training workshops on various subjects, including the impact of ghost nets, ALDFG collection protocols, reuse opportunities and safe release techniques for sea turtles entangled in these nets. In addition, local scientists and biologists will collect and analyze information on the nature of drifting ghost gear in the Noonu Atoll area.

**Pacific trials new high-tech tools in response to illegal fishing**

**Solomon Islands** – Pacific Islands Forum Fisheries Agency (FFA) is building on its high-tech response to illegal and unreported fishing with new tools being trialled to complement its existing suite of monitoring, control and surveillance tools.

FFA Director Dr Manu Tupou Roosen said that as FFA’s collaborative surveillance Operation Rai Balang came to a close, it was useful to reflect upon the importance of the Pacific continuing to utilize cutting-edge technology. The participants of Operation Rai Balang included eight FFA Member states: Federated States of Micronesia, Kiribati, Nauru, Palau, Papua New Guinea, Republic of Marshall Islands, Solomon Islands and Vanuatu. This was supported by Quadrilateral defence partners: Australia, France, New Zealand and the United States.

“Our surveillance operations typically cover an area of over 13 million square kilometres of the Pacific so we always use a sophisticated combination of intelligence, analysis, satellite and remote monitoring and sea and air surveillance to ensure maximum effectiveness over such a large area,” said Dr Tupou-Roosen.

FFA Director of Fisheries Operations, Allan Rahari, said that FFA had been trialling two new technologies, Starboard Marine Intelligence, and satellite radio frequency detection.

Starboard is a web-based software that analyzes automatic identification system (AIS) data and creates vessel histories that highlight significant events, such as fishing activity, port visits, when two vessels meet at sea, and vessel detections in satellite data and from surveillance assets. It works on any device with an internet connection, enabling critical information to be accessed by a frontline staff member with a mobile device.

**Measures against illegal fishing**

**Cambodia** – The Khmer Times reported that on 5 April 2022, Minister of Agriculture Veng Sakhon announced measures to strengthen action against forest, wildlife and fisheries crimes.

These measures are:

- Lead and coordinate the relevant competent forces to ensure the use of necessary means to maintain and protect forest, wildlife and fishery resources within its jurisdiction.
- Prevent the burning, clearing and fencing of forest lands and flooded
forest lands by taking measures to control the storage, circulation and processing of all kinds of non-timber forest products, as well as to prevent and suppress all kinds of fishery crimes.

- In case of actual crimes, measures must be taken to prevent and crack down immediately according to the respective jurisdictions to avoid escalation of the crime.

Meanwhile, authorities of the fisheries in various provinces bordering the Tonle Sap continue to step up efforts to crack down on fisheries crimes as various reports show that certain fish populations are threatened by illegal fishing.

**IUU carding system improves governance**

EU - The EU IUU Fishing Coalition has published a report called “Driving Improvements in Fisheries Governance Globally: Impact of the EU IUU Carding Scheme on Belize, Guinea, Solomon Islands and Thailand”. The Coalition is a consortium of Environmental Justice Foundation, Oceana, The Nature Conservancy, The PEW Charitable Trusts and Worldwide Fund for Nature (WWF) to combat IUU fishing and improve transparency in the fisheries sector.

The report stated that fisheries governance in all four countries has improved, appearing particularly effective at enhancing legislative arrangements in non-cooperating countries. There were also improvements in compliance and enforcement, which are expected to give rise to social, economic and environmental benefits. The report also made a series of recommendations regarding the carding scheme and how it can be improved. Read more at: [http://www.iuuwatch.eu/wp-content/uploads/2022/03/2022-EU-IUU-Coalition-Carding-Study.pdf](http://www.iuuwatch.eu/wp-content/uploads/2022/03/2022-EU-IUU-Coalition-Carding-Study.pdf).

**Discussion with World Bank for sustainable and inclusive growth**

Sri Lanka - The Government of Sri Lanka and the World Bank convened a high-level policy dialogue to discuss the findings and recommendations of a report titled ‘Priorities for Sustainably Managing Sri Lanka’s Marine Fisheries, Coastal Aquaculture, and the Ecosystems that Support Them’. “The fisheries sector has the potential to make Sri Lanka competitive in the global markets and to increase jobs, food security, and export earnings in a sustainable manner for the benefit of local communities,” said the World Bank Country Director for Sri Lanka, Maldives, and Nepal. “New knowledge, innovative thinking, and close coordination between the public and private sectors are crucial to realizing this potential.
Sri Lanka’s marine fisheries sector was hit hard by the COVID-19 pandemic. Fish catches declined by as much as 20 percent and exports fell by 26 percent in 2020. National catches are not sufficient for domestic demand and need to be complemented by imports. In 2020, Sri Lanka imported USD 218 million worth of fish. Sustainable management of fisheries is key to ensuring Sri Lanka’s food security and meeting the high domestic demand for fish.

Conflict affects global whitefish market

Russia/Ukraine – Russia is the world’s leading supplier of whitefish, mainly pollock and cod. Russian fish is not only widely consumed in the EU, Japan, the US and South Korea, it is also processed in China and exported to these markets. The current conflict between Russia and Ukraine has therefore had a significant effect on the global whitefish market.

The trade between seafood importers and Russia was interrupted after the EU announced the list of the banks that would be removed from the messaging system of the Society for Worldwide Interbank Financial Telecommunications (abbreviated as SWIFT). SWIFT is used for approximately 70% of money transfers within Russia. However, Russia’s banking transactions with China are not affected because China has its own system. Other sanctions and embargoes are being implemented, and some retailers have also removed Russian fish from their outlets. In addition, there was an almost overnight surge in global fuel prices, which has led to increases in input costs for seafood production and export.

The longer the conflict goes on, the greater its effect will be on consumer prices for seafood. The Washington Post gave the example of higher prices for sushi in Japan as a result of Japanese government sanctions against Russian seafood. Products from Russia made up 8.6% of all seafood imports (mainly salmon, crab, roe and sea urchin) in Japan last year, making Russia the third-largest exporter of seafood to Japan, according to the Ministry of Agriculture, Forestry and Fisheries. Seafood imports from Norway have also declined because of rerouted and canceled flights out of Europe after sanctions limited access to Russian airspace. Furthermore, Japan announced that it is revoking Russia’s “most-favoured nation” trade status, which will result in higher tariffs for imported seafood. Reportedly, prices of popular seafood and delicacies are now soaring in Japan.

EU import value in 2020 affected by COVID-19

EU – “The EU Fish Market 2021” report stated that in 2020, extra-EU imports of fishery and aquaculture products totalled 6.15 million tonnes worth EUR 24.21 billion. Compared with 2019, they decreased by 9% in value for a loss of EUR 2.30 billion, and by 2% in volume, corresponding to a decrease of more than 125,500 tonnes. Nonetheless, imports of some of the major species – including salmon, warmwater shrimps and Alaska pollock – increased. Values fell more than volumes from 2019 to 2020 because of the more significant decrease of high-value species mainly destined for the HoReCa sector, which was included in the shutdowns initiated to control the spread of COVID-19.

Salmon, by far the main species imported in the EU, accounted for 16% of total extra-EU imports in volume and 25% in value in 2020 with Norway and the UK as its main countries of origin. In volume terms, cod comes after salmon among most imported species, with again Norway as the main supplier and, to a lesser extent, Iceland and Russia. Among most valued species, on the other hand, shrimps come after salmon, and more specifically warmwater shrimps (frozen shrimps of the genus Penaeus), as well as miscellaneous shrimp species. Ecuador, Vietnam and India are their main countries of origin. Imports from China are largely constituted by frozen fillets of Alaska pollock, while imports from Morocco are more diversified: sardine and fishmeal cover the largest shares in volume but most of their value is represented by octopus and squid with the latter largely originating from the Falkland Islands. Skipjack tuna is also among top-valued species imported in the EU, with Ecuador as its largest supplier.

