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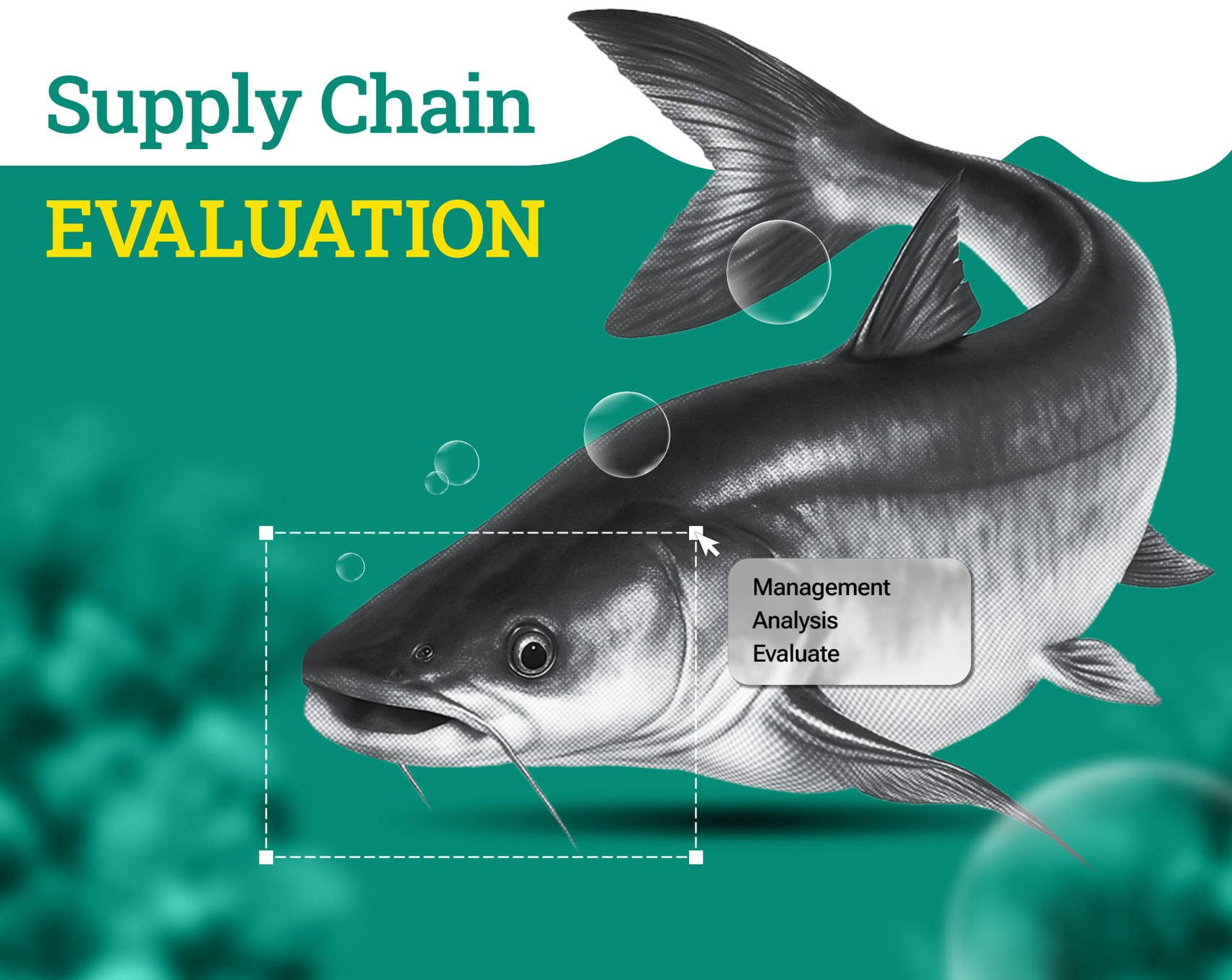

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Vietnam Fisheries Magazine
Nguyen Dinh Chieu 116,
Da Kao Ward, District 1,
70000 Ho Chi Minh city, Vietnam
Tel : +84 28 6277 7616
Fax: +84 24 3771 1756
vietfishmagazine@gmail.com
www.vietfishmagazine.com

Hanoi Office
Nguyen Cong Hoan 10,
Ba Dinh District,
100000 Ha Noi, Vietnam
Tel: +84 24 3771 3699
Fax: +84 24 3771 1756

Editor
Hung Duong
toasoan@thuysanvietnam.com.vn

Publisher
Nam Anh
namanh@thuysanvietnam.com.vn

Associate Editor
Minh Thanh
minhthanh@thuysanvietnam.com.vn

Design and Layout
Duong Pham
duongpham@thuysanvietnam.com.vn

Media Manager
Nghia Duong
+84 944 66 3828
nghia@thuysanvietnam.com.vn

Subscriptions
Vietnam Fisheries Magazine is published bimonthly.
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Lobster exports soar to USD 712 million in 2025 amid rising risks

Vietnam's lobster exports surged USD 712 million in the first ten months of 2025, up 135% year-on-year, driven almost entirely by shipments to China and Hong Kong. October alone saw exports reach USD 93 million, a 75% increase from the same month last year, according to Vietnam Customs. China and Hong Kong absorbed USD 702 million, also up 135%, extending the strong momentum from 2024, when Vietnam's lobster exports to China tripled from USD 141 million in 2023 to USD 404 million in 2024. However, farm-gate prices have swung sharply due to oversupply following holiday peaks and intensified competition from Australia, Canada, the US and Southeast Asian suppliers. China's reopening to Australian lobster has added further pressure, while tighter inspection and facility registration rules may delay customs clearance and raise logistics costs. Supply stability faces fresh uncertainty after severe flooding in late November devastated major farming zones in Phu Yen province. Damage to stocks for early-2026 harvests could tighten supply and trigger price volatility. Despite risks, exporters expect strong demand through Lunar New Year.

First 700-tonne tilapia shipment from Vietnam sent to Brazil

The first container, carrying 24 tonnes, left Ho Chi Minh City on Nov. 6 and is expected to arrive at Santos port on Dec. 17. The fish will be distributed through JBS supermarkets, the Horeca channel and its product showcase facilities, Vietnamese Ambassador to Brazil Bui Van Nghi said. The full order consists of 32 containers totalling 700 tonnes, according to the ambassador. JBS, the world's largest beef and poultry producer, employs around 280,000 people across 150 plants worldwide. The company is investing USD 150 million in two beef processing facilities in Vietnam. Nghi said the shipment represents a concrete step toward implementing recent commitments by Vietnamese Prime Minister Pham Minh Chinh and Brazilian President Luiz Inacio Lula da Silva to increase agricultural market access. Vietnam has agreed to allow Brazilian beef imports, while Brazil has opened its market to Vietnamese tilapia and pangasius. Vietnam and Brazil are also pushing negotiations on a trade agreement between Vietnam and the Mercosur bloc, which Brazil will chair in 2025, aiming to diversify markets and deepen bilateral trade.

Pangasius exports top USD 1.8 billion in 10 months

Vietnam's pangasius exports reached USD 217 million in October 2025, up 8% year-on-year, bringing the cumulative 10-month total to over USD 1.8 billion, a 9% increase. The figures indicate a clear recovery after a Q3 slowdown. Exports to China and Hong Kong rose 19% to USD 73 million, returning to growth after a flat September. In contrast, shipments to the U.S. fell 17% to USD 29 million, while the U.K. dropped 33% to USD 4 million. Brazil saw a modest 1% increase to USD 15 million. Within the CPTPP bloc, 10-month exports reached USD 305 million, up 36%, accounting for 17% of total pangasius exports, with Japan rising 14% and Malaysia up 37%. The EU market totaled USD 149 million, a 3% increase, led by Spain (+22%), while the Netherlands and Germany continued to decline. Frozen fillets remain the mainstay at nearly USD 1.5 billion, up 11%, while whole frozen pangasius reached USD 315 million, largely unchanged. Processed products grew 19% to USD 44 million, accounting for 2.4% of exports, showing room for value-added growth. With U.S. duties at 0% under POR20, Vietnam aims to boost exports to CPTPP, Middle East, and EU markets through 2026.

Vietnam accelerates sustainable marine aquaculture towards 2030

Vietnam is stepping up its marine aquaculture sector as a driver of economic growth, environmental protection, and food security. Boasting over 3,200 km of coastline and an exclusive economic zone of more than 1 million km², the country is well positioned to expand offshore aquaculture and relieve pressure on coastal fisheries. Yet challenges remain, including limited zoning, fragmented infrastructure, lack of advanced technology, and stricter certification and traceability standards. Dr. Pham Anh Tuan of the Vietnam Fisheries Association warns that nearshore areas are reaching environmental limits, increasing risks of disease and pollution. He advocates expanding offshore farming with modern techniques, high-quality broodstock, and robust logistics, supported by research-driven innovation and updated policies. Vietnam's marine aquaculture, focused on fish, seaweed, mollusks, and lobsters, produced 832,000 tonnes in 2024, generating about USD 900 million in exports. Guided by "Transparency - Responsibility - Sustainability", the 2030 strategy aims for industrial-scale, environmentally friendly growth, integrating production, processing, and marketing to strengthen Vietnam's role in the global seafood market.

Can Tho

Emerges as Mekong Delta aquaculture hub

Can Tho is emerging as a key aquaculture hub in the Mekong Delta, harnessing its freshwater, brackish, and saltwater zones to build sustainable, export-focused value chains. Following its merger with Hau Giang and Soc Trang, the region now covers all three water types, allowing better coordination in production, processing, and trade. "Can Tho has abundant water resources, stable hatcheries, and a network of producers and processors, forming the foundation for an integrated, sustainable aquaculture value chain," said Quach Thi Thanh Binh, Deputy Director of the city's Department of Agriculture and Environment. The city has developed farming clusters for high-value species such as tra fish, basa, tilapia, climbing perch, and brackish-water shrimp. Local businesses work closely with farmers to meet international standards, applying VietGAP certification and traceability systems to reach EU, US, and Japanese markets. Cooperative models are expanding, with Ky Nhu Cooperative producing VietGAP-certified basa, making value-added products, and converting byproducts into collagen, fish oil, and fish meal. By 2030, Can Tho aims to become the Mekong Delta's comprehensive aquaculture hub, with resilient, traceable, and eco-friendly supply chains driving growth.

