Exploitative Labor Practices in the Global Shrimp Industry

Prepared by Accenture for Humanity United

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Acronyms Guide

ACC	Aquaculture Certification Council
ASC	Aquaculture Stewardship Council
BAP	Best Aquaculture Practices
BDT	Bangladeshi taka
BFFEA	Bangladesh Frozen Food Exporters Association
CP	Charoen Pokphand Food Public Company
DOF	Thailand Department of Fisheries
DOL	Thailand Department of Labor
EJF	Environmental Justice Foundation
ERS	United States Department of Agriculture Economic Research Service
EU	European Union
FAO	United Nations Food and Agriculture Organization
FDA	United States Food and Drug Administration
GAA	Global Aquaculture Alliance
GAP	Good Aquaculture Practices
GDP	Gross Domestic Product
GRASP	GlobalGAP Risk Assessment on Social Practices
ha	Hectares
HACCP	Hazard Analysis Critical Control Point
ILO	International Labour Organization
IPEC	International Programme on the Elimination of Child Labour
LPN	Labour Rights Promotion Network
MPEDA	Indian Marine Products Export Development Authority
MSC	Marine Stewardship Council
MT	Metric ton
NGO	Nongovernmental organization
NMFS	National Marine Fisheries Service
PL	Shrimp post-larvae
ShAD	Shrimp Aquaculture Dialogues
TFFA	Thai Frozen Food Association
THB	Thai baht
UNIAP	United Nations Inter-Agency Program on Human Trafficking
USAID	United States Agency for International Development
USD	United States dollars
USDA	United Stated Department of Agriculture
WWF	World Wildlife Fund

Executive Summary

Shrimp has become a favorite staple of the American dinner plate, retaining its association with luxury even while developing into a cheaply traded global commodity. While concerns about health and quality have led to increased oversight of shrimp entering the U.S. market, the path from pond to plate is not without human cost. Recent reports have documented the gross exploitation of workers in the shrimp production industry, particularly of migrant workers in Thai peeling sheds and Bangladeshi shrimp-fry collectors.[1] This report seeks to explain and evaluate the complexity of the shrimp supply chain, to survey certification schemes, to clarify how and where exploited labor enters, and to recommend the changes necessary to keep the shrimp Americans consume as socially healthy as they are nutritious.

Technological developments in aquaculture have fueled the globalization of the shrimp supply chain. Since the 1980s, Western markets have received an increasing share of their shrimp from Asian and Latin American producers. Production is particularly concentrated in China, Thailand, Vietnam, Indonesia, Ecuador, Mexico, India, and Bangladesh. Among these, the Asian countries alone account for nearly 80 percent of the world's shrimp supply.[2] In this report, two countries are used as benchmarks: Thailand and Bangladesh. These two leading shrimp sources for American and European markets operate at the far ends of the supply spectrum in terms of the sophistication of their production methodology. By understanding the extremes, readers can infer the mean.

Although shrimp represents a significant share of exports, the shrimp industry in Bangladesh tends to use more traditional methods of cultivation. Poor coastal families collect wild shrimp fry to deliver to the tidal ponds of low-tech shrimp farmers, who raise the shrimp until maturity. Local — often predatory — trading networks buy and sell shrimp in stages to the exporters who ship their minimally processed product to overseas markets.

In contrast, the government of Thailand has encouraged the sophistication of its domestic shrimp industry. Backyard hatcheries, often family-run, cultivate shrimp fry in bulk for delivery to large-scale aquaculture farms, where shrimp grow in high-density, high-yield ponds or tanks. Once mature, most Thai shrimp are traded in the vast Samut Sakhon seafood market for sale to large processing plants. The sophistication of the Thai industry has allowed Western companies to order highly processed shrimp products directly from Thailand, creating a high demand for migrant laborers to work in factories freezing, packaging, or breading shrimp products. Preprocessing these shrimp — a work-intensive process of peeling by hand — is an underregulated part of this sophisticated chain. Migrant workers, often trafficked under false pretenses from Burma, are subjected to poor wages, high arbitrary fines, police or employer brutality, and long hours without proper protections.

Once the processed shrimp leaves its country of origin, it enters the most concentrated part of the supply chain. The importer-exporter relationship is essential to ensure that Western companies and their consumers receive the constant and consistent supply of shrimp they demand. Once imported, shrimp products move through wholesalers to the consumer-facing end of the supply chain. Food product manufacturers, retailers, and food service providers move the shrimp to their final destinations. Consumer goods manufacturers process shrimp into prepackaged meals like frozen dinners or shelf-stable dry goods. Retailers — particularly large chains like Wal-Mart, Kroger, Costco, Safeway, Publix, and Trader Joe's — offer consumers relatively lower prices and are popular with the average shrimp consumer. Meanwhile, half the shrimp in America is sold by food-service operators, particularly restaurants. Red

[1] See especially Solidarity Center, 2008.
[2] FAO, 2009.

Lobster, for example, is famous for its all-you-can-eat shrimp promotions; its parent company, Darden, imports nearly 4 million kilograms of shrimp per year.[3]

As supply chains have globalized and become more opaque, certification schemes have emerged for corporations and retailers to ensure that quality and health standards are maintained in distant overseas production systems. Certification, however, has not addressed all the challenges in the shrimp supply chain. Opaque chains continue to hide gaps in certification enforcement, while voluntary adherence allows quality certification without guarantees of social or environmental responsibility. Sound labor practices especially have been poorly enforced within multiple existing certification schemes, taking second place to environmental concerns. Additionally, the proliferation of multiple certification schemes has confused consumers and has weakened incentives for responsible production by companies already competing for the lowest production costs

The most notable certification schemes are the Best Aquaculture Practices, the GlobalGAP Integrated Farm Assurance Standards, and the Aquaculture Stewardship Council Shrimp Standards. The structures of all three major schemes largely meet the standards recommended by the United Nations Food and Agriculture Organization, but the strength of labor standards within these structures varies significantly.

Stronger labor standards are most needed to protect workers operating extralegally or in opaque gaps in the supply chain. In both extremes of sophistication examined in this report, Thailand and Bangladesh, workers continue to be exploited. Specifically, Bangladeshi fry collectors and shrimp farmers suffer from price manipulation and debt bondage through predatory moneylenders or traders further up the chain, while Thailand fills its shrimp-peeling sheds with migrant laborers from Burma, who are often trafficked and abused. Child labor has been documented in both countries, among fry-collecting families in Bangladesh and in the Samut Sakhon seafood market in Thailand. Although both countries have domestic seafood-exporting associations that claim to regulate the entirety of their shrimp industries, in fact they turn a blind eye to the plight of certain workers, whether due to lack of external pressure or lack of internal enforcement capacity.

Addressing these chronic problems will require pressure on multiple levels. Although consumers can push for change, the largest gains will be made by the industry leading initiatives to improve its supply chains and by a clearer, streamlined certification process with rigorous requirements. In response to growing consumer concerns about the environment, consumer-facing labeling has been increasingly used to indicate the use of industry best practices from catch to aquaculture to processing. But few labels or retailers share information about the human supply chain behind their shrimp, leaving consumers without the tools to evaluate the human impact of their shrimp purchases. Therefore, downstream buyers and certifiers should exert their influence to ensure that all levels of the supply chain, including preprocessing facilities, are included in certification. U.S. importers have a critical role to play, as this is the most highly concentrated level of the Thai shrimp supply chain and therefore importers could have unique leverage to improve practices throughout the chain. In Bangladesh, a key change should be alternative forms of financing for those at the earliest stage of the supply chain, whether through cooperatives or microfinance. Additionally, the Bangladeshi government should support the transition from wild-fry collection to small-scale hatcheries. In Thailand, labor brokers are a principal problem. Thailand should regulate and license its brokers, while civil society should assist the development of ethical labor brokers to compete in the industry. Thailand's migrant workers urgently need NGO-sponsored legal aid to give them recourse for abuse. Finally, Thailand should amend its labor laws to include indicators of exploitation.

[3] USCBP, 2012.

Introduction

Americans eat more shrimp than any other consumers around the world. Shrimp is identified as America's favorite seafood, cooked in all manners of cuisines, enjoyed by both rich and poor, gourmets and health-conscious eaters alike. American consumption of shrimp has soared since the 1970s, and domestic demand has increasingly outpaced domestic supply since 1982. By 2007, over 80 percent of the shrimp consumed in the United States originated in another country.

The American shrimp market has opened an opportunity for many poorer economies with developed coastal waters or aquaculture systems. These industries have created a number of unskilled jobs for workers in regions with high levels of unemployment and poverty.

But many of these workers are trapped in slavery.

In 2012, the United Nations' International Labour Organization (ILO) estimated that nearly 21 million individuals were living and working under conditions of slavery around the globe. According to the ILO, slavery is more prevalent now than ever, manifesting itself as debt bondage, forced labor, child labor, human trafficking, and sex trafficking.

Modern-day slavery is embedded deep in the global shrimp supply chain. A number of recent reports have documented the prevalence of exploitative conditions for workers in the shrimp industry, particularly in Bangladesh and Thailand.[4] Although these two countries have quite different supply chains in terms of both sophistication and market orientation, both industries rely on exploitation of vulnerable and otherwise marginalized populations. The shrimp industries of Thailand and Bangladesh operate at the far ends of the spectrum of shrimp production; analyzing the two extremes can help us understand the intermediate part of the spectrum.

This report is designed to offer a summary of the global shrimp market, an exploration of shrimp production from pond to plate, a closer analysis of the Thai and Bangladeshi shrimp industries, an assessment of where forced labor enters the supply chain, an evaluation of the main certification mechanisms available, and some suggestions for a stronger future course of action.

In preparing this report, Accenture and Humanity United hope to provide a path forward for all stakeholders in the global shrimp industry to collaborate and to eliminate slavery in the production of shrimp.

Methodology

In 2010, Humanity United funded a study to understand the extent to which 25 global commodities are affected by forced and trafficked labor.[5] Based on this information, in March 2011, Humanity United prioritized slavery in the global shrimp industry as a primary focus. Accenture partnered with Humanity United to analyze the global shrimp industry, focusing on production systems in Bangladesh and Thailand and on the U.S. consumer market. To supplement the extensive desk-based research, an Accenture team based in Bangkok collaborated at length with various stakeholders to verify the findings of the desk research and to better identify the factors that allow worker exploitation to continue.

[4] See Solidarity Center, 2008.
[5] See the Verité Forced Labor Commodities Atlas (http://www.verite.org/commodities) for a summary of results.

The Global Shrimp Market

This section provides an introduction to the shrimp global market for shrimp, including factors driving supply and demand.

America as Shrimp Consumer

America is the largest global consumer of shrimp, with a reliance on imported supply.

During the 1970s, fleets of shrimp boats trawled the Gulf of Mexico and the United States' coastal waters in the Atlantic and Pacific Oceans, harvesting the seabed for shrimp. At this time, the United States was the largest producer of shrimp in the world, and the supply of shrimp for American consumption was roughly balanced between those caught domestically and those imported from other countries with similarly large fisheries.

In 1976, when the United Nations' Food and Agriculture Organization (FAO) began to record global trade data for seafood commodities, America was already the second largest importer of shrimp, behind Japan.[6] American consumers considered shrimp a luxury for which they were willing to pay a premium. As countries around the world took notice of America's large and growing demand for shrimp, nations with significant territorial waters invested even further in trawling fleets to maximize the harvest of shrimp. Developing countries with proven fisheries — such as India, Indonesia, and Thailand — began to sell shrimp to America as a cash crop. Beginning in 1982, a steadily increasing majority of the shrimp consumed in America originated outside of the country.[7]

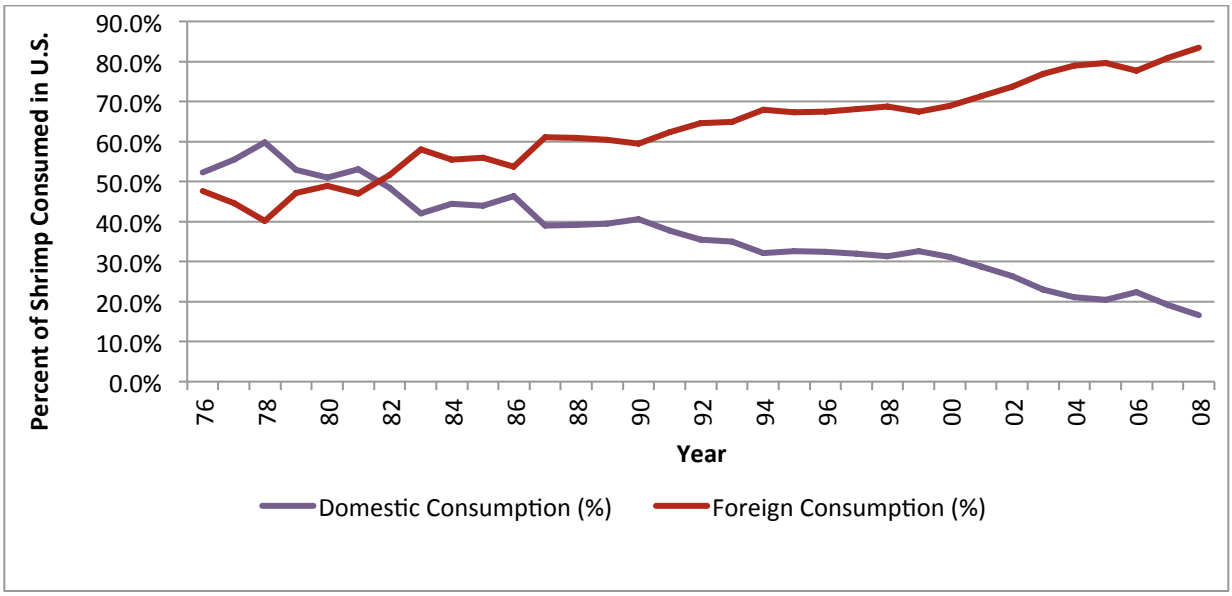

Figure 1: Origins of U.S. Shrimp, 1976–2008[8]

[6] FAO, 2009.
[7] FAO, 2009.
[8] FAO, 2009.

The Rise of Aquaculture

Aquaculture has led to the proliferation of foreign shrimp production.

In the 1980s, aquaculture benefited from scientific breakthroughs and new technologies. It became possible to artificially re-create the natural spawning of shrimp in warm-water ponds at an industrial level. This advancement changed the face of shrimp production and reshaped the global shrimp industry. Shrimp production was no longer constrained by a country's territorial waters and the natural reproductive patterns of shrimp. Rather, production was now constrained only by the availability of labor, capital, and tropical coastal land. Over the next decade, aquaculture shrimp production grew by 76.4 percent per year; this development dramatically outpaced traditional trawling, which grew by just 2 percent annually. As a result, aquaculture production grew from 25.8 percent of global shrimp production in 1990 to 52.4 percent in 2009.[9]

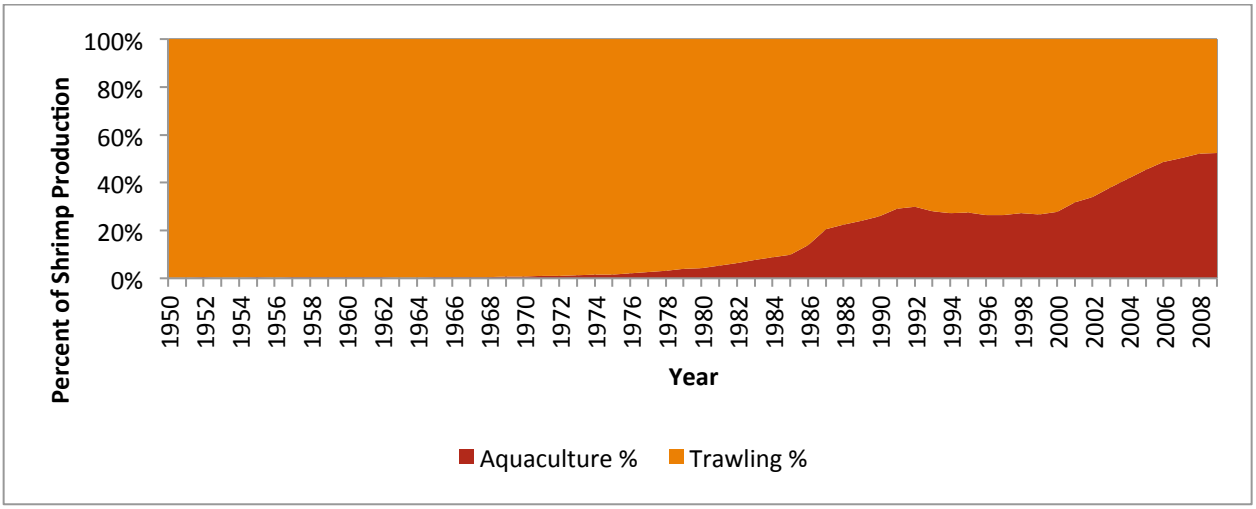

Figure 2: Global Shrimp Production by Method, 1950–2009[10]

Asia and, to a lesser extent, Latin America were the two regions to take greatest advantage of aquaculture's potential. In both regions, labor and tropical coastal land were plentiful and cheap. Widespread regional poverty meant there was a workforce willing to work for wages far below Western levels. Without significant existing industry, land was often fallow, cultivated by indigenous peoples and subsistence farmers or used for producing other, less profitable commodities like rice. Governments and corporations eager to engage in trade with America and the West were able to expropriate or reallocate land for aquaculture relatively easily.

International economic development organizations, such as the World Bank, also supported the opportunity for economic growth presented by aquaculture. Throughout the 1980s, millions of dollars in funding were invested in Asian and Latin American aquaculture projects by these groups, providing the necessary capital to seed the aquaculture industry.[11]

The scope and scale of these investments, together with the availability of suitable land and a ready labor force, created a comparative advantage for Asian and Latin American countries. In particular, seven countries — **China, Thailand, Vietnam, Indonesia, Ecuador, India, Bangladesh —** began to dominate shrimp aquaculture. By 1990, these countries accounted for 84.4 percent of the 680,255 tons of shrimp

[9] FAO, 2009.
[10] FAO, 2009.
[11] World Bank, 2012b.

cultivated globally, a dominant position that these countries have been able to maintain over the past two decades.[12]

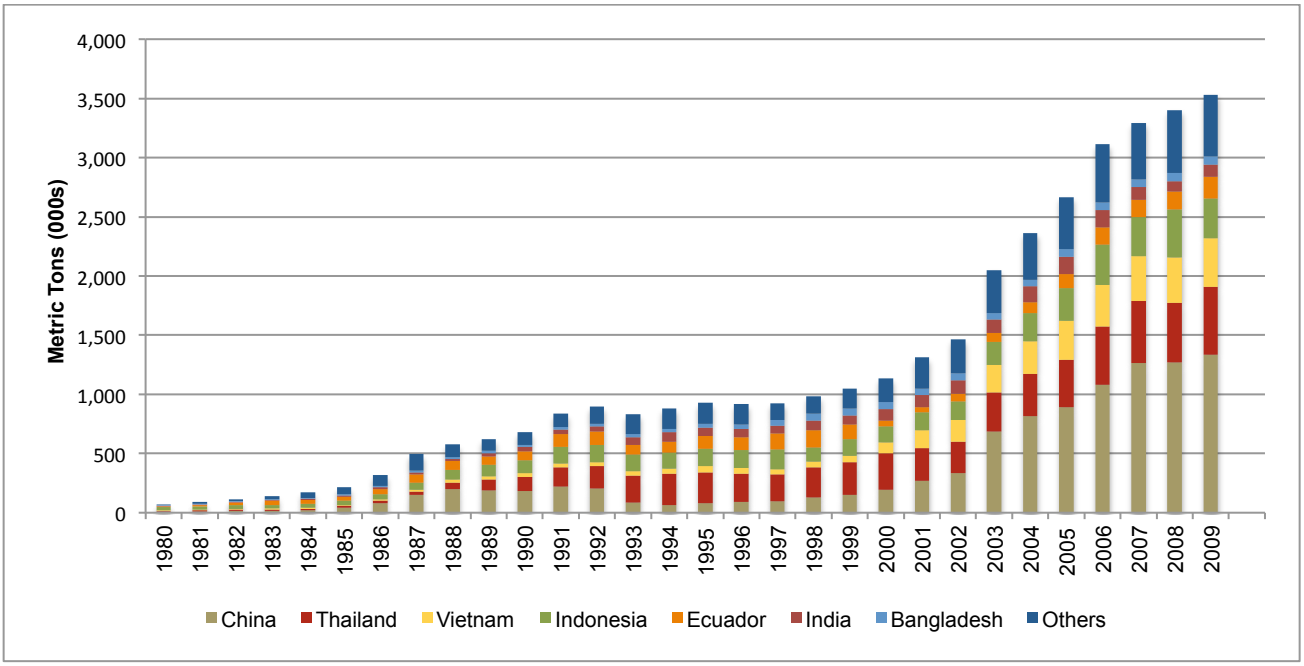

Figure 3: Aquaculture Shrimp Production by Country, 1980–2009[13]

The rise of aquaculture in Asia and Latin America contributed to a shift in global shrimp production away from developed economies such as the United States, Europe, Japan, Canada, and Australia. In 2009, only 9.1 percent of shrimp was produced in the developed countries where shrimp are primarily consumed, though only decades earlier these economies were the primary sources of shrimp. Shrimp production has particularly shifted towards Asian countries, which in 2009 accounted for 78.2 percent of total shrimp production.[14]

[12] FAO, 2009.
[13] FAO, 2009.
[14] FAO, 2009.