Rebound in Vietnamese tuna exports to the EU

Vietnam/EU – The Vietnam Association of Seafood Producers and Exporters (VASEP) reported that in 2021, Vietnam was the 7th largest supplier of tuna for EU markets, following Ecuador, Seychelles, the Philippines, Papua New Guinea, China, and Mauritius. Due to the costly ocean freight costs in 2021, there was a shrink in the EU’s imports of tuna from Asian countries, namely China, the Philippines, Indonesia, and Thailand, in contrast to the rising imports from African or Central American countries like Seychelles, El Salvador, and Ecuador.
In the early months of 2022 however, Vietnamese tuna exports to the EU countries have recovered. Export turnover in January 2022 approximated US$15m, almost double that for January 2021. While the upward trend of tuna exports to the EU is expected to continue this year, Vietnamese tuna processing and exporting enterprises may face challenges such as increased transportation costs and production costs (the price of pre-processed fish, sunflower oil, etc.) due to the conflict between Russia and Ukraine. These issues are expected to affect product prices and reduce the competitiveness of tuna enterprises in target markets such as the EU.

**Higher costs divert March supplies from Asia to the EU**

**Norway** - The Norwegian Seafood Council (NSC) reports that despite the tense global trade situation, the export value of Norwegian seafood has never been higher in a first quarter than in 2022. In the first three months of the year, Norway exported seafood worth NOK 34 billion. This is a growth in value of 22%, or NOK 6.2 billion, measured against the first quarter last year.

While the share of seafood exports to Asia increased in the first two months of the year, it was lower in March. “Complicated logistics due to closed
airspace over Russia and new shutdowns due to increasing corona infection rates in China have changed the flow of goods. In March, we see, among other things, that the share of the EU is increasing”, said CEO Renate Larsen.

The USA was the largest growth market for Norwegian seafood in the first quarter. Exports increased by NOK 785 million, to a total of NOK 2.6 billion. This was followed by France, with a growth of NOK 730 million, to NOK 2.5 billion. China was in third place with a growth of NOK 668 million, to NOK 1.8 billion. “The loss of exports to Belarus and Ukraine has had a relatively small impact on salmon exports. Last year, the share of these markets was about 2% of total salmon exports. However, high salmon prices and increased costs for shipping to Asia have led to a shift in the flow of goods from Asia to the EU in March. This is the opposite of the trend from January and February”, said NSC Seafood Analyst, Paul Aandahl.

Australian report ‘Don’t Mince Words’ targets plant-based labelling

USA/Australia – The National Fisheries Institute (NFI), in referring to the Australian Government’s new ‘Don’t Mince Words’ report, asserted that it is needed to bring clarity to the market. “Research shows consumers are clearly confused and rather than ignoring this growing issue, legislators, regulators and stakeholders in Australia are taking it head on,” said NFI President John Connelly. “It’s a proactive approach that starts with an understanding that vegetable amalgams aren’t meat and shouldn’t be labelled as such. Now, policymakers there are being directed to figure out exactly how they should be labelled.” The NFI says that the U.S. Food and Drug Administration (FDA) should also fulfill its own responsibilities to enforce its existing labelling requirements to inform American consumers.

The report was released by the Australian Senate Committee with oversight of fisheries and agriculture issues. It recommends the development of a “National Information Standard that defines and restricts the use of meat category brands to animal protein products” only. “The Committee’s recommendations will help ensure animal protein terms, imagery and descriptions are used on actual animal products,” said Seafood Industry Australia CEO Veronica Papacosta. “We welcome increased consumer competition, that’s good for everyone, but if the products aren’t marketed in a fair and honest way, that’s good for no one.”

(Visitor’s note: Please turn to the Publications page to read a synopsis of this report.)

Thai Union partners with SFP

Thailand - Thai Union Group has entered into a partnership with Sustainable Fisheries Partnership (SFP) to further improve transparency in the Company’s supply chains. The partnership will allow Thai Union to continue to improve the monitoring, transparency and traceability of its supply chains, as well as assess and monitor its global wild and farmed supply chains used in its businesses in the EU, U.S. and Asia. Additional sustainability indicators, such as certifications, Human Rights Risk Assessment, NGO ratings and traceability will be included in the monitoring.

It will also allow Thai Union to continue to deepen its participation in the Ocean Disclosure Project (ODP), with supply chain and sustainability information to be made publicly available through the
Report finds that squid fishing is in dire need of regulation

A new Greenpeace International report called ‘Squids in the Spotlight’ raises the alarm on what it says is a rapidly growing and largely unregulated squid fishing industry. The report notes that the global squid fishery has grown over 10-fold since 1950 to almost 5 million tonnes annually in the last decade and is now jeopardizing marine ecosystems around the world. Some fishing areas are seeing a more than 800% increase in the number of vessels in just the last five years.

The ocean’s resources sustain the livelihoods of about 3 billion people worldwide, the vast majority of whom live in developing countries. But those livelihoods are under threat, as the ocean and its ability to sustain life are in grave danger due to human activities, such as pollution and overfishing. Every year, an estimated 5 to 12 million metric tonnes of plastic flow into the ocean, which represents 95% of our planet’s biosphere. And due to overfishing, the percentage of fish stocks within biologically sustainable levels fell from 90% in 1990 to less than 66% in 2017.

The 4th Oceans Forum led by the United Nations Conference on Trade and Development (UNCTAD) was held from 6 to 8 April 2022. It was a unique platform to identify opportunities to find solutions for using trade as a tool to protect the ocean and its resources, accelerating the implementation of Sustainable Development Goal 14’s trade-related targets.
Papua New Guinea’s tuna sector at a crossroads between growth, sustainability

Sylvester Pokajam, the president of Papua New Guinea’s Fishing Industry Association, is calling on his country’s government to reform its National Fisheries Authority’s policy document, which guides its regulation of the sector.

In a 4th March statement, Pokajam said the policy – adopted in 2018 – had never been discussed or approved by the NFA, which he ran from 2004 to 2014, claiming it was “hijacked” by outside interests and sent directly to former PNG Prime Minister Peter O’Neill for approval.

The policy is dragging on efforts to improve and grow the country’s tuna industry, according to Pokajam. Between 1998 and 2013, six new tuna processing plants were built in PNG, but investment has been scarce since then, he said.

“In fact, we had two project agreements signed by the state and the companies from China and South Korea but they (companies) pulled out,” Pokajam said. “They pulled out because the problem is this, the policy was not able to address their interest. Therefore, the government, through NFA, must review its policy in terms of vessel scheme rates and soon.”

The most significant problem with the current policy document is the higher prices it charges for the country’s vessel-day scheme, which governs its tuna-fishing sector. Pokajam said other Pacific nations are charging USD 6 000 to USD 7 000 (EUR 5 470 to EUR 6 380) for daily access for their domestic fleets, but in PNG, the cost is USD10 500 (EUR 9 600) daily. Those higher prices are passed through to processors, which have threatened to close due to high operational costs, he said.

“The processing plants will close down and fishing will go bilateral and there will be no more PNG flag,” Pokajam said. “This is the danger and that is the advice I got from the industry.” In late February, Pokajam told The National that the number of tuna purse-seiners flagged to Papua New Guinea had dropped significantly as a result of the higher prices. “More PNG flagged vessels are reflagging to other PNA countries, especially Nauru and FSM (Federated States of Micronesia),” Pokajam said. “Since 2019, a total of 28 vessels reflagged to FSM and 9 reflagged to Nauru.”

Pokajam said these two countries “offered discounts on vessel-day scheme fees and facilitated access for vessels to fish in the first Eastern High Seas fishing zone.” Only a dozen purse-seiners remain flagged to Papua New Guinea, Pokajam said. National Fisheries Authority (NFA) Acting Managing Director Justin Ilakini previously told The National that the country needed “conducive policies in place to attract vessels to carry the PNG flag and fish in the country’s fishing zones.” The standoff comes as FIA said it will pursue FISH Standard for Crew certification for 32 of its purse-seiners, operated by five separate companies.

An accredited third-party certification program, the FISH Standard for Crew seeks to ensure that fish sold all around the world is harvested by crews who are ethically hired, treated with respect, paid properly, and allowed fair access to address grievance. Besides ensuring crews are treated fairly, the certification provides assurance to buyers that their tuna comes from a responsible source, according to PNG Fishing Association Sustainability Director Marcelo Hidalgo.

“This journey took FIA PNG across a robust due diligence process implementation that started in 2018 that included policy development, procedure development and implementation, audit tools, internal webinars to increase awareness, and internal audits,” Hidalgo said. The commitment follows from FIA PNG’s adoption of a responsible sourcing policy in 2018, Hidalgo said.