VFM

Vietnam's seafood exports hit USD 8.36 billion by Q3 2025, striving to meet full-year target

As of the end of Q3 2025, Vietnam's seafood exports reached USD 8.36 billion, up 16% year-on-year, according to the Vietnam Association of Seafood Exporters and Producers (VASEP). Shrimp remained the leading product, earning USD 3.4 billion, up 22%, the highest in the past three years, while pangasius exports reached USD 1.6 billion, up 9%. Squid, octopus, and crabs all recorded double-digit growth, supported by recovery in CPTPP markets.

China overtook the U.S. as Vietnam's top seafood market, importing USD 1.8 billion, up 34% year-on-year. The U.S. followed with USD 1.4 billion (+8.4%), then Japan at USD 1.3 billion and the EU at USD 884 million. The Ministry of Industry and Trade stressed that in the remaining two months of 2025, the sector must sustain market stability, navigate trade barriers, and meet the full-year export target.

Enterprises are encouraged to focus on high-value-added products to boost competitiveness, minimize tariff impacts, and fully leverage markets under free trade agreements while maintaining stable demand in China and ASEAN. At the same time, they must address the "IUU yellow card" issue by complying with strict technical standards. Since the EU applied the yellow card in 2017, Vietnam has strengthened its legal framework with 11 circulars and 2 decrees, modernized fleet management with 79,360 vessels including over 7,000 vessels 15 meters and above, and completed registration, licensing, and VN-Fishbase data updates, ending the "three-no" vessel situation (unregistered, unlicensed, uninspected).

Digital transformation is linking VN-Fishbase with electronic traceability, digital logbooks, and administrative systems to enable full-cycle fisheries management. Long-standing violations are nearly resolved, with just 0.33% outstanding, while Vietnam continues coordinating with the EU on foreign vessel infractions and product traceability, reflecting a comprehensive, government-led effort.

VFM

NUMBER AND FACTS

USD 498 MILLION

Vietnam's shrimp exports in October 2025, their highest since the start of the year, up 26% year-on-year.

42,176 HECTARE

Tilapia farming area nationwide in 2024, producing 316,000+ tons, with USD 40 million in exports.

36,500 TONS

Total crab production in Ca Mau by 2030, with at least 30% entering export markets and value chains.

NEWS

■ Lam Dong is cementing its sturgeon brand, with 2025 production expected at 2,300 tons (VND 450 billion). Leveraging cold-water resources and integrated farming, the province produces 5.1 million fry, reducing reliance on imports, boosting quality and competitiveness, and expanding both domestic and export market opportunities.

■ Nghe An intensifies fight against illegal fishing (IUU), completing 14 of 19 tasks. The province enforces vessel registration, VMS, traceability, and port control, while supporting fishermen with equipment upgrades and livelihood programs. Coordinated, transparent management advances sustainable, legal fishing and boosts export credibility.

■ Ca Mau is set to become a regional aquaculture hub, with its signature crab as the star product. The 2025 Ca Mau Crab Festival highlights sustainable shrimp-crab-forest farming, boosts tourism, and promotes exports. With top-quality crab and eco-friendly production, Ca Mau strengthens livelihoods, brand value, and global competitiveness.

■ Hai Phong's Agricultural Extension Center successfully piloted VietGAP-certified HDPE cage farming of pearl grouper in Hai Phong and Quang Ninh. Fish averaged 1.125 kg, 75.8% survival, 17 kg/m³ yield, boosting profits 69.8%. Fully contracted output, eco-friendly practices, job creation, and tourism potential mark a scalable, sustainable coastal aquaculture model. ■

Standardizing fisheries

An urgent need

Global seafood markets are tightening import standards, forcing Vietnam's fisheries sector to fully comply with regulations or risk exclusion from international trade. As a result, standardizing fisheries has become an urgent priority.

Vietnam Fisheries Magazine recently interviewed Dr. Pham Anh Tuan, former Deputy Director General of the Vietnam Directorate of Fisheries (now the Directorate of Fisheries and Fisheries Surveillance under the Ministry of Agriculture and Rural Development) and a Standing Committee member of the Vietnam Fisheries Association, to clarify the standards and requirements for aquaculture and fisheries.

Toward sustainable development

● **VFM: Global seafood markets are increasingly imposing strict regulations on imported products. To maintain its export position, Vietnam's fisheries sector must make significant adjustments. In your view, what international factors are driving the need for standardization?**

Dr. Pham Anh Tuan: For seafood exports, the foremost requirement is full compliance with the quality standards of importing markets, including limits on banned substances, antibiotics, and allowable safety thresholds. Additionally, each market enforces its own regulations: the EU tightens measures against IUU (illegal, unreported, and unregulated) fishing; the United States emphasizes marine mammal protection; and many countries impose anti-dumping measures and regulate fisheries subsidies.

Recently, requirements have expanded to include animal welfare, environmental protection, labor conditions, minimum wages, carbon emissions, and changes in land and forest use during production processes.

All these measures aim to achieve two objectives: safeguarding consumer safety and protecting the environment as well as the communities involved in the supply chain.

● **VFM: How would standardizing fisheries benefit both seafood exports and fishermen's operations?**

Dr. Pham Anh Tuan: Standardization in fisheries, through compliance with regulations and the attainment of sustainability certifications, primarily benefits the sector itself. It fosters sustainable development, as emphasized by the Prime Minister during the IUU Steering Committee meeting: "We must do it for ourselves, not just to appease the market."

Achieving certifications ensures not only safer production but also environmental protection, labor welfare, and social responsibility. In the long term, standardization strengthens the domestic foundation, broadens market access, and boosts exports.

Market principles must be followed

● **VFM: What do international standards, such as ASC, BAP, and GlobalGAP, require in aquaculture in terms of production processes, biosecurity, and traceability?**

Dr. Pham Anh Tuan: Standardization consists of two components: mandatory regulations and voluntary standards/certifications. Regulations are compulsory, such as bans on specific chemicals or limits on residue levels.

Standards such as ASC, BAP, and GlobalGAP promote best aquaculture practices and are technically voluntary. In practice, however, they have become market requirements: without these certifications, many importers and retailers, including Walmart, will reject products, while consumers increasingly prefer certified seafood.

Therefore, while technically voluntary, these standards have effectively become prerequisites for market access. In short, quality regulations must be strictly adhered to, while specific standards should be selected based on buyer requirements and target markets.

● **VFM: What are the main challenges and costs for farms and businesses in implementing these aquaculture standards?**

Dr. Pham Anh Tuan: First, farmers and the entire supply chain must clearly distinguish between mandatory regulations and voluntary certifications to avoid confusion. They must also understand the detailed requirements of each standard, for instance, ASC versus BAP or GlobalGAP.

Generally, reputable aquaculture certifications cover four key areas: food safety, disease management, environmental protection, and social responsibility, differing primarily in the stringency of their requirements. Once the standards are understood, production systems must undergo audits to identify gaps and implement corrective actions.

A major challenge is the cost of certification, including investments in system upgrades and auditing fees, which often exceed the capacity of small-scale farmers, the majority in Vietnam. Even with group certification models, coordinating tens or even hundreds of farms remains a significant challenge.

Addressing challenges in fisheries

● **VFM: In fisheries, how does standardization to remove the EU IUU 'yellow card' and comply with the U.S. MMPA affect Vietnam's seafood sector and fishermen?**

Dr. Pham Anh Tuan: IUU is a direct factor. While exports continue, extended inspections and verification increase costs and cause significant losses. World Bank reports show that the EU IUU yellow card caused substantial economic losses and reputational damage to Vietnam's seafood sector.

Moreover, marine mammal protection regulations in the U.S. prevent many seafood products, particularly certain species and fishing gear from entering the market, representing quantifiable losses. Therefore, the fisheries sector must adapt and standardize to meet international requirements.

● VFM: What challenges do fishermen face when implementing proper seafood fisheries standardization?

Dr. Pham Anh Tuan: Key IUU requirements include a strict prohibition on illegal fishing, which applies not only in foreign waters but also within domestic zones if legal areas or target species are violated. Traceability and product certification processes are also complex and time-consuming.

Vietnam has a large fleet, particularly vessels under 15 meters operating nearshore, which remain poorly monitored. Even vessels over 15 meters, equipped with monitoring devices, face operational and oversight challenges. Product certification is further complicated by limited technical capacity and entrenched production practices, meaning that changes cannot occur overnight.

Adaptation requires agility

● VFM: What support mechanisms and policies are needed to help farmers and fishermen implement standardization?

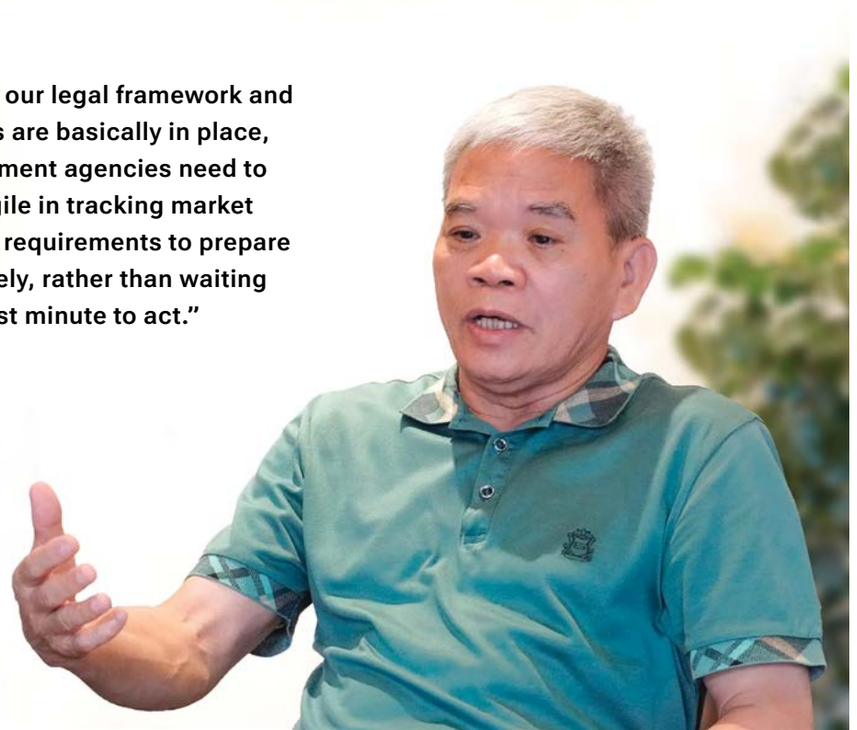
Dr. Pham Anh Tuan: Two issues are critical. First, fisheries standardization must focus on long-term development, not merely on export compliance. Vietnamese laws and regulations are largely adequate, but authorities need to anticipate market trends and requirements, preparing proactively rather than responding belatedly. The EU IUU yellow card demonstrated that without comprehensive vessel data and detailed evidence, international requirements could not be met. Emerging issues, such as emissions, animal welfare, and fisheries subsidies, must also be addressed proactively.