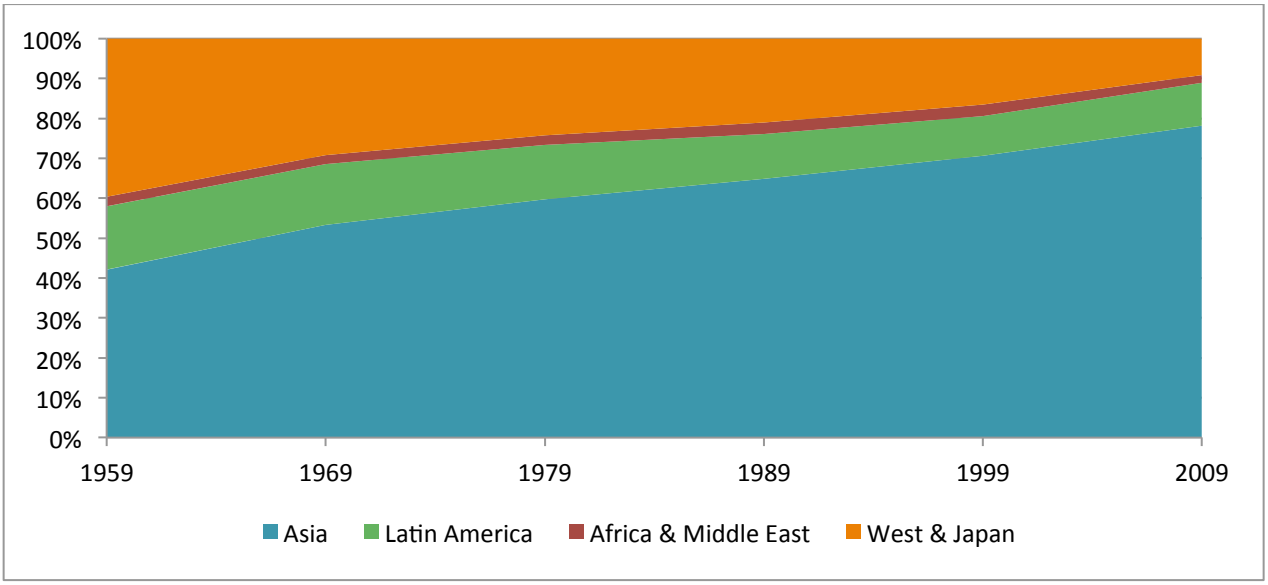

Figure 4: Shrimp Production by Region, 1959–2009[15]

Shrimp Industry and Trade Wealth

The shrimp industry is an important source of revenue for many exporting countries

For developing countries with limited industries, like Bangladesh and Ecuador, revenues from shrimp have become a crucial component of foreign trade and the economy as a whole. In 2008, revenue from shrimp exports accounted for 3.93 percent of Ecuador's total foreign export revenue and 3.43 percent of Bangladesh's.[16] In 1990, the total global supply of cultivated shrimp was valued at over USD 4.2 billion; more recently, in 2009, cultivated shrimp stocks were valued at USD 14.6 billion, with much of this revenue focused in the seven key shrimp-exporting nations.[17]

For these producer nations in Asia and Latin America, shrimp's trade value is so high that it is too valuable to consume domestically. Shrimp is thus produced almost exclusively as an export good. Since 1980, the share of shrimp commodities exported from the seven major aquaculture producers has approached 100 percent of their annual collective production.[18] Of the seven major aquaculture producers highlighted, only China consumes the majority of its shrimp domestically, and this demand is met largely by cheap varieties sourced domestically or imported from other foreign exporters.[19]

Decreasing Shrimp Prices

Globalized shrimp supply, driven by aquaculture, has led to cheaper shrimp prices.

The rise of aquaculture has contributed to a tremendous increase in the supply of shrimp globally, which has outpaced the increased global demand. Reflecting this relationship, the price of shrimp has decreased significantly. In 1982, the international price of shrimp reached USD 16.17 per kilogram. Thirty years later, the price of shrimp has dropped almost by half to USD 8.37 per kilogram, a 48.2 percent

[15] FAO, 2009.
[16] FAO, 2009; World Bank, 2012a.
[17] FAO, 2009.
[18] FAO, 2009.
[19] FAO, 2009.

reduction.[20] While the price of shrimp is highly volatile and complex, this significant reduction in price is largely attributable to the expansion of global shrimp production.

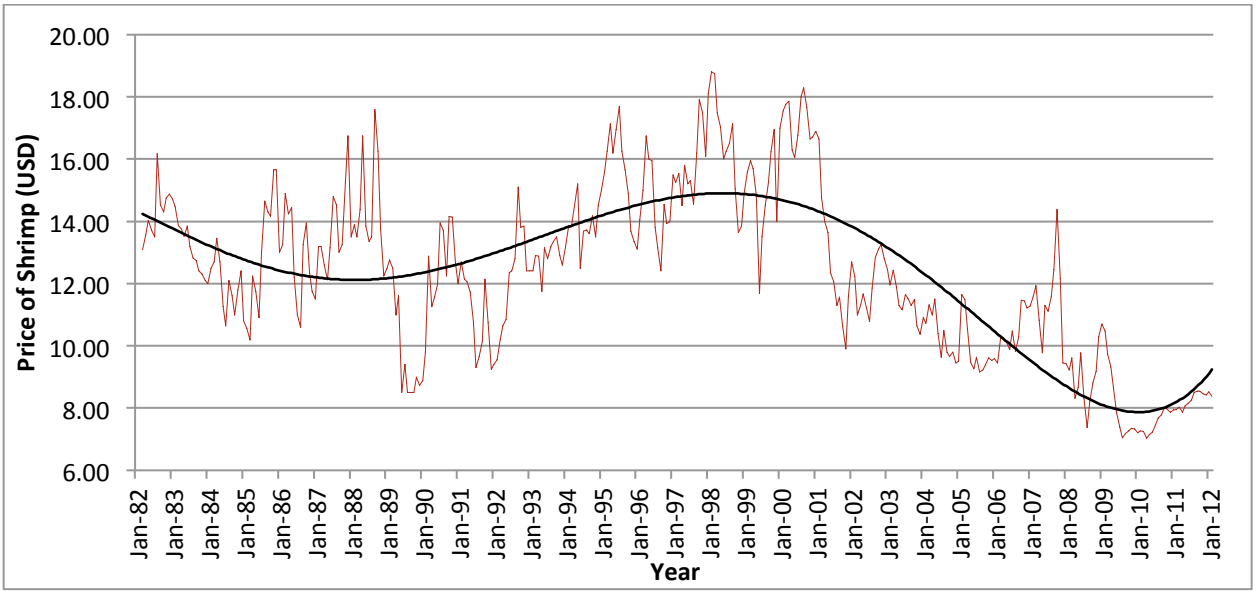

Figure 5: Price of Shrimp (USD), 1982–2012[21]

Commoditization of Shrimp

Developed countries are importing more low-cost, foreign commodity shrimp.

In 1980, exported shrimp products from producers were primarily destined for three key markets: the United States, Japan, and Europe, which together accounted for 80.9 percent of the 554,961 tons of shrimp consumed globally.[22] Despite the rapid growth in shrimp production facilitated by aquaculture, demand in these three markets has grown nearly as fast as global supply. In 2009, the United States, Japan, and Europe still accounted for 72.7 percent of the 2,030,589 tons of shrimp products consumed globally, with an increasing share sourced from overseas.[23] There are smaller, secondary markets where shrimp consumption has also increased, including China, Canada, Australia, Russia, Mexico, Taiwan, Singapore, and South Korea.

[20] IMF, 2012.
[21] IMF, 2012.
[22] FAO, 2009.
[23] FAO, 2009.

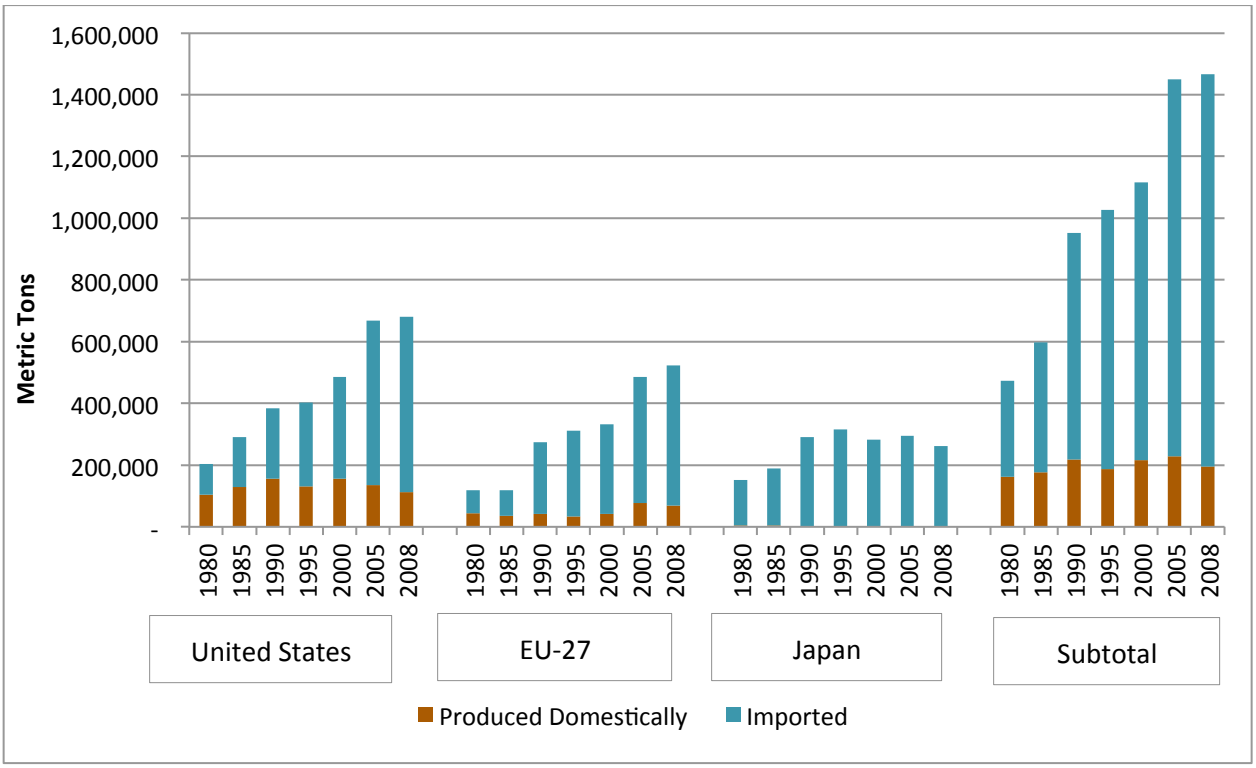

Figure 6: Breakdown of Source in Major Shrimp Buyer Markets, 1980–2008[24]

In the United States, shrimp consumption has grown by 6 percent annually since 1982; shrimp is now the single most popular seafood in America, more popular than salmon, tuna, bass, and cod.[25] The precise cause for the increase in popularity of shrimp is open to discussion. Whatever the cause, the growth in American consumption of shrimp occurred in parallel with large marketing initiatives by American seafood restaurant franchises such as Red Lobster. Typically these restaurants market shrimp as a luxury item to be sold at a premium, though the cost of this shrimp to the restaurant is significantly lower now than ever before. Restaurants like Red Lobster are also successfully marketing shrimp to a broader demographic in the United States than before: shrimp is no longer a luxury food restricted to only wealthy Americans or to be consumed only on special occasions. Households of all incomes are eating more shrimp now than ever.[26]

[24] FAO, 2009.
[25] FAO, 2009.
[26] Trade Partnership, 2007.

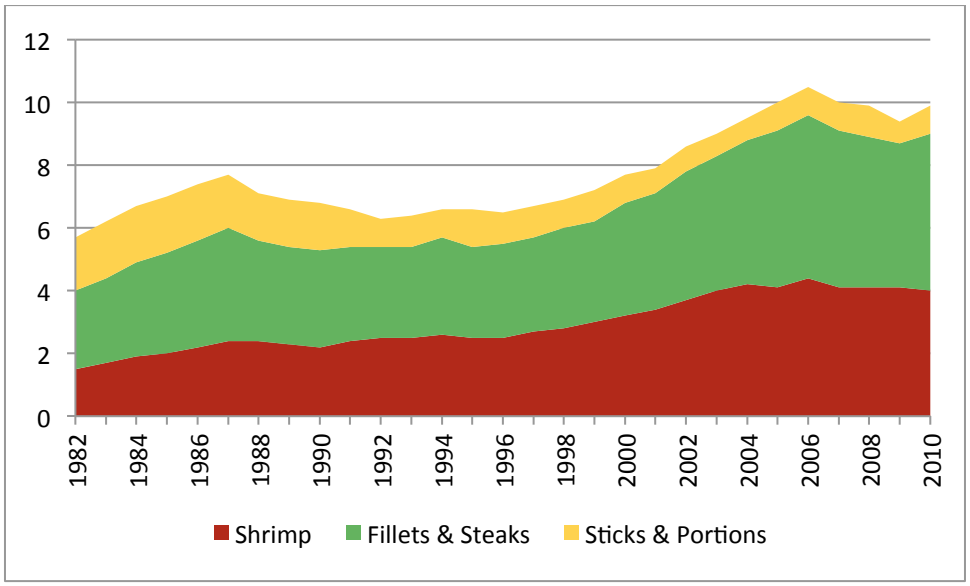

Figure 7: Seafood Consumption in the United States, 1982–2010[27]

Dependence on Imports

Consumers in developed countries rely on imports from key developing countries.

In 2011, the U.S. imported 569,885 metric tons of shrimp from 49 countries. Of this, 81.8 percent was imported from just seven major producing countries, with Thailand alone accounting for 32.2 percent of American imports.[28]

Shrimp imports to the European Union (EU) in 2011 were slightly more fragmented than in the United States. However, the seven key producers still accounted for 57.9 percent of imports, with an additional 12.5 percent of imports sourced from Argentina and 9.1 percent from Greenland.[29]

Imports to Japan are also dominated by five of the seven major shrimp producers: Vietnam, Thailand, China, India, and Indonesia. Collectively these five exporters account for nearly three-quarters of Japan's imported volume in 2011, totaling 204,214 metric tons.[30]

It is clear that these three major import markets have come to rely on shrimp production in the developing world — in Asia and Latin America specifically — to supply the shrimp that their consumers demand.

[27] NMFS, 2011a.
[28] FAO, 2009.
[29] Eurostat, 2011.
[30] NMFS, 2011b.

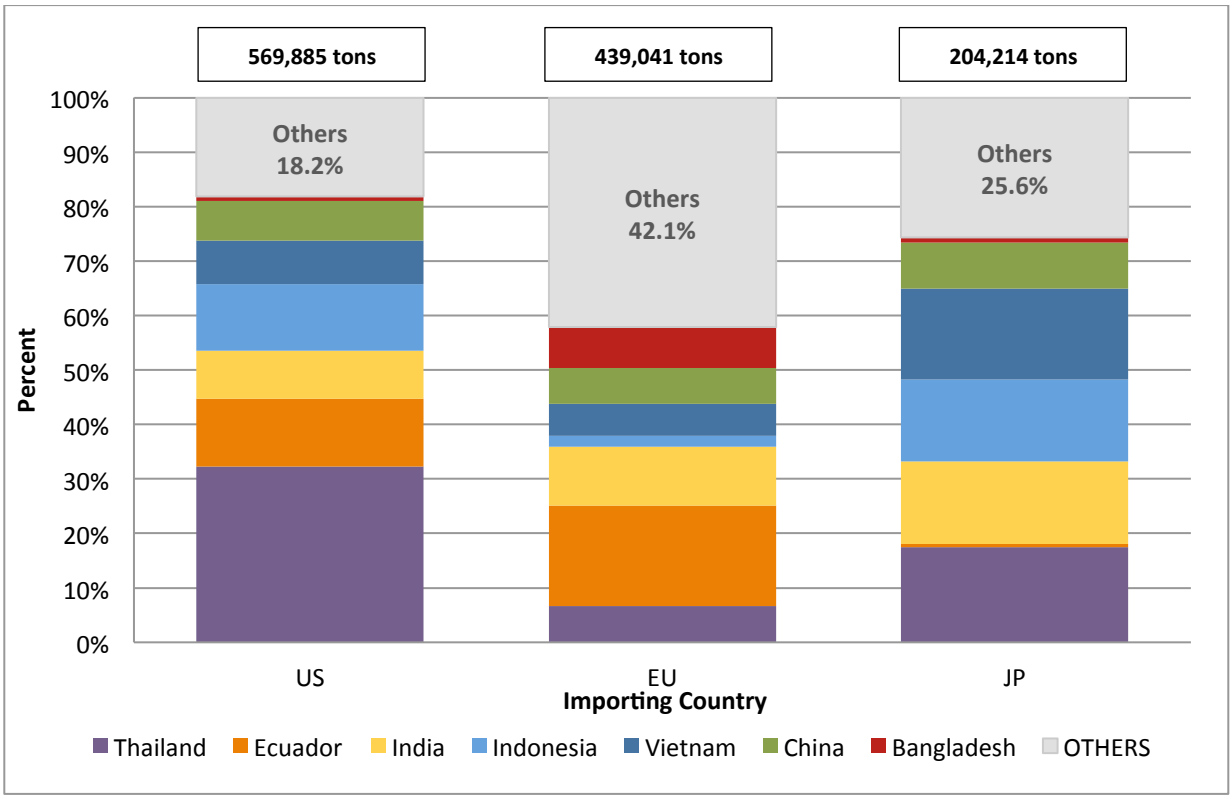

Figure 8: Shrimp Imports for the United States, European Union, and Japan by Country of Origin, 2011[31]

Summary Analysis of the Global Shrimp Market

Shrimp is an important, globalized commodity that is in high demand in developed countries, especially the United States, Europe, and Japan. These wealthy countries rely on a supply of shrimp from developing countries' trawling and, increasingly, aquaculture production in key exporting countries like Bangladesh, China, Ecuador, India, Indonesia, Thailand, and Vietnam. The proliferation of the shrimp production and processing industry in these countries has created opportunities for economic development in the developing world, and shrimp serves as a key commodity for external revenue from foreign trade. While some have benefited economically from the shrimp industry, it is important to understand how these benefits are spread throughout the industry and, in particular, whether workers are realizing any of this profit. The next section will describe in detail how shrimp travels from pond to plate through the global shrimp supply chain across two of the critical but highly disparate shrimp-producing nations: Thailand and Bangladesh.

[31] FAO, 2009; NMFS, 2011b; Eurostat, 2011.

The Global Shrimp Industry Supply Chain

This section describes in detail how shrimp travels from pond to plate through the global shrimp supply chain.

Globalization has led all countries to re-evaluate their industries in light of global markets. For developed economies, this means increasingly relying on goods produced in developing countries. With labor and land surpluses often still available in the developing world, agriculture and food-commodity industries are prime candidates for export-driven industry. No exception, the shrimp supply chain for consumers in developed countries begins overseas in several major shrimp-producing countries.

The growth of the shrimp production and processing industry in these countries has created opportunities for economic development and trade revenue. While some have benefited economically from the shrimp industry, it is important to understand how these benefits are spread throughout the industry and, in particular, whether workers are realizing any of this profit.

The supply chain schematic below is based on research on five shrimp-producing countries (Bangladesh, India, Indonesia, Thailand, and Vietnam) and the U.S. downstream supply chain. (Country-specific information is provided in the following section for the industries of Bangladesh and Thailand. The remaining countries are addressed in Appendix E.)

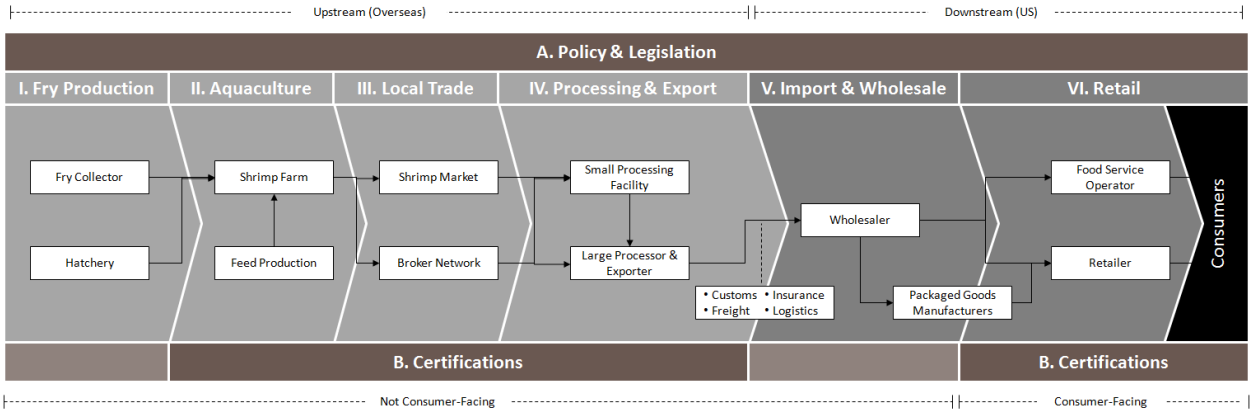

Figure 9: Schematic of the Global Shrimp Supply Chain

The level of industry sophistication varies across the primary producing countries. Thailand and Bangladesh represent opposite ends of the spectrum. Thailand's shrimp aquaculture industry has benefitted from decades of investment and improvements. Conversely, Bangladesh has not been able to develop an intensive shrimp aquaculture industry, primarily due to a lack of financial resources, weak policy development, and irregular enforcement of environmental regulations. After describing the general steps in production supply, this report focuses on the contrasting models of production in Thailand and Bangladesh. As these two countries represent the extreme ends of industry development, it is reasonable to infer that other national shrimp aquaculture industries fall somewhere in between. It is also important to note that, though the Thai and Bangladeshi industries are very different, exploitative labor practices have been identified and reported in both.

Fry Production

Shrimp aquaculture operations require stocks of juvenile shrimp called fry or post-larvae. There are currently three models of fry production within the shrimp industry: wild fry collection, large-scale hatchery cultivation, and "backyard" hatchery operations.