The audit for the FISH Standard for Crew certification will take place in Papua New Guinea in the first week of April 2022. Fourteen purse-seiners operated by Frabelle, eight operated by Trans-Pacific Journey (TPJ), six owned by TSP Marine Industry, and two each owned by Blue Catch and International Food Corporation (IFC) will be included in the audit.

“With an average crew on board of 28 crew per tuna purse-seiner, this certification process will assess almost 900 crew working on board FIA PNG tuna purse seiners operating inside PNG’s archipelagic waters and its exclusive economic zone fishing area with a Marine Stewardship Council [Marine Stewardship Council] tuna availability of 129 000 metric tons,” Hidalgo said.

In late 2019 and early 2020, Frabelle and RD Fishing initiated a trial of the FISH Standard for Crew audit process. Out of that effort came a standard procedure, training program, and...
audit tools for the FIA to disseminate to its members – an effort that was supported and reviewed by an international stakeholder technical working group that included Human Rights at Sea, Conservation International, the Global Tuna Alliance, and Fish Wise.

“This stakeholder working group provided critique and feedback to increase the comprehensive approach that is aligned with more than 20 guidance documents, regulations, good practices, and standards based in ILO C188, IMO, and human rights conventions that look after the crew welfare and working conditions,” Hidalgo said.

The Papua New Guinea Fishing Industry Association’s purse-seine skipjack and yellowfin tuna fishery received Marine Stewardship Council certification in May 2020. The fishery includes on-shore processing plants in Papua New Guinea (PNG), supported by PNG-flagged vessels and locally based foreign fishing vessels. According to an FIA fact sheet, the tuna industry organization collectively operates 48 tuna purse-seiners with MSC certification and six factories with MSC chain of custody certification, with a combined processing capacity of 980 metric tons daily. The fleet has 100 percent on-board observer coverage despite COVID-19, and 91 percent of its tuna is caught from unassociated, free-school sets. Data from the fleet is collected via the Papua New Guinea government’s Fisheries Information Management System (iFIMS), Hidalgo said.

“We’ve got the certificate and now we are moving to work on the tropical rock lobster in the Torres Strait, following a treaty between Australia and PNG,” Hidalgo said. “It takes time to do the right thing in a responsible manner. In this way, FIA PNG members are increasing the recognition of their good practices with the people working on the fishery, the natural resources, and the planet.”

Pokajam said the MSC certification and the PNG fleet’s other efforts toward sustainability are a major selling point for the country’s tuna. And he said the fleet is now pushing for MSC certification of its other fisheries.

“We are now certified Marine Stewardship Council (MSC) fisheries so that is the way to go,” Pokajam said. “We’ve got the certificate and now we are moving to work on the tropical rock lobster in the Torres Strait following a treaty between Australia and PNG.”


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Promoting sustainable fishing and processing best practices.
INSURANCE SERVICES FOR THE ASIAN SMALL-SCALE FISHERIES SECTOR

By Raymon van Anrooy, Fabiola Espinoza Córdova and Suchitra Upare

A recent FAO review of fisheries and aquaculture insurance found that in Asia the underwriting experiences in both capture fisheries and aquaculture insurance were good over the last decade and seem to have improved in recent years. An estimated 275,000 fishing vessels are insured and at least 32,000 aquaculture farmers in Asia have some stock mortality insurance cover. However, more than 1.8 million fishing vessels, mainly small-scale, still operate without insurance cover in Asia. Insurance coverage can be increased through awareness raising of fishers about the benefits of insurance, capacity building of insurers about the fishing and aquaculture business, and gradual adoption of compulsory insurance requirements in legislation.

Commercial fishing is a risky business. The Food and Agriculture Organization (FAO) estimates that every year, more than 32,000 fishermen and women die during fishing operations across the world. The numbers of fishers injured or suffering from work-related illnesses are much higher. Fishers often work long hours under harsh weather conditions, increasing the likelihood of accidents or injury.

Most of the 39 million fishers worldwide are active in small-scale fisheries and 85 percent of the fishers live in Asia (FAO, 2020). Small-scale fishers generally do not participate in or have access to government-supported social security systems. Many small-scale fishers are self-employed or work on vessels without formal contracts. If their vessel sinks or they get into an accident, they will have no income.

Fisheries insurance can help to secure incomes and investment in fisheries, and to bring greater social and economic stability to fishing communities. Access to insurance services strengthens the capacity of fishers and fishing communities to adapt and thrive in the face of accidents at sea or natural disasters.

In 2020-21 the FAO conducted a world review of capture fisheries insurance. The findings will be published later in 2022, but some highlights from the Asian region are contained in this article in the following sections.

The insurance market

Asia is the fastest-growing region in terms of gross written premiums for non-life insurance (Staib et al., 2019). China and Japan are two of the largest insurance markets in the world while Bangladesh, Vietnam, and China have made improvements in the regulatory framework for insurance services provision in recent years. They have gradually

Some insurance benefits to fisheries businesses

- Protection against accidents and natural hazards.
- Compensation for loss/damage to fishing assets (vessels, equipment, infrastructure).
- Coverage of third-party liability.
- Compensation in case of crew injury and loss of life.
- Increased access to institutional credit and investment.


opened their domestic insurance and reinsurance markets to foreign insurers. These developments have made a positive impact on the fisheries and aquaculture insurance markets.

**Supply and demand**

The demand for capture fisheries insurance in the region has dropped slightly over the past decade. This is primarily due to a reduction in industrial fishing fleets, especially in Japan and China. However, the decline in industrial fleets and its corresponding insurance demand do not apply to small-scale fishing vessels. Demand for insurance in small-scale fisheries is high but largely unmet. For example, in China and India, only respectively 6 percent and 5 percent of the fishing vessels operating in 2019 were insured. Considering that 68 percent of the world’s fishing fleet operates in Asia (FAO, 2020), the overall demand for fisheries insurance remains high in the region.

The demand for aquaculture insurance among small-scale farmers in Asia has increased. Most large aquaculture producing countries in Asia (except for Bangladesh) have aquaculture insurance programmes in place. Some programmes are implemented successfully by public insurance companies, others remain in a pilot stage, and some governments actively seek public-private partnerships for insurance provision to the sector. Despite the positive developments, the proportion of aquaculture production covered by insurance is low. In China the aquaculture area underwritten in 2019 amounted to over 50,000 hectares, which represents less than 1 percent of the estimated total aquaculture area in the country.

Central and local governments continue to play a key role in the supply and promotion of insurance to small-scale fishers in Asia. These fisheries and aquaculture insurance programmes are often supported by premium subsidies ranging from 20 percent to 100 percent of the premium value, depending on the country and characteristics of the fishing vessel or aquaculture operation. The subsidies are not only available for fishing vessels or aquaculture stock mortality cover, but also for accident- and health insurance products. Subsidized programmes are undoubtedly contributing to the advancement of insurance provision to the sector in the region.

The main constraints to the provision of insurance to small-scale fisheries (and aquaculture) remain the same as those noted a decade ago: small-scale fishers/fish farmers’ lack of access to financial and extension services, lack of financial literacy and limited awareness of insurance benefits. Insurers continue to be risk-averse mainly due to limited knowledge about fisheries and aquaculture businesses and their operations as well as the high administrative costs involved when dealing with remote fishing communities.

**Underwriting and production assets covered**

Mutual insurance arrangements are the most common type of insurance services available for small-scale fishers in Asia. In China and Japan nearly 80 percent of the capture fisheries/aquaculture policies are underwritten through such arrangements. It should be noted that these countries have strong institutional frameworks that allow producer organizations to manage mutual insurance.

New models for aquaculture insurance have been piloted and are currently being implemented in a few countries. For example, in Indonesia, subsidy insurance programmes are run by the government in partnership with insurance companies. In China, private companies provide insurance to aquaculture cooperatives through the so-called “cooperative plus commercial insurance” scheme. In India and Bangladesh there are several NGOs and microfinance institutions which are increasingly involved in insurance distribution.

The most common types of fishing vessels insured do not differ much from those reported a decade ago. They are: bottom trawlers, pelagic trawlers, purse seiners, seiners, longliners and tuna pole-and-line vessels. The types of hull materials accepted for insurance coverage remain broadly the same: steel, glass reinforced plastic (GRP), aluminium and wood.