Second, the government should invest in infrastructure from aquaculture zones to ports and support training and production organization for fishermen, who mostly operate small-scale ventures. Practical measures in fisheries include reducing vessel numbers and enforcing seasonal fishing bans, but above all, supportive policies must enable fishermen to transition sustainably.

VFM: What role should processing and export companies play in encouraging compliance among fishermen and farmers?

Dr. Pham Anh Tuan: High-quality aquaculture businesses should lead in standardization. Processing and export companies, with their understanding of markets and consumer demand, should communicate requirements to both authorities and producers. They should collaborate with smallholders to organize large production zones instead of simply purchasing raw material. Many companies have successfully implemented this approach.

"Currently, our legal framework and regulations are basically in place, but government agencies need to be more agile in tracking market trends and requirements to prepare appropriately, rather than waiting until the last minute to act."



Dr. Pham Anh Tuan, former Deputy Director General of the Vietnam Directorate of Fisheries and Standing Committee Member of the Vietnam Fisheries Association

VFM: In the long term, what comprehensive strategy should Vietnam adopt to standardize the entire seafood value chain, and which short and long term solutions should be prioritized to meet international standards?

Dr. Pham Anh Tuan: Vietnam already has clear strategies for fisheries development, focusing on reducing wild capture, promoting aquaculture, developing marine farming, and digital transformation. However, gaps remain between strategy and action, with unclear roadmaps, resources, and responsibilities.

Authorities should conduct comprehensive assessments, review all export market regulations to identify compliance gaps, and prioritize solutions to address them. For requirements like IUU and MMPA, detailed implementation roadmaps are needed. Emerging international standards such as animal welfare and emissions must also be anticipated, enabling Vietnam's seafood sector to quickly adapt.

Sincere thanks for the insights!

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Sustainable fishing grounds

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As Vietnam's fisheries face mounting pressures, managing fishing quotas alongside the restoration of fishery resources is increasingly seen as the key to sustainable development.

Pressure from declining fishery resources

With over 3,260 km of coastline and vast fishing grounds, Vietnam was once renowned for its abundant marine resources. However, overfishing, destructive practices, and marine pollution have caused severe declines in fishery resources.

According to the Ministry of Agriculture and Environment, coastal fishery resources have dropped by 20-30% compared to 20 years ago. Average annual catch has remained relatively stable at around 3.9 million tons since 2010-2015, while the fleet remains large, with 82,333 vessels, most operating nearshore.

Nguyen Quang Hung, Deputy Director of the Directorate of Fisheries and Fisheries Surveillance, warned: "Coastal fishery resources are nearly depleted. Many fishing grounds now yield only small, low-value fish. Without strict management, the risk of 'empty' fishing grounds is unavoidable."

The consequences are that fishermen must venture farther offshore, incurring higher costs, while catch volumes remain unstable, threatening livelihoods historically tied to the sea.

Fishing quotas

To prevent overexploitation, quota-based fishing permits were introduced under the 2017 Fisheries Law. Offshore quotas are issued on five-year cycles, based on assessments of fishery resources, their recovery potential, and the composition of the fishing fleet.

Under Decision 1037/QD-BNN-TS dated April 11, 2024, the Ministry of Agriculture and Environment announced 29,552 offshore fishing permits for 2024–2029, representing a 5.6% reduction from the previous period. The decrease primarily affects trawl vessels,

while the increase in support vessels reflects efforts to conserve resources, promote sustainable development, and combat illegal, unreported, and unregulated (IUU) fishing.

The Directorate of Fisheries and Fisheries Surveillance explained that quotas are allocated based on the composition of the offshore fleet, local socio-economic conditions, traditional fishing practices, and the availability of fishery resources. The provinces receiving the most permits are Kien Giang (3,720), followed by Gia Lai (3,280) and Quang Ngai (3,102).

Reducing quotas not only limits the number of vessels but also promotes a shift from "take-at-all-costs" fishing toward regulated harvesting, helping to lay the foundation for responsible fisheries.

Restoration of fishery resources

Alongside reduced fishing quotas, Vietnam has stepped up efforts to restore fishery resources, establishing sixteen marine protected areas covering more than 270,000 hectares that serve as "gene banks" for rare species.

Provinces such as Khanh Hoa, Quang Nam, and Quang Ninh release tens of millions of native juveniles annually to restore natural populations. In 2023 alone, more than 100 million juveniles including fish, crabs, lobsters, and bivalves were released nationwide.

Other measures include seasonal fishing bans during spawning seasons, the use of larger mesh sizes to avoid catching juveniles, and modifications to fishing gear to minimize habitat damage. Notably, WWF Vietnam has partnered with fishermen in Binh Dinh, Gia Lai, and Khanh Hoa to pilot circle hooks in tuna fisheries, reducing bycatch of sea turtles, sharks, and other endangered species.

Assoc. Prof. Dr. Nguyen Chu Hoi, Executive Vice President of the Vietnam Fisheries Association, emphasized: "There can be no sustainable fisheries if fishing grounds are depleted. Conservation, along with the restoration of fishery resources, serves as a 'savings account' for future generations of fishermen."

Co-management

A major challenge lies in the nearshore fleet of vessels under 20 CV, which accounts for nearly 40% of the total fleet and complicates administrative management. Current regulations prohibit vessels under 20 CV or those using destructive gear, such as dredges and trawls, from operating nearshore. However, many families lack land or alternative livelihoods, leaving them dependent on the sea for survival.

Experts advocate expanding co-management models, giving fishing communities greater authority to oversee their own fishing grounds. Provinces such as Thua Thien Hue, Quang Nam, Khanh Hoa, and Binh Thuan have established dozens of co-management groups, where fishermen collaboratively allocate areas, set fishing seasons, establish conservation agreements, and monitor compliance.

Tran Van Linh, Chairman of the Da Nang Fisheries Association, noted: "When fishermen participate in management, they see fishing grounds as shared assets to be preserved rather than exploited. This is how policy moves from paper into practice."

Standardizing fisheries for integration

Quota management and the restoration of fishery resources not only conserve marine resources but also lay the groundwork for standardized, internationally compliant fisheries, a key step in addressing the EU's "yellow card" on IUU fishing applied to Vietnam's seafood since 2017.

Permitted vessels must be equipped with vessel monitoring systems (VMS), maintain detailed fishing logs, offload at designated ports, and report catches transparently. These measures bring Vietnam's fisheries in line with international best practices and ensure full traceability of seafood products.

Vietnam currently has over 82,333 fishing vessels: 39,330 vessels of 6–12 m; 14,404 of 12–15 m; 26,095 of 15–24 m; and 2,453 over 24 m. Offshore fishing permits for 2024–2029 total 29,552, a 5.6% reduction from 2019–2024, including 27,132 for harvesting vessels and 2,420 for support vessels.

Tran Dinh Luan, Director of the Directorate of Fisheries and Fisheries Surveillance, stressed: "Standardizing fisheries goes hand in hand with managing fishing grounds. To export sustainably, Vietnam must ensure that its seafood is harvested legally and responsibly."

Quota management, the restoration of fishery resources, and community co-management form the three pillars of sustainable fishing grounds. Together, they provide the foundation for standardized fisheries, an intelligent investment in natural capital that conserves resources, delivers long-term returns, reinforces Vietnam's position in global seafood markets, and protects fishermen's livelihoods.

Thuy Khanh

Residents of Bich Dam Island, Nha Trang Bay (Khanh Hoa), participate in a dialogue on marine resource conservation Photo by Thuy Khanh