The traditional method for obtaining shrimp fry is to collect brood stock from coastal waters populated by wild shrimp or to trap them in naturally reticulated ponds. Artisans called **fry collectors** use fine nets to skim estuaries to catch shrimp larvae. In the 1990s, this practice came under scrutiny for its excessive and environmentally damaging by-catch of unintended marine species.

In response, many countries practicing shrimp aquaculture have discouraged and even outlawed wild fry collection. Instead, they have actively promoted and supported the development of **hatchery operations** to cultivate fry stocks. Technological advancements have enabled the large-scale production of shrimp fry in small and large hatcheries, which require less labor and produce more consistent yields of fry than fry collection. With the controlled conditions of hatchery ponds, it is possible to match and even improve on the natural maturation period and survival rate of fry. Farm-raising brood stock allows hatcheries to domesticate shrimp over multiple generations and to select for faster growth and superior disease resistance, while also enabling hatcheries to produce shrimp fry year-round.[32]

A third model, small-scale or "**backyard" hatchery operation,** is prolific in Thailand and other producer countries in Southeast Asia. These operations, often run as family businesses, use little technology and cultivate fry in small tanks (10,000 liters or less).[33] While the density of shrimp fry and yields of these operations are less than those of large-scale operations, they are less susceptible to disease and can typically restart production quickly after disinfection without causing economically devastating effects on the operators. The 1995 Farm Performance Survey established that Thai small-scale operations yielded more benefits (i.e. return on investment, post-larvae survival rates) than medium and large-scale operations in Indonesia, Taiwan, and the Philippines.[34]

Shrimp Aquaculture

At 15-21 days old, fry are ready for stocking in aquaculture ponds. There are five primary shrimp aquaculture practices, ranging from traditional to ultra-intensive techniques, but the most common techniques are **extensive**, **semi-intensive**, and **intensive**. These three categories are distinguished by their stocking densities (shrimp/m^2), and the level of inputs required.

The practices implemented in a particular country depend on several factors, namely availability of suitable land and capital, technological capacity, level of education of the operators, local infrastructure, and the degree of development of the supply and other support industries.

Extensive shrimp aquaculture is primarily used in areas with limited infrastructure (i.e. power for aeration), lack of trained aquaculture specialists, high availability of inexpensive land, and high interest rates. In that type of environment, individual or family novice producers, who generally lack access to credit, are able to set up their operation with few inputs and little technical expertise. They depend instead on natural advantages to compete in the market place, relying on cheap land and labor, naturally occurring seed stock and feeds, and an absence of environmental regulations on coastal lands.

Extensive producers rely on tidal flows to provide most of the food for the shrimp and the water exchange required. Feed for shrimp is naturally occurring, and in some cases fertilizer or manure is added to promote algal growth. These extensive ponds are relatively susceptible to crop losses due to flooding

[32] DOF, 2009b.
[33] DOF, 2009b.
[34] ADB/NACA, 1997.

from high tides caused by storms or from excessive rainfall, and the low stocking densities result in only modest yields. Land and labor are the principal inputs, with minimal management of water systems required, which keeps operational costs at a minimum. Disease outbreaks are rare due to low stocking densities and no supplementary feeding.[35]

Note: "Traditional" culture practices differ from extensive methods in that they are completely dependent on the natural tidal entry for seed, food, and water exchange. Furthermore, traditional systems are often characterized by polyculture with fish or by rotation with rice, such as in West Bengal and Kerala in India.[36]

Semi-intensive shrimp aquaculture involves stocking densities beyond those that the natural environment can sustain without additional inputs. Consequently these systems depend on a reliable fry supply and greater management of the pond's operation than extensive ponds require. Semi-intensive shrimp aquaculture relies on water pumps to exchange up to 25 percent of pond volume daily. With higher stocking rates of shrimp per square meter, farmers have some dependency on formulated feeds to augment natural food in the ponds. The fry are usually raised in nursery ponds until they are large enough to be stocked at lower densities in "grow-out" ponds.

Semi-intensive and intensive farming practices require the aquaculturist to implement more control over the environment and commit to greater capital inputs. In addition, technical skills are needed. All of the costs associated with semi-intensive production are much higher relative to those for extensive production, including a more complex system of ponds, installation of a pump system to regulate water exchange, skilled management, labor, purchased feed and seed stock, and increased energy usage. The higher the culture intensity, the higher the capital required, and the higher the risks involved. Thus, the increased capital inputs required for semi-intensive culture often preclude its adoption by small-scale producers.

Intensive shrimp aquaculture systems have evolved primarily in countries such as Thailand with high land costs, ample supplies of clean seawater, adequate infrastructure, and well-developed hatchery and feed industries. Intensive shrimp farming introduces small enclosures, high stocking densities, around-the-clock management, and very high inputs of formulated feeds. Aeration — the addition of oxygen to the water — permits much higher stocking and feeding levels. The water exchange rate in intensive ponds is usually more than 30 percent per day. Frequently conducted in small ponds, intensive farming is also practiced in tanks, which may be covered or located indoors. Construction costs range from USD 10,000–35,000 per hectare. Sophisticated harvesting techniques and easy pond clean-up after harvest permit almost constant production. Although yields can be more than double that of semi-intensive production, production costs range from USD 5–7 per kilogram of live shrimp. The risk of disease can be serious in intensive culture, especially if water discharge from one pond or farm is taken into another to be reused.[37]

Intensive production methods require the use of skilled and semiskilled workers, who are usually in short supply and not susceptible to exploitation. Like semi-intensive production, intensive aquaculture requires a high degree of control over all inputs, whether environmental, capital, or technical.

Ultra-intensive techniques are characterized by an extreme level of inputs. These systems rely on advanced technology (such as antibiotics, feed, and infrastructure) for higher survival rates and stocking densities to increase their yield per hectare. The capital investment for this method is substantially greater, but because the grow-out environment is more controlled, many of the risks associated with

[35] FAO, 1986.
[36] Shiva & Karir, 1997.
[37] FAO, 1986.

climatic fluctuations and diseases are reduced. In the most intensive ponds, the systems are nearly closed and water is recycled.

Aquaculture Type	Stocking Densities	Maximum Yields (metric tons per hectare per year)	Water Exchange
Extensive	1–3 shrimp per m^2	0.6–1.5 MT/ha/yr.	Minimal aeration or tidal
Semi-Intensive	3–10 shrimp per m^2	2–6 MT/ha/yr.	Up to 25% pond volume exchanged per day
Intensive	10–50 shrimp per m^2	7–15 MT/ha/yr.[38]	More than 30% pond volume exchanged per day

Table 1: Comparison of Aquaculture Methods

Local Trade

Shrimp farmers rely on brokers and trade systems to market and distribute their shrimp to processors and exporters. The specific patterns of movement of harvested shrimp from farms to processing plants are distinctly different between producer countries and follow two major models: trader networks and fixed shrimp markets.

Trader networks are often exploitative of farmers. Sometimes farmers have been locked into lower (nonmarket) prices by finance arrangements with the local brokers and traders. Even when this is not the case, farmers are frequently obliged to sell to these traders, as they have few other options. The supply chains in these networks are usually quite long, and traders sell to wholesalers, adding margins at each stage.

The alternative model is to create defined **shrimp markets** where regular trade can take place between farmers, traders, and processors. These simplified models allow farmers to receive the fair market price of shrimp; likewise, industrialized buyers benefit from the consistent supply of shrimp available at markets.

Processing and Export

Although currently the majority of shrimp are exported either whole or beheaded and peeled, there is a long-term trend towards processed (or "value-added") products. Processed products are more profitable than undifferentiated frozen shrimp, which are usually traded as a commodity with a low price basis. Food habits are changing in developed countries, where consumers are no longer willing to depend on excessive time for preparing food. "Heat and eat" seafood products have proved to be a perfect niche for shrimp at the retail level for customers seeking convenience. Market demand for specific value-added products has also been rising in the catering and retail sectors in the U.S., EU, and Japan.

The demand for processed shrimp products has created a major industry in export. These services are now provided by high-capacity factories that pursue product differentiation strategies to improve profitability. Overseas processing plants can generally be divided into small preprocessing facilities and large, industrial processing facilities.

[38] DOF, 2009b.

Small preprocessing facilities are predominantly concerned with low value-add activities, including peeling, deheading, and deveining shrimp. These facilities are often not accommodated in purpose-built buildings and can be located in sheds and other temporary sites.[39] Small outfits such as these often work under contractual arrangements with large factories to provide additional processing volume and cost advantages. Occasionally, small facilities may buy shrimp directly from the market, perform the processing, and resell their shrimp to large facilities. Given the low level of processing that takes place at these facilities, they are not covered by food-safety regulatory systems. Peeling pod shrimp is very labor-intensive; peeling sheds are large employers of unskilled and low-skilled employees. However, given the temporary nature of their activities and facilities, small preprocessors typically are not registered with government or industry agencies. In practice, this also means that these processing facilities are not subject to the requirements of certifications.[40]

Large, industrial processing facilities process significant volumes of shrimp and seafood using sophisticated methods in their operations. They are capable of producing value-added goods — heavily processed products like battered shrimp and ready-to-eat foods. These facilities are typically registered with industry associations and engage directly in export activities, maintaining direct business relationships with foreign importers. To do so, these factories hold multiple certifications to ensure their procedures and policies are generally compliant with consumer market requirements. Though industrialized, such facilities are still very labor-intensive, as low-cost labor in these developing countries makes manual labor more cost-effective for producers.[41]

In most producer countries, a company must be a member of the national exporter association for seafood in order to export shrimp internationally. These industry groups typically set community policies and practices to help regulate the quality of national exports and to avoid trade duties, fines, or bans. Typically the members of these associations are exclusively companies that own and operate large, industrial processing facilities.

[39] Solidarity Center, 2010.
[40] Edge, 2012f.
[41] Edge, 2012a.

Case Studies: Bangladesh and Thailand

Over the last 20 years, the global shrimp aquaculture industry has grown significantly and has undergone important changes, such as the shift from wild catch to aquaculture. Today, shrimp is a major international commodity. The most important producer countries are located in Asia, with various levels of industry sophistication. Thailand has taken the global lead in production volume and is recognized as a producer of high-quality shrimp products. In contrast, Bangladesh's shrimp industry is still at sa rudimentary stage and — despite being one of the country's primary export sectors — is often plagued with quality issues. This contrast is evident in the relative levels of production. Although roughly the same number of workers are employed in the shrimp sector in both countries, the average yield per hectare in Thailand is 17 times higher than the yield in Bangladesh, and Thailand produces about seven times more total volume than Bangladesh.[42]

Shrimp Production in Bangladesh

Fry Production

Recognizing the negative environmental impact of wild fry collection, the government of Bangladesh has prohibited the collection of all wild fish and shrimp fry. However, despite being illegal on paper, wild fry collection is still common practice and employs some 400,000 workers.[43] Aquaculture farmers in Bangladesh tend to prefer wild-caught fry, which tend to have a higher survival rate during cultivation. During summer months, children frequently help fry collectors sort shrimp larvae from by-catch species.

Aquaculture

Extensive shrimp aquaculture in Bangladesh began in the 1970s, when farmers began trapping natural fry in tidal waters in nearby coastal enclosures, where no feed, fertilizers, or other inputs were applied. In some areas, the land was used in rotation for rice/shrimp and salt/shrimp production. Juvenile fish and shrimp that entered with the tidal waters were reared largely without feed or additional husbandry, resulting in an average harvestable production of only around 300 kg/ha.[44] By 1980, the country had less than 20,000 ha of these brackish-water extensive ponds.

Extensive farming has grown in recent years, and by 2008, land dedicated to ponds had grown by nearly 11 times (totaling 217,877 ha). Aquaculture has been concentrated in the districts of Bagerhat, Satkhira, Pirojpur, Khulan, Cox's Bazar, and Chittagong.[45]

Since 1993, some Bangladeshi farms, particularly in Cox's Bazar, have begun to industrialize and apply semi-intensive production models. These developments are helping Bangladesh overcome major challenges with disease and increase overall shrimp production (to 145,580 MT in 2008).[46]

Local Trade

In Bangladesh, shrimp reaches buyers through trader networks that often include a number of middlemen. Each trader along these chains adds substantial margin to the shrimp, despite not adding any value to the product.[47] There are too many non-value-adding middlemen along this part of the supply chain, where a financial bonding system extorts high profit margins from hatcheries and producers.

[42] FAO, 2009.
[43] Gammage, 2006.
[44] Mazid, 2002.
[45] FAO/UNDP, 1985.
[46] Wahab, 2003; Bangladesh Statistical Yearbook, 2008.
[47] Barmon, 2011.

Collusion between suppliers throughout the supply chain keeps prices of a number of key input factors at an artificially high level.[48]

Traders achieve profit by purchasing shrimp from farmers without grading, by underestimating the weight of shrimp or by only measuring the "dry weight" of shrimp. When reselling shrimp, traders apply deceptive methods to increase the resale price of their shrimp. These methods include grading and pricing shrimp according to official systems and submerging shrimp in water for hours to increase their weight. Shrimp traders do not have notable costs for storage, as they typically resell shrimp on the same day they purchase it.[49]

Wealthy traders appear to exploit poor and marginalized Bangladeshi shrimp farmers by issuing conditional loans to finance shrimp aquaculture operations. If farmers breach contractual conditions to earn higher, market-based prices, a trader may verbally or even physically assault the farmers.[50]

Larger regional wholesalers often lock local traders into similar agreements. Wholesalers provide finance to traders or larger farmers, who are obliged to sell their products directly to a single wholesale depot based on the contract of conditional loans, often resulting in below-market prices. Traders are often subjected to the same forms of abuse from wholesalers as they impose on farmers.[51]

Commission agents are typically medium- to large-sized entrepreneurs who have access to large financial resources and usually provide conditional loans to wholesalers. Wholesalers receive conditional loans from commission agents and agree to contractual exclusivity.[52] They are the link between a wholesaler and the manufacturers or exporters. The commission agents contact the exporters on behalf of local wholesalers. They receive a commission fee for shrimp sales from the wholesalers. Commission agents apply opportunistic behavior to maximize their profits by suppressing the purchase price and using contractual bonding. Some commission agents take bribes from wholesalers to prioritize their products with larger, higher-paying exporters.[53]

Processing and Export

In Bangladesh, companies that export shrimp to foreign buyers are represented by the Bangladesh Frozen Foods Exporters Association (BFFEA). In 2011, 29 companies sold shrimp to buyers in the U.S., and 24 of those were BFFEA members. Together they exported 4,687 MT, representing 18 percent of the total shrimp exports from Bangladesh and 0.8 percent of the total exports to the U.S. market. In addition, almost all shrimp exports from Bangladesh (over 99 percent in 2011) are low-margin whole (i.e., largely unprocessed) shrimp.[54]

The export processing industries in Bangladesh are mostly based on traditional knowledge of handling and processing fresh and frozen shrimp collected from farmed or wild catch sources. Management and workers lack skills, technical expertise, and equipment. Technology is not advanced enough to produce value-added shrimp products suitable for export in a competitive international market.

There are 131 processing plants in the country, of which 85 are licensed; 70 of these have EU approval, and about 42 have a green channel to the United States.[55] Raw shrimp are acquired through a small number of commission agents, who are the final aggregators in the domestic supply chain and who source from smaller dealers and depots further upstream. The shrimp are sent to the port in freezer

[48] World Bank, 2005.
[49] Barmon, 2011.
[50] Barmon, 2011.
[51] Barmon, 2011.
[52] Barmon. 2011.
[53] Barmon, 2011.
[54] USCBP, 2012.
[55] BFFEA, 2012.

trucks for export. Processed shrimp are loaded into refrigerated containers and are shipped by barges to the Port of Mongla or, more recently, Chittagong for loading onto feeder vessels. From these ports, the shrimp are shipped via Singapore to Northern Europe and the East Coast of the United States. All international shipments are subject to hub and spoke networks adopted by shipping lines, resulting in multiple ports en route to destinations, causing a competitive disadvantage for Bangladesh, while adding cost and duration to shipments. Bangladeshi shipments are often held in Singapore until a suitable volume is reached.[56]

On average the factories earn USD 1.50 per kilogram of shrimp processed, and nearly 30,000 nonmanagement workers are employed in the processing factories.[57] While significant processing capacity exists (up to 270,000 MT per year), utilization rates may be as low as 15–30 percent.[58] The World Bank reported that this overcapacity is the result of an overgenerous government incentive package that offers a waiver on import duty on machinery, a nine-year tax holiday, cheap loans, and export price support. The weak institutional environment was unable to verify that these incentives are being used as intended by lawmakers, allowing processing plants to divert loans and apply tax shields to other businesses.[59]

When exporting to the U.S., Bangladeshi exporters sell primarily to large wholesale companies, such as Red Chamber and the Eastern Fish Company, which add value in U.S.-based factories and then sell shrimp products to retailers and restaurants.[60] The negligible level of value-added activities provided by Bangladeshi exporters suggests that only small margins can be achieved. Bangladeshi exporters do not engage freight-forwarding agents or maintain representative offices in the U.S. to facilitate the shipment of goods, which suggests that the exporters maintain no strong business relationships with U.S. importers or buyers.[61]

Rank	Name of Exporter	Volume	# Shipments	% Volume
1	Apex Foods Ltd.	859,575	51	14.8%
2	Gemini Sea Food Ltd.	764,174	42	13.1%
3	Organic Shrimps Export Ltd.	548,865	28	9.4%
4	Rupsha Fish & Allied Ind. Ltd.	319,769	17	5.5%
5	Kuliarchar Sea Foods (Cox's Bazar) Lt	308,000	18	5.3%
6	Sar & Co. Ltd	306,000	17	5.3%
7	Sobi Fish Processing Ind. Ltd.	229,900	12	3.9%
8	Khulna Frozen Foods Export Ltd.	211,162	11	3.6%
9	Saint Martin Sea Food Ltd.	188,113	11	3.2%
10	Jahanabad Sea Foods Ltd.	149,020	8	2.6%
11	Sea Fresh Ltd.	145,495	8	2.5%
12	Asian Sea Food Ltd.	117,500	6	2.0%
13	Choudhury & Co. (Bangladesh) Ltd.	117,029	6	2.0%
14	Bright Seafood Limited	96,302	5	1.7%
15	Meenhar Sea Foods Ltd.	77,230	4	1.3%

Table 2: Top 15 BFFEA Members, 2011 Export Data[62]

[56] USCBP, 2012.
[57] USAID, 2005.
[58] DOF, 2009; World Bank, 2008; USAID, 2005.
[59] World Bank, 2008.
[60] USCBP, 2012.
[61] USCBP, 2012.
[62] USCBP, 2012.

The U.S. market concentration of exports across BFFEA members is not particularly prominent, with no single exporter representing greater than one-hundredth of a percent of the U.S. total volume.[63] Two exporters, Apex Foods and Gemini Sea Food, each accounted for over 10 percent of the Bangladeshi export volume in 2011, although neither appears to have a consistent trade relationship with a major U.S. buyer.[64] Rather, each sold many small shipments to a varied group of U.S. buyers, suggesting that Bangladesh is used as a commodity spot market for international buyers.

The demand of the processing plants for raw shrimp has outpaced supply, increasing competition for shrimp supplies. As a result, the processing plants tend to purchase shrimp by ignoring quality aspects and occasionally fail to attain appropriate market prices in the competitive global market due to quality concerns.[65] Such quality compromises may create future image problems for the Bangladeshi export market in a highly competitive and strictly regulated global market.

[63] USCBP, 2012.
[64] USCBP, 2012.
[65] Edge, 2012f.

Shrimp Production in Thailand

Fry Production

In contrast to the wild fry collection of Bangladesh, Thailand's fry production is highly effective and based in more than 2,000 small-scale backyard hatcheries, mainly located in Chacehongsao, Chonburi, and Phuket. These hatcheries produce 80 billion shrimp fry annually, or about 90 percent of Thailand's total production. The Thai government has supported these hatcheries through their early stages by effectively sharing technologies directly with small hatchery operators. This has facilitated a widespread cottage industry of small sustainable businesses; the share of farms using hatchery-raised fry has exploded from 3 percent in 2000 to 99 percent in 2008.[66]

Description	2000	2008
Registered farms	34,979	30,732
Active farms	25,000	n/a
Pond area (ha)	81,120	52,000
Production (MT)	309,794	466,330
Average yield (kg/ha)	3,819	8,968
Production, *White Shrimp* (MT)	5,200	464,420
Production, *Tiger* (MT)	304,594	1,910
Farms domestic PL	3 percent	99 percent
Farms CoC* certified	186	(0.7 percent, 5,119 ha)
Farms GAP* certified	18,109	(72 percent, 34,596 ha)

Table 3: Comparison of Marine Shrimp Farming in Thailand, 2000 and 2008 (Thailand DOF)

Aquaculture

Shrimp farming in Thailand developed rapidly during the mid-1980s, supported by the technological breakthrough in shrimp feed development and breakthroughs in fry cultivation in 1986. By 2000, land used for aquaculture ponds totaled 81,120 ha.[67]

Countries like Thailand and, to some extent, Vietnam have built the financial, technological, and educational foundation to move their shrimp industries from extensive to intensive practices. As these countries developed, the government imposed restrictions that prevented new land from being converted into farms due to environmental-protection legislation. This required the industry to increase yields rather than land in order to increase output, which led to greater aquaculture intensity.[68] In contrast, in countries like Bangladesh and Indonesia, the majority of shrimp farming uses extensive practices due to a lack of capital, technology, and infrastructure, as well as a severe lack of enforceable environmental controls for new farm developments.