The range of species and culture systems covered by aquaculture policies worldwide is diverse and has increased in recent years, though most insurers continue to focus on insuring the aquaculture species and systems they are most familiar with.

**Aquaculture production systems that can be insured**

- **Offshore:** Marine cages, barges, oyster and mussel hang culture/rope/line and bottom culture
- **Onshore:** Ponds, greenhouse tanks, recirculation aquaculture systems (RAS), submersible and semi-submersible systems, raceway and gravity tanks, hatcheries and on-growing units

**Policies in force**

Capture fisheries insurance policies generally cover fishing vessels (i.e. marine hull), gear/equipment protection (i.e. machinery) and/or provide safety and liability protection (i.e. P&I insurance, employer’s/crew liability and public
liability. Insurance for catch loss and revenue variations are not common. For aquaculture insurance, policies mainly provide coverage for stock mortality (in situ and in transit), although P&I (including third-party liability) and protection for buildings and onshore aquaculture equipment are also widely available.

FAO estimates that there were 2.86 million motorized fishing vessels in the world in 2018, of which 2.1 million vessels are from Asian countries (FAO, 2020). Some 450,000 of these vessels are covered by insurance according to the latest information. In the Asian region it is estimated that there are around 275,000 insured fishing vessels. This means that more than 1.8 million fishing vessels operate without insurance. Japan is the country with most insured fishing vessels. Approximately 112,000 fishing vessels are insured in Japan. China is the second largest market with 55,500 insured vessels, followed by the Philippines with 40,467 and India with around 7,000 vessels insured. In Indonesia and Viet Nam the number of fishing vessels insured is estimated to be above 30,000.

In terms of aquaculture insurance, the number of insurance policies available in the region has at least quadrupled in the last 15 years. In 2020, the total number of aquaculture insurance policies in Asia is estimated at 32,000, including 15,000 in Indonesia and 12,000 in China, but this figure is likely an under-estimate.

**Risk management and handling of claims**

Risk management and claims handling processes have not changed much in the last decade. Insurers continue to use per-acceptance surveys in their risk assessment process. Where insurance is offered through mutual insurance associations, members of the fishers organizations (in the case of China and Japan, mainly) are often involved in risk management practices as well as claims handling procedures. In-house risk surveyors are also often used.

**Underwriting experiences**

Underwriting experiences differ greatly among insurance companies and years. In general the underwriting experiences in both capture fisheries and aquaculture insurance were rather good over the last decade and seem to have improved in recent years (e.g. in Japan, China and India). However, the impacts of extreme weather events such as cyclones in India and typhoons in China, Japan, and the Philippines (in 2013 and 2018) negatively affected the underwriting experiences in both sectors.

**Increasing access of small-scale fishers to insurance services**

Closing the gap between demand and supply of insurance services for small-scale fishers and aquaculture farmers requires concerted efforts. Policy and decision-makers will need to understand that insurance services are essential for strengthening the sustainability of fishing and aquaculture operations, and will contribute to their ecological and economic viability. Moreover, government investments in affordable life- and accident insurance for fishers and aquaculture farmers will contribute to social protection.

Awareness raising among small-scale fishers and aquaculturists on better risk management, disaster preparedness and insurance services is needed. There is still much capacity to be built among insurance providers, fisherfolk organizations, NGOs and government agencies, in the design and implementation of insurance programmes that suit the needs of small-scale fishing and aquaculture communities.

Gradual adoption of compulsory insurance requirements in national legislation, for instance through linking fishing
Insurance supply is competitive for large-scale industrial fishing vessels, especially for those operating in areas under the mandate of regional fisheries management organizations (RFMOs). These vessels are often well covered by insurance (marine hull insurance and P&I). As they operate in areas beyond national jurisdiction (ABNJ) and in the exclusive economic zones (EEZs) of countries other than those they are flagged to, their insurance needs are often set by RFMOs, in line with International Maritime Organization (IMO) Conventions, and/or the laws of the coastal states of the EEZs they operate in or pass through.

Various IMO Conventions include compulsory insurance requirements for large vessels, and do not distinguish between merchant marine or fishing vessels. Some of the most relevant Conventions are:

- the **International Convention on Civil Liability for Bunker Oil Pollution Damage 2001** (Bunkers Convention), which requires shipowners of vessels of 1,000 tons or more to obtain either insurance or another type of financial security to cover liability, as established under international law or any applicable international regime.

- the **Nairobi International Convention on the Removal of Wrecks 2007** (Wreck Removal Convention), which applies to any seagoing vessel of 300 tonnes (24 metres in length) or more – including large fishing vessels – and provides the basis for a shipowner’s liability with regard to wreck removal costs. The vessel’s registered owner is required to have insurance or other financial security to cover wreck removal costs.

Most Asian countries have ratified these IMO Conventions and have integrated compulsory insurance requirements in their legislation for large vessels. However, few countries have done so for small- and medium-scale fishing vessels. The introduction of compulsory insurance for smaller vessels also needs attention.

Fishing and aquaculture businesses that care about their property, personnel and the environment make sure that they are insured. Insurance contributes to the sustainability of the fishing and aquaculture business, providing compensation for damage and loss and helping to restart businesses after accidents and natural disasters.

**Further information**

- FAO has published brochures on “Insurance for small-scale fisheries” and “Aquaculture Insurance for small-scale producers”. A handbook for insurance and fisheries stakeholders was also prepared in 2019 containing guidelines for increasing access of small-scale fisheries to insurance services in Asia. These guidelines are being implemented by Asia-Pacific Rural and Agricultural Credit Association (APRACA) membership consisting of rural finance organizations from 24 Asian countries.

- The Global Network for capacity building to increase access of small-scale fisheries to financial services (CAFI SSF Network) acts as a platform where members promote, develop and facilitate capacity building, knowledge exchange, advocacy and awareness, share experiences, good practices and provide support and advice to stakeholders to increase access of adequate financial services for SSF (small-scale fishers and small-scale aquaculture) producers.

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4. Information about APRACA can be found at: https://www.apraca.org/
5. For more information on CAFI SSF, please contact CAFI-SSF@fao.org or visit: https://www.linkedin.com/in/cafi-ssf-network-388253191/
RESTORING FISHERIES IN ASIA: LOOKING AT AREA 57 TO SEE HOW FISHERY ASSESSMENTS ARE ESSENTIAL FOR SUSTAINABLE FISHERIES

By Simon Funge-Smith and Rishi Sharma

FAO Fishing Area 57, stretching from the Bay of Bengal down to western Australia, contains some of the most intensive coastal small-scale fisheries in the world, as well as oceanic tuna fisheries. Building long-term capacity to assess and manage fisheries sustainably in the region would result in strengthened capacity for fishery management in Southeast and South Asia and improve understanding of country level progress towards relevant Sustainable Development Goals. Some of the preconditions include leveraging of national or international financing, and recognition of the importance of a harmonized regional approach.

Fisheries are a critical component of food security and livelihoods, as well as an important part of the economies of Southeast and South Asia. The marine fisheries of this region are contained within the UN Food and Agriculture Organization (FAO) Fishing Areas 57 and 71.

FAO Fishing Area 57 comprises the Bay of Bengal with its densely populated coastlines, all the way down to the west coast of Australia and the oceanic fisheries that lie between. This Area contains some of the most intensive coastal small-scale fisheries in the world, as well as oceanic tuna fisheries. The fishery landings of Area 57 that include parts of western Australia and South Asia (wild capture, excluding aquaculture), have averaged 8 million tonnes per year since the mid-1990s (Figure 1), and have demonstrated a continual increase in landings throughout this period.

FAO estimates that 18 million people are directly employed in the fisheries sector in Area 57, with over a million active vessels of all sizes. Most of the fish caught are used directly for food, with a variable amount (5%) of the catch from the trawl fisheries used for fish meal and fish oil. A substantial amount of this fish is exported and traded within the region and internationally with a total value of nearly US$20 billion, of which only 5% is from commercial tuna fisheries (Figure 2).

