

Fish 2.0 Market Report: Farmed Shrimp

An Investor Update on Sustainable Seafood



Farmed Shrimp: Demand Drives Sustainable Investment Opportunities

Shrimp production, valued at \$12 billion to \$15 billion, is one of the most important segments of the global seafood industry. Shrimp farming, also known as shrimp aquaculture, accounts for just over half the world's shrimp supply. It occurs in over 60 countries worldwide, but over 80% of production is based in Asia. Latin America is the second largest producing region, accounting for 16% of the global total, with Brazil and Ecuador supplying major volumes.

Most farmed shrimp is destined for export, and shrimp makes up approximately 15% of all internationally traded seafood. The export value of shrimp to the US and EU is US\$5 billion and €2 billion respectively, and shrimp is the most consumed seafood in both regions. The US is the single largest market for shrimp, with India and Thailand serving as the primary exporters of product to the US.

The farmed shrimp industry's rapid growth and high density of operations has created problems, including disease outbreaks that have significantly impacted some regions. In addition, although the industry generates economic benefits in many developing countries, it is also associated with some serious environmental and social challenges. These include habitat destruction as well as alarming human rights abuses, such as the recently reported instances of slavery occurring in the Thai shrimp feed industry.

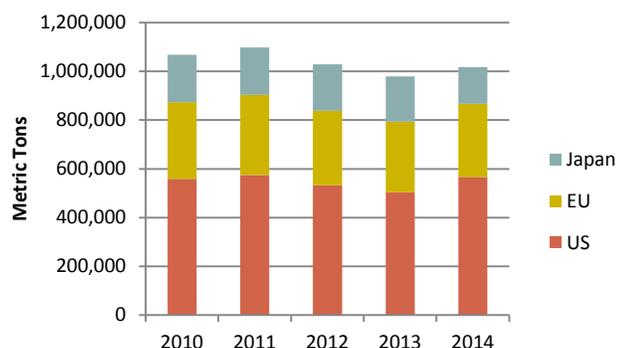
These social and environmental problems create an opportunity for investors. Demand for shrimp is expected to remain strong, and responsible investment in this value chain could enable the industry to evolve more sustainably. Specific investing opportunities include:

- Developing disease control technologies
- Innovating new feed sources and formula optimization
- Providing traceability information on feeds to shrimp producers
- Expanding closed-containment production systems in relevant markets

Stable Market Demand Supports Supply Rebound and Expansion

- The Industry Has Expanded Rapidly.** The farmed shrimp industry in Asia expanded rapidly from 2000 to the early 2010s, fueled by a surge in demand from the US, the EU, and Japan. To meet increasing demand, shrimp farmers in Asia have begun using intensive, high-yield methods, necessitating elevated use of antibiotics and pesticides.
- High-Density Disease Risks Are Being Contained.** Disease, facilitated by high-density farming methods, is a cyclical issue. In 2012 and 2013, Early Mortality Syndrome (EMS) caused shrimp farming losses in the range of \$2 billion and \$5 billion. The hardest-hit producing countries include China, Thailand, Vietnam, Malaysia, and Mexico. Researchers have now determined the cause, and the industry should be able to bring EMS under control in the short or medium term. The production of impacted countries should then rebound to healthy levels.
- New Regions Grow Production to Meet Demand.** Demand from the three largest markets (Japan, the EU, and the US) remained stable, despite increasing shrimp prices due to the drop in supply that resulted from the EMS outbreak.
- Price Volatility Is Subsiding.** Countries that the disease did not impact, including India, Indonesia, and Ecuador, have increased production by 12% in aggregate to meet market demand, causing price volatility from EMS to subside. These countries also use a less dense production model, decreasing the risk of disease outbreak. Due to increased supply, the record 2015 prices are expected to experience a correction in the next year.

Consistent Shrimp Imports by Major Consumption Regions



Sources: Rabobank, NOAA

Shrimp Farming Risks & Challenges

- Disease and Health Management Are Keys to Successful Production.** Disease is the biggest production risk in the industry. Underinvestment in disease management could devastate the future of the industry.

High-density farms have more health issues than lower-density operations. These farms crowd shrimp in warm pools of nutrients, creating ideal conditions for disease outbreaks. Also, intensively farmed water sources remain productive for only 5 to 10 years due to waste buildup and other factors.
- Pollution, Labor and Habitat Destruction Issues Must be Addressed.** Shrimp farms tend to operate around a shared water source, such as a river, pond, or bay. The waste, uneaten feed, and bacteria these farms produce pollute these shared waters, damaging the environment. Waste also causes bacteria to breed among the shrimp populations, requiring high antibiotic use and other veterinary treatments.

Shrimp farms directly generate jobs. However, in many communities, this comes at the expense of the growth of other industries, due to the habitat destruction and natural resource removal caused by shrimp farming.

Illegal activity throughout the supply chain, such as human trafficking and corruption, are significant issues and could impede shrimp farming businesses from participating in international trade. Illegal labor activities are especially prevalent in the feed segments of the shrimp supply chain.
- Decreasing Feed Supply Will Present New Challenges.** The global aquaculture industry is facing a significant shortage in fish meal, a key ingredient in fish feed needed for shrimp production. Shrimp requires its feed to contain approximately 30% fish meal, making it one of the more nutrient-intensive species in aquaculture.

Feed, which can make up as much as 50% of shrimp farming costs, has steadily increased in price due to a surge in demand and decline in supply. Feed prices are expected to maintain an upward trend.
- Increasing Production Costs Are Becoming the Norm.** Increased costs due to disease management have been at the forefront of the shrimp industry recently. Other cost threats include increased energy expenses to manage high-intensity farms and increased labor costs from wage increases in countries including China and Thailand.