Mekong Delta aquaculture adapts to climate change

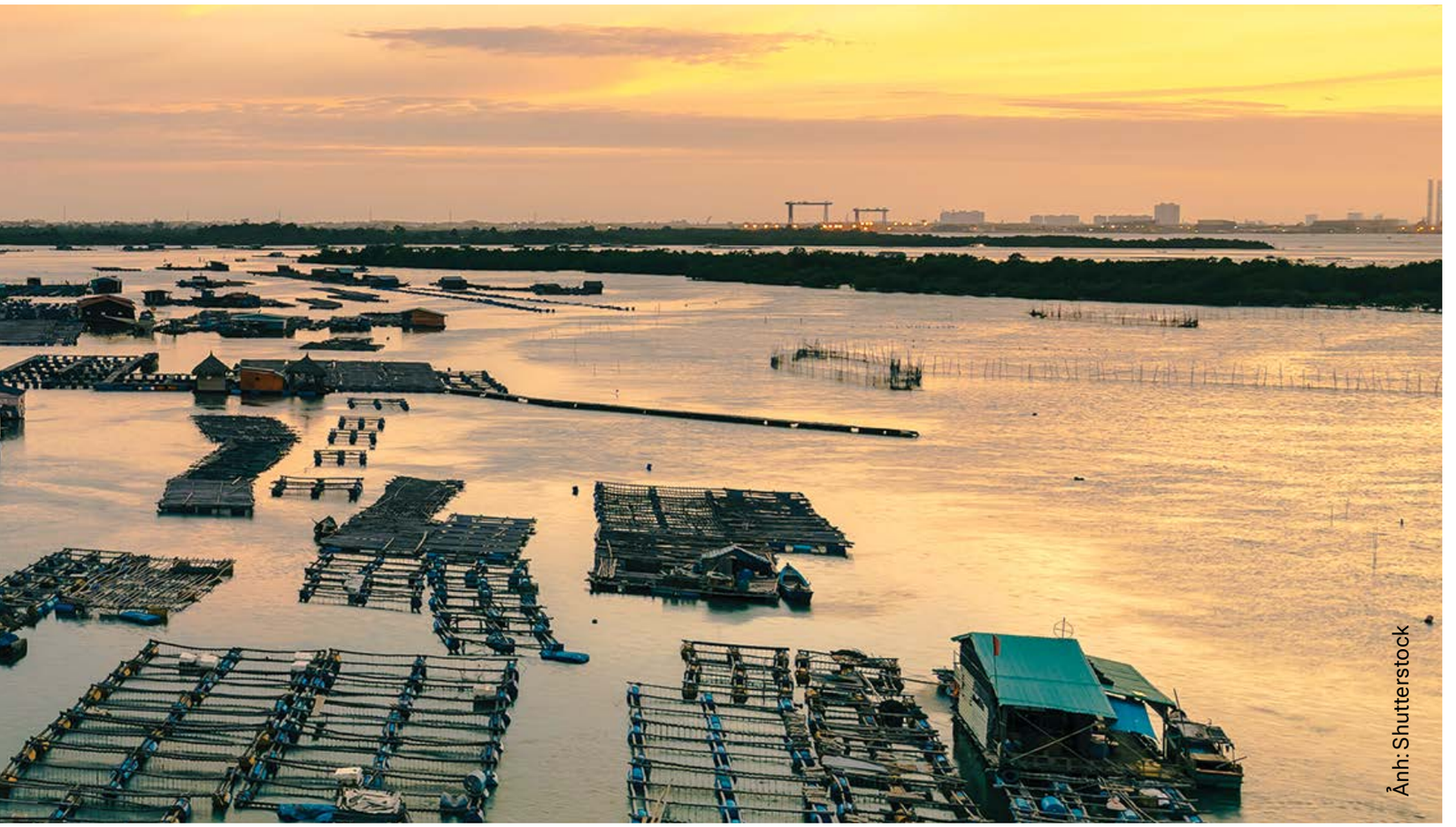
Climate change is challenging aquaculture in the Mekong Delta, demanding strategic action to secure economic and environmental sustainability.

The Mekong Delta is Vietnam's largest aquaculture region, contributing approximately 65% of national farmed aquatic production and 60% of seafood export turnover. The region benefits from favorable natural conditions, including over 1.2 million hectares suitable for aquaculture, of which 750,000 hectares are tidal areas, an extensive river network, and a tropical monsoon climate. Key species such as pangasius and brackish water shrimp have reinforced Vietnam's position in the global seafood market over recent years.

However, the sector faces significant challenges. Climate change, sea level rise, saltwater intrusion, and droughts are increasingly severe. Major salinity intrusion events in 2015-2016 and 2019-2020 caused substantial production losses, highlighting ecosystem vulnerability. In addition, unstable seed quality, environmental pollution, complex disease dynamics, fragmented production systems, and volatile markets have constrained economic efficiency relative to the sector's potential.

To provide a scientific basis for strategic development, the Institute of Fisheries Economics and Planning conducted a comprehensive survey assessing the current status and cultivation potential of priority aquatic species in the Mekong Delta. From a list of 39 candidate species, 12 were selected as priorities: six brackish/marine species (clams, cobia, mud crabs, blood cockles, oysters, gobies) and six freshwater species (eels, snakehead fish, tiretrack eel, tilapia, catfish, frogs). Selection criteria included economic value, adaptability to climate change, and commercial development potential.

Survey results indicate a growing trend in both farming area and production of these priority species. Clam cultivation is concentrated in Ben Tre, Tra Vinh, Bac Lieu, and Ca Mau, with production reaching hundreds of thousands of tons annually. Mud crabs, blood cockles, and oysters have been designated as strategic products by several coastal provinces. In freshwater systems, eels and snakehead fish are expanding in An Giang, Dong Thap, and Hau Giang; tilapia is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emerging as a potential export species; while frogs and tiretrack eels are suited to small-scale operations but yield high profits.

Many farming models demonstrate clear economic benefits, with average household profits ranging from VND 200-300 million per year, surpassing those of some traditional species. Species such as eels, tilapia, clams, and mud crabs show strong adaptability to a wide range of salinities. Nevertheless, constraints remain: limited control over seed supply, dependence on wild capture for several species, prevalence of diseases such as white spot, EMS, and EHP, small-scale production limiting access to export markets, and price volatility.

A SWOT analysis identifies natural advantages, ecological diversity, and market demand as key strengths; seed quality, farming technology, and small-scale operations as weaknesses; rising global seafood demand and free trade agreements as opportunities; and climate change, stringent quality requirements, and international competition as threats.

Based on these findings, the potential for developing priority aquaculture species in the Mekong Delta is substantial. Salinity-affected agricultural land can be converted to integrated aquaculture systems, enhancing climate adaptation and economic value simultaneously. Domestic demand is growing rapidly, and international markets are accessible provided traceability and food safety standards are met. Advances in science and technology, including recirculating aquaculture systems, biofloc technology, and AI-based environmental management, offer additional opportunities for sustainable intensification.

By 2030, development should focus on brackish/marine species (cobia, mud crab, clams, blood cockles, oysters, gobies) and freshwater species (eels, snakehead, tilapia, catfish, tiretrack eels, frogs), with the establishment of concentrated farming zones integrated with processing and market systems.

Three priority solutions are recommended: (i) Selective breeding, artificial breeding, and quality control; (ii) Application of advanced farming technologies and strengthened production linkages; (iii) Development of processing, branding, and diversification of export markets.

The study also proposes three key projects: high-quality seed development, advanced aquaculture technologies, and processing–market development toward large-scale commercial production. Successful implementation of these initiatives could generate significant momentum for the Mekong Delta aquaculture sector.

The Mekong Delta is not only the hub of shrimp and pangasius production but also hosts diverse aquatic species with potential to become future economic drivers. Effective development requires close coordination among government agencies, enterprises, farmers, and research institutions. Sustainable aquaculture, adaptive to climate change and integrated with value chains and international markets, will ensure the MD consolidates its central role in Vietnam's aquaculture sector and strengthens its global presence.

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MMPA and global fisheries

CHALLENGE OR CATALYST FOR INNOVATION?

The U.S. Marine Mammal Protection Act (MMPA) has far outgrown its domestic roots, emerging as a major force reshaping global seafood trade. Exporting countries now face rising pressure to modernize their fisheries or risk losing access to the U.S. market.

A stringent technical barrier

Enacted in 1972, the Marine Mammal Protection Act (MMPA) was among the U.S.'s first laws aimed at safeguarding marine life. Its goal: to prevent the hunting, killing, or harming of whales, dolphins, seals, sea lions, and manatees. What sets the MMPA apart, however, is its reach beyond U.S. waters—any country exporting seafood to the United States must comply.

Initially, the law focused on domestic fisheries. But as global trade grew, the MMPA's influence expanded. A pivotal moment came in 2016, when NOAA Fisheries introduced rules requiring all seafood-exporting nations to prove that their fishing practices affect marine mammals no more than U.S. standards. The move turned the MMPA into one of the toughest technical barriers in international seafood trade.

Tough market scrutiny

The United States is one of the world's top three seafood markets, importing tens of billions of dollars in products each year. For many exporters, it represents 15-30% of total seafood revenue, especially for tuna, squid, octopus, and shrimp. Any shift in U.S. import rules can send shockwaves across the global industry.

Under the MMPA, all seafood exporters must meet strict marine mammal protection standards. They are required to monitor fishing operations, log any entanglements or deaths, and put mitigation measures in place. Failure to comply can lead to outright import bans.

Fisheries using bycatch-prone gear like purse seines, gillnets, and bottom trawls are hit hardest. In many developing countries, these low-cost, widely used nets carry a high risk of trapping dolphins, whales, and sea otters.

Fishing costs, often without guaranteed compensation through higher profits.

As a result, exporters and fishers must change their practices, investing in dolphin-safe nets or placing independent observers on vessels to monitor interactions. These measures push up costs, often without any guarantee of higher returns.

For countries heavily dependent on the U.S. market, non-compliance can be catastrophic. If a single fishery falls short of MMPA standards, its products can be blocked from import, putting the livelihoods of hundreds of thousands of fishers at risk.

Mexico offers a stark example. Its yellowfin tuna fishery was once barred from the U.S. market over high dolphin mortality, triggering a years-long trade dispute at the World Trade Organization, famously known as the "Tuna-Dolphin Dispute."

In Southeast Asia, tuna, squid, and other pelagic fish exporters including Indonesia, the Philippines, and Thailand face similar pressure to tighten fisheries management, monitoring, and reporting to avoid potential U.S. bans.

Innovate or lose market

After years of legal battles over the U.S. ban, Mexico learned that maintaining market access required proactive changes in fishing practices to reduce marine mammal bycatch, rather than relying on trade disputes alone. The country introduced stricter monitoring, placed independent observers on vessels, and adopted marine-friendly nets, gradually restoring its standing in the international market.

In South America, major anchovy and tuna producers such as Chile and Peru have stepped up monitoring of industrial fisheries, using onboard observers and electronic surveillance to track marine mammal interactions. Research programs evaluate bycatch risks and guide mitigation, enabling regulators to provide transparent data to NOAA and meet U.S. equivalency standards.

In Southeast Asia, Indonesia and the Philippines, home to the region's largest tuna fleets, have joined regional initiatives such as the Western and Central Pacific Fisheries Commission (WCPFC), working with international partners to improve fishing gear and monitoring. Pilot projects have tested safer nets, tracking devices, and trained fishers to respond when marine mammals are caught. These efforts are steadily generating more reliable data, boosting the chances of meeting U.S. standards.

Mexico subsequently tightened its monitoring measures, requiring fishing vessels to carry independent observers and to adopt marine-wildlife-friendly net technologies. These efforts have gradually helped the country restore its credibility on the international market, though significant challenges remain.