Figure 1: Landings of all stocks in Area 57 over time (NEI marine fishes and others comprise greater than 50% of the landings)

Despite the importance of fisheries in Area 57 to the Asian economies, the scientific monitoring and management of many stocks do not apply scientific stock assessments. The data used for inference on stock status in Area 57 come from a smaller number of stocks and landings (Figure 3, based on 43% of landings for the region) than the total fisheries of the area. Sustained increases in landings do not necessarily mean that the fishery resources continue to be sustainably utilized. It is essential to balance landings data with an understanding of the status of the stocks that form these fisheries. Without stock assessments, it is impossible to determine whether fish populations are depleted to the extent that they are no longer able to provide the biological and economic stability for continued investment by small, medium and large enterprises, or to identify capacity for increased production.

**Difficulties in determining sustainability**

From the early 1970s the rapid expansion of commercial marine fisheries in the region ran relatively unchecked as there was previously very limited commercial fishing effort prior to 1955 and the fished stock was able to accommodate this increasing effort.

Starting in the late 1980s and early 1990s, there were increasing signs that fishing was creating impacts on a wide variety of stock across many of the region's fisheries, primarily due to motorization and expansion of trawl-based fishing techniques. Establishing measures to address this was challenging, as management frameworks had not been upgraded to match the rapid expansion of fisheries and it was difficult to provide a coherent answer to the question of “how much fish, and what types, can this fishery provide sustainably?”.

Even if it was acknowledged that there was over-capacity and overfishing, there were few obvious solutions to addressing this issue, without significant reduction in both commercial and small-scale fishing fleets, and loss of employment in the capture and processing sectors. This was a problem that was politically difficult to address as most of the short-term outcomes appeared unattractive in terms of reduced profitability, incomes and lost employment.

Although there have been increasing efforts by the Southeast and South Asia countries in Area 57 to improve and sustainably manage their respective fishery resources, there remain challenges in delivering effective management based on understanding of the state of fishery resources. This is partly due to low national capacity in some countries but also the complex and diverse characteristics of their marine capture fisheries, involving multi-species and multi-gears. The region's fisheries range from large-scale industrialized fisheries for pelagic fishes like oil sardine, herring, and tuna, to artisanal fisheries for nearshore and estuarine species.

The fishery management approaches are also diverse and operate across many scales and management issues are difficult to address. It is evident that there is no management approach that will be effective across the wide range of scales, gears and contexts that are found in Area 57. However, despite the problems identified, solutions are possible using small cooperative co-management approaches. There is a growing body of research on small-scale and artisanal fisheries that suggests that despite the lack of traditional top-down management by central governments, many of these fisheries have managed to avoid the “tragedy of the commons” problem where common-pool resources are inevitably degraded (Feeny et al. 1996; Ostrom et al. 1999).

The limited assessment and poor understanding of the state of fisheries resources has implications for sustainability and achieving SDG 14 targets, which are evaluated on single species level, but also has direct ramifications for economic consequences to the countries. The draft texts of the WTO agreements on fisheries subsidies, mainly focus on subsidies that contribute to certain forms of IUU fishing activities that lead to overfishing and overcapacity.
Over the past fifty years, various methodologies on stock assessment have been used to attempt to determine the status of commercially exploited fish stocks, but these have rarely provided the necessary answers to inform fishery management for decision-making. The limitations on appropriate multi-species methods, limited data and human capacity for stock assessment remains a major challenge for the Southeast and South Asian countries in Area 57 region.

Application of modern stock assessment methods would allow for an evaluation of the successes and failures of the differing approaches. Thus, building capacity to apply new methods and conduct meaningful assessments that can inform management and achieve the results of stock rebuilding and sustainable use, is of paramount importance in this region.

The case for a regional approach

Countries have to act nationally to manage fisheries, but there are also powerful reasons for aligning and harmonizing actions for a collective regional outcomes. These are in line with the ongoing and previous regional initiatives, that have so far been unable to develop the necessary focus on this key aspect of fishery management and sustainable use.

A map of the global coverage of stock assessments that are used to infer the state of the world’s marine fisheries shows that whilst South and SE Asia have a significant percentage of global fishery landings, there are very limited assessments of the state of these fishery resources (Figure 4). The number of stocks evaluated for assessments relative to the landings is lower than 5% in most cases.

There are signs of increasing commitment to try to resolve some of the more pressing issues related to unsustainable fishing in the region. Global Environment Facility (GEF)-funded Large Marine Ecosystem (LME) projects have focussed on improving the overall assessment frameworks and implementation of robust management plans that would improve the sustainability of these sectors over the next decade. An example in Area 57 is the Bay of Bengal LME Strategic Action Plan, which contains multiple targets related to marine living resources:

- Restore fisheries resources that are degraded.
- Restore and maintain species composition.
- Reduce the proportion of juvenile fish caught and/or retained.
- Restore biodiversity status of 1980 by 2025.

There is a major challenge to develop effective ways to track these fisheries and to use this information to develop meaningful management responses. Part of this challenge has been the very wide variety of gears used and the mixed stocks that are exploited in these fisheries, especially the demersal coastal fisheries. Hence, finding uniform measures...
that address multiple stocks and scales has been difficult, other than having a blanket reduction in landings, complete closures, or large effort reductions across all sectors.

Knowing what measure and how to define what contributes sustainable management has been a problem in the region. There is still a requirement for some sort of basis for how to establish the levels of maximum effort, what types of gear and the respective allocations for the small-scale and large-scale segments of the fishery. Alongside these are economic and food production goals for the region, which puts other issues into focus, like “What is the effect on overall marine biodiversity and system resilience of these decisions for the region?”

The capacity to use improved assessment methods that use local knowledge and representative sampling methods, enables the identification of priority species and stocks for rebuilding or sustainable long-term use. Linking this to management planning and enforcement is also a critical step, if we are to avoid the science-policy (or assessment-management) disconnect that has been a common feature of stock assessment in the past.

Building long-term capacity to assess and manage fisheries sustainably in the region is an important step towards being able to frame and answer these questions, and would have four beneficial outcomes:

- Improved understanding of the status and trends of fisheries, and strengthened capacity for fishery management in Southeast and South Asia.
- Strengthened capacity of national and relevant regional fishery organizations (e.g. SEAFDEC, BOBP-IGO) to facilitate development and application of appropriate fishery assessment models that can be applied by countries to multi- and single-species fish stock assessments.
- Contributes to rebuilding, restoration, and sustainable use of marine capture fisheries resources to support Asian countries in Area 57.
- These also improve understanding of country level progress towards SDG 14 Goal that in turn helps to empower and promote better management of the fishery resources. An indirect effect of this is an improvement in contribution to SDG 2 (zero hunger) as fisheries are a substantial portion of the protein diet of these regions.

Achieving these outcomes requires leveraging of national or international financing, and a realization at national and international level of the importance of this type of investment. There is also a need to be realistic with respect to available financial resources and human capacity needed.
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to determine how many stocks within a country need to be monitored, in order to track the current state and trend of fisheries within a fishing area.

This will strengthen regional and national governance and fisheries management planning frameworks in Area 57 in particular, and also across the South and Southeast Asian regions. Ultimately it will provide better awareness of the approaches to sustainably manage fisheries using appropriate management procedures, thus optimizing regional objectives and contributing to the achievement of SDG 2 and SDG 14.

References

ONE HOOK, ONE LINE, ONE FISH AT A TIME

By Emilia Dyer

“One hook, one line, one fish at a time” creates environmental, social and economic benefits which ripple throughout our oceans and the coastal communities connected to them. This article by the International Pole and Line Foundation (IPNLF) relates the stories of a few one-by-one fishers in Cape Verde, Azores, and the Canary Islands, but they could just as well represent millions of small-scale fishers and fish workers in other parts of the world whose lives and livelihoods are entwined with the ocean. The International Year of Artisanal Fisheries and Aquaculture (IYAFA 2022) is a timely reminder that the efforts of these men and women must be recognized and supported.

One-by-one fishing lies at the heart of many coastal communities around the world. For many, this way of fishing has become an integral part of their culture. Each is distinctively unique, from the dramatic islands of the Azores to the ancient fishing villages of Indonesia, and from the busy coasts of Brazil to the abundant seas of South Africa. These regions are often characterized by their remoteness, challenging topography and economic dependence on this age-old method of fishing which unites them as communities and bonds them with the ocean.

Such localized, small-scale fishing not only brings communities together in culture, it provides for their daily meals and it can lift them from poverty, empowering them to take on commercial opportunities. Just one man on his boat, catching tuna - one hook, one line, one fish at a time - creates environmental, social and economic benefits which ripple throughout our oceans and the coastal communities connected to them.