Intensive production now dominates the industry in Thailand. This industrialization allowed Thailand to produce 538,953 metric tons of shrimp in 2009 from about 25,000 active farms.[69] Almost 90 percent of shrimp production in Thailand was cultured in 2007 and 2008. In addition, because imports of wild, trawl-caught shrimp from Thailand are currently banned in the U.S., it is likely that in recent years, virtually all the shrimp products imported to the U.S. from Thailand were farmed.

The majority of shrimp aquaculture operations in Thailand are family-owned enterprises or small businesses with small land holdings. There are, however, some large conglomerates with interests in farming. The largest farmed shrimp producer in Thailand, Charoen Pokphand Food Public Company (CP) is vertically integrated with feed manufacturers, brood stock farms and hatcheries, laboratory services,

[66] DOF, 2009b.
[67] FAO, 2009.
[68] FAO, 2009.
[69] FAO, 2009; DOF, 2009b.

grow-out farms, processing plants, an export trade company, and a research and development division. Despite this integration, CP still accounts for a relatively small volume of cultivated shrimp.[70]

Local Trade

In Thailand, local trade supply chains are much shorter than those in Bangladesh — shrimp may be directly sold to seafood processors and exporting companies by farmers or regional suppliers. However, the majority of shrimp is directly sold to processors by farmers through central shrimp markets. These markets serve as an outlet for farmers and regional suppliers coming from other provinces, attaining competitive auction prices for produce.[71] The Samut Sakhon shrimp market is the largest in Thailand and facilitates trade of 900–1,050 MT of shrimp every day — three-quarters of all Thai shrimp. Fifty percent of Thai seafood processors hold established factories in the central region, yet the central region can only produce 9 percent of raw shrimp. The Samut Sakhon shrimp market thus consolidates shrimp shipments from the eastern and southern regions for centralized processing. Most of this shrimp is destined for export, and only 10 percent is consumed in the domestic market.[72]

Processing

Once destined for the export market, Thai shrimp moves into the hands of processors and exporters. Thailand's shrimp exporters are the most sophisticated community of shrimp producers in the developing world, organized effectively through the Thai Frozen Foods Association (TFFA). All frozen seafood producers and exporters need to be registered with the TFFA to gain access to international markets. In total, this industry group represents the interests of 330 seafood processors and traders who are then subjected to regulatory control on health, safety, and social aspects of their operations.

In 2011, it was estimated that 42.7 percent of total shrimp exported from Thailand to the United States was further processed upon import.[73] Importers and buyers in the food sector assert significant control over their end product, stipulating detailed requirements with regard to quality and processing. However, the responsibility placed on Thai exporters has been increasing, reflecting the confidence in the maturity and sophistication of the Thai shrimp-processing industry.

Preprocessing and Peeling Sheds

In Thailand, small preprocessing facilities are frequently referred to as peeling sheds, because these facilities typically remove the heads and hard shells (peeling) of shrimp, considered the most time-consuming component of shrimp processing. Once peeled, the shrimp are further processed and frozen by larger exporting industries.

According to the TFFA, there are 97 peeling sheds registered by the industry that provide shrimp to Thai exporting organizations.[74] An estimated 200 peeling sheds, including all of the 97 registered with the TFFA, are registered with the Thailand Department of Fisheries (DOF) and are subject to Thai regulations. The TFFA, the ILO, and the International Programme on the Elimination of Child Labour (IPEC) estimate that there are at least an additional 400 unregistered sheds.[75] The Labour Rights Promotion Network (LPN), a labor rights organization working in the Thai shrimp industry, estimates that the true number of small preprocessing facilities is closer to 2,000;. The LPN asserts that many of these unregistered facilities supply shrimp to TFFA members.[76] According to TFFA officials, however, the use of

[70] Edge, 2012e.
[71] James, 2009.
[72] DIT, 2007.
[73] USCBP, 2012.
[74] Edge, 2012a.
[75] Edge, 2012d.
[76] Edge, 2012g.

illegal peeling sheds would lead to a cancellation of the processor's membership and, consequently, a suspension of access to export markets.

These unregistered sheds are not subject to any regulatory control by DOF or Thailand's Department of Labor (DOL). Details such as business location, ownership, and key activities (such as turnover, employment records, or production-related data) are unknown. ILO/IPEC, in association with the TFFA, is mapping the location of these peeling sheds as a first step toward investigating and addressing reported exploitative labor practices. A key challenge, however, is that these sheds can easily be closed or relocated with little effort.[77]

These peeling sheds are not subject to Hazard Analysis Critical Control Point (HACCP) regulations. Instead, liability for these facilities is placed on the TFFA member processors who buy shrimp from small facilities for export. Because the TFFA member is ultimately held liable for any problems with the health or quality of the shrimp, members heavily scrutinize shrimp from peeling sheds for quality and health issues. However, they do not investigate the labor practices associated with the peeling sheds.[78]

Factory Processing

The Thai seafood-processing industry employs about 700,000 workers and produces a large variety of seafood products in more than 2,400 manufacturing plants.[79] Thailand's value-added processing relies on manual labor. Typically, Thai processing factories employ a large work force (usually in excess of 3,000 workers), 90 percent of whom are migrants, as Thai people prefer to work in other industries.[80] The work force consists of mostly women, who work at minimum wages based on piecework by weight of processed shrimp. There is an acute shortage of labor, and large processors employ agents for the hiring and management of migrant laborers. TFFA factory workers generally welcome overtime, which is usually available during peak seasons.[81]

Export: Thailand and the U.S.

Thailand is the leading shrimp-exporting country in the world and also the largest single supplier to the U.S. market. In 2011, of the top 30 shrimp exporters to the U.S., 8 were Thai companies, including 4 of the top 5 global exporters. A total of 61 companies exported from Thailand to the U.S., with the top 15 exporters accounting for 52.6 percent of total Thai exports to the U.S. (and 23.1 percent of U.S. imports)[82] The actual export volume of these companies may be even higher, given that many documents of shipments from Thai exporters are not publically declared. The remaining exporters are family-run businesses that also process other seafood products.[83]

[77] Edge, 2012d.
[78] Edge, 2012f
[79] DOF, 2009.
[80] Edge, 2012b.
[81] Edge, 2012c.
[82] USCBP, 2012.
[83] USCBP, 2012.

Rank	Name of Exporter	Volume	# Shipments	%Volume[1]	%Volume[2]
1	Thai Union Group	26,775,000	1,511	11.0%	16.8%
2	Thai Royal Frozen Food Co. Ltd.	14,061,178	803	5.8%	8.8%
3	PTN Group	13,556,304	795	5.6%	8.5%
4	Pakfood Public Co. Ltd.	11,912,516	699	4.9%	7.5%
5	Marine Gold Products Limited	10,610,993	596	4.4%	6.7%
6	May Ao Foods Co. Ltd.	7,813,344	429	3.2%	4.9%
7	Asian Seafoods Coldstorage Public Comp.	6,069,159	308	2.5%	3.8%
8	Narong Seafood Company Limited	5,470,390	311	2.2%	3.4%
9	CPF Group	5,395,055	342	2.2%	3.4%
10	Kitchens Of The Oceans (Thailand) Ltd.	5,226,797	303	2.1%	3.3%
11	Good Luck Product Co. Ltd.	4,715,046	223	1.9%	3.0%
12	Xian Ning Seafood Co. Ltd.	4,235,407	250	1.7%	2.7%
13	A Foods 1991 Co. Ltd.	4,166,375	231	1.7%	2.6%
14	Andaman Seafoods Co. Ltd.	4,038,739	261	1.7%	2.5%
15	Kongphop Frozen Foods Co. Ltd.	3,898,940	150	1.6%	2.4%

Table 4: TFFA Members, Top 15, 2011 (U.S.)[84]

The Thai Union Group is the largest single exporter, exporting 26,775 metric tons of shrimp to the U.S. (4.8 percent of U.S. imports). Other prominent Thai exporters include the Thai Royal Frozen Food Company (2.5 percent of exports to the U.S.), the PTN Group (2.4 percent), Pakfood Public Company (2.1 percent), and Marine Gold Products (1.9 percent).[85] Most large Thai exporters have U.S.-based representation to facilitate and maintain business relationships with American buyers, which is considered a key success factor in their dominance of the U.S. shrimp market. Thai Union, for instance, through its merger with Chicken of the Sea and other acquisitions, is also the largest distributor of shrimp in the United States.

In 2011, Thai shrimp were exported from 15 different ports along the Gulf of Thailand. The largest port, accounting for 31.5 percent of shipments, is Samut Sakhon, coinciding with the largest concentration of shrimp processing. An additional 55.3 percent of shipments leave from four ports nearby in Bangkok, Laem Chabang, Samut Prakan, and Lat Krabang. Globally, Samut Sakhon, Laem Chabang, and Bangkok are three of the five ports with the highest volumes of exported shrimp.

Import

U.S. Customs trade data shows that in 2011, American buyers purchased 569,885 MT of shrimp from 60 countries.[86] Importing is typically done by wholesalers, who purchase large volumes of shrimp for redistribution to resellers. Wholesalers sell shrimp products through four distinct channels in the U.S.:

(1) **Food manufacturers:** to be processed into shelf-stable goods, ready-to-eat-meals, and other frozen foods
(2) **Retailers**: sold as indiscriminate shrimp (i.e., seafood counter wholesale) and also to be packaged as private-label goods (i.e., store brand)
(3) **Food service providers**: such as restaurants, hospitals, or catering businesses
(4) **Private-label shrimp brands:** marketed as generic brands to smaller retailers and supermarkets

[84] USCBP, 2012.
[85] USCBP, 2012.
[86] USCBP, 2012.

Many importers operate onshore processing facilities to add value to products for product differentiation and increasing profit margins. In contrast to developing countries, the U.S.'s high cost of labor necessitates a high degree of automation, with strong financial investments and large volume for amortization reasons. U.S. processors may operate wholesale divisions to have a balanced product offering sales to marketers, retailers, and food service operators.

The size and sophistication of these importers varies significantly. In 2011, the top 10 importers accounted for 170,982 MT, or 30 percent of the total volume of shrimp imported to the U.S.[87] As evidenced by the high market share held by this small group, importing is the activity along the supply chain where volumes are most concentrated.

Many major shrimp importers are highly integrated operations — owned by or in partnership with other stakeholders in the shrimp supply chain — with considerable market power. They tend to have strong relationships with both the largest retail and food service customers in the U.S., as well as the major export companies in producer countries. In general, shrimp importers are not recognizable, consumer-facing brands, and because they are usually privately held and foreign-owned companies, there is little background information available on these organizations.

The largest known importer of shrimp to the U.S. is **Chicken of the Sea**, which has merged with the largest exporter in the world, the **Thai Union Group**, to create a highly integrated seafood conglomerate. Through Thai Union's production facilities, Chicken of the Sea produced 25,352 tons of shrimp in 2011. In addition to this volume, the importer purchased 21,482 tons from at least 95 suppliers in 12 countries. Chicken of the Sea's total volume is estimated at 46,834 metric tons or 8 percent of total U.S. imports. Chicken of the Sea sells this supply of shrimp through multiple channels: selling wholesale to retailers and food service operators, and marketing its own branded products. With such a share of the supply, Chicken of the Sea is capable of filling orders for some of the largest retailers and restaurants in America. In 2011, Chicken of the Sea's customers included the largest retailer in the country, Wal-Mart, and the largest restaurant conglomerate, Darden (USCBP, 2012).

The Eastern Fish Company is the second-largest U.S. importer of shrimp. In 2011, the company sourced a reported 28,703 metric tons of shrimp from 62 suppliers in 10 countries. The Eastern Fish Company wholesales shrimps to several major retailers, including chains Kroger, Publix, Safeway, and Price Chopper, as well as selling its own private-label brand, Sail, directly to consumers through retail outlets and to food service operators (USCBP, 2012).

The third-largest importer of shrimp is Ocean Bistro Corporation, reported to have imported 16,625 metric tons of shrimp in 2011 from 29 exporters in 8 countries (USCBP, 2012). Ocean Bistro imports large volumes of frozen shrimp, which it wholesales to Safeway under the Bistro Waterfront brand.[1] It also imports large quantities of processed shrimp. Though Ocean Bistro is a major actor in the industry, very few details on the company are publicly available. It is notable, however, that it shares a U.S. address with Red Chamber Company, a major, privately held, Chinese-owned seafood importer that is reportedly the largest seafood importer in America — though its volumes and revenues are not reported publicly (USCBP, 2012).

The shrimp supplied by all the largest importers in America can be directly traced back to countries where exploitative labor takes place. While many importing companies have their own inventories and catalogs of shrimp that they offer, they also place orders to their exporting counterparts on behalf of corporate buyers, using detailed specifications. These specifications are often based on industry standards, certification schemes, and detailed instructions on value-adding activities and packaging.

Once the order has been placed, neither the buyer nor the importer has direct involvement in order fulfillment; the shipment of shrimp orders is usually arranged and managed by the exporting company. No shrimp businesses have integrated shipping operations, so all shipments are exported using container

[87] USCBP, 2012.

shipping vessels such as APL, Maersk, and Orient Overseas Container Line. Additionally, high-volume importers frequently engage freight forwarders, specialized logistics experts, to optimize and expedite their shipments.

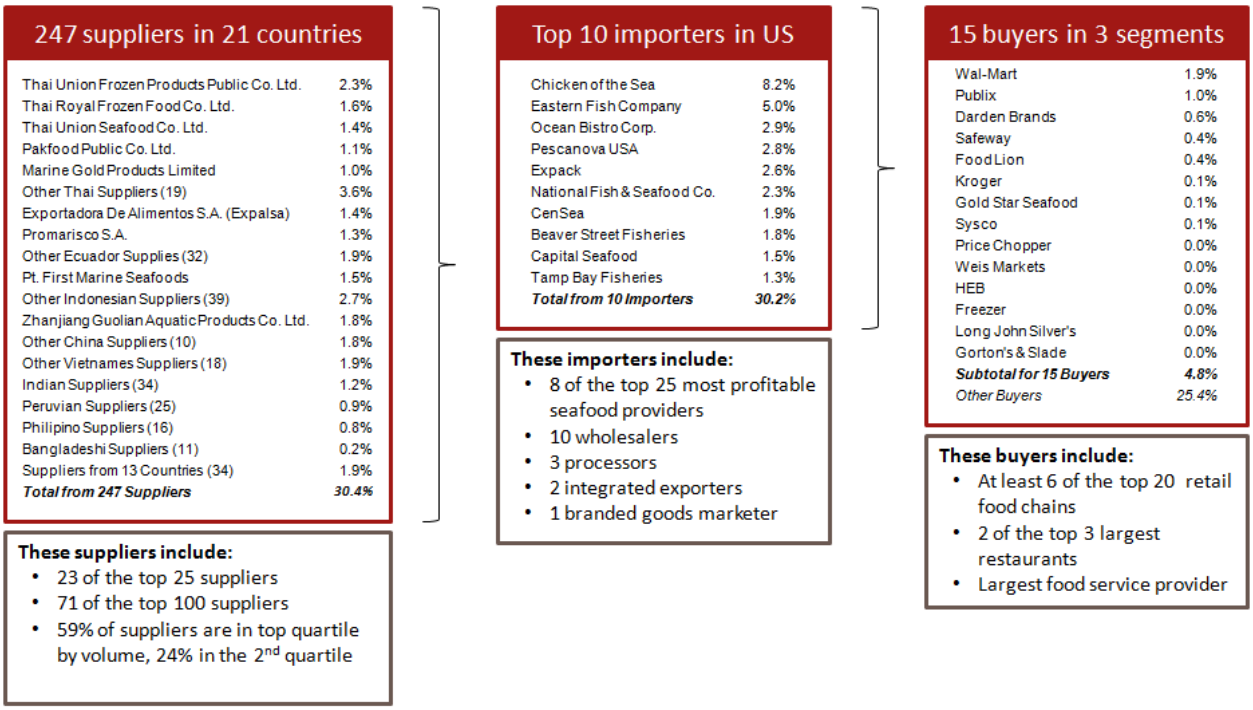

Figure 10: U.S. Supply Chain Volume Concentration, 2011[88]

The length and complexity of the supply chain creates distance between the end buyers of shrimp in the U.S. and the producers from where the shrimp is sourced. Although certifications have been embraced by end retailers and food service organizations, these schemes can't effectively guarantee that purchases are responsible or ethical. Major buyers can be clearly linked to exporters and processors with questionable labor practices, who are able to circumvent the voluntary governance intended by certification schemes.[89]

Customs in the United States

The United States is highly sensitive to goods entering its domestic markets, particularly food products such as shrimp. All seafood shipments entering the U.S. are first inspected by the U.S. Customs and Border Protection Agency to ensure that all customs protocols are enforced. Customs brokers, experts on specific port protocols, are usually engaged by importers to facilitate this process. In 2011, 70.3 percent of shrimp entered the U.S. through just five major ports.[90]

Shipments for seafood are also inspected by the U.S. Food and Drug Administration (FDA) to ensure that health and quality standards are met. Any goods that do not satisfy the inspection are required to be disposed of or shipped outside of the U.S. Goods that are considered fit for U.S. retail are also reviewed

[88] USCBP, 2012.
[89] USCBP, 2012.
[90] Note: Thai shrimp imports into smaller ports increased in 2011 (USCBP, 2012). Though the reasons for this trend cannot be verified, some speculate that importers target smaller and less well-staffed ports to reduce the scrutiny on product quality and potential tariffs by customs and FDA agents.

by the U.S. Department of Commerce to apply any duties and tariffs. In line with a ruling by the U.S. government in 2004, shrimp imported from Brazil, China, Ecuador, India, Thailand, and Vietnam are subject to these tariffs.[91]

Rank	Port of Lading	Volume		# Shipments	
1	Los Angeles, CA	203,295,210	26.8%	11,596	30.0%
2	Newark, NJ	125,150,304	16.5%	6,523	16.9%
3	New York, NY	99,688,735	13.1%	3,863	10.0%
4	Miami, FL	53,479,273	7.1%	2,818	7.3%
5	Long Beach, CA	51,508,264	6.8%	2,691	7.0%
6	Savannah, GA	46,885,799	6.2%	2,223	5.7%

Table 5: Major U.S. Ports of Lading for Shrimp[92]

Distribution

Retailer, consumer goods manufacturers, and food service providers are the final buyers of shrimp along the supply chain. These companies typically buy shrimp from wholesale importers and sell shrimp directly to consumers. These organizations are consumer-facing and typically have well-known and recognizable brands.

Name of Store	2010 Revenue	# Stores
Wal-Mart	$307,736,000	4,358
Kroger	$78,326,000	3,609
Target	$65,815,000	1,750
Costco	$58,983,000	412
Safeway	$33,262,000	1,475
SUPERVALU	$30,975,000	2,436
Publix	$25,072,000	1,173
Ahold USA / Royal Ahold	$23,518,000	751
Delhaize America	$18,799,000	1,627
Meijer	$15,319,000	198
H-E-B	$14,947,000	299
Whole Foods Markets	$8,736,000	288
Aldi	$8,362,000	1,135
A&P	$8,123,000	382
Winn-Dixie Stores	$7,207,000	485
Trader Joe's	$6,817,000	359
Giant Eagle	$6,398,000	384
Wegman's Food Markets	$5,599,000	76
Price Chopper Supermkts.	$3,500,000	128
Harris Teeter	$3,660,000	207

Table 6: Top 20 Grocery Retailers, 2010 (Schultz, 2010)

Consumer goods manufacturers buy processed shrimp from wholesale shrimp importers. Though not always the case, these companies typically outsource much of the production to other processors, both domestic and foreign, and are largely in control of marketing these products. Consumer manufactured goods are typically ready-to-eat frozen or shelf-stable meals that are sold through retailers, such as frozen dinners from Stouffer's, Birds Eye, and Hungry Man.

Retailers sell many products on behalf of consumer goods manufacturers and typically sell shrimp products through their own store brands. Private store brands are usually packaged overseas, imported through wholesalers, and have very little overhead costs for retailers, which allows them to market their product at lower prices. Given the relatively lower price of store brands, they are popular with shrimp consumers.

While **food service operators** such as restaurants account for half the shrimp sold in the United States, each individual restaurant sells a relatively low volume of shrimp. Independent restaurants (those not part of restaurant chains) do not warrant in-house imports. Only food service operators who operate scaled networks of stores warrant this level of investment. For example, Darden's Red Lobster chain sells more shrimp in the U.S. than any other restaurant. To ensure a secure and steady supply of shrimp, Darden

[91] Economist, 2006.
[92] USCBP, 2012.

established an integrated supply chain that includes joint ventures in shrimp cultivation in Malaysia and import operations.[93]

The top U.S. retailers frequently operate sophisticated, often integrated supply chains and purchase shrimp products based on committed sustainability policies. In contrast, small retail businesses simply obtain their supply from local wholesale suppliers and are largely removed from any involvement with other nodes in the supply chains. These smaller companies struggle to compete against the efficiencies in purchasing and distribution that are available to large food retailers.

It is estimated by industry consultants that half of seafood is consumed at home and purchased largely through the top 20 retailer chains that operate in the U.S. (see Table).[94] These chains have expanded to more than 60 percent of the market in recent years, mainly by acquiring local and regional chains. Typically, these stores sell unpackaged shrimp (raw or cooked) from seafood counters and shrimp packaged as store-brand products or as processed consumer goods. Based on the analysis provided in the tables above, it is estimated that the major food retailing chains hold a market share of about 30 percent of the total U.S. shrimp-volume sales.[95] With nearly one-third of the shrimp-market share concentrated in the hands of a few major retailers, this suggests these companies may hold considerable power to influence conditions and behaviors in the upstream supply chain.

Retailer Profiles

Wal-Mart

Wal-Mart is the largest retailer in the United States and also the largest retailer of shrimp: It is estimated that over half of seafood consumers shop at Wal-Mart. In 2011, Wal-Mart imported shrimp from 30 different shrimp importers in seven countries. Wal-Mart bought this shrimp through multiple wholesalers, including: National Fish & Seafood Company, Beaver Street Fisheries, Thai Union, and Red Chamber.[96]

[93] Darden, 2012.
[94] Perishables Group, 2008.
[95] Perishables Group, 2008.
[96] USCBP, 2012.