Experts say the MMPA is both a challenge and a driver of sustainable change for seafood exporters. Lessons from Mexico, Chile, and Indonesia show that only stronger management, transparent reporting, and technological upgrades can bring fisheries into compliance. In the long run, meeting the standards not only secures access to the U.S. market but also helps build a reputation for responsible, sustainable fishing, an increasingly valuable asset in global seafood trade.

Tuan Minh

Shrimp exports challenged, yet remain on track

Vietnamese shrimp exporters have posted a solid USD 3.38 billion in export value for the first nine months of 2025, despite mounting challenges. With trade barriers, stiff competition, and tightening raw material supply, proactive and flexible strategies remain critical to sustaining gains and exploring new markets.

Breaded shrimp, which command higher value and are exempt from anti-dumping duties, give Vietnam's shrimp industry a competitive edge in the U.S. market.

According to the Vietnam Association of Seafood Exporters and Producers (VASEP), total seafood exports reached USD 8.33 billion in the first nine months, up 15.5% year-on-year, with shrimp driving growth at USD 3.38 billion, a 20.3% increase. This reflects both a recovery after recent market fluctuations and exporters' ability to adapt to global trade uncertainties. Growth was supported by steady demand from the U.S., Japan, and the EU, alongside rising orders from other Asian markets.

Shipments to Europe and North America typically peak from mid-October to late November, tapering off into Q1, while Asian markets such as Japan and South Korea remain active through year-end. This year, however, U.S. exports are expected to conclude by October 15 to mitigate tariff risks.

Ho Quoc Luc, Chairman of Sao Ta Food JSC, noted that the U.S. Department of Commerce will announce the final anti-dumping (AD) duty on December 9. Consequently, exports to the U.S. are likely to drop sharply after October 15 to avoid higher duties. Combined with limited raw material supply, Q4 shipments are expected to fall, but the strong first nine months suggest the industry is on track to reach its USD 3.8-4 billion annual target.

Not all shrimp products face steep AD tariffs. Breaded and battered shrimp, for instance, remain untaxed, offering exporters opportunities to optimize sales. Early 2026, however, could be challenging if final AD rates are high, potentially requiring cash deposits or retroactive duty payments on 2023 shipments, which may depress U.S. exports in Q1 2026.

Supply constraints persist in key provinces such as Ca Mau, Can Tho, Vinh Long, and An Giang. While volumes may dip, prices remain firm and are expected to hold through early 2026.

Vo Van Phuc, CEO of Vinacleanfood, said exports have picked up since September, but tariffs, competition, and raw material shortages continue to pressure margins. While prices may remain stable, larger shrimp sizes could see some declines. Revenue is expected to meet or exceed targets, but profitability remains uncertain.

VASEP highlighted that proactive shipping ahead of tax and technical barriers has helped maintain momentum. Companies have restructured markets, boosted exports to Asia, strengthened positions in traditional markets, and invested in value-added, traceable products. Yet challenges from AD, countervailing duties (CVD), and global competition remain.

Experts recommend closely monitoring trade policies, diversifying markets beyond traditional destinations (U.S., EU, Japan), and expanding into ASEAN, the Middle East, and niche markets. Developing value-added products, adopting innovative farming and processing technologies, and strengthening the Vietnamese brand via premium culinary channels and e-commerce will be essential for long-term competitiveness.

Despite hurdles, Vietnamese shrimp exporters achieved USD 3.38 billion in the first nine months of 2025. With proactive, flexible, and innovative strategies, the industry is positioned to protect its gains and pursue further international opportunities.

Xuan Truong

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U.S. MARINE MAMMAL

WHAT IS MMPA?

A pioneering U.S. legislation enacted in 1972 that laid the foundation for ecosystem-based marine conservation.

Core Mission

Maintain the health and stability of marine ecosystems and protect all marine mammal species.

Key Prohibition

Bans the hunting, harassment, capture, killing, and trade of marine mammals and any products derived from them.

MANAGEMENT UNIT

NOAA FISHERIES

Manages: Whales, dolphins, seals, sea lions.

U.S. FISH & WILDLIFE SERVICE

Manages: Polar bears, walruses, sea otters, manatees, dugongs.

MARINE MAMMAL COMMISSION

Role: Independent oversight agency providing recommendations to ensure effective implementation of the law.

KEY ACTIONS

▸ Protect & Restore

Prevent marine mammal populations from falling below sustainable levels and restore them.

▸ Mitigate impacts

Develop plans to minimize incidental capture of marine mammals in commercial fishing, aiming for a "zero bycatch" goal.

▸ Scientific research

Continuous stock assessment reporting to monitor the health and trends of marine populations.

▸ Cooperation & Management

International: Requires seafood-exporting nations to the U.S. to implement comparable marine mammal protection standards.

National: Empowers Alaska Native communities with co-management authority for conservation and subsistence harvesting.

"A commitment to a healthy, biodiverse ocean for future generations."
– MMPA

PROTECTION ACT (MMPA)

IMPACT SCOPE

Countries must demonstrate that their fishing practices do not harm marine mammals, equivalent to U.S. standards.

For Vietnam:

The United States currently recognizes only a portion of Vietnam's seafood products as compliant.

Import Ban Risk: 12 wild-capture fisheries (including tuna, squid, octopus, and mackerel) have been denied recognition and would be prohibited from entering the U.S. market. Estimated loss: Approximately USD 200-500 million per year.

Effective date: January 1, 2026.

Reasons for non-compliance:

1. High-risk fishing gears that may interact with marine mammals.
2. Lack of comprehensive monitoring and reporting of incidental catch.
3. Mitigation measures have not demonstrated effectiveness according to U.S. standards.

Vietnam's response

- Reviewing and revising legal and regulatory documents while establishing a robust fisheries monitoring program.
- Developing a comprehensive action plan and preparing detailed technical documentation to be ready for working sessions with relevant authorities.
- Strengthening diplomatic engagement and consultations with the U.S. side to clarify assessment criteria, while learning from countries that have already achieved full recognition to improve the application dossier in the upcoming phase.

Seaweed boosts shrimp performance

Red seaweed *Lithothamnium calcareum*, the main component in Marisert, offers multiple benefits in shrimp farming: it improves feed conversion ratio (FCR), increases survival rate, shortens the culture cycle, and enhances production, while also stabilizing pond conditions and reducing the risk of acute hepatopancreatic necrosis disease (AHPND).

Seaweed and seaweed species number in the thousands, in excess of 12,000 so to speak. They are broadly categorised into brown, green and red with thousands of species within each category. Seaweed plays a vital role in marine ecosystems and is utilised by humans for a myriad of purposes from cosmetics, nutraceuticals, alginates along with use in human and animal nutrition etc.

Red seaweed specialists

Celtic Sea Minerals is an animal nutrition company which is part of the Marigot Group. Based out of Ireland and in operation over 30 years, the company is a specialist in seaweed and seaweed extracts with a particular acumen derived from red seaweed algae: lithothamnium calcareum. The company's expertise in animal nutrition using seaweed has led the company down to have over 60 scientific peer reviewed papers and with exports across 75 countries and growing.

The red seaweed contains 74 minerals with the major two being calcium and magnesium along with a polysaccharide hydrogel which are all inherent in the material. The seaweed has a regenerative cycle where only the dead material is harvested from a fjord in Iceland. The live plant is never touched and as the plant absorbs the minerals from the ocean, the plant calcifies and hardens and eventually falls off forming deposits downstream in the fjord. The deposits range in size but can be anywhere from seven metres high to eleven metres wide.

Trials spanning across 20 years have shown strong consistent results in shrimp farming in both commercial and academic environments. A trial in New Orleans in USA with L. vannamei shrimp started off the journey into using the product in shrimp farming which showed positive results in improved FCR (Feed Conversion Ratio), reduced mortality whilst also improving water alkalinity. L. vannamei shrimp were used due to their prevalence constituting over 50 percent of the shrimp cultured globally.

The branded product Marisert was used in two different areas of shrimp culture, a feed adjunct to replace a mineral pack in nursery and grow out feeds and the direct use of the product in solution to alleviate the alkalinity depletion which is normal at the end of the grow out cycle.

Growth, survival & production gains

Average grow out times were 84 days with an average weight of 18.64 grams, survival of 81 percent and 7,55kgs/cubic meter. Average growth, independent of mineral treatment was 1.47grams/ week. It appears that the nutritional advantage is principally provided in the first 50-70 days of post larval development.

Looking at the end of the nursery period (47 days post larval) the shrimp using a three percent Marisert supplement achieved an average size 29 percent larger than their control counterparts. This cuts eight days off the nursery period, dramatically reducing support requirements and feed costs. If nursery operations are run in parallel with grow out, the combination of time saved in the nursery phase and the grow out phase will save 16 days in a cycle. This translates to at least 54 extra growing days a year for production or an increase of 14.7 percent, minimum, in potential annual production. It also had the added benefit of eliminating the need to monitor the systems alkalinity and do buffer additions during the last five weeks of the grow out cycle. This represents a significant decrease in the monitoring effort and the elimination of another chemical additive late in the grow out cycle.

Two further trials were conducted in Guatemala with Acuamaya in 2022 and 2023. The first trial had a stocking density of 80 shrimp/mt2 with a three kg inclusion of Marisert. Protein level of 30 percent. Larvae were same origin and plated same day or one day difference. Ponds at a size of 5000mts with five each for both the control and treatment. Weekly measurements were conducted with technical personnel from Acumaya. Trials were done at a difficult period of time due to cold weather entering Guatemala at the end of the trials November/December.

The second trial conducted in 2023 relayed similar results. Feed formulation had only vegetable protein (soy) at 30 percent protein level. Stocking density was 100 shrimp/ mt2. 10 ponds once again were used split evenly between control and treatment. Rain happens in late May and June, when the rainy season starts, not much change in water quality and temperature average of 24-28 degrees Celsius – the best time of the year to produce shrimp in Guatemala. Weekly measurements were conducted with technical personnel from Acumaya.