The International Pole and Line Foundation (IPNLF) is a charity that represents these small-scale one-by-one tuna fisheries while simultaneously pushing the industry to focus more on sustainability. Our vision for the future is a world with thriving fisheries that work in balance with nature by catching one fish at a time. This is why we work, both directly on the ground with local coastal communities and with decision-makers such as RFMOs, local governments and other NGOs. We recognize the importance of championing and promoting local, traditional methods of fishing as they currently fight for their place in the supply chain against industrial bodies. We believe that these communities hold the answer to the future of our oceans as we move away from overfishing towards a more holistic approach to sustainability in which we take social and economic elements into account for driving change as a responsible approach.

Livelihoods through one-by-one fishing

People lie at the heart of what we do and we’d like to tell their stories. We created “Tuna Tales- In Balance With Nature”, a documentary series for the Tuna Tales Project which unites the stories of one-by-one fishing communities around the world. It spans from the immense beauty to the harsh challenges of this way of life. One-by-one provides opportunities to those who would have otherwise been limited, like Susana Sousa, who’s able to have her freedom and put her daughter through university.

Our oceans are at risk as a result of decades of industrial overfishing which is driving down fish stocks, decimating...
biodiversity and overwhelming our oceans with pollution. The impacts of these destructive fishing activities is putting the future of people’s livelihoods and families, like Alfredo Durão’s, at risk and is being felt, increasingly, among the day-to-day lives of artisanal fishers like Jesus Machín.

**Susana Sousa, São Jorge Island, Azores**

Artisanal fisheries create 90% of jobs in the fisheries sector. One-by-one fisheries, like these in the Azores, provide these opportunities to a far greater number of people for each tonne of tuna they harvest. That is why the one-by-one fishery is so important for São Jorge island, not only for the fishers and the dock workers, but for the women who are offered opportunities to create their financial independence in the Santa Catarina Factory. Together they form a cohesive coastal community. People like Susana Sousa, for whom the one-by-one fishery provides her with a job, an income, and her freedom. “When we have our jobs, we have our salaries, and we have our freedom. We don’t depend on anyone.”

Even more fundamental than a salary, jobs like these offer Susana, and thousands of women like her, freedom. When they have their own income, they don’t have to depend on anyone else, they are free to make their own way. “Since I started working here my life has changed a lot. I have a house and a daughter in University. All because of this salary.”

**Jesus Machín, El Hierro, Canary Islands**

Surrounded by beautiful lunar landscapes, La restinga is a small village on the south coast of El Hierro island in the Canaries. In recent decades, Jesus Machín, a 42-year-old fisherman, and the rest of the people in this small fishing community, have witnessed the revolution of the fast-growing large industrial fishing fleet. This boom brought the pressure of industrial fishing into the shallow waters around the island. Jesus knows he’s highly dependent on these waters; he contemplates the ocean with his feet grounded on the island. The ocean surface seems to be endless, and the longevity of its species, eternal. But in fact, he knows small continental shelves around the Canary Islands make their marine ecosystem even more vulnerable and limit the available fishing grounds. He is aware of their success in one-by-one fishing tuna around the island but also knows that it is highly dependent on healthy, abundant fish stocks. Overfishing these waters could drive them into a disaster. “An artisanal boat that fishes one-by-one would never put the resource at risk. On the other hand, a boat with a purse seine net that is two kilometres long and hundreds of metres deep, will definitely cause damage.”

Although the concept of marine protected areas is something that is instinctively put in the hands of politicians, 26 years ago, a group of fishers from this village resolved not to wait for the goodwill of those in command. They decided to create...
their own marine protected area to assure the good health of the fish stocks they rely on to survive.

The “Mar de las calmas” marine protected area was born and is, even now, the most important sanctuary of life that assures a better future to the island fisheries. The actions of these fishers have become an example for the Canary Islands archipelago, for Macaronesia and for all Europe.

“A protected area that supported the interests of our fisheries was created and we’ve seen that it has been a great success. Not only for fisheries. In this village there was only one diving centre and now there are almost ten”, said Jesus.

Alfredo Durão is the captain of the fishermen association’s boat which employs most of the fishers at Monte Trigo. They know that by working together, things are made easier. “The ocean is everything to us. Because here we are fully dependent on it.”

Times are changing and to be a fisher requires more and more perseverance. Not too long ago, they could use their small boats to catch tuna right there in the bay where risks were low. Nowadays, with the industrial fleet putting pressure on the surrounding waters, Alfredo and his crew, as well as all the other fishers from Monte Trigo, are forced to go out far to the northwest banks, more than 18 miles away from the shore, and risk their lives to catch tuna to make sure they continue to be able to provide for their families.

Despite the community coming together to buy more suitable boats, it still has its limitations and as time goes by, these limitations are becoming more and more evident. After a 7-hour trip to the northwest fishing ground, they still have to catch enough tuna, one-by-one with their bare hands, to feed their families. At this point, the island is just a shadowy shape
on the horizon and the boats, here and there, disappear in between the mountainous waves.

“A long time ago fishermen used to be able to catch tuna right here in the bay. Now we have to go much further to the far northwest banks to fill our boats, because of the purse seiners that catch all the tuna before they get to our coastal waters”. Overfishing and harmful fishing practices by industrial fleets is pushing communities like those in Monte Trigo to the brink of their survival. They are being forced to compete beyond their capabilities in a system which often fails to recognise their rights and needs. If we continue on this path what does that mean for their futures? And their families’ futures?

“I have my family but if I can’t provide for them in future then who is going to look after them? Who is going to care for them? No one.”

It’s vital that we preserve this ecosystem so that the wildlife and people around the world can continue to thrive for future generations. It is no secret that our ocean’s health is in serious danger; we understand the gravity of climate change, we are aware of the effects of overpopulation on the planet, and, needless to say, most recently as the global pandemic unfolds, studies gradually start to show the effects on our physical and mental health. The ocean’s health concerns us all and we, therefore, share the power and responsibility to change this.

Now is the time to turn things around: to invest in fishing communities, safeguard their livelihoods and protect our environment. Effective policy changes are urgently needed across the world’s oceans to prevent environmental and social collapse in these vulnerable regions. By understanding the people and lives behind these fishing methods we can better support them and transform our system to meet their needs and the needs of our ocean. Transform our world to one in balance with nature.

Emilia Dyer is Communications Officer with the International Pole and Line Foundation (IPNLF). She is a Marine Biologist who recently graduated from the University of Exeter which sparked her curiosity for ecology and the drivers of change in the ocean, with a deeper interest in how we positively manage the ocean in a time of such rapid change. She supports the IPNLF Marketing and Communications Team work streams and continues to write for her blog www.ecology-matters.org.
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INFOFISH

Eurofish hosts Albanian Minister

Ms Frida Krifca, the Albanian Minister of Agriculture and Rural Development and Ms Elida Petoshati, the Albanian Ambassador to Denmark visited the Eurofish offices in Copenhagen in March this year to discuss future collaboration. Eurofish has strong ties to Albania, one of the founding countries together with Denmark, Latvia, Romania, and Norway who signed the agreement for the establishment of Eurofish back in 2002.

Future focus areas for Eurofish could be the Albanian mussel industry and the potential export of its products into the EU. Eurofish is also part of a project consortium with Croatian and Italian partners that seeks to build capacity within the marine fishery industry in Albania. The project is developing a master’s programme in marine fisheries and upgrading the curricula at maritime training centres to IMO standards. These centres offer professional training to fishermen. As part of the project, Eurofish hosted a study tour of relevant Danish institutions in October 2021.

INFOFISH

Croatian Ambassador discusses cooperation with Eurofish

Tina Krce, the Republic of Croatia’s Ambassador to Denmark, visited the Eurofish headquarters at the invitation of Marco Frederiksen, the Eurofish Director. The meeting was attended by Toni Bartulin, Project Manager, and Christian Philip Unmack, Senior Project Manager.

The activities of Eurofish were discussed at the meeting, with special emphasis on projects in which the Republic of Croatia actively participates. In addition, the possibility of cooperation with the Embassy of the Republic of Croatia in Copenhagen was discussed.