Wal-Mart Exporters	Volume (kg)	Wal-Mart Importers	Volume (kg)
Thailand	**13,350,159**	National Fish & Seafood Company	8,655,718
Good Luck Product Co. Ltd.	3,337,058	Beaver Street Fisheries	1,851,945
Andaman Seafoods Co. Ltd.	2,338,705	Chicken of the Sea / Thai Union	519,550
Narong Seafood Company Limited	2,317,342	Red Chamber	32,040
Pakfood Public Co. Ltd.	2,041,600	Others	7,229,770
Marine Gold Products Limited	987,307	**Grand Total**	**18,289,023**
Xian Ning Seafood Co. Ltd.	975,180		
Inter Pacific Marine Products Co. Ltd.	723,083		
Others	629,884		
Viet Nam	**2,549,175**		
Nha Trang Seaproduct Company	2,085,675		
Ut Xi Aquatic Products Processing Corp.	231,158		
Others	232,342		
Indonesia	**1,284,581**		
Pt. Bumi Menara Internusa	542,899		
Pt. Centralpertiwi Bahari	323,619		
Others	184,179		
India (5)	**745,052**		
Malaysia (1)	**277,833**		
United Arab Emirates (1)	**49,101**		
Bangladesh (1)	**33,122**		
Grand Total	**18,289,023**		

Table 7: Wal-Mart Suppliers, 2012[97]

Wal-Mart has partnered with the Global Aquaculture Alliance (GAA) and the Aquaculture Certification Council (ACC) to create standards and to certify that its shrimp suppliers adhere to environmental and social certification standards within the farm-raised shrimp production and processing facilities. Currently, all the factories that supply shrimp to Wal-Mart have been certified and registered with the ACC, and they are in the process of certifying shrimp farms' ACC standards. Wal-Mart is also working with Conservation International and other nongovernmental organizations to ensure that all of its shrimp suppliers adhere to the Best Aquaculture Practices standards.[98]

Kroger

Kroger is the nation's largest traditional grocery retailer, with 2,439 supermarkets and multidepartment stores in 31 states. The stores operate under two dozen local banner names, including Kroger, City Market, Dillons, Jay C, Food 4 Less, Fred Meyer, Fry's, King Soopers, QFC, Ralphs, and Smith's. Kroger's shrimp originates from three suppliers in Thailand and three suppliers in Indonesia. Most of this shrimp is sold to Kroger by the Eastern Fish Company.[99]

[97] USCBP, 2012.
[98] Greenpeace, 2012.
[99] Greenpeace, 2011; Kroger, 2012.

Kroger Exporters	Volume (kg)	Kroger Importers	Volume (kg)
Thailand	**811,678**	Eastern Fish Company	832,188
Asian Seafoods Coldstorage Public Comp.	529,223	Others	28,575
Thai Royal Frozen Food Co. Ltd.	207,900	**Grand Total**	**860,763**
Tey Seng Cold Storage Co. Ltd.	45,980		
Others	28,575		
Indonesia	**49,085**		
Pt. Centralpertiwi Bahari	32,654		
Pt. Central Proteina Prima	16,431		
Grand Total	**860,763**		

Table 8: Kroger Suppliers[100]

Kroger is working with the GAA Best Aquaculture Practice (BAP) program to ensure that the farmed seafood sold in its stores meets strict standards for sustainability. A key requirement in its seafood-procurement decisions is that all shrimp must have BAP Level 2 certification by the end of 2011.[101] Because not all aquaculture species have BAP or other globally accepted standards in place, Kroger is urging the GAA, the World Wildlife Fund (WWF), and similar organizations to work together to create additional specifications and standards for seafood products.[102]

Costco

Costco is one of the largest seafood retailers in America. Costco's shrimp volume can be traced back to only three exporters, although it appears that much of its volume data has been removed from public records at the company's request. Despite this, records indicate that Costco's Kirkland Estates store brand is at least partially imported by wholesalers Rich Products and Ore-Cal.

Costco Exporters	Volume (kg)	Costco Importers	Volume (kg)
Thailand	**6,917,057**	Rich Products Corp.	1,086,240
Thai Royal Frozen Food Co. Ltd.	4,065,660	Ore-Cal	91,883
Marine Gold Products Limited	2,307,152	Others	5,748,584
Others	544,245	**Grand Total**	**6,926,707**
Canada	**9,650**		
Others	9,650		
Grand Total	**6,926,707**		

Table 9: Costco Suppliers[103]

Costco is engaged in the WWF's Shrimp Aquaculture Dialogues and is evaluating whether it will require all Thailand-based suppliers to be certified under this scheme. In addition, the WWF and Costco are developing a strategy to guide suppliers toward full compliance with standards.[104] The assessment will focus on environmental and social performance in the production of farmed shrimp. Finally, through this project, Costco is evaluating the Aquaculture Stewardship Council (ASC) certification to determine whether it will require all Thai farms to be certified under this standard.[105]

[100] USCBP, 2012.
[101] GAA, 2010.
[102] GAA, 2010.
[103] USCBP, 2012.
[104] Greenpeace, 2012.
[105] Greenpeace, 2012.

Safeway

Safeway is among the largest grocery chains in the United States and operates over 1,700 supermarkets under eight banners.[106] Safeway sources its shrimp from 15 exporters in four countries: Thailand, Indonesia, Bangladesh, and India. This total includes 10 exporters from Thailand. Safeway's shrimp is provided by four importers: Eastern Fish Company, Chicken of the Sea, Ocean Bistro, and Red Chamber.[107]

Safeway Exporters	Volume (kg)	Safeway Importers	Volume (kg)
Thailand	**2,942,047**	Eastern Fish Company	973,219
Kitchens Of The Oceans (Thailand) Ltd.	771,688	Chicken of the Sea / Thai Union	726,790
Thai Union Frozen Products Public Compar	460,320	Ocean Bistro Corp.	713,888
Asian Seafoods Coldstorage Public Comp.	412,889	Red Chamber	154,019
Thai Royal Frozen Food Co. Ltd.	400,040	Others	1,377,582
Leo Global Logistics Co. Ltd.	226,972	**Grand Total**	**3,945,498**
Thai Union Seafood Co. Ltd.	146,255		
Andaman Seafoods Co. Ltd.	145,309		
Chanthaburi Frozen Food Co. Ltd.	144,000		
Pakfood Public Co. Ltd.	143,360		
Sino Connections Logistics (Thailand) Co.	47,672		
The Union Frozen Products Co. Ltd.	43,542		
Indonesia	**932,455**		
Pt. Bumi Menara Internusa	685,990		
Pt. Centralpertiwi Bahari	246,465		
Bangladesh	**52,200**		
Apex Foods Ltd.	52,200		
India	**18,796**		
Apex Exports	18,796		
Grand Total	**3,945,498**		

Table 10: Safeway Suppliers[108]

At the core of Safeway's policy is the company's sustainable seafood commitment: By 2015, all fresh and frozen seafood will be sourced from environmentally and socially sustainable and traceable sources; at a minimum, Safeway's suppliers must be engaging in a credible improvement project.[109] To meet this goal, SeaChoice and Safeway will engage with suppliers to assess and improve sustainable seafood procurement. The partnership between Safeway and SeaChoice is in collaboration with FishWise, a California-based nonprofit focused on helping seafood retailers, distributors, and producers develop and implement comprehensive sustainable seafood policies. Both SeaChoice and FishWise are members of the Conservation Alliance for Seafood Solutions, which developed the Common Vision for Environmentally Sustainable Seafood, which Safeway's Sustainable Seafood Policy is based on.[110]

Publix

Publix is the largest employee-owned retailer in America.[111] Publix's shrimp is sourced from eight suppliers in three countries: Thailand, Ecuador, and India. Shrimp is provided to Publix by three wholesalers: Eastern Fish Company, Chicken of the Sea, and a small share through Red Chamber.[112]

[106] Safeway, 2012.
[107] USCBP, 2012.
[108] USCBP, 2012.
[109] Safeway, 2012b.
[110] Safeway, 2012b.
[111] Economist, 2007.
[112] USCBP, 2012.

Publix Exporters	Volume (kg)	Publix Importers	Volume (kg)
Thailand	**6,082,664**	Eastern Fish Company	3,492,177
Thai Royal Frozen Food Co. Ltd.	2,447,231	Chicken of the Sea / Thai Union	2,234,251
Thai Union Frozen Products Public Compar	1,932,742	Red Chamber	9,450
Pakfood Public Co. Ltd.	934,114	Others	1,391,732
Thai Union Seafood Co. Ltd.	759,127	**Grand Total**	**7,127,610**
The Union Frozen Products Co. Ltd.	9,450		
Indonesia	**1,008,892**		
Pt. Centralpertiwi Bahari	648,345		
Pt. Central Proteina Prima	360,547		
India	**36,054**		
Pt. Centralpertiwi Bahari	36,054		
Grand Total	**7,127,610**		

Table 11: Publix Suppliers[113]

Publix does not currently participate in any seafood eco-labeling programs. Publix currently offers several Marine Stewardship Council-certified (MSC) seafood products but does not use the MSC label.[114]

Trader Joe's

Trader Joe's principal suppliers are from Thailand: Kitchens of the Oceans, Sea Wealth, and SMP Food Products.[115] It is not known who imports Trader Joe's shrimp.

Trader Joe's Exporters	Volume (kg)	Trader Joe's Importers	Volume (kg)
Thailand	**505,159**	Others	505,159
Kitchens Of The Oceans (Thailand) Ltd.	365,935	**Grand Total**	**505,159**
Sea Wealth Frozen Food Co Ltd	108,000		
Others	18,000		
SMP Food Products Co. Ltd.	13,224		
Grand Total	**505,159**		

Table 12: Trader Joe's Suppliers[116]

In 2010, Trader Joe's committed to shift all seafood purchases to sustainable sources by December 31, 2012, including all products frozen, fresh, canned, and so on.[117] The company's seafood policy addresses customer concerns, including the issues of overfishing, destructive catch or production methods, and the importance of marine reserves. The company's strategy is to use its purchasing power to leverage change within the seafood supply community. Moreover, Trader Joe's pledged to support leaders within the industry who are making positive efforts to "get off the red list" (that is, moving toward closed-containment farmed shrimp). In addition to the mandatory Country of Origin and Wild/Farm-Raised information currently provided on its seafood labels, Trader Joe's is in the process of enhancing and updating its package labeling for all seafood items to include information on species' Latin names, origin, and catch or production method. The sourcing policy includes the adherence to "red lists," such as the Seafood Watch list, to focus the company's product development.

Restaurants

Food service businesses such as restaurants are large distributors of seafood. It is estimated that half of the shrimp volume consumed in the U.S. is served at restaurants and through other food service

[113] USCBP, 2012.
[114] Greenpeace, 2011.
[115] USCBP, 2012.
[116] USCBP, 2012.
[117] Greenpeace, 2011.

operations.[118] In 2007, the food-service seafood market was valued at USD 44.5 billion, and an estimated USD 10 billion is attributable specifically to shrimp sales.[119] Despite the large volume and value of shrimp sold through food service, this segment is highly fragmented, and few restaurants purchase volumes of shrimp that justify dedicated import operations.

Instead, the majority of restaurants buy shrimp from wholesale operations and have no involvement and little insight in the upstream supply chain. This fragmentation and low volume makes linking most restaurants to specific importers and exporters of shrimp both unfeasible and largely irrelevant. The exceptions are Darden and Long John Silver's (part of Yum Brands). These high-volume restaurant chains are the two largest seafood restaurant companies in the U.S., with significant purchase volume.

Darden

Darden Restaurants, the world's largest full-service restaurant company, owns and operates 1,824 restaurants that generate more than USD 7 billion in annual sales.[120] Darden's brands include well-known restaurants Red Lobster, the Olive Garden, LongHorn Steakhouse, and the Capital Grille. In 2011, Darden was the sixth-largest restaurant in the U.S. and the largest seafood restaurant owner. Darden is famous for its all-you-can-eat shrimp promotions.[121] While much of the volume of shrimp imported by Darden is not public, it is possible to identify that its shrimp were sourced from at least four suppliers located in Thailand, Ecuador, and China, imported largely by two large wholesalers: Chicken of the Sea/Thai Union and Pescanova USA.[122] Darden Aquafarm, a subsidiary of Darden, plans to jointly develop a large aquaculture farm in Kota Kinabalu and Sabah in East Malaysia.[123]

Darden Exporters	Volume (kg)	Darden Importers	Volume (kg)
Thailand	**3,400,797**	Chicken of the Sea / Thai Union	3,332,941
Thai Union Frozen Products Public Compar	2,934,147	Pescanova USA	219,337
Thai Union Seafood Co. Ltd.	466,650	Others	153,572
Ecuador	**219,337**	**Grand Total**	**3,705,850**
Promarisco S.A.	219,337		
China	**85,716**		
Zhanjiang Regal Integrated Marine Resourc	85,716		
Grand Total	**3,705,850**		

Table 13: Darden Suppliers[124]

All of Darden's aquaculture products are certified to the standards of the GAA (which the company cofounded in 1997), including 100 percent of Darden's aquacultured shrimp processors.[125] Darden maintains a team of quality specialists dispersed throughout China, Thailand, and India to inspect and approve for production more than 50 million pounds of seafood. The company requires shrimp-processing facilities to be certified in compliance with GAA standards, to cover food safety, health, and wellness of the work force.[126]

[118] Economist, 2009.
[119] Economist, 2009.
[120] Darden, 2012.
[121] Darden, 2012.
[122] USCBP, 2012.
[123] Darden, 2012.
[124] USCBP, 2012.
[125] Darden, 2010.
[126] Darden, 2012.

Long John Silver's

Long John Silver's is one of the chains owned by Yum brands, the second-largest restaurant retailer in the United States. In 2011, Long John Silver's imported shrimp from three suppliers (two in Thailand and one in Ecuador) sourced by three importers: Beaver Street Fisheries, Pacific Coral Seafood, and Siam Canadian.[127]

Long John Silver's Exporters	Volume (kg)	Long John Silver's Importers	Volume (kg)
Thailand	**235,580**	Siam Canadian	235,580
Phatthana Frozen Food Co. Ltd.	141,000	Pacific Coral Seafood	39,301
Chanthaburi Frozen Food Co. Ltd.	94,580	Beaver Street Fisheries	35,322
Ecuador	**213,174**	Others	138,551
Empacadora Bilbo S.A. (Bilbosa)	213,174	**Grand Total**	**448,754**
Grand Total	**448,754**		

Table 14: Long John Silver's Suppliers[128]

Yum Brands, the parent company for Long John Silver's, does not publicly share the details of its sustainability policies. The labor-related supplier code of conduct only sets minimum standards for suppliers and subcontractors within the U.S. market.

[127] USCBP, 2012.
[128] USCBP, 2012.

Certifications

Consumers of shrimp who live largely in the United States, Europe, and Japan are far removed from shrimp producers in Asia and Latin America. In many producer countries, government regulation is not sufficiently rigorous to ensure responsible and traceable production of shrimp and other seafood. Traditional market forces have not motivated upstream industries to produce at the level of quality that consumers in the global North expect. Certification schemes have been developed to fill this gap; in many cases, they have been developed by the Western industries themselves.

Since the 1990s, certification and consumer-facing labeling have become a promising, market-based approach for the shrimp industry to promote the use of the best practices for catch, aquaculture, and processing. Certifications generate motivation in the broader corporate community by enabling greater consumer choice in seafood purchasing and informing suppliers' use of resources. Though no market statistics are available on the volume of certified shrimp, an increasing portion of globally traded shrimp is produced under standards defined in a certification scheme. However, enforcement is often uneven, and few schemes set particular standards for labor conditions in addition to their commitments to environmental sustainability. The proliferation of certification schemes has also created an irregular incentive structure for corporations that desire only to check a "certified" box.

Major Shrimp Aquaculture Certification Schemes

While there are many different certification schemes for aquaculture shrimp (see Appendix A for a more complete list), the most notable of these schemes are the **Best Aquaculture Practices (BAP)**, the

The many certification schemes for seafood vary significantly. Many organizations target different objectives through certification, which has caused the number of these schemes to proliferate over the past 20 years. The objectives of schemes shape the scope and approach of shrimp certification standards. The following are some of the divergent criteria for certification:

Criteria	Description and Examples
Objective	The key purpose of the certification scheme: e.g., conserve biodiversity in key fisheries, reduce mangrove deforestation, eliminate slavery in aquaculture production, etc.
Issue Scope	The issues that are targeted by certification standards: e.g., ecological sustainability, fisheries management, traceability of certified products through the supply chain, economic, socio-ethical, environmental impacts of production processes, animal welfare, etc.
Geography Scope	The geographic scope of the certification, i.e., global, regional, national, subnational, and local.
Product Scope	The segment of production that is targeted by the certification scheme, e.g., aquaculture, wild fisheries, species, etc.
Category of Scheme	The relationship between standard-setting organizations and accreditation organizations, i.e., first-party, second-party, third-party.
Scheme Participation	The ability of targeted organizations to participate or not participate in the certification scheme, i.e., voluntary, mandatory, restricted.

GlobalGAP Integrated Farm Assurance Standards, and the **ASC Shrimp Standards**.

The **BAP** are voluntary standards set by the Global Aquaculture Alliance (GAA) and accredited by the Aquaculture Certification Council (ACC). Founded in 1997, the GAA is largely composed of American corporate buyers of shrimp, including wholesalers, retailers, and restaurants. BAP standards focus on certification of up to three different facilities: shrimp hatcheries, shrimp aquaculture operations, and processing facilities. The BAP are the most popular set of standards in the American market, and many of the producers of shrimp geared toward export to the United States have been certified under BAP standards. In total there are 112 BAP-certified processing facilities globally, and all but 6 of them are located in the seven primary shrimp-producing countries discussed in this report.[129]

The **Integrated Farm Assurance** standards are voluntary standards set by **GlobalGAP**, a nonprofit organization founded in 1997 by a number of European retailers. GlobalGAP standards define good agricultural practices across several different forms of production, including aquaculture. The GlobalGAP standards are structured across various modules, but they focus primarily on agricultural practices, including shrimp aquaculture operations. The GlobalGAP standards are adopted largely in the European market.[130]

The **Aquaculture Stewardship Council (ASC) Shrimp Standards** are also voluntary standards based on the multistakeholder Shrimp Aquaculture Dialogue (ShAD) initiative led by the WWF. This approach is largely based on the structures and procedures of the Marine Stewardship Council, the leading standard for wild-catch seafood (also founded by the WWF). The ASC standards pertain specifically to aquaculture operations. These shrimp standards are not yet operational but are expected to become one of the most adopted standards globally, and many corporations have already committed to adoption.[131]

Credibility

Food and Agriculture Organization's *Technical Guidelines on Aquaculture Certification*

The variance in objectives, structures, and procedures for certification schemes has led many to question the credibility of certification schemes for aquaculture. In response, the FAO has authored the *Technical Guidelines on Aquaculture Certification* — a meta-certification — which prescribes principles, minimum criteria, and institutional and procedural requirements for aquaculture certification schemes. Altogether, the FAO prescribes 155 key points that define credible certifications. The structure and procedures of certification schemes can be compared to these guidelines to determine whether an individual certification scheme is credible. These key points are summarized by several high-level considerations:

- Aquaculture standard-setting procedures and structures should be transparent and independent**.** These organizations should be governed by a body of diverse stakeholders and also include technical committees and consultation forums composed of independent experts. All procedures and standards should be written, reviewed, and amended on a regular basis.
- The scope should include standards for all the major issues in socially responsible and sustainable production, including animal health and welfare, food safety, environmental integrity, and socioeconomic factors.
- Standards should be based on international standards and policies, such as international agreements, conventions, codes of practice, and guidelines.
- Standard-setting should be collaborative and informed by multistakeholder expertise and input.

[129] GAA, 2012.
[130] GlobalGAP, 2012.
[131] ShAD, 2011.

- Accreditation should be undertaken by impartial, competent, and transparent third-party accreditation bodies that are segregated from standard-setting activities. Certification bodies themselves should be certified and conform to industry-appropriate standards.
- Conformity adjudication should be managed through a defined and structured independent process.

Certification Schemes: Criticism and Concerns

The structures and procedures of the major shrimp-certification schemes largely meet the FAO guidelines. All the major shrimp-certification schemes are voluntary, third-party schemes that effectively segment standard-setting and accreditation activities. And, while the primary objectives of certifications may vary, each of these notable schemes includes standards addressing multiple issues that broadly impact the shrimp industry. Each standard is codified in written policies and procedures that are publically available. However, a challenge associated with the FAO guidelines is that the guidelines are much more strict regarding the structure than the substance of the certification.

Critics also suggest that BAP and GlobalGAP are partisan to industry stakeholders and do not rigorously require ongoing compliance after initial accreditation.[132] Critics also claim that standard-setting is often performed by bodies largely composed of corporate buyers and that standards are not influenced by a multistakeholder perspective. Others accuse certifications of creating a façade of social responsibility and sustainability rather than actually making standards that meet an appropriate level of scrutiny. This same criticism has been made of the new ASC organization, and some NGOs have criticized the Shrimp Dialogues initiative for excluding smallholder producers and communities.[133]

A recent study by the University of Victoria evaluated the overall sustainability of seafood certification schemes. The ASC standards ranked third, while GlobalGAP and the GAA's Best Aquaculture Practices ranked 15th and 16th respectively, out of 20 evaluated certifications.[134]

Labor Standards in Certification

The FAO guidelines suggest that the scope of certification schemes should broadly target socioeconomic issues, including the labor rights and conditions that are the focus of this study. However, the strength of labor standards in the major shrimp aquaculture schemes varies significantly.