In a recent scientific laboratory trial conducted in Europe, the administration of the Marisert treatment led to a six percent reduction in the vibrio count associated with Acute Hepatopancreatic Necrosis Disease (AHPND)-provoked mortality in both low density (100 shrimp/ m2) and high-density (400 shrimp/m2) groups. Further analysis will be carried out to determine mode of action.

Seamus Callanan
Business Development Manager Middle East & Asia, Celtic Sea Minerals, Ireland

6 KEY STEPS IN SEAFOOD SUPPLY CHAIN VERIFICATION

1 INPUT VERIFICATION (FRY & MATERIALS)

▶ **Ensure safety and compliance from the very start.**

- **Fry / Seed stock:** Quarantine, pathogen testing, traceable origin, certified sources.
- **Feed & veterinary supplies:** Only approved products in Vietnam. Strict control of antibiotic residues and banned substances.

2 PRODUCTION VERIFICATION (AQUACULTURE & FISHING)

▶ **Confirm sustainability, legality, and safety of raw materials.**

- **Aquaculture:** Assess farm conditions (water, sludge treatment). Monitor operations via logbooks (feed, chemicals). Comply with VietGAP, GlobalG.A.P., ASC, etc.
- **Wild capture:** Verify vessel legality (licenses, VMS). Check logbooks, catch reports, and ensure no IUU violations.

3 PROCUREMENT & TRANSPORT CONTROL

▶ **Maintain traceability and safety standards throughout.**

- All raw materials must have verifiable traceability documents from approved farms/vessels.
- Ensure proper preservation (cold chain) from pond/port to processing facility.

4 PROCESSING PLANT VERIFICATION

▶ **Control all food safety risks.**

- Assess facilities, equipment, sanitation (SSOP), and GMP compliance.
- Review HACCP-based quality programs (mandatory for most exports).
- Global standards: HACCP, BRC, IFS Food, etc.

5 BATCH SAMPLING & LAB TESTING

▶ **Scientifically confirm product safety.**

- Government inspectors collect random representative samples.
- PAccredited labs (e.g., NAFIQPM) test for:
  - Pathogens (Salmonella, E. coli, etc.)
  - Banned chemicals and antibiotic residues
  - Heavy metals (mercury, lead, etc.)

6 EXPORT CERTIFICATION (HEALTH CERTIFICATE)

▶ **Final official approval confirming full compliance.**

- Based on verification of Steps 1-5.
- If all importing country requirements (EU, USA, Japan, Korea, etc.) are met, authorities issue the Health Certificate.

**Note: This is a general reference. Requirements may vary by product type (shrimp, pangasius, bivalves, etc.) and export market. Businesses must follow specific technical regulations for each destination.*

THE KEY TO VIETNAM'S SUSTAINABLE SEAFOOD

Global trade is facing tighter technical, environmental, and carbon regulations, making international standards the common language of commerce. Vietnam's seafood industry is building transparent, compliant, and green supply chains to secure sustainable growth.

A new benchmark for competitiveness

Vietnam is currently the world's third-largest seafood exporter, after China and Norway, with export revenue reaching USD 9.4 billion in 2024. The sector targets USD 10 billion in 2025, supported by recovering consumer demand in major markets and the ongoing restructuring of global supply chains.

But volume alone is no longer enough. Key markets including the EU, the United States, Japan, South Korea and China are tightening requirements on food safety, environmental protection, social responsibility and carbon emissions. From 2026, the EU will implement its Carbon Border Adjustment Mechanism (CBAM), with seafood included in the expansion roadmap, meaning products that fail to meet "green" standards risk losing market access.

Nguyen Hoai Nam, Secretary General of the Vietnam Association of Seafood Exporters and Producers (VASEP), warned that Vietnamese companies could be squeezed out of the global arena unless the entire value chain upgrades its practices. "Standards are no longer just a passport to export, but a benchmark of national competitiveness," he said.

Meeting these requirements, he added, must begin at the source. Vietnam currently operates 7,224 hatchery and nursery facilities, of which 2,563 require certification to operate. Only 1,822 have been certified, equivalent to 71.1%. Small-scale and fragmented production continues to hinder quality control, particularly for key species such as whiteleg shrimp, black tiger shrimp, pangasius and tilapia.

In feed production, over 80% of raw materials are still imported from South America, India and China, driving up costs and raising quality risks. Some provinces,

including Bac Lieu and An Giang, have established regional broodstock centers and compliant feed supply chains, but the model has yet to be widely adopted. Without stronger control at the input stage, efforts to meet international standards further down the supply chain risk remaining largely symbolic.

A stronger push needed for certification standards

Certification standards have become a key gateway for Vietnamese seafood to enter high-value markets. The country now has over 1,300 farming areas certified under VietGAP; around 350 pangasius and shrimp farms meeting ASC or BAP standards; multiple clam farming zones certified under MSC and ASC; and several major companies holding GlobalGAP or participating in EU and Japanese sustainability audits. These certifications are seen as essential "passports" for accessing demanding markets such as the EU, the United States and Japan.

However, certified areas account for only about 25% of total commercial aquaculture acreage. Most smallholder farmers remain outside the system due to high certification costs ranging from VND 80 million to 150 million per cycle, limited access to technical experts and challenges in obtaining green financing.

Analysts say that achieving international certification requires more than farm-level paperwork or production techniques. It demands aligned improvements in infrastructure, environmental management and market linkages, conditions that remain major obstacles for small producers.

Most seafood businesses are small and medium-sized, with limited financial, human and technological capacity. Many meet only basic HACCP requirements and lack the resources to pursue ASC or BAP, which demand full-chain compliance from farming and processing to social and environmental governance. Certification and maintenance costs account for 3-5% of product prices, squeezing profit margins, while green credit policies and transition funding have yet to provide meaningful support.

Economist Tran Quoc Huy warned that without stronger technical and financial support, small firms risk being excluded from global supply chains. He added that certification should be treated as a technology investment rather than a short-term cost.

One emerging solution is the "group certification" model, in which cooperatives or lead enterprises handle documentation and monitoring on behalf of multiple farmers. The approach has shown early success in the Mekong Delta, significantly cutting certification costs and improving market access.

Processing moves toward "green" standards

While upstream farming continues to face major constraints, processing remains Vietnam's strongest competitive advantage in the seafood sector. The country has nearly 830 industrial-scale processing plants, 95% of which meet HACCP, ISO 22000 or equivalent standards. Many companies have also secured BRC, IFS and Halal certifications to serve European and Middle Eastern markets.

Industry leaders such as Minh Phu, Vinh Hoan, Sao Ta and Nam Viet have invested in automation, green factories and artificial intelligence in quality control. As a result, the share of deeply processed products has steadily increased, accounting for more than 45% of total export value in 2024.

However, market requirements now go beyond food safety to encompass social and environmental responsibility. Criteria on CO_2 emissions, wastewater treatment and recyclable packaging are increasingly mandatory. Many experts say the biggest challenge over the next five years will not be production capacity, but emissions management and supply-chain transparency. Companies that can track and control carbon data will gain a competitive edge.

Market demands now go beyond food safety to include social and environmental responsibility. Criteria on CO_2 emissions, wastewater treatment and recyclable packaging are increasingly seen as prerequisites.

Several Vietnamese companies are already leading the green transformation: Vinh Hoan recycles 100% of pangasius by-products into fish oil, collagen, gelatin and animal feed; Minh Phu develops ecological shrimp farms integrated with mangrove forests; and Sao Ta uses water-circulation systems, energy-saving technologies and onsite waste treatment. The Mekong Delta is also piloting a "carbon credit for aquaculture" scheme, allowing companies to record and trade emissions reductions, a move aligned with the EU's CBAM requirements.

Dr. Pham Duc Binh of the Hanoi University of Science and Technology emphasized that a green supply chain is not only a market-driven pressure, but also an opportunity to restructure the sector toward higher value, reduced risk and climate resilience.

Under the Fisheries Development Strategy to 2030, with a vision to 2045, Vietnam targets annual exports of USD 12-13 billion; more than 80% of products certified safe and sustainable; 100% of farming areas digitally identifiable and traceable; and a 15% reduction in sector-wide CO_2 emissions.

To achieve these goals, experts propose three priority measures: improving national standards and regulations, aligning with international benchmarks and promoting mutual recognition between VietGAP, GlobalGAP and ASC; and incorporating carbon and circular-economy criteria. At the same time, businesses need support for the green transition through lower certification costs, technical training, digitalization and the creation of a national database covering farming zones, processing plants, emissions and certifications, forming a foundation for automated, transparent traceability for international partners.

In an increasingly competitive global market, standards are no longer barriers but "golden keys." A supply chain that is standardized, green and digitalized will enable Vietnamese seafood to win consumer trust and strengthen its position among the world's leading exporters.

Phan Thao

Vietnam seafood bets on EU compliance

The European Union is one of Vietnam's four largest seafood export markets, making adherence to supply chain regulations crucial, particularly amid ongoing U.S. trade tensions.

Maximizing human rights

As one of Vietnam's top shrimp exporters to the EU, Ho Quoc Luc, chairman of Sao Ta Food JSC, says European countries are placing growing emphasis on environmental and labor standards, viewing them as essential for production. While Vietnam's labor laws already meet international norms, companies must still comply with European rules on working hours, benefits, maternity leave, and a strict prohibition on child labor to protect workers' rights.

Luc cited Sao Ta's shrimp farms as an example. Worker housing, once simple huts deemed unsafe by European markets, now meets strict EU standards. Housing must be sturdy, private, well-ventilated, and include basic amenities such as fans and electricity. Dining facilities must offer proper cooking areas, seating, and sanitary installations, including toilets and sinks. Today, all Sao Ta shrimp farms fully comply with these requirements, enabling them to export to the EU.

Prioritizing environmental standards

On environmental standards, Luc emphasized that businesses must comply with strict requirements covering emission control, energy efficiency, and carbon offsetting. The EU monitors the entire production chain, demanding precise measurement of emissions from machinery, equipment, and personnel. Companies are expected to adopt energy-efficient machinery, cut fossil fuel use, boost reliance on renewable energy, and even undertake reforestation projects to offset emissions.