INFOFISH

Launch of e-photobook in conjunction with IYFA 2022

To commemorate the International Year of Artisanal Fisheries and Aquaculture 2022 (IYFA 2022), INFOFISH (under a Letter of Agreement with the FAO Regional Office for Asia and the Pacific) organized two webinars from 29-30 March 2022 that put the spotlight on Asia as home to the world’s majority of small-scale fishers and aquaculturists. The main objectives of the webinars were to raise awareness on IYFA 2022, launch the IYFA 2022 photobook, promote the results of the Illuminating Hidden Harvests (IHH) study on small-scale fisheries, as well as advocate policy support for small-scale fisheries and aquaculture.

Presentations were delivered by several speakers representing the Women’s Cooperative Thailand; WorldFish (Ben Belton); Fisheries Administration, Cambodia (Somony Thay, Director, Department of Aquaculture); Bureau of Fisheries and Aquatic Resources, the Philippines (Rafael V. Ramiscal, Chief, Capture Fisheries Division); International Collective in Support of Fishworkers (ICSF - Sebastian Mathew); and Southeast Asian Fisheries Development Center (SEAFDEC). The Opening Remarks were by Rohana Subasinghe, IYFA Steering Committee Vice-Chairperson. Nicole Franz from FAO Rome provided a look at the findings from the Illuminating Hidden Harvests study on small-scale fisheries. The e-photobook was launched at the end of the first day.
Strengthening the voice of Pacific fishers

FAO, SPC and INFOFISH launch the International Year of Artisanal Fisheries and Aquaculture (IYAFA 2022) in the Pacific

The International Year of Artisanal Fisheries and Aquaculture (IYAFA 2022) was launched in the Pacific Islands, during an event on 31 March 2022 to mark the occasion by FAO, Pacific fishers, the Pacific Community (SPC) and INFOFISH.

The IYAFA 2022 year-long regional campaign will highlight the Pacific fishers’ voices and stories, sharing successes, experiences and lessons learned from small-scale fisheries initiatives in the Pacific. The launch called for action and collaboration with all relevant stakeholders to join efforts in making Pacific IYAFA celebrations successful.

The interactive session provided a unique opportunity to discuss the role that small-scale fishers, fish farmers and fish workers play in food security and nutrition, poverty eradication and sustainable natural resource use, in the region. The panelists also highlighted the essential role of women in small-scale artisanal fisheries and aquaculture and how they contribute to community empowerment.

"Small-scale fishers, fish farmers and fish workers provide healthy and nutritious food to billions of people and contribute to achieving Zero Hunger. For this very reason, it is incredibly important to recognize millions of small-scale fishers, fish farmers and fish workers,” stated Ms Xiangjun Yao, FAO’s Subregional Coordinator for the Pacific Islands.

The Pacific region is characterized by vast areas of ocean, dotted by myriads of islands that are home to thousands of coastal communities. These communities hold precious traditional knowledge and rights to inshore marine resources. Over the years, catches of the most accessible coastal resources – fish, seashell and seaweed of the lagoons and reefs have been declining in many Pacific islands. It is estimated that coastal catch added over USD300 million to the GDP. In the Pacific, 88 percent of the households consume fish or seafood weekly and 58 kg of fresh fish is consumed per person, per annum in the region.

“Pacific fishers are also adversely impacted by several factors such as climate change, population growth and COVID-19,” says Andrew Smith, the SPC’s Coastal Fisheries and Aquaculture Programme Deputy Director. “SPC is engaged in a strong community-driven approach that will build resilient island communities and sustainable livelihoods” he concluded.

During the event, several video stories from Pacific island fishers and fish farmers were shared, including a testimony from Ms Arun Lata, a woman aquaculture farmer from Fiji. “Due to the economic crisis from the health pandemic, my neighbours started to fish from my fish ponds too and I left it open. We don’t know who is going to survive, who is going to be there with all that’s happening. People need protein in their meal so I let them fish around the tilapia fish ponds”, she said.

To access the event recording, go to: www.youtube.com/channel/UCScmS1G2carGh0H4xvf_tng
To access the video series, “Guardians of the Pacific”, go to: https://bit.ly/GoP_seriesEN

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Vacuuming up sea urchins

Sea urchins are harvested for either food or culling purposes. They are usually hand-picked from the sea bed, and as any diver will say, this harvesting method is inefficient, expensive in terms of labour costs, and presents safety risks to harvesters. An alternate way to harvest sea urchins is by using tools which operate like a vacuum machine, being able to pick up the urchins and transfer them directly into a boat, net, or shore-located container.

Developed by Norwegian firm C Robotics, the C Bud and the C Disc are mobile diver-operated tools that can be used for harvesting various species from the seabed.

The C Bud

The C Disc

The C Disc incorporates a handheld suction nozzle, which the diver simply places onto individual urchins. An attached hose delivers the sucked-up urchins either to a surface support vessel, to a net suspended in the water between that vessel and the diver, or to the shore. According to the company, this setup allows for an average catch rate of 1.9 urchins per second.

The C Bud also uses a suction nozzle, although that nozzle is built into a remotely-operated tracked vehicle that moves across the sea floor. The vehicle is connected via a hose and an electrical tether to a surface support vessel, where its human operator is guided by real-time video from the C Bud’s spotlight-aided cameras. An onboard positioning system helps that person keep track of where the vehicle is relative to themselves, plus the C Bud is able to detect and avoid obstacles on its own.

Apart from urchins, sea trials have shown that the C Bud can collect up to 16,000 scallops per hour. The same trials reportedly indicated that it causes considerably less disruption to the seabed than more traditional methods such as drag dredging, plus its use results in much less bycatch.

Manufacturer: C Robotics, Norway (cr@crobotics.no).

Sustainable seabed harvesting technology

Arctic scallops (sometimes called Icelandic scallops)

Together with Norwegian independent research institute SINTEF, TAU Tech has developed a seabed-friendly harvesting method for Arctic scallops (Chlamys islandica). This is based...
on suction technology which will lift the scallops from the seabed and into a collection unit.

In January 2022, Norwegian company Bjordal announced that it has signed a contract with TAU Tech for delivery of a complete processing factory onboard the Arctic Pearl vessel. The factory will be fitted to facilitate automated processing of about 100 tonnes of harvested scallops per day. The final product will be peeled, single frozen scallops, ready for delivery to the market. Delivery of the vessel will take place in mid-2022.

*Manufacturers: TAU Tech, Norway (https://en.tautech.no/produkter); Bjordal AS, Norway (sales@pebjordal.no).*

**Harvesting without trawl nets**

In Precision Seafood Harvesting, fish are caught without traditional trawl nets. Instead, they swim comfortably underwater inside a large flexible PVC liner, where the correct size and species can be selected before being brought onboard the fishing vessel.

Developed after ten years of research in New Zealand, this method allows fishing vessels to target specific species and fish size, and greatly increases protection for small fish that can swim free through ‘escape portals’ and non-target fish (by-catch), which are released unharmed. Fish are brought on deck still swimming inside the liner, in perfect condition, meaning fresher, more sustainable fish for consumers and higher value products for fishing companies using the technology.

Sanford, along with Aotearoa Fisheries and Sealord have invested NZ $26 million into the project under a Primary Growth Partnership (PGP) with the Ministry for Primary Industries (MPI), which is matching the investment. Scientists at Plant & Food Research are partnering with the fishing companies to develop and trial the technology on commercial fishing vessels.

*Manufacturer: Sanford, New Zealand (info@sanford.co.nz).*

**Harvesting and replanting seaweed at the same time**

Traditionally, growing seaweed entails attaching pieces of seaweed to ropes, waiting for it to grow, then manually harvesting and re-seeding the lines. An Indian start-up called Sea6Energy has developed the SeaCombine, a fully mechanised cultivation system that can simultaneously harvest and replant seaweed in deep ocean waters. Working like a ‘sea tractor’, it also allows farming in deeper and rougher waters than otherwise possible by traditional methods.

Sea6Energy has downstream processing for seaweed, turning it into products for agriculture, animal health, food ingredients, bioplastics, and renewable chemicals.

According to a press release from sustainable aquaculture investment fund Aqua-Spark (the lead investor in Sea6Energy), the SeaCombine makes sustainably farming the ocean a possibility, while capturing CO2 and transforming it into valuable products.