Social Accountability International is a nongovernmental organization that has set international standards for labor conditions based on the ILO Conventions. In addition to the standards covering the ILO Core Conventions scope, Social Accountability's SA8000 standard also prescribes standards for health and safety, disciplinary practices, working hours, and remuneration. Considered the leading international labor standard, SA8000 should be the model of strong labor standards in shrimp aquaculture certification.

Considered the leading international labor standard, SA8000 should be the model of strong labor standards in shrimp aquaculture certification.

[132] EJF, 2003.
[133] Forest Peoples Programme, 2009; Latham, 2012.
[134] SERG, 2011.

A comparison of SA8000 standards to the labor standards in the major shrimp aquaculture certification schemes (see Appendix B) reveals that there is a large discrepancy in the quality of labor content. Both the BAP and the GlobalGAP standards include standards on health and safety, but they largely fail to address other key labor issues. In the absence of specific standards, these certifications call for national standards and laws to be met, rather than international standards. National labor standards in the developing world, however, often fall short of international standards. Although the need for greater regulation than national standards was the impetus for market-based certification in the first place, these certification schemes were generally designed to ensure product quality, not fair labor practices.

The BAP standards do include additional criteria for working hours and remuneration, but both standards again point to national policies, which are often unclear or unenforced.

Terminology Note

The ILO, the world authority on international labor standards, makes recommendations on the international labor rights that should be afforded to all employees. At present, 189 ILO recommendations are codified as ILO Conventions. Eight of these conventions are commonly known as the ILO Core Conventions, which focus on child labor, forced labor, freedom of association, collective bargaining, and discrimination.

GlobalGAP includes a rigorous set of labor standards in its GlobalGAP Risk Assessment on Social Practices (GRASP) certification, but it has been confined to an optional module that is not mandatory for certification. Thus, organizations can be certified under GlobalGAP's scheme *without* meeting these social standards. While complete data on accreditation is not available, it appears that many GlobalGAP members are not certified under GRASP.[135]

On the other hand, the forthcoming ASC requirements are largely in line with ILO and SA8000 standards, and the scheme includes standards that address all eight of the major labor issues. The ASC references international standards for each of these issues, which tend to be stronger than those legislated nationally. ASC standards are also outcome-based and are therefore less subject to interpretation than other standards.

Certification Along the Supply Chain

Certification accreditation structures, accreditation procedures, and rigorous standards are all fundamental to the credibility of certification schemes. Ultimately, however, effective implementation of the standards along every step in the supply chain is critical to eliminate exploitative labor practices. In this regard, it appears that each of the major shrimp aquaculture certifications falls short in eliminating exploitative labor practices.

Certification standards target facilities within the shrimp industry supply chain and focus on the major production control points — hatchery operations, shrimp aquaculture operations, and shrimp-processing facilities. Each of these facilities must meet the certification standards in order to produce certified shrimp products.

BAP standards have modules that target hatcheries, shrimp aquaculture operations, and processing facilities, with processing facilities standards most heavily adopted. GlobalGAP and ASC standards focus specifically on aquaculture operations.

In terms of health, safety, and labor standards, positive initiatives earlier in the supply chain can be undone by poor standards further along. For example, shrimp may become tainted by bacteria during transportation, thereby negating all earlier efforts to keep shrimp products sterile during production. To meet the health and safety requirements, each stakeholder must ensure that standards are met.

[135] GlobalGAP, 2012.

Unlike a bacteria-contaminated shrimp, the results of earlier socioeconomic practices are impossible to see in the product itself. However, the principle of consistent responsibility throughout the supply chain should also apply to labor standards. If shrimp is processed under exploitative labor practices, the product is effectively socially tainted, negating the socially responsible labor practices at the shrimp aquaculture farm where it was cultivated.

Health standards are easier to apply, in that the product itself can be tested objectively to reveal whether there is any contamination. As mandated by health regulations, processors of shrimp test shrimp for bacteria and contamination prior to the sale being finalized. If no contamination is found, there is no concern that health and safety standards have not been met.

Unfortunately, labor conditions cannot withstand the same scrutiny. The only approach that can affirm with certainty that shrimp have been produced responsibly throughout the supply chain is complete transparency into that supply chain. In most cases, this is feasible only through traceability and effective regulation. But traceability is not required under the codes of conduct for the major shrimp certification schemes, creating a significant gap in the regulation of socially responsible labor practices through certification.[136]

Demand for Certification

Demand for shrimp certification is typically driven by sustainability strategies and commitments from major corporate buyers. In contrast, the broader corporate social responsibility movement has been largely driven by consumer demand: companies produce in a manner that meets consumer expectations for social accountability and sustainability. A recent report on consumer responsiveness to sustainability labeling suggests that, in fact, consumers do not respond to certification schemes and labeling initiatives. Even when seafood is labeled as unsustainable and socially irresponsible by NGOs, consumers continue to buy.[137]

Despite this, major retailers and restaurants are advancing sustainable sourcing strategies for seafood, including shrimp. Most of the major seafood retailers in the United States actively participate in sustainability reporting initiatives led by NGOs like Greenpeace, and they respond to criticisms by developing commitments to seafood certifications and other sustainability initiatives. Appendix C summarizes the commitments of many of the largest American and European buyers of shrimp, including retailers, restaurants, consumer goods manufacturers, and wholesalers. In turn, these commitments drive certification adoption.

In addition to aligning themselves with customer expectations and attitudes, buyers may be motivated to source certified shrimp by their own market-oriented interests. Certification helps to ensure that imported products meet the health and quality standards that their businesses stand on, while sustainability secures future supplies of aquaculture-cultivated shrimp.

The cost of certification and associated maintenance costs are absorbed by the organization being certified — the hatchery, aquaculture farm, or processing facility. While these costs may be offset by higher prices, this is not always the case. Higher prices associated with sustainable procedures do not necessarily cover the total and ongoing costs of compliance, which place additional pressure on profit margins already squeezed by large-scale retailer procurement tactics.[138] Many larger facilities that sell products to multiple geographies and customers may be certified under multiple schemes. As a result, few aquaculture operators or processors are motivated to take on the additional regulatory burden without external motivation from buyers.

[136] GAA, 2012; GlobalGAP, 2012.
[137] BRS, 2012.
[138] Edge, 2012e.

Exploitative Labor Practices in the Global Shrimp Industry

Exploitative labor practices in shrimp production, while difficult to quantify, have been repeatedly documented over the last decade, with Thailand and Bangladesh known to have particular challenges. Since 2003, a series of reports by leaders in the field — such as the Environmental Justice Foundation, the Solidarity Center, the ILO, and the U.S. State Department — have all identified labor abuses such as child labor and exploitation of domestic and migrant laborers in the shrimp industry. Although the exact scale and magnitude of exploitative labor practices has not been fully quantified, there is ample evidence suggesting widespread labor exploitation, with force, fraud, or coercion used to maintain the labor supply.

While production models for shrimp in Bangladesh and Thailand are quite different, exploitative labor practices are common to both nation's industries. In looking at the underlying issues that allow and indeed cause exploitation to take place, it is clear that similar practices could be taking place in the other major shrimp-producing countries in Asia and Latin America. While no widespread reports have been commissioned to study industries in China, Ecuador, Indonesia, India, or Vietnam, it does not mean that such practices do not occur. Given the similarities in the comparable basic structures of the supply chains and the inability of developing countries' governments to regulate appropriate labor standards, it is in fact highly likely that the problems that have been documented in Bangladesh and Thailand are also present in the other primary shrimp-exporting countries.

Bangladesh: Exploitation of Fry Collectors

Bangladesh has expanded its shrimp-farming industry with extensive aquaculture, often at a high environmental and social cost. Research suggests a high incidence of systemic labor exploitation in fry collection, aquaculture, and processing. Reports indicate high occurrences of child labor and bonded labor, particularly in the southwest areas of the Gulf of Bengal, bordering India. The consolidation of shrimp aquaculture has led to the displacement of labor from agricultural activities and migration to urban areas. Human rights abuses have been strongly linked to the growth of shrimp farming, and communities clearly identify the increased power and exploitative practices as a direct result of the concentration of finance in the hands of a wealthy few.[139]

Only the environmentally unsustainable practice of catching wild shrimp fry to stock aquaculture ponds has prevented many impoverished households from suffering complete insolvency following their loss of land. As of 2008, an estimated 400,000 artisan fry collectors and about 70,000 fry traders are finding work in the shrimp industry in Bangladesh,[140] but fry collectors are among the most impoverished and marginalized groups in Bangladesh. They tend to be unskilled and untrained: About 93 percent of women and 70 percent of men are functionally illiterate. An estimated 86 percent of all fry collectors are landless, with few opportunities for alternative income generation. Approximately one-third of the women interviewed in a recent survey were divorced, separated, deserted, or widowed, leaving them in a highly vulnerable position.[141] They are often subject to sexual harassment or excluded from community activities because their work is considered demeaning.[142]

The 2006 reinstatement of a government ban on wild fry collection — motivated by concerns over environmental sustainability — has made the situation more desperate for fry collectors.[143] Many hundreds of poor fishermen are now trapped in serious debt, unable to repay the loans that enabled them

[139] Solidarity Center, 2008.
[140] Solidarity Center, 2008.
[141] Solidarity Center, 2008.
[142] Tasnoova, 2010.
[143] Tasnoova, 2010.

to buy nets and other equipment. Moneylenders have filed legal cases, including local influential shrimp businessmen who made loans on the proviso that fry collectors would return the money and supply the shrimp fry.

Even when employed, collectors derive very little income from their work, typically just over USD 1 per day during the three-month season.[144] Each subsequent layer of middlemen in the fry market gains a substantial profit, and the price increases significantly from its origins at the fry collectors and hatcheries. Middlemen who buy wild fry from fry collectors and artificial fry from hatcheries have a profit margin of almost double that received by the fry collectors and hatcheries.[145] Some fry collectors become indebted to fry traders who advance money in exchange for the catch, for which the traders will typically set a nonmarket price and take part of the proceeds as interest. These middlemen have been accused of fixing the market price of fry; fry collectors have also reported being verbally and physically abused when failing to supply sufficient quantities.[146]

Middlemen buy shrimp larvae from both collectors and hatcheries throughout the year, with a peak season from April until August. During the peak season, traders conduct their business on a daily basis; in the lean period, they manage their business volume based on the availability of fry and farm demand, substantially reducing the income of fry collectors.[147]

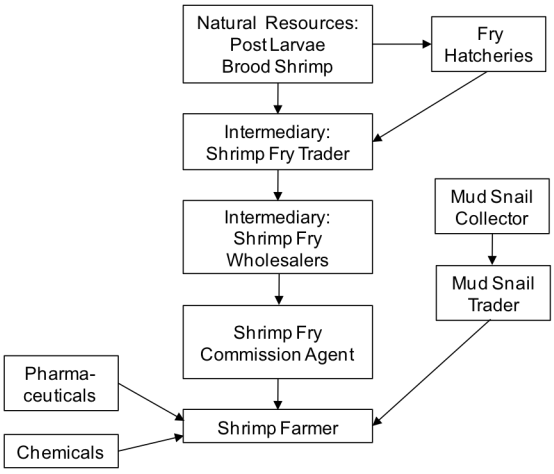

Figure 11: Shrimp Fry Supply Chain in Bangladesh (Tasnoova, 2010)

Fry wholesalers in turn purchase shrimp sourced from both collectors and hatcheries. They purchase large volumes directly from fry traders, trade twice a day, and quickly resell.[148] The market price depends on the availability of fry and local market demand. Field surveys indicate that prices often fluctuate, and there have been instances when local market prices of shrimp larvae have decreased from BDT 4,600 per thousand (USD 57) to only BDT 1,300 (USD 16) within a month because of excessive supply. Before trading, the fry is sorted and counted by workers who receive BDT 15 (USD 0.19) for every 1,000 fry counted. These workers are generally male and often local college and school students working on a part-time basis.[149]

[144] Tasnoova, 2010.
[145] Barmon, 2011.
[146] Tasnoova, 2010.
[147] Tasnoova, 2010.
[148] Tasnoova, 2010.
[149] Tasnoova, 2010.

Bangladesh: Exploitation of Shrimp Farmers

Bangladesh has over 160,000 smallholder farms under cultivation, mostly using extensive farming methods,[150] where farmers are often subjected to subsistence working conditions associated with debt bonding by landlords. Most poor farmers obtain loans from moneylenders, often secured on the promise of future shrimp harvests. In general, shrimp traders, rich farmers, and local businessmen act as moneylenders who can collateralize loans with the farmer's principal asset: land. Small loans are usually made without any documentation, while bigger ones require either written descriptions of terms, which might include a line on assets, or the signing or thumb-printing of a blank sheet of revenue stamp paper.[151] Farmers often do not have the opportunity to sell their produce at market rates, due to an opaque system of middlemen and landowners applying a system of debt bonding and price fixing.[152]

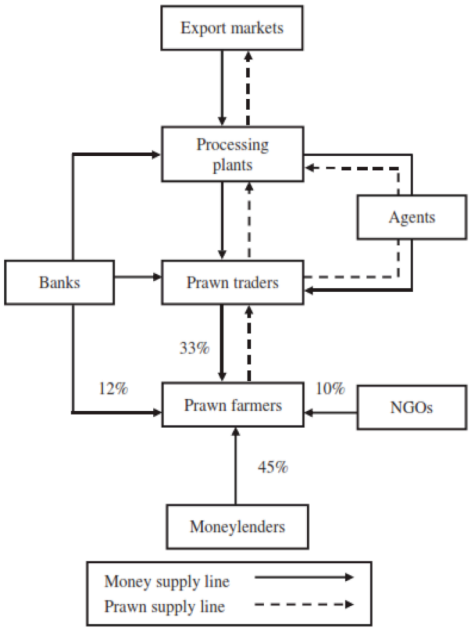

Figure 12: Shrimp Credit Supply Chain (Ahmed et al., 2002)

[150] World Bank, Bangladesh Shrimp Farms.
[151] Tasnoova, 2010.
[152] Aftabuddin et al., 2009.

Thailand: Exploitation of Migrant Workers in the Processing Industry

The ever-growing Thai shrimp industry has created a high demand for labor, but most Thai natives refuse to work in the sector; entrepreneurial labor brokers employ migrants instead. Government policies restrict legal labor migration, however, which means that processing companies face a perpetual labor shortage that cannot be resolved. These labor shortages sometimes force companies to take drastic measures, such as reducing their production volumes.[153] For laborers, the situation is more precarious. Due to the complex legal migration process as well as deceptive recruitment practices, many migrants enter Thailand illegally.

The main source of employment generated by Thailand's shrimp industry is in the large processing factories. The factories are industrial plants with an almost entirely female work force. The work conditions involve standing all day, with workers having to seek permission even to go to the toilet.[154] Though factory workers generally receive the minimum wage, they must pay for their own transport to the factories and for protective clothing. There are no unions, overtime is compulsory, all hiring is casual, and there are no employment guarantees, although prevailing labor shortages in the shrimp-processing industry tend to promote long-term employment.[155]

Migrants in Processing Operations

The larger abuses of labor occur in smaller processing operations, such as peeling sheds. These facilities are rudimentary, and work is often performed by squatting on the floor, without protective clothing and with no health or safety standards in place.

Many of the most exploited workers in Thailand are Burmese immigrants or refugees. They pursue work in the small, unregistered shrimp-peeling sheds that operate under contract for large factories, often under poor working conditions. Although the scale and magnitude of these exploitative practices need to be further quantified, Labour Rights Promotion Network (LPN) data indicates that 19 percent of the migrant workers in small Thai processing plants are below 15 years of age, while another 22 percent are between 15 and 17. More than 75 percent of all workers work more than 8 hours per day, and 40 percent endure shifts longer than 12 hours, earning an average of USD 4.60 per day.[156] Many employers were unsure whether migrant workers were entitled to leave the workplace without permission during their time off.[157] Research by LPN indicates that exploitation of Burmese migrants is systematic, occurring often through debt bondage and labor subcontracting, without institutional accountability.[158] The LPN estimates that for roughly 20–30 percent of Burmese migrant workers, the coercive and deceptive means by which they are recruited and retained in exploitative working conditions constitutes trafficking into forced labor.[159]

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The Thai Frozen Food Association (TFFA) insists that its members have no business connection with unregistered peeling sheds.[160] Indeed, the TFFA is directly involved in the ILO/IPEC program to eliminate child labor. In contrast, discussions with the LPN suggest an opaque contracting system with a far larger

[153] Edge, 2012a.
[154] Solidarity Center, 2010.
[155] Solidarity Center, 2010.
[156] Edge, 2012c.
[157] Solidarity Center, 2008.
[158] Edge, 2012g.
[159] LPN, 2011.
[160] Edge, 2012a.

Profile: Samut Sakhon

Samut Sakhon province in Thailand is the biggest seafood-processing industrial area in the country. The province has a resident population of approximately 450,000 (LPN, 2011). An additional 250,000 or more workers are Thai migrants, principally from northeastern Thailand, with another 160,000–200,000 foreign migrants, mosty from Burma (LPN, 2011). Thai workers mostly work in supporting (i.e., driver, security guard, etc.) and supervisory functions. The majority of migrant workers and their families are from Burma, with an estimated 50 percent of Mon ethnicity, 30 percent Burman, 10 percent Karen, with the remaining 10 percent composed of other ethnic groups, including Shan, Tavoyan, Kachin, and PaO (LPN, 2011). According to estimates by the Labour Rights Promotion Network (LPN), approximately 70,000 Burmese workers were registered in the province in 2007, a number that increased to 120,000 by mid-2009 (LPN, 2011).

number of peeling sheds engaged to preprocess shrimp for exporting manufacturers. This suggestion is strengthened by a common-sense comparison of the total Thai exported volume of shrimp with the processing capacity of just 97 registered sheds.

The employment paths of migrant workers vary. Some workers cross the border on their own and pursue work in unregistered peeling sheds by using personal networks of friends or relatives already in Thailand. More often, workers are approached by agents promising lucrative salaries and conditions in Thailand. These deceptive promises encourage them to enter into contractual obligations that often develop into bonded labor. Once the migrant workers have entered Thailand illegally, they are often obligated to work for a particular agent who contracts labor to peeling sheds. They have no ability to control the location or the type of work in which they are to be engaged, and salaries are often below the minimum wage level and include deductions for food, accommodation, debt repayments, interest, mistakes, and protective equipment (i.e., gloves).[161] These migrant workers can incur debts of THB 5,000–50,000 (USD 163–1,635) when starting their employment, a substantial amount given the daily pay of about THB 210 (USD 6.87).[162] Often workers need several months, sometimes years, to repay their debt to the employer or labor broker. During this time they are not free to change employer.

Child Labor

Though child labor has been observed predominantly among migrant workers in home-based shrimp- and seafood-processing facilities, Thai children in the Samut Sakhon area have also been observed sorting seafood on the docks and working in small-scale, often home-based, peeling sheds in the southern coastal areas of Songkhla and Nakhon Si Thammarat.[163]

Labor Brokers

Labor brokers play a major role in labor exploitation of migrants. A minority of brokers (10 percent) work in compliance with the law, often in direct employment or contractual arrangements with large processing plants, as part of a human resources function.[164] Their key activities are recruitment, obtaining work permits or visas, transportation, health care, translation, and ongoing support. Broker recruitment is based on personal networks and reputation, and they are usually respected and trusted actors in the labor market.

However, the vast majority of labor brokers and agents (90 percent) are engaged in exploitative practices (which often involve deceptive recruitment, trafficking, and extortive money lending) that frequently lead to

[161] Edge, 2012c; Edge, 2012f.
[162] Edge, 2012c; Edge, 2012b.
[163] Soonthorndhada, 2011.
[164] Edge, 2012c.

bonded or forced labor. Labor brokers have direct contacts with counterparts in Burma and are often associated with trafficking new migrants across the border to Thailand. There is no registration scheme or license requirement to operate as a broker beyond having a registered business, and that lack encourages unethical practices. Migrants who engage with these brokers do not possess valid travel or work permits and end up as illegal migrants, vulnerable to exploitation by illegal or semilegal employers and police. Large processing companies do not employ workers without visas and travel documentation, leaving illegal migrants no option but to work in illegal peeling shed under poor conditions. Workers are occasionally physically punished for not paying debts on time or for attempting to escape an employer.[165]

Police Exploitation

A final key challenge for migrants is the collusion between brokers, employers, and police, who collectively employ illicit practices to keep laborers at their workplace. Police issue registration cards (which are not recognized by the Department of Immigration) in exchange for bribes, to allow migrant workers to move outside their work facilities without being arrested.[166] These cards are color-coded to allow movements only within a certain area. If police apprehend a worker outside the permitted area, they are returned to their employer in exchange for a fee (i.e., a bribe), which is then deducted from the worker's salary. There have also been reports of systematic harassment, temporary imprisonment, and extortion, depriving migrants of their savings.[167]

[165] Edge, 2012c.
[166] Edge, 2012b; Edge, 2012c.
[167] Edge, 2012b.

Recommendations to Eliminate Labor Exploitation in the Global Shrimp Industry

As the price of shrimp products has decreased over time, the demand in developed countries has risen commensurably, and the production of inexpensive shrimp continues to rise. An important factor for the low cost of shrimp is the availability of cheap labor in producer countries. Farming and processing shrimp is particularly labor-intensive, often only feasible in countries where inexpensive labor is readily available. This has led to exploitative labor practices in various parts of the supply chain in export countries. This research identified several channels of labor exploitation in the Thai and Bangladeshi shrimp industry, particularly the systematic exploitation of producers in Bangladesh and migrant process workers in Thailand. Within the more advanced industry in Thailand, abuse is obscured and invisible to outsiders, while countless underprivileged workers are openly exploited in underdeveloped Bangladesh.