Animal welfare is also a key concern. Livestock must be raised in conditions that respect their natural behaviors. For example, adult shrimp cannot undergo eye ablation - a common practice in Vietnam's artificial shrimp breeding, posing initial challenges for the industry. Shrimp must be stocked at densities that allow comfortable swimming and adequate oxygen, well below conventional industrial levels, rendering this approach nearly unprofitable for small-scale operations. Farms are also required to monitor water quality, including dissolved oxygen and mineral content, and track shrimp health via cameras to quickly detect and address stress. "In short, full compliance with animal welfare standards is achievable only for large-scale farms; smaller operations often struggle to meet them," Luc said.

Ensuring transparency

Traceability safeguards product safety and ensures compliance with free trade

Photo: Khoa Nguyen

agreements, preventing imported goods from being falsely labeled as Vietnamese. Whereas farm and document audits used to take place every two to three years, ASC officials in Vietnam now carry out on-site inspections and closely monitor input materials as well.

Traceability remains a major challenge for farms and businesses, requiring strict oversight of the entire chain from raw materials to exported products to meet EU standards. While it may sound straightforward, gaining full trust from the EU is particularly difficult for smallholders and small enterprises. VASEP has collaborated with the EU to harmonize regulations on aquaculture inputs, particularly veterinary drugs, aiming to standardize limits on banned substances in both farming and processing.

Challenges, but big opportunities

Supply Chain Due Diligence (SCDD) involves assessing and addressing potential risks across the supply chain, financial, including operational, environmental, and social. The process ensures compliance with legal and sustainability standards while minimizing negative impacts on people and the planet. Its ultimate goal is to establish a supply chain that is ethical, legally compliant, and sustainable, encompassing environmental, social, and governance (ESG) considerations.

Businesses admit that fully meeting European supply chain standards is challenging. Yet those that succeed often unlock significant opportunities. "Companies that fully comply with EU standards hardly need to find customers; European buyers come to them," Luc said.

Given the fragmented nature of Vietnam's aquaculture, particularly shrimp farming, meeting EU standards is extremely difficult. Therefore, restructuring production through cooperation, value chain linkage, and land consolidation policies will be key to the sector's growth.

Vietnamese exporters to the EU have proactively prepared and implemented supply chain controls, giving European buyers confidence. It is not only companies but also the broader agricultural sector that has spent years preparing for this. In fact, major EU buyers, especially reputable companies, highly appreciate Vietnam's preparation.

Xuan Truong

Vietnamese tilapia expands global reach via sustainable supply chains

By building green supply chains, Vietnamese tilapia is emerging as a strategic choice for sustainable aquaculture, combining economic growth with environmental responsibility.

Huge potential, expanding markets

Vietnam's tilapia farming area reached around 42,000 hectares in 2024, producing 316,000 tonnes and generating USD 41 million in export revenue, according to the Directorate of Fisheries and Vietnam Fisheries Surveillance. In the first eight months of 2025, exports totaled USD 63.3 million, nearly triple the same period last year. Key production hubs include the Mekong Delta (An Giang, Dong Thap), the Red River Delta (Bac Ninh, Hai Phong), and northern upland provinces like Phu Tho and Son La.

Currently among the world's top 10 tilapia producers, Vietnam supplies major markets including the U.S., EU, Middle East, and South America, exporting frozen fillets, fresh fish, and ready-to-cook products. Imports remain minimal and mostly support re-export processing.

At the recent Tilapia Production and Consumption Forum in Hai Phong, Deputy Director of the Directorate of Fisheries and Fisheries Surveillance, Nhu Van Can, noted that although export value currently stands at USD 70-80 million, the potential remains enormous. "Tilapia could become Vietnam's next billion-dollar aquaculture sector if developed along green lines, with integrated supply chains and a national brand," he said.

To achieve this, the Directorate is promoting eight initiatives, from concentrated farming zones and selective breeding of GIFT and red tilapia strains, to supply chain integration and circular technologies, all aimed at standardizing processes, enhancing quality, and reducing emissions. "The goal is not to expand farmed areas at any cost, but to give each zone its identity, standards, and traceability," Can emphasized.

Nguyen Hoai Nam, Secretary General of the Vietnam Association of Seafood Exporters and Producers (VASEP), said tilapia is becoming one of the most widely consumed fish globally. Global production surpassed 7 million tonnes

in 2024 and is projected to reach 7.3 million tonnes in 2025, growing at about 3.5% annually. Asia remains the largest production hub, accounting for 67% of output, with China leading at 1.8 million tonnes, more than half of total global exports.

Tilapia is considered "easy to farm, adaptable, and highly efficient," while meeting global consumption trends for healthy, sustainably sourced, and traceable food. Major markets, including the U.S., EU, Japan, and the Middle East, are increasingly importing tilapia certified by ASC, BAP, or GlobalGAP, a positive sign for developing producers like Vietnam.

"This is a golden moment for Vietnam to accelerate, as many major producing countries face rising costs, environmental pressures, and disease challenges," Nam said.

Collaboration for growth

These strategies are being implemented through local models. In An Giang, the Mekong Delta's freshwater fish hub, tilapia is farmed using bio-circular methods with demonstrable results. The province has over 1,000 hectares of commercial tilapia, most certified VietGAP, according to Tran Thanh Hiep, Deputy Director of the Provincial Department of Agriculture and Environment.

"We are not expanding indiscriminately. Our focus is on raising technical standards, reducing emissions, reusing water, and treating organic waste. The goal is sustainable growth, environmental protection, and improved livelihoods," Hiep said

An Giang shows that when authorities collaborate with farmers, sustainability becomes more than a slogan. Each pond and household forms a vital link in Vietnam's emerging green value chain. Similar models are now appearing in northern provinces, where enterprises are leading development.

At Xuyen Viet Fisheries Production & Trading Cooperative in Hai Phong, a fully integrated supply chain spans broodstock, farming, harvesting, processing, and export. Ponds are monitored 24/7 via sensors, data is managed digitally, and Biofloc technology is used to recycle microorganisms and reduce waste.

"We farm cleanly from pond to plate, with full transparency across the chain. When farmers, businesses, and authorities share a common goal, Vietnamese tilapia can reach far," said Mr. Le Van Viet, Chairman of Xuyen Viet. The company also invests in deep processing and value-added products, including fillets, fish cakes, and ready-to-eat item.

By-products are converted into protein powder, fish oil, and organic fertilizer, creating a circular economy that adds value while protecting the environment. VASEP estimates that if half of tilapia businesses adopt green models like Xuyen Viet, export value could increase by 40%. "Green is not just a trend, it's a prerequisite for international markets," Nam emphasized.

The shift toward data-driven production is being powered by technology. "Farmers once relied on experience; now they rely on data. Whoever controls the data controls quality," said Ngo The Anh, Head of Aquaculture at the Directorate.

Circular RAS systems, IoT sensors, automated feeding, and electronic logs are gradually replacing traditional methods, helping farmers control the environment and improve efficiency. Technology is also unlocking new uses for by-products, with 30–40% of fish biomass convertible into collagen, fish oil, or pharmaceutical ingredients.

The combination of policy, technology, and enterprise is bringing Vietnam closer to creating a national tilapia brand, akin to pangasius. By 2030, products are expected to carry farm traceability codes, a unified logo, and meet green, clean, and transparent standards.

"A brand is more than a name; it's a commitment to quality, responsibility, and Vietnam's reputation on the global stage," emphasized Deputy Director Nhu Van Can.

Vietnam aims to produce 400,000 tonnes of tilapia domestically and reach USD 100 million in exports by 2030. The plan includes building a national brand, "Vietnamese Tilapia," certified under ASC, BAP, or VietGAP. Key strategies focus on high-quality breeding, advanced farming technologies, integrated value chains, deep processing, cost reduction, digitalization, and robust quality management.

However, progress is constrained by financing and infrastructure bottlenecks. Many smallholders and SMEs struggle to access green credit for technology investment. Targeted incentives are needed for circular production, by-product processing, and electronic traceability systems, Nam said. "When economic and environmental benefits go hand in hand, green becomes reality," he added.

Vietnam's tilapia sector today rests on three pillars: government policy, enterprise-led value chains, and skilled farmers. Together, they position Vietnamese tilapia not only as a growing export commodity but also as a symbol of sustainable, integrated aquaculture.

Thuy Khanh

Commercial performances of the bioactive protein ingredient (MOTIV) in the booster feed and super-growwth feed for whiteleg shrimp (*Penaeus vannamei*, Boone 1931).

■ **Nguyen Duy Hoa, PhD.**
Technical Director, Empyreal products, Cargill Inc.
Phone: +84(0)703515168 - Email: duyhoa_nguyen@cargill.com

High-quality protein sources such as fish meal, squid meal, krill meal, dehulled soybean meal and low-ash poultry meal are commonly used in shrimp feed production. However, shrimp farming faces disease and environmental challenges, requiring the shrimp feed industry to not only address the feed quality for growth but also for shrimp health and sustainable requirements. Therefore, the shrimp feed industry aims to find solutions from innovative plant-based protein sources for sustainable business while still ensuring shrimp health and growth. Motiv, a Cargill Corporation bioactive protein product manufactured in North America, is a premium and concentrated protein product (69% protein), rich in health nutrients, especially gut health (including organic acids, biopeptides, carotenoids, phytosterols, polyphenols, inositols, vitamin A). Studies evaluating Motiv trials in indoor tanks and out-door ponds have shown the optimal performances at an inclusion of 7.5% to 10% of Motiv in shrimp feed formulas which not only promotes better growth but also improves hepatopancreas and gut health and also enhances darker red color. This paper shares the performances of Motiv protein product at an inclusion of 7.5% in the booster feed in Thailand and in the super-growth feed in Vietnam from commercial shrimp ponds.

7.5% Motiv performances in booster feed in Thailand

***Approach for the formulation of 7.5% Motiv booster feed*:** Motiv at an inclusion of 7.5% is combined with 1.25% marine seaweed and 0.125% health additives to replace other protein sources, including dehulled soybean meal (3.963%), poultry meal (0.765%), and squid liver meal (4.226%) in a regular commercial feed to produce the booster feed with the aims of deploying bioactive protein quality and health nutrients from Motiv, seaweed and health additives. Proximate nutrient analysis of the booster feed and regular feed shown in Table 1.