The Cost of Cheap Shrimp: Human Trafficking and Slavery in Thailand

Increased consumer and business interest in supply chain activity is uncovering human rights issues in food systems, including the seafood industry. Within farmed shrimp, slavery in the Thai industry is a systemic issue, with abuses occurring throughout the supply chain involving labor traders, fishing boats, fish meal factories, and shrimp farms.

One of the most publicized segments of these abuses is slave labor associated with the feed industry that supplies Thai shrimp farms. Low-quality, mixed fisheries—referred to as “trash fish”—are the main source for feed ingredients in the Thai shrimp industry. When migrants often from Myanmar or Cambodia, travel to Thailand in search of work, traffickers saddle them with debt as payment for the crossing into Thailand and then sell them to boat captains as crew to pay off that debt. The \$7 billion Thai fishing industry has an estimated workforce of 300,000 people, and up to 90% are migrants. It is unknown what proportion of these migrants has been trafficked.

Two primary factors can help combat slavery in the Thai shrimp industry: 1) better data and visibility in supply chains and 2) stronger labor standards and enforcement. Many retailers and distributors in the US and the EU are working with suppliers in Thailand to enforce supplier standards through traceability. If US and EU retailers can work with their partners to enforce their standards throughout the farming and feed supply chains, corrupt actors involved in trash fish harvesting or other preprocessing aspects of the industry may lose shrimp farming clients whose end-market buyers verify legal practices. In time, this could trigger a substantial, positive change that growing markets of consumers and governments who support sustainable and ethical products would welcome.

International pressure on Thailand from NGOs and government bodies remains strong. Global initiatives are emerging to stop trafficking and help businesses clean up their supply chains:

- Verité is one of several global NGOs working to end labor injustices, and Project Issara, with support from Humanity United, aims to eliminate human trafficking in global supply chains.
- In 2014, the US government proposed the Business Supply Chain Transparency on Trafficking and Slavery Act, which requires businesses to publicly disclose actions taken to prevent forced, child, and slave labor and human trafficking.
- In June 2015, the US reaffirmed its Tier 3 status for Thailand, which is the worst grade a country can receive with respect to human trafficking violations. This rank could prompt non-trade-related sanctions such as reducing access to the World Bank and limitations on US foreign assistance.



Image sources:
community.cengage.com,
The Guardian, Time

Responsible Investor Actions to Support Sustainable Shrimp Farming

Responsible investors can address human rights abuses in shrimp industry supply chains through the following actions:

- Advocate for businesses to disclose policies on sustainability, labor, and human rights issues
- Urge businesses to report on supply chain risks and initiatives, particularly if sourcing product from at-risk regions
- Encourage businesses to develop relationships with value chain partners that operate with transparency; ask whether they know and disclose supplier locations
- Ask companies what rules and systems they use to monitor and audit supply chain participants beyond the first layer
- Ask the business if it partners with any certification organizations to strengthen the value and integrity of audits and other reports
- Support policies to stop and eradicate slavery and other illegal forms of labor within supply chains and encourage government to provide agencies with adequate resources for enforcement

Investment Opportunities to Strengthen Shrimp Farming

Global demand for shrimp is strong and consistent even in the face of production challenges, such as EMS and the social challenges described above. Despite the extreme price volatility—a near 100% increase—associated with supply decline due to EMS, imports to major production countries remain stable.

Within this strong commodity market, there is room to optimize the industry. Many shrimp farms are underperforming due to disease risk and supply chain sustainability challenges. Ample opportunities exist to improve technologies, infrastructure, and processes for farmed shrimp.

- **Disease Control Technologies.** High-density shrimp production is the leading cause of disease outbreak, and businesses with new technologies that address disease threats in a sustainable manner are seeking investors.

Strong businesses working on disease prevention are likely to have built partnerships with academic research centers. For example, businesses in the UK and Asia have partnered with the UK's Centre for Environment, Fisheries and Aquaculture Science (Cefas) to develop a DNA-testing technology for rapid detection of specific diseases impacting shrimp.

The market would likely welcome such a technology since some diseases have the potential to wipe out an entire shrimp farm in a week. Analysts estimate improved diagnostic technologies could save the aquaculture industry up to \$6 billion annually.

- **New Feed Sources and Optimized Formulations.** There is a substantial opportunity to invest in companies that are developing new feed inputs and biotechnologies. Over the past several years, research efforts have focused on formulating non-fishmeal-based shrimp feed and optimizing current feed formulations. For example, Cargill recently invested \$30 million in a shrimp feed production facility in Ecuador. Given that feed can account for as much as 50% of a shrimp farm's operating expenses, the market is clamoring for a cost-effective solution to support the global highs in shrimp demand.

Additionally, as shrimp feed production has been identified as a key source of labor abuses and trafficking issues, producers are seeking new clean and traceable sources of feed.

- **Sustainable Production Systems.** Closed-containment aquaculture systems offer an alternative farming method that does not face the production challenges of open-water shrimp farming, such as habitat destruction, effluents, and contaminants. Closed-containment systems, which include recirculating aquaculture systems (RAS), make efficient use of water and offer a controlled grow-out environment, reducing the need for medicines and other veterinary treatments. Due to the relatively higher operating costs of closed-containment systems, the industry mostly uses them for premium products in developed markets. As US and EU businesses are increasingly scrutinizing their supply chains, demand for products made in these systems will increase if producers can keep costs competitive. There is opportunity for investment in developing scalable closed-containment systems in and for the US market, where over 90% of shrimp is imported but retailers and consumers demand premium, sustainable products.

Beyond these investment areas and technology focal points, given the ongoing demand for shrimp, we expect that all leading shrimp producers with emphasis on sustainability could be prime targets for investment.

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