To address the serious labor concerns present in the global shrimp industry, the following recommendations should be pursued.

Uniformity in Requirements

Consumers largely expect and rely on supermarket and restaurant chains to provide information that allows them to purchase in a sustainable and ethical manner. However, relying on eco-labels to address labor exploitation is insufficient for two reasons. First, these certifications do not cover the entire supply chain: There is no reference to unregistered peeling sheds or unscrupulous middlemen in any of the certification schemes, and so these types of exploitation may continue indefinitely. Second, the general social and labor standards included in many of the existing labeling schemes are inadequate to address forced and trafficked labor.

Recommendation: Comprehensive and Credible Certification Standards, Consolidated Under a Single Umbrella

Challenge: Actors within the supply chains in consumer countries have recognized the environmental damage and the social inequalities caused by the rapid increase of consumption, and have reacted by adopting voluntary, private governance in the form of labels and certifications. Yet the exploitation of workers in the shrimp industry still persists. In fact, consumers are often confused about the value these abundant certifications and labels represent. Labeling schemes are often in direct competition with each other and vary considerably in their approach and scope.

Recommendation: Comprehensive and credible certification standards should be consolidated under a single umbrella. While this is a long-term goal, an important immediate step should be to establish credibility and transparency along the length of the supply chain. Certification should trace every aspect of the supply chain and establish a clear chain of custody. Each entity that touches the shrimp should be evaluated for its practices in order to create a truly credible and effective certification mechanism.

Corporate Action

Corporate buyers (i.e., retailers or restaurants) and importers can assert significant influence over practices and methods applied in the production and processing of shrimp products. Buyer representatives frequently visit production facilities in Thailand to ensure adherence to regulatory compliance and agreed standards.

Recommendation: Corporate Buyers Should Require Registered Peeling Sheds

Challenge: Although the Thai shrimp supply chain is strongly governed by regulations and voluntary standards, the scope of governance covers only the official and registered part of the supply chain. However, most of the exploitative labor practices occur within peeling sheds, an unregistered and hence concealed part of the Thai shrimp industry.

Recommendation: Corporate buyers should demand that shrimp be processed only by registered peeling sheds. Appropriate controls and assurances should be in place to regulate these relationships. As there are only 97 peeling sheds registered with TFFA, the shortage of capacity resulting from this demand would result in registration of previously unknown facilities.

Corporate buyers should be able to confirm that their purchases from Thailand are not tainted by exploitative labor. To regulate this, buyer inspectors should demand access to inspect preprocessing plants (i.e. peeling sheds), to speak to workers, and to have access to employment-related records. Inspectors could also ensure that the production capacity of the nominated preprocessing plant correlated with the capacity of the main processing factory. Finally, corporate buyers can demand that the "chain of custody" documentation is complete and reflects all stages of production, including the deheading, peeling, and deveining of shrimp.

Recommendation: Increase Pressure on U.S. Importers

Challenge: In this analysis, the U.S. downstream supply chain is clearly linked to sources in Thailand and Bangladesh, where exploitative labor has been identified. The largest concentration of volume is between exporters and importers, while the U.S. shrimp retail sector operates under a much more fragmented market structure. However, importers do not commit to sustainability policies and are essentially indifferent to environmental or social issues. Importers have been bypassed by NGOs and the general public in the past when addressing sustainability concerns. Importers are generally not visible to consumers, and strategies on how to approach or lobby importers need to be different from those for customer-facing consumer brands.

Recommendation: The large-volume players in the U.S. shrimp supply chain — U.S. importers — may possess opportunities to assert purchasing power and influence over foreign exporters. Importers and their buyers also need to go beyond the practice of using voluntary certification schemes to simply mitigate the risk of exposure on sustainability. Purchasing power and behavior are powerful drivers for changing supply chains, especially where large-volume concentrations are at play. Moreover, strong and long-term relationships have been maintained in a very competitive environment, creating a distinct opportunity for importers and their corporate buyers to make a difference to thousands of underprivileged workers.

Bangladesh

The root cause of labor exploitation in Bangladesh lies with the lack of credit and finance accessible to the poor.[168] This enables moneylenders, shrimp/fry traders, and landlords to exploit those working deep within the supply chain as fry catchers or farmers. Corrective or preventative actions should be concerned with breaking the cycle of debt-induced dependency and bondage. All of these exploitative practices can be associated with following key causes:

- A complex **network of fry traders and middlemen** who control wild fry purchases, using a system of money lending and debt bonding to purchase fry at nonmarket prices to achieve

[168] Ahmed, 2008.

substantial profit margins at the cost of the producers. Middlemen have a hierarchical, pyramid-shaped structure, where the flows of finance and shrimp produce are bidirectional.

- A similar **system of collectors, traders, and commission agents** using extortive, unethical practices, combined with money-lending to purchase shrimp at favorable prices. Farmers, who carry most of the risk (weather, diseases, etc.), are unable to obtain a fair share of the profit.

Recommendation: Provide Shrimp Aquaculture Facilities with Alternative Financing Schemes

Challenge: Bangladesh has over 160,000 smallholders, who are often subjected to subsistence pay associated with debt bonding by landlords. Most of them obtain their financing from moneylenders, through loans that are often secured by future shrimp harvests. Small loans are usually made without any documentation, while larger ones require either written descriptions of terms (which might include a line on assets) or the signing or thumb-printing of a blank sheet of revenue stamp paper. Moneylenders may take the assets (i.e., land, equipment) of smallholders who default on their loans. Smallholders often do not have the opportunity to sell their produce at market rates; instead they operate in an opaque system of middlemen and land owners who use debt bonding and price-fixing for profit maximization.[169] Producers are often not in a position to improve their productivity and profitability. Individually, they hold little purchasing power to obtain input factors like fry, feed, chemicals, and pharmaceuticals, and they are rarely in a position to get training, certification, and market information on pricing for their inputs.

Recommendation: Alternative ways of financing shrimp farmers must be considered to improve the exploitative practices in the Bangladeshi shrimp farms.

Farmers should be able to take *loans at commercial rates* and sell their produce at market prices to buyers of their choice. Market-based interest rates would reduce the cost of finance and increase the profitability of their business.

Vertical integration of smallholders by means of cooperatives would lead to improved purchasing power for farm input, collective bargaining with wholesalers, and market-based farm-gate prices. Moreover, unfair grading of shrimp by traders could be avoided through collective action. Vertical integration of farms could be similar to schemes introduced to other commodity supply chains (such as coffee), where producer and farming communities have been horizontally integrated. For example, Indian shrimp farmers are forming cooperatives with the support of the Indian government. NGOs like Fair Trade have successfully improved farming communities in several food commodities like coffee by providing information on best practices, market access, and social services.

Alternatively, *microloan schemes* have helped rural communities improve the livelihoods of subsistent farm producers in many parts of the world by reducing dependence on unethical moneylenders and landlords. By applying microlending schemes (i.e., Grameen, Kiva, Good Return), farmers may break the cycle of debt-based dependence on middlemen.

Recommendation: Support the Transition from Fry Collection to Smallholder Hatchery Operations

Challenge: Livelihood opportunities for the poorest people living in the Bangladeshi coastal zone are constrained by a lack of access to low-cost credit and expertise. The majority of fry collectors are landless, illiterate, and of low social status, making them vulnerable to exploitation. Harvesting of wild fry has been outlawed for environmental reasons, which creates a further challenge for fry collectors, who now operate illegally. There are very few alternatives for fry collectors to generate income, which makes them vulnerable to exploitative practices.

[169] Aftabuddin et al., 2009.

Recommendation: Small loans may enable fry collectors to break their bonding with moneylenders and fry traders, thus allowing them to sell fry at market rates. Although this is not a sustainable solution for all the estimated 400,000 fry collectors, it would allow them to improve their living standards in the short term. A long-term solution would include the development of alternative employment or industries that are suited to their abilities and skills. There are a variety of measures the government could adopt to support NGOs in assisting the transition to these alternative livelihoods.

In 2002, the Bangladeshi government suggested several immediate options to help fry collectors. These should be implemented, including:

- Ensure access to low-cost credit and training for small-enterprise development by fry collectors, to weaken the link between fry collectors and traders, allowing fry collectors to access the fry market to obtain market-based prices.
- Conduct research on the scope and feasibility for developing new coastal enterprises, in particular aquaculture such as cage-farming, crab-fattening, or feed-mill activities.
- Conduct research and a feasibility study for the development of small-scale fry nursery operations. The introduction of micro hatcheries in the fry marketing chain could provide employment for fry collectors, improve the survival rates of hatchery fry, and significantly reduce costs for farmers. The concept of family-operated micro hatcheries is well established in Thailand, requiring low levels of financial investment and training.[170]

Thailand

The effort to improve livelihoods and the employment situation in Thailand's shrimp industry must counter a set of complex incentives. Exploitative labor practices have been established and institutionalized in an industry where significant export revenues and profits have accrued to transnational companies and to local elites.

Because of the economic importance of the shrimp industry — the national contribution to GDP, the export value, and the employment it generates — a concerted effort is needed to address issues related to its labor market. Any proposals must include evaluating its governance, structure, and regulation, especially in the extended supply chain. The frequent use of subcontracting makes the industry vulnerable to poor working conditions, and breaches of both national laws and international labor standards on labor exploitation and abuse. Existing product-quality and labor-monitoring certification schemes need to be improved to address the full scope of the supply chain. Processing companies must also be pressured to ensure that they understand and enforce regulations prohibiting forced and trafficked labor.

These issues stem from the way migrant workers find employment in Thailand. Exploitative practices involving bonded migrant labor from Burma can be related to the following root causes:

- **Severe labor shortages** in the Thai shrimp processing industry, where the demand for legal workers is higher than the supply. This has led to the emergence of a semilegal preprocessing industry to perform some of the most labor-intensive processing tasks (such as peeling) on a subcontractual basis for large factories.
- **Restrictive immigration laws** that create a complex and unresponsive administrative system for migrant labor supply, with excessive time latency and high cost for migrants.
- An **unregulated labor-broker system** that has the ability to dictate unfavorable or deceptive terms and conditions to existing or prospective migrant workers.

[170] Government of the Peoples' Republic of Bangladesh, 2002.

- **No protections in Thai law** for illegal migrant workers. This allows them to be subjected to illicit practices, extortions, and coercion without legal recourse.
- Inability for migrant workers to join **unionized labor**.

Recommendation: Establishment of Ethical Labor Brokers

Challenge: The existing network of labor brokers dictates unfavorable terms and conditions to existing or prospective migrant workers, who have few alternatives for gaining employment in Thailand. Migrants are systematically exploited by debt bonding, contract switching, confiscation of personal documents, penalties, and termination fees.[171]

Recommendation: Labor brokers should apply ethical and fair practices during the recruitment process and provide ongoing support (i.e., visa renewal, health service, housing assistance) for the duration of employment. No fees should be paid by the worker; fees for recruitment and registration of workers should be borne by recruiting companies, thus eliminating financial bonding.

Further research is needed to investigate the institution of an ethical labor-brokering system to significantly improve the life of migrant workers in the Thai shrimp industry. The establishment of a best-practice employment brokerage, perhaps operated by a grassroots NGO, could counter exploitative practices currently in place. The scope of work for the brokerage should cover a range of activities, including:

- Recruitment activities in Burma
- Standardized, fair contracts in the language of the worker
- Transportation
- Visa and work permit processing
- Labor contracting with processing enterprises
- Housing and social welfare (i.e., health)

The foundation of an ethical labor brokerage would provide a competitive alternative within the immigrant labor brokerage market, thus encouraging or forcing established brokers to improve their practices based on market forces. Such a scheme could be self-funding and might set a precedent for other industries and countries.

Recommendation: Regulate and License Labor Brokers in Thailand

Challenge: Labor brokers in Thailand can operate without licenses or qualifications and need only be a registered company. There are no restrictions or obligations to act according to an ethical or moral standard, often leading to opportunistic and exploitative practices aimed at maximizing profit. Significant evidence exists of extortive brokerage fees, continuous debt bonding, and deceptive behavior practices. Few legal avenues are available to stop the worst cases of labor bonding. Brokers are not held accountable for exploitative practices, as long as no offenses are committed under the common law.

Recommendation: Labor brokers should be registered, licensed, and recognized as an essential and important part of the industry. They should be subject to a set of ethical and legal standards. Licenses should be awarded based on personal character, reputation, and subject-matter knowledge. Brokers should be held accountable and liable for their conduct and subjected to pay compensation for any breaches of the license conditions. Disciplinary measures should be in place to uphold the license conditions, including financial penalties and revocation of licenses.

[171] UNIAP, 2011; LPN, 2011; Edge, 2012b.

The Department of Employment should regulate the labor-brokerage system by using a license approach to set ethical guidelines and fees. Licensed labor brokers should be obligated to do the following:

- Assume full and complete responsibility for all claims and liabilities that may arise in connection with the use of the license
- Assume joint and solitary liability with the employer for all claims and liabilities that may arise in connection with the implementation of a contract, including but not limited to payment of wages, death and disability compensation, and repatriations
- Assume full and complete responsibility for all acts of its officials, employees, and representatives done in connection with recruitment and placement
- Repatriate the deployed workers and their personal belongings when the need arises
- Guarantee compliance with the existing labor and social legislations of Thailand for the employment of the recruited workers
- Provide standardized, written employment contracts in the employee's language

Recommendation: Amendments to the Thai Labor Laws

Challenge: Thai labor laws do not address the key indicators of forced labor, such as withholding of passports, wage deductions (i.e., penalties, protective clothing), forced savings, access to workers' bank accounts, and so on. This has led to widespread forced-labor practices that cannot be legally challenged.

Recommendation: Forced-labor indicators should be incorporated into Thai labor legislation to make these practices illegal, so that employers could be legally challenged. Ratification of all ILO conventions and the inclusion of forced-labor indicators would significantly reduce forced-labor conditions in Thailand.

Thailand's labor laws should prevent key exploitative practices by addressing the key indicators of forced labor:

- Withholding of personal documents such as passports, work permits, or employment contracts
- Contract break fees
- Deduction and withholding (i.e., charging for protective clothing or visa renewals, financial penalties for underperformance, etc.)
- Forced savings
- Brokerage fees to be paid by workers
- Access to employees' bank accounts
- Employer not obligated to maintain and renew work permits
- Contract substitution without employee consent
- Lack of freedom of movement between employers
- Lack of freedom of association for migrant workers

Recommendation: Increase Frequency and Quality of Workplace Inspections by the Department of Labor

Challenge: Although the Department of Labor regularly inspects workplaces, there have been very few penalties and convictions for breaches of regulations. The lack of penalty can largely be attributed to the limited access to company premises, frequent tip-offs, alleged corruption, and notorious departmental resource constraints.[172] This has led to a condition of widespread exploitative labor practices and poor working conditions, especially in small peeling sheds.

[172] Edge, 2012b.

Recommendation: An independent body or task force should be created, with the right to enter company premises without prior notice, to inspect labor conditions, and to potentially fine or prosecute offending employers on an ongoing basis. These labor inspectors should have no affiliation to the industry (i.e., preferably not local) and should be assessed and awarded on the number of penalties or successful prosecutions resulting from their work. These inspections should meet the following criteria:

- Must have the legal right to enter all processing plants, without giving advanced notice
- Must be conducted by impartial, specially trained personnel
- Should be performed by an independent government body, to avoid corruption or collusion (i.e., tip-offs or bribing)
- Should set performance standards for inspectors (such as number of successful convictions)
- Should be able to impose a legislative deterrent, including significant penalties and fines, which could provide ongoing finance for inspection services

Thai government officials concerned should actively attempt to solve the worst forms of labor exploitation by encouraging employers to improve working conditions and to regularly inspect workplaces, particularly by regulating and registering small and unregistered shrimp-processing workplaces.

Recommendation: Provide Legal Aid to Migrant Workers

Problem: Migrant workers are frequently harassed and occasionally imprisoned by police for the purpose of extorting money. Fictitious charges of drug possession or illegal gambling are laid unless the immigrant can pay bribes to be released. Migrants have no option but to comply with demands, because there is no legal recourse available to them. In addition, unreasonable claims or other forms of extortion by labor brokers or employers cannot be challenged by migrants, due to the high cost of legal representation and court costs. In the case of legal proceedings, migrants would get support and protection to prevent reprisals or repercussions.

Recommendation: An NGO-based legal-aid system could support migrants by intervening during police arrests and challenging unethical practices of employers or brokers. The legal service should be available seven days a week, in the native language of the migrant. In addition, legal cases should be made public to act as a deterrent and to set a legal precedent. To prevent retaliation, support in the form of finance and shelter should be provided to migrants for the duration of court cases.

This legal aid system should be able to:

- Protect and shelter complaining migrants from reprisals (i.e., support and shelter while waiting to give evidence in court, etc.)
- Communicate in the language of the migrants
- Seek retribution for extortion practices by police (i.e., worker compensation)
- Publicize cases of harassment and extortion, both anecdotally and quantitatively
- Make court transcripts and sentences publicly available

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Appendix A: List of Major Seafood Certification Schemes

Scheme	Type	Main Market Orientation	Food Safety	Animal	Environment	Social & Ethical	Food Quality
Codex Alimentarius	S, C, G	Global	Y	–	–	–	Y
World Organisation for Animal Health (OIE)	S, C, G	Global	Y	Y	–	–	–
GLOBALG.A.P	S, CS	Europe	Y	Y	Y	–	Y
Global Aquaculture Alliance (GAA)/Aquaculture Certification Council (ACC)	CS,L	United States	Y	–	Y	Y	–
Naturland	CS, L	Europe	Y	–	Y	Y	Y
Friend of the Sea	C, S	Global	–	–	Y	–	–
Seafood Watch	C, L	United States	–	–	Y	–	–
Alter-Trade Japan (ATJ)	C, L	Japan	–	–	Y	Y	?
Federation of European Aquaculture Producers (FEAP) code of conduct	C	Europe	Y	Y	Y	Y	Y
Safe Quality Food (SQF)	S, L, CS	Global	Y	–	–	–	Y
British Retail Consortium (BRC)	S, L, SC	Global	Y	–	–	–	Y
Quality Certification Services (QCS)	CS, L	Global	Y	–	–	–	Y
Fairtrade	L	Global	–	–	–	Y	–
ISO 22000	S	Global	Y	–	Y	–	Y
ISO 9001/14001	S	Global	–	–	Y	–	Y
Aquaculture Stewardship Council (MSC)	C, S, L	Global	Y	Y	Y	Y	–
Fair-Fish	S, L	Switzerland	–	Y	Y	Y	–
International Social and Environmental Accreditation and Labelling Alliance (ISEAL)	S,C,L	Global	–	–	Y	Y	–
Scottish Salmon Producers' Organization (SSPO), Code of Good Practice (COGP)	C,L	Global	Y	Y	Y	–	Y
Pêche responsable Carrefour, France	C, L	Global	–	–	Y	–	–
SIGES Salmon Chile	CS, L	Europe, United States	Y	Y	Y	–	Y
Shrimp quality guarantee ABCC, Brazil	CS, C, L	Europe, United States	Y	Y	Y	Y	Y
Thai quality shrimp, GAP, Thailand	S, L	Europe, United States	Y	–	–	–	Y
COC-certified Thai shrimp, Thailand	S, L	Europe, United States	Y	Y	Y	Y	–
International Federation of Organic Agriculture Movements (IFOAM)	S, L	United Kingdom,	Y	Y	Y Organic	Y	Y
Soil Association	S, L	United Kingdom	Y	Y	Y Organic	Y	Y
Agriculture Biologique	S, L	Europe	Y	Y	Y Organic	–	–
Bioland, Germany	CS, L	Europe	Y	Y	Y Organic	–	–
Bio Gro, New Zealand	S, L	Global	Y	Y	Y Organic	–	–
Debio, Norway	CS, L	United Kingdom,	Y	Y	Y Organic	–	–
KRAV, Sweden	C, L	Europe	Y	Y	Y Organic	–	–
BioSuisse	C, L	Switzerland	Y	Y	Y Organic	–	–
National Association for Sustainable Agriculture, Australia (NASAA)	C, L	Global	Y	Y	Y Organic	–	–
Irish Quality salmon and trout	C, L	Europe	Y	Y	Y Organic	–	Y
Label Rouge, France	C, L	France, European Union	Y	–	–	–	Y
La truite charte qualité	C, L	France, European Union	Y	–	–	–	Y
Norway Royal Salmon	S, L	Europe	Y	Y	–	–	Y
Norge Seafood, Norway	S, L	Europe	–	–	Y	–	–
Qualité aquaculture de France	S, L	France, European Union	–	–	Y	–	Y
Shrimp Seal of Quality, Bangladesh	S, L	Global	Y	–	Y	Y	Y
China GAP	C, CS	Global	Y	Y	–	–	Y
Fishmeal and fish oil Code of Responsible Practice (CORP)	C, CS	Global	Y	–	Y Sustaina	–	Y
The Responsible Fishing Scheme	C, CS	United Kingdom	–	–	Y Responsible Fishing	Y Safety for Fushers	–

1 S = standard, C = Code, G = guidelines, L = label, CS = certification scheme. Source: Adapted from FAO (2009a).

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Appendix B: Comparison of Major Shrimp Aquaculture Certification Schemes