Table 1. Proximate nutrients

Nutrients	Regular feed	Booster Feed
Moisture (%)	10.892	11.00
Protein (%)	38.061	40.061
Lipid (%)	6.871	6.773
Fiber (%)	2.025	2.147
Ash (%)	10.831	10.957

The results of using 100% booster feed compared to 100% regular feed are presented in Table 2. The results showed that although the feed cost for 1 kg of shrimp weigh gain (THB/kg) was higher for the booster feed compared to the regular feed (56.225 ± 1.661 vs. 52.786 ± 5.080), the booster feed yielded higher performances than regular feed in terms of shrimp harvest weight (22.50 ± 0.707g vs. 18.556 ± 2.939g), average daily growth (0.2750 ± 0.007g vs. 0.214 ± 0.018g) and harvested yield (1.624 ± 0.076 vs. 1.148 ± 0.0739 kg/m2), especially profit per kg of harvested shrimp (86.485 ± 2.680 vs. 78.194 ± 32.594 THB/kg), respectively for the booster feed vs the regular feed. (THB: Thailand currency).

Table 2. Harvested performances of 100% booster feed vs 100% regular feed

Parameters	Booster		Regular Feed				
	Pond B1	Pond B2	Pond R1	Pond R2	Pond R3	Pond R4	Pond R5
Pond area (m^2)	1,200	1,200	4,320	4,000	1,920	1,920	1,920
Density (inds/m^2)	104.16	104.16	104.16	104.16	104.16	104.116	104.16
Day of culture (day)	84	84	76	74	85	100	98
Survival Rate (%)	90.07	80.30	99.45	97	97.2	122.17	109.87
Average(%)	85.05 ± 6.91		105.242 ± 10.79				
Yield/m^2 (kg/m^2)	1.687	1.57	1.11	1.12	1.06	1.22	1.23
Average (kg/m^2)	1.624 ± 0.076		1.148 ± 0.0739				
Feed cost (THB/kg)	55.05	57.40	48.30	47.24	52.72	58.67	57
Average (THB/kg)	56.225 ± 1.661		52.786 ± 5.080				
ADG (g/day)	0.27	0.28	0.21	0.21	0.24	0.19	0.22
Average	0.275 ± 0.007		0.214 ± 0.018				
Harvest weight (g/ind)	22	23	16	15	21	19.23	21.55
Average	22.50 ± 0.707		18.556 ± 2.939				
FCR	1.28	1.32	1.25	1.25	1.22	1.36	1.31
Average	1.30 ± 0.028		1.278 ± 0.056				
Profit/kg (THB/kg)	88.38	84.59	43.68	41.62	106.65	98.45	100.57
Average	86.485 ± 2.680		78.194 ± 32.594				

(Note: survival rate > 100% due to extra postlarvaes supply from hatcheries)

Table 3. Harvested performances with partial booster feed & regular feed

Pond elements	Booster		Regular Feed	
	Pond B1	Pond B2	Pond R1	Pond R2
Pond area (m^2)	4,800	1,600	1,4400	4,800
Density (inds/ m^2)	52.08	52.08	52.08	52.08
Day of culture (day)	112	117	113	104
Survival Rate (%)	95.86	87.43	96.21	104.71
Average(%)	91.645 ± 5.960		100.46 ± 6.010	
Yield/m2 (kg/ m^2)	1.52	2.12	0.92	1.158
Average (kg/m^2)	1.820 ± 0.424		1.039 ± 0.168	
Feed cost (THB/kg)	54.06	54.02	56.55	55.34
Average (THB/kg)	54.040 ± 0.028		55.945 ± 0.855	
ADG (g/day)	0.28	0.24	0.21	0.25
Average	0.260 ± 0.028		0.230 ± 0.028	
Weight (g/shrimp)	29.29	27.78	17.76	19.97
Average	28.535 ± 1.067		18.865 ± 1.562	
FCR	1.36	1.38	1.46	1.42
Average	1.370 ± 0.014		1.440 ± 0.028	
Profit/kg (THB/kg)	156.52	162.50	93.72	99.31
Average	159.510 ± 4.228		96.515 ± 3.952	

The results in Table 3 shows when feeding shrimp with partial booster feed before the harvest (22.44% in pond B1 and 31.74% in pond B2) also results in better performances than 100% regular feed (Pond R1 and Pond R2). The results showed that a portion of 22.44% and 31.74% of the booster feed in feeding program was more efficient performances in terms of higher yield (1.820 ± 0.424 vs. 1.039 ± 0.168 kg/m^2), higher average daily growth (0.260 ± 0.028 g vs. 0.230 ± 0.028 g), lower feed conversion rate (1.370 ± 0.014 vs. 1.440 ± 0.028), and the feed cost per kilogram of weight gain is lower (54.040 ± 0.028 vs. 55.945 ± 0.855) and the net profit per kilogram of harvested shrimp is higher than that of regular feed (159.510 ± 4.228 vs. 96.515 ± 3.952 THB/kg).

7.5% Motiv performances in super-growth feed in Vietnam

***Approach for the formulation of 7.5% Motiv super-growth feed*:** the commercial super-growth feed consisting of 2.5% Motiv is added with an additional 5% Motiv to produce 7.5% Motiv super-growth feeds by combining 5% Motiv with 0.2% tuna oil, 0.015% cholesterol, 0.13% L-arginine, 0.125% L-lysine, 0.01% L-methionine, and 0.02% choline chloride (5.5% total) to replace 5.5% fishmeal in the 2.5%-Motiv super-growth feed. The proximate nutrients of the 2 feeds was analyzed by UpScience (Table 4).

Table 4. Nutrients of the two super-growth feeds

Nutrients	2.5% Motiv	7.5% Motiv
Energy (Kcal/kg)	3,471	3,525
Moisture (%)	10.66	10.06
Protein (%)	44.29	44.11
Lipid (%)	6.41	6.59
Fiber (%)	1.10	1.03
Ash (%)	10.56	10.04
Cholesterol (%)	0.2097	0.1942
EPA (mg/100g)	206.3	202.7
DHA (mg/100g)	541.3	520.3
ARA (mg/100g)	69.56	66.17
Phosphorus (%)	1.25	1.21
Calcium (%)	2.07	2.02

Shrimp farm in Bac Lieu on day 95 reaching average weight of 39.2g from 1 pond was divided into 2 ponds with the same area (1,300 m^2) and each of the two feed 2.5% Motiv & 7.5% Motiv was fed to each pond for 10 days. The average daily growth (ADG) calculated for 10-day feeding period was 0.64g/day for 7.5% Motiv feed and 0.46g/day for 2.5% Motiv feed, and final weight of 45.6g/shrimp and 43.9g/shrimp, yield of 3.05 kg/m^2 and 2.30 kg/m^2 as well as harvest biomass of 3,964 kg vs 2,994.5 kg, especially higher profits (67,375 VND/kg compared to 58,457 VND/kg), respectively for 7.5% Motiv feed and 2.5% Motiv feed (Table 5).

Shrimp farm in Tien Giang on day 89 with an average weight of 28.6g were also tested in 4 ponds of 1,000 m^2 (2 ponds for 7.5% Motiv feed and 2 ponds for 2.5% Motiv feed). The average harvest results per 1,000-m^2 pond unit presented in Table 6 also show that all harvested parameters, including harvest yield, harvest biomass, the average daily growth (ADG), net profit per 1,000m^2 are all higher for 7.5% Motiv super-growth feed than those of the 2.5% Motiv super-growth feed.

Table 5. Performances after 10 days of feeding in Bac Lieu farm

Parameters	7.5% Motiv Feed	2.5% Motiv Feed
Pond area (m^2)	1.300	1.300
Starting test day of culture	95	95
Ending day of culture	104	104
Starting weight (g/shrimp)	39.2	39.2
Harvest weight (g/shrimp)	45.6	43.9
ADG for 10 days (g/day)	0.64	0.46
ADG for full crop (g/day)	0.44	0.42
FCR	1.46	1.46
Harvest biomass (kg)	3,964	2,994.5
Survival rate (%)	86.85	85.34
Harvested yield (kg/m2)	3.05	2.30
Average profit/kg (VND/kg)	67,375	58,457

Table 6. Average performances per 1,000 m2 in Tien Giang farm

Parameters	7.5% Motiv Feed	2.5% Motiv Feed
Pond area (m^2)	1000	1000
Starting test day of culture	89	89
Ending day of culture	124	117
Shrimp weight at start (g/ind)	28.6	28.6
Final weight (g/ind)	46.5	41.5
Final ADG (g/day)	0.38	0.35
FCR r	1.38	1.35
Harvest biomass (kg)	3,600	3,200
Survival Rate (%)	86	89
Harvest yield (kg/m^2)	3.6	3.2
Profit (VND/1000m^2)	229,100,000	190,000,000

In addition, the results of harvested shrimp color fed on 7.5% Motiv Feed were darker red color and more uniform color than the shrimp fed on 2.5% Motiv Feed (Figure 1). Hepatopancrea's microscopic observation also showed more oil droplets in the hepatopancreas of the shrimp fed on 7.5% Motiv Feed than shrimp fed on 2.5% Motiv Feed (Figure 2).

Figure 1. Shrimp color before boiling and after boiling

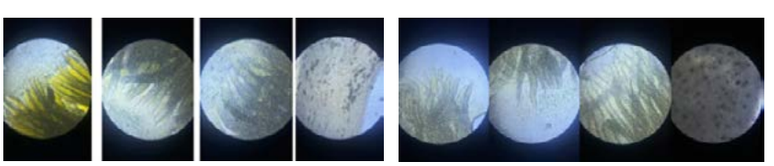

Figure 2. Shrimp hepatopancreas - 7.5% Motiv (left) and 2.5% Motiv (right)

Conclusion: *Motiv at an inclusion of 7.5% in the diet formula either in the Booster Feed or Super-growth Feed promotes better shrimp growth and result in higher harvested yield, higher harvested biomass and higher profits, healthier hepatopancreas, darker red color and better shrimp color uniform.*

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