*Manufacturer: Sea6Energy, Chennai, India (http://www.sea6energy.com).*
FRESHWATER EEL CULTURE INDUSTRY PRACTICES IN THE PHILIPPINES

This publication contains a comprehensive outline of the flow of trade and farming practices for Anguillid eel species (A bicolor and A marmorata) in the Philippines. The authors go into detail on the various aspects of culture: tanks, aeration, filtration, water management, feeding, disease control, and on to harvesting, marketing, gender roles and participation, and ending with a section on challenges faced by eel farmers in the Philippines.

The publication can be viewed online through the National Fisheries Research and Development Institute (NFRDI) website: www.nfrdi.da.gov.ph.

HANDBOOK ON CONVENTION ON BIOLOGICAL DIVERSITY (CBD) FOR SMALL-SCALE FISHING COMMUNITIES
By Ramya Rajagopalan. Developed and published by International Collective in Support of Fisherworkers (ICSF) and Centro Internazionale Crocevia (CIC) with the support of SwedBio (2021).

The Voluntary Guidelines for Securing Sustainable Small-scale Fisheries in the Context of Food Security and Poverty Eradication (SSF Guidelines) recognize that the health of the aquatic ecosystems and its associated biodiversity, are the fundamental basis for the livelihoods of marine and inland fishing communities and contribute to their overall well-being. This makes the Convention on Biological Diversity (CBD) highly relevant to these communities and their fisheries.

Since 2004, fishworker organizations (FWO) have been engaging in national and international processes of the CBD relevant to SSF communities. It is critical that the provisions of the CBD are better understood, especially in the context of the implementation of the SSF Guidelines and the human rights-based approach.

This Handbook developed by ICSF and Crocevia describes the various components of the CBD, and their links to the SSF Guidelines and the Sustainable Development Goals (SDGs). It provides a broad overview of CBD programmes, targets and commitments on aquatic, marine and coastal biodiversity, with illustrative examples and recommended actions for FWOs and civil society.

SEAWEEDS AND MICROALGAE: AN OVERVIEW FOR UNLOCKING THEIR POTENTIAL IN GLOBAL AQUACULTURE DEVELOPMENT

Algae, including seaweeds and microalgae, contribute nearly 30 percent of world aquaculture production (measured in wet weight), primarily from seaweeds. Seaweeds and microalgae generate socio-economic benefits to tens of thousands of households, primarily in coastal communities, including numerous women empowered by seaweed cultivation.

This document examines the status and trends of global algae production with a focus on algae cultivation, recognizes the algae sector’s existing and potential contributions and benefits, highlights a variety of constraints and challenges over the sector’s sustainable development, and discusses lessons learned and way forward to unlock full potential in algae cultivation and FAO’s roles in the process. From a balanced perspective that recognizes not only the potential of algae but also constraints and challenges upon the realization of the potential, information and knowledge provided by this document can facilitate evidence-based policymaking and sector management in algae development at the global, regional and national levels.

The publication can be viewed online at: https://doi.org/10.4060/cb5670en.
IMPACTS OF PLASTIC POLLUTION IN THE OCEANS ON MARINE SPECIES, BIODIVERSITY AND ECOSYSTEMS

*Authors* by Tekman, M. B., Walther, B. A., Peter, C., Gutow, L. and Bergmann, M. *Published by* World Wildlife Fund for Nature (WWF) Germany, Reinhardstraße 18, D-10117, Berlin, Germany (January 2022).

This new report commissioned by World Wildlife Fund for Nature (WWF) provides the most comprehensive account to date of the extent to which plastic pollution is affecting the global ocean, the impacts it is having on marine species and ecosystems, and how these trends are likely to develop in future. Compiled by researchers from the Alfred Wegener Institute Helmholtz Centre for Polar and Marine Research (AWI), it reveals a serious and rapidly worsening situation that demands immediate and concerted international action:

- Today almost every species group in the ocean has encountered plastic pollution, with scientists observing negative effects in almost 90% of assessed species.
- Not only has plastic pollution entered the marine food web, it is significantly affecting the productivity of some of the world’s most important marine ecosystems like coral reefs and mangroves.
- Several key global regions – including the Mediterranean, the East China and Yellow Seas and Arctic sea ice – have already exceeded plastic pollution thresholds beyond which significant ecological risks can occur, and several more regions are expected to follow suit in the coming years.
- If all plastic pollution inputs stopped today, marine microplastic levels would still more than double by 2050.

*The publication can be viewed online through: http://www.wwf.de/plastic-biodiversity-report.*

DON’T MINCE WORDS: DEFINITIONS OF MEAT AND OTHER ANIMAL PRODUCTS

*Printed by the Senate Printing Unit, Parliament House, Canberra, Australia (2022).*

The growth of new protein categories such as plant-based, cultured and blended animal and plant-based proteins are recognized as providing consumers with new sources of protein. While it appears most plant-based protein product manufacturers use clear labelling and terms, such as ‘plant-based burger’, there are no labelling standards to ensure that animal terms or images are not used on plant-based protein product packaging.

Inclusive of the introduction, this report consists of six chapters:

- Chapter 2 considers evidence about consumers’ understanding of plant-based proteins. The chapter seeks to determine whether consumers are confused by current labelling practices across the plant-based protein sector and the potential impact on the traditional protein market. This chapter also considers the cultured meat industry;
- Chapter 3 considers in more detail the regulatory framework that governs the plant-based protein sector. Specifically, the chapter looks at the Food Standards Australia New Zealand Code (FSANZ Code, the Code) in more detail, the Code’s application on plant-based products and the types of descriptors that are used by the sector;
- Chapter 4 explores the proposed voluntary and mandatory pathways forward under Australian Consumer Law;
- Chapter 5 looks at the opportunities presented by Australia’s protein sector, consisting of both traditional and plant-based protein products, to meet global demand. This chapter also considers the levies paid by the traditional protein sector, and potential adverse economic impacts resulting from the misappropriation of meat terminology by the plant-based protein sector; and
- Chapter 6 considers matters related to the nutritional qualities of plant-based proteins and traditional protein products. It reviews stakeholders’ concerns about claims made by the plant-based sector about its products’ nutritional value, and the assumptions made by consumers about those products’ nutritional equivalency to traditional meat and dairy products. This chapter also considers the environmental and animal welfare statements made by manufacturers of plant-based proteins about the traditional protein sector.

*This report can be viewed online at: https://creativecommons.org/licenses/by-nc-nd/4.0/**
## 2022

### MAY

- **3 - 5**
  **Aquaculture UK**
  Aviemore, Scotland
  https://aquacultureuk.com/

- **24 - 28**
  **Thaifex - Virtual Trade Show**
  Bangkok, Thailand
  https://thaifex-anuga.com/en/

- **24 - 27**
  **World Aquaculture 2021**
  Merida, Mexico
  https://www.was.org/meeting/code/WA2021

### JUNE

- **1 - 3**
  **POLFISH**
  Gdansk, Poland
  http://polfishfair.pl/

- **8 - 10**
  **Infofish World Shrimp Trade Conference and Exhibition (Hybrid)**
  Putrajaya, Malaysia
  www.shrimp.infofish.org

### AUGUST

- **21 - 23**
  **Seafood Expo Russia**
  Saint-Petersburg, Russia
  https://seafoodexporussia.com/en/

- **24 - 26**
  **16th Shanghai International Fisheries and Seafood Exhibition**
  Shanghai, China
  https://www.worldseafoodshanghai.com/en/

### SEPTEMBER

- **23 - 26**
  **11th Symposium on Diseases in Asian Aquaculture (DAAI1)**
  Sarawak, Malaysia
  https://www.daa11.org/

### OCTOBER

- **11 - 13**
  **17th INFOFISH World Tuna Trade Conference & Exhibition**
  Bangkok, Thailand
  www.tuna.infofish.org

- **26 - 28**
  **China Fisheries & Seafood Expo**
  Qingdao, China
  https://chinaseafoodexpo.com/

### NOVEMBER

- **29 - Dec 2**
  **World Aquaculture Singapore 2022**
  Singapore
  https://www.was.org/Events/Calendar#.YhwO9t8RWIE
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17th INFOFISH WORLD TUNA TRADE CONFERENCE & EXHIBITION

11–13 October 2022
Bangkok, Thailand