Certification	Social Accountability 8000	Best Aquaculture Practices	Global GAP	Shrimp Aquaculture Standards
Child Labor	SA8000 1.1 The company shall not engage in or support the use of child labor (1+2) as defined above.	Annex 2: 1.1.4 The Applicant must comply with National child labor laws.		7.1.1 Number of incidences of child labor: 0
	SA8000 1.2 The company shall establish, document, maintain, and effectively communicate to personnel and other interested parties (3) policies and procedures for remediation of children found to be working in situations which fit the definition of child labor above, and shall provide adequate support (4) to enable such children to attend and remain in school until no longer a child as defined above.			
	SA8000 1.3 The company shall establish, document, maintain, and effectively communicate to personnel and other interested parties policies and procedures for promotion of education for children covered under ILO recommendation 146 and young workers (5) who are subject to local compulsory education laws or are attending school, including means to ensure that no such child or young worker is employed during school hours and that combined hours of daily transportation, school, and work time does not exceed 10 hours a day.			
	SA8000 1.4 The company shall not expose children or young workers to situations in or outside of the workplace that are hazardous, unsafe or unhealthy.			
Forced Labor	SA8000 2.1 The company shall not engage in or support the use of forced labor (1), nor shall personnel be required to lodge “deposits” or identity papers (2) upon commencing employment with the company.			7.2.1 Number of incidences of forced, bonded, or compulsory labor: 0

Certification	Social Accountability 8000	Best Aquaculture Practices	Global GAP	Shrimp Aquaculture Standards
Safety	of any specific hazards, shall provide a safe and healthy working environment (1) and shall take adequate steps to prevent accidents and injury to health arising out of, associated with or occurring in the course of work, by minimizing, so far as is reasonably predictable, the causes of hazards inherent in the working environment. (2)	3.4.1 Machinery operators, including drivers and repair personnel must be properly trained and licensed, if applicable, in machine operations, maintenance and worker safety. 3.4.2 The Applicant must have a training program to orient workers in health, safety, contamination and especially basic hygiene, with workers properly trained to dispose of potentially dangerous compounds such as coolants and toxic substances. 3.4.3 The Applicant must maintain training plans and records for training in general safety, personal hygiene and first aid.	health and safety? AF 3.1.2 Does the farm have written health and safety procedures addressing issues identified in the risk assessment of AF 3.1.1? AF 3.1.3 Have all workers received health and safety training? AF 3.3.2 Do all workers handling and/or administering veterinary medicines, chemicals, disinfectants, plant production products, biocides, and/or other hazardous substances and all workers operating dangerous or complex equipment as defined in the risk analysis AF 3.1.1 have certificates of competence, and/or details of other such qualifications? AF 3.4.1 Do accident and emergency procedures exist; are they visually displayed, and are they communicated to all persons associated with the farm activities? AF 3.4.2 Are potential hazards clearly identified by warning signs? AF 3.4.3 Is safety advice for substances hazardous to worker health available/accessible? AF 3.4.4 Are first aid kits present at all permanent sites and in the vicinity of fieldwork?	practices/ procedures/policies: 100% 7.4.2 Percentage of health- and safety-related accidents and violations recorded and mitigated through corrective actions: 100% 7.4.3 Employer responsibility and proof of insurance (accident/injury) for employee costs in a job-related accident or injury when not covered under national law: 100%

Certification	Social Accountability 8000	Best Aquaculture Practices	Global GAP	Shrimp Aquaculture Standards
			AF 3.4.5 Are there always an appropriate number of persons (at least one person) trained in first aid present on each farm whenever on-farm activities are being carried out? AF 3.5.1 Are workers, visitors and subcontractors equipped with suitable protective clothing in accordance with legal requirements and/or label instructions and/or as authorized by a competent authority? AF 3.5.2 Is protective clothing cleaned after use and stored so as to prevent contamination of the personal clothing? AB 4.1.1 Does the person responsible for decision-making in the use of chemicals (including medication and treatments) have appropriate training? AB 4.1.2 Does the training outline the hygiene standards (based on hazard risk analysis) to be adopted by workers and visitors and subjects listed in the GlobalGAP Aquaculture Standard? AB 4.2.3 Are diving operations carried out in accordance with relevant legislation or as a minimum in accordance with health and safety assessment?	
	SA8000 3.2 The company shall appoint a senior management representative (3) responsible for the health and safety of all personnel, and accountable (4) for the implementation of the health and safety elements of this standard.	Annex 2: 1.0 Worker Relations Applicants must develop policies and systems regarding the maintenance of Worker Safety and good employee relations.	AF 3.6.1 Is a member of management clearly identified as responsible for workers' health, safety and welfare? AF 3.6.2 Do regular two-way communications meetings take place between workers and management? Are there records from such meetings?	

Certification	Social Accountability 8000	Best Aquaculture Practices	Global GAP	Shrimp Aquaculture Standards
	SA8000 3.3 The company shall ensure that all personnel receive regular (5) and recorded health and safety training, and that such training is repeated for new and reassigned personnel.	3.3 Medical Care 3.3.1 The Applicant must provide adequate medical care for employees, including access to or communication with medical authorities in case of emergencies or accidents. 3.3.2 Applicants must record the basic medical care provided by their facility. 3.3.3 First aid kits must be readily available to employees		
	SA8000 3.4 The company shall establish systems (6) to detect, avoid or respond to potential threats to the health and safety of all personnel.			
	SA8000 3.5 The company shall provide, for use by all personnel, clean lavatories, access to potable water, and if appropriate, sanitary facilities for food storage.	BAP 3.1 Staff Facilities 3.1.1 The Applicant must provide a safe environment for employees to eat meals and hygienically store food for meals. 3.1.2 Safe drinking water must be readily available to employees. 3.1.3 The Applicant must have a sufficient number of toilets and sinks which are in good repair and readily accessible to employees. Annex 2: 1.1.6 Where applicable the Applicant must provide meals which are wholesome and commensurate with local eating customs.	AF 3.6.3 Do workers have access to clean food storage areas, designated rest areas, hand washing facilities, and drinking water? AB 4.2.1 Do workers have access toilets, eating facilities and potable water? AB 4.2.2 Is all human waste from toilets collected and disposed of through sanitary sewage disposal systems without contamination of the operation area and not released directly into open water systems as untreated raw waste?	

Certification	Social Accountability 8000	Best Aquaculture Practices	Global GAP	Shrimp Aquaculture Standards
	SA8000 3.6 The company shall ensure that, if provided for personnel, dormitory facilities are clean, safe, and meet the basic needs of the personnel.		AF 3.6.4 Are on-site living quarters habitable and have the basic services and facilities?	7.9.1 Evidence that living conditions are clean, sanitary and safe for habitation: Yes
Freedom of Association and Collective Bargaining	SA8000 4.1 The company shall respect the right of all personnel to form and join trade unions of their choice (1) and to bargain collectively. (2)			7.6.1 Incidences of employees denied freedom to associate, ability to bargain collectively or have access to representatives chosen by workers: 0
	SA8000 4.2 The company shall, in those situations in which the right to freedom of association and collective bargaining are restricted under law (3), facilitate parallel means of independent and free association and bargaining (4) for all such personnel.			
	SA8000 4.3 The company shall ensure representatives of such personnel are not the subject of discrimination (5) and that such representatives have access to their members in the workplace.			
Discrimination	SA8000 5.1 The company shall not engage in or support discrimination (1) in hiring, remuneration, access to training, promotion, termination or retirement based on race, caste, national origin, religion, disability, gender, sexual orientation, union membership, political affiliation, or age.			7.3.1 Number of incidences of discrimination: 0 7.3.2 Evidence of proactive anti-discrimination practice: Yes
	SA8000 5.2 The company shall not interfere with the exercise of the rights of personnel to observe tenets or practices, or to meet needs relating to race, caste, national origin, religion, disability, gender, sexual orientation, union membership, or political affiliation.			
	SA8000 5.3 The company shall not allow behavior, including gestures, language, and physical contact, that is sexually coercive, abusive or exploitative.			

Certification	Social Accountability 8000	Best Aquaculture Practices	Global GAP	Shrimp Aquaculture Standards
Disciplinary Practices	SA8000 6.1 The company shall not engage in or support the use of corporal punishment, mental or physical coercion, and verbal abuse.			7.7.1 Incidences of abusive disciplinary actions: 0 7.7.2 Evidence of non-abusive disciplinary policies and procedures: Yes
Working Hours	SA8000 7.1 The company shall comply with applicable laws and industry standards on working hours. The normal workweek (1) shall be as defined by law but shall not on a regular basis (2) exceed 48 hours. Personnel shall be provided with at least one day off in every seven-day period. (3) All overtime work shall be reimbursed at a premium rate (4) and under no circumstances shall exceed 12 hours per employee per week. (5)	Annex 2: 1.1.2 The Applicant must abide by the National mandated work week were applicable.		7.5.2 Incidences of abuse of working hours and/or overtime laws
	SA8000 7.2 Other than as permitted in Section 7.3, overtime work shall be voluntary.	Annex 2: 1.1.3 The Applicant must comply with National labor laws for pay, overtime and holiday compensation for hours worked beyond the regular work day or week.		7.2.1 Number of incidences of forced, bonded, or compulsory labor: 0
	SA8000 7.3 Where the company is party to a collective bargaining agreement freely negotiated with worker organizations (as defined by the ILO) (6) representing a significant portion of its workforce, it may require overtime work in accordance with such agreement to meet short-term business demand. Any such agreement must comply with the requirements of Section 7.1 (above).			
Remuneration	SA8000 8.1 The company shall ensure that wages paid for a standard working week (1) shall always meet at least legal or industry minimum standards and shall be sufficient to meet basic needs of personnel and to provide some discretionary income. (2)	Annex 2: 1.1.1 The Applicant must ensure that workers are paid at least the minimum wage, including benefits, required by local and National labor law.		7.5.1 The percentage of employees who are paid fair and decent wages: 100%
	SA8000 8.2 The company shall ensure that deductions (3) from wages are not made for			

Certification	Social Accountability 8000	Best Aquaculture Practices	Global GAP	Shrimp Aquaculture Standards
	disciplinary purposes, and shall ensure that wage and benefit remuneration are detailed clearly and regularly for workers; the company shall also ensure that wages and benefits are rendered either in cash or check form, in a manner convenient to workers. (4)			
	SA8000 8.3 The company shall ensure that labor-only contracting arrangements (5) and false apprenticeship schemes (6) are not undertaken in an effort to avoid fulfilling its obligations to personnel under applicable laws pertaining to labor and social security legislation and regulations.			
Migrant Workers	All national laws must be followed.	Annex 2: 1.1.5 The Applicant must employ only legally documented workers.		All national laws must be followed.
Action Response Plans/ Procedures			AF 7.1 Is there a complaint procedure available relating to issues covered by the GlobalGAP Standard and does this procedure ensure that complaints are adequately recorded, studied, and followed up including a record of actions taken?	7.8.1 Evidence of implementation of a corrective action plan (updated annually) that addresses unintended problems associated with labor relations and internal monitoring of labor activities: Yes 7.8.2 Evidence of implementation of an emergency action plan and annual (or more frequent) internal monitoring activities: Yes 7.8.3 Evidence of implementation of a verifiable conflict resolution policy for conflicts and complaints tracked transparently, and proof that conflicts and complaints from employees are responded to within three months after being received: Yes

Appendix C: Commitments of Major Shrimp Buyers

Major Buyer	Buyer Type	Certification Commitments
Asda	Retailer	Have adopted BAP standards for processing
Costco	Retailer	Participating in ASC ShAD initiative
Food Lion	Retailer	Have adopted BAP standards for processing
Kroger	Retailer	Have adopted BAP standards for processing
		Participating in ASC ShAD initiative
Marks & Spencer's	Retailer	Participating in ASC ShAD initiative
Meier	Retailer	Have adopted BAP standards for processing
Price Chopper	Retailer	No certifications adopted
Publix	Retailer	Have adopted BAP standards for processing
Royal Ahold	Retailer	Have adopted BAP standards for processing
		Have adopted GlobalGAP standards for farming
		Participating in ASC ShAD initiative
Safeway	Retailer	Have adopted SeaChoice and FishWise standards
Sainsbury's	Retailer	Have adopted International Fishmeal and Fish Oil Organization (IFFO) standards
Sam's Club	Retailer	Have adopted BAP standards for processing
		To adopt ASC standards for farming
Target	Retailer	Have adopted BAP standards for processing
Tesco	Retailer	Have adopted International Fishmeal and Fish Oil Organization (IFFO) standards
		Have adopted BAP standards for processing
Trader Joe's	Retailer	No certifications adopted
Waitrose	Retailer	Have adopted BAP standards for processing
Wal-Mart	Retailer	Have adopted BAP standards for processing
		To adopt ASC standards for farming

Major Buyer	Buyer Type	Certification Commitments
Wegman's	Retailer	Have adopted BAP standards for processing
Whole Foods	Retailer	Have adopted independent certification
Winn-Dixie	Retailer	Have adopted BAP standards for processing
Darden	Restaurant	Have adopted BAP standards for processing
Long John Silver's	Restaurant	Have adopted BAP standards for processing
Sysco	Food Service	Participating in ASC ShAD initiative
Bird's Eye	Consumer Goods	Participating in ASC ShAD initiative
Findus	Consumer Goods	Have adopted BAP standards for processing
Gorton's	Consumer Goods	Have adopted BAP standards for processing
Beaver Street Fisheries	Wholesaler	Have adopted BAP standards for processing
Chicken of the Sea / Thai Union Group	Wholesaler	Have adopted BAP standards for processing
Eastern Fish Company	Wholesaler	Have adopted BAP standards for processing
Empress International	Wholesaler	Have adopted BAP standards for processing
Expack International	Wholesaler	Have adopted BAP standards for processing
H&N Seafood	Wholesaler	Have adopted BAP standards for processing
Highliner Foods	Wholesaler	Have adopted BAP standards for processing
Mazetta Company	Wholesaler	Have adopted BAP standards for processing
National Fish & Seafood Company	Wholesaler	Have adopted BAP standards for processing
Ore-Cal Corporation	Wholesaler	Have adopted BAP standards for processing
Pescanova USA	Wholesaler	Have adopted BAP standards for processing
Red Chamber	Wholesaler	Have adopted BAP standards for processing
Rich Products Corporation	Wholesaler	Have adopted BAP standards for processing
Tampa Bay Fisheries	Wholesaler	Have adopted BAP standards for processing

Appendix D: Overview of Shrimp Supply Chains in Vietnam, India, and Indonesia

Vietnam

Vietnam is the fastest-growing shrimp producer in the world, whose product is quickly increasing in volume and value in world markets. Vietnam's total production of aquaculture and fisheries in 2008 was 4.6 million tons, with an export value of USD 4.5 billion. In 2010, Vietnamese shrimp exports totaled more than USD 2 billion.

In 2008, the aquaculture and fishery sector contributed 4 percent of Vietnam's total GDP (18 percent of agricultural GDP). The sector accounted for 7.2 percent of total national export values, making it the fourth-largest national export after crude oil, garments, and footwear. It provides jobs for more than 4 million people. Vietnamese shrimp was exported to 92 markets, with the participation of 341 exporters (VASEP, 2011).

Supply Chain Overview

The Vietnamese shrimp supply chain is predominantly geared towards export, with only 6 percent of shrimp going to domestic consumption. It is an intricate system of farm-produce trading. The majority of farmers sell to collectors or wholesalers, who follow a closed network of strong relationships to bring the produce to the various buyers, whether export-oriented processors or those in the domestic market.

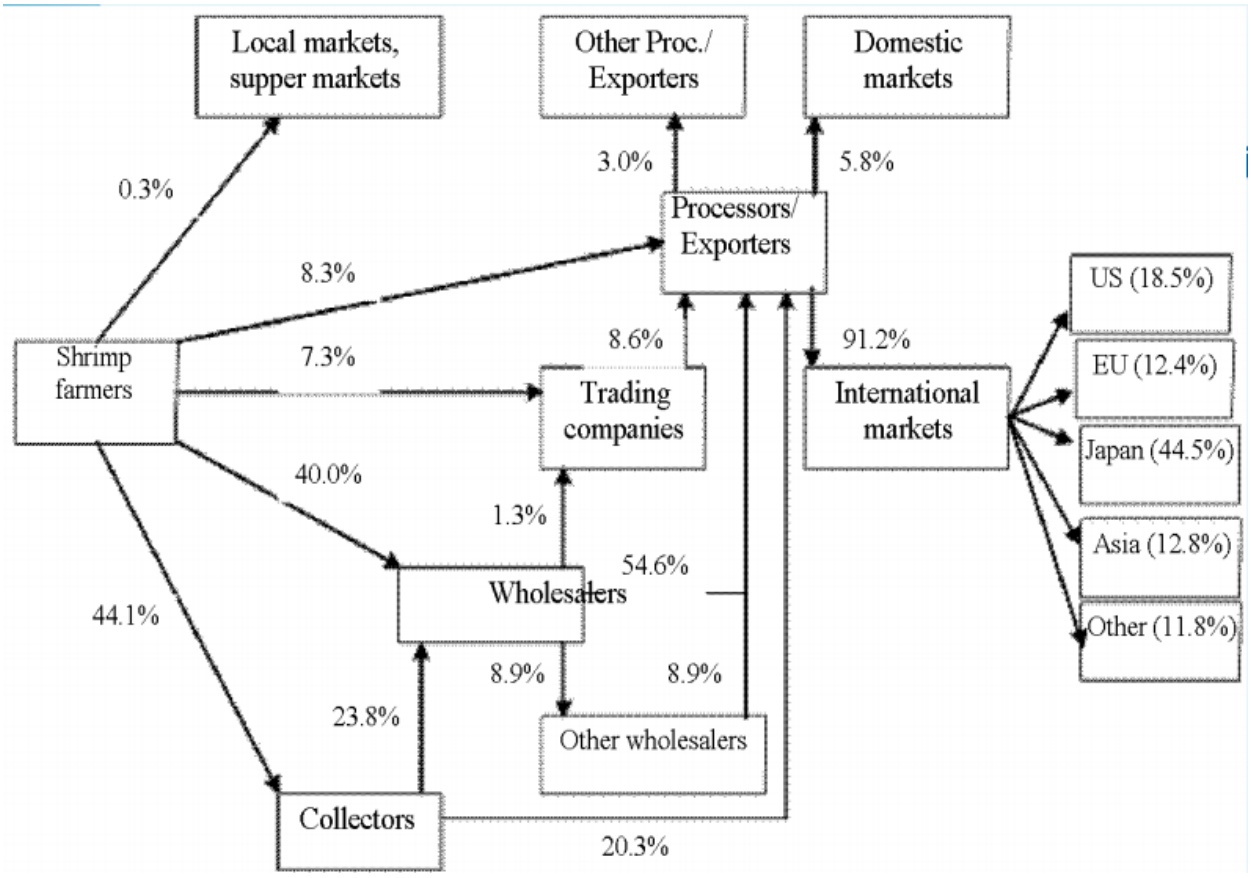

Figure 13: Marketing Channels of Shrimp Production in Mekong Delta. Source: 80 farms, 20 traders, and 20 processors surveyed in 2005 (NACA 2006).

In 2010, approximately 651,000 hectares of land, primarily in the south, were used for shrimp aquaculture. The vast majority of production is either improved extensive, semi-extensive, or extensive culture (MoFI, 2005).

Households operating **extensive farms** are mostly poor, with a general lack of knowledge of shrimp culture. They are often former rice farmers who have restructured their land for aquaculture shrimp farming, running the farms with an average production of 0.5–0.9 tons per hectare. Wild-caught fry are allowed into the fields via tidal water exchange, and no feed, chemicals, antibiotics, enzymes, vitamins, or minerals are used. Harvesting follows the lunar calendar. Extensive farms have been improved since 2000, and there are only a few unimproved extensive farms continuing to operate in Vietnam.

In recent years, Vietnam has been developing **semi-intensive farming** that yields more per hectare. Shrimp aquaculture is a high-risk investment, however, and on average only one out of three farms succeeds. Failure can be attributed to the outbreak of diseases, bad management, and lack of expertise. The high failure rate fuels a move toward larger farms, leading to a marginalization of smaller extensive farmers, who may lose their land in the process.

Investors and speculators from the major cities have bought up land for aquaculture, driving up prices to levels that are often unattainable to local farmers. These new “city farmers” often establish intensive farms with production of 2–6 tons per hectare. High investment in equipment must be made in the first year, as the construction of pond, dikes, irrigated- and drainage-water systems, and equipment is required.

These farms require large inputs of high-quality feed and pharmaceuticals, mainly imported from Thailand and Taiwan. They frequently employ low-skilled workers such as former farmer but also employ consultants. Seafood-processing companies prefer this kind of supplier setup, leading to even larger quantities of raw materials in ever more capital-intensive production.

Traders (Middlemen)

The vast majority of traders are local Chinese, often former rice traders who saw possibilities in the shrimp trade after the trade in rice was nationalized in the late 1970s. This group has created a lucrative trust-based market dominated by insider networks that relay information on prices, the financial stability of buyers, and access to credit. Large-scale traders use the Internet to check world market prices and to confirm price offers for seafood-processing companies’ raw materials. Traders participate freely in shrimp business without legal constraints.

Traders are divided into two types, collectors and wholesalers. Collectors are responsible for all activities like harvesting, preserving, and transporting. Wholesalers, who operate with large amounts of cash, perform the much simpler job of financing. When collectors signal that farmers want to sell shrimp, wholesalers contact processing firms to receive a price. Wholesalers then provide cash for the collectors to pay farmers, taking a profit on each transaction. Collectors therefore receive a fixed amount of cash, with their profits dependent on the price paid to shrimp farmers. At the peak season, a trader needs large amounts of capital (between USD 30,000 and USD 240,000). In the event that collectors have enough cash to pay the shrimp farmers, the traders can make transactions directly with processing firms, bypassing wholesalers. Of all transactions between middlemen and processing firms, however, only about 10 percent are between collectors and processing firms.

Flexible access to capital and credit is very important for a wholesaler, as requirements differ according to the seasons and the state of the tides. In general, state-owned enterprises do not use long-term contracts in their relations with brokers, as they are not allowed to pay a price higher than 5 percent of the market rate.

Processing

Processing and exporting firms have to comply with domestic standards on food safety and sanitation, as well as the regulations required by importing countries. Domestically, firms are regulated by rules issued by National Agro-Forestry-Fisheries Quality Assurance on quality control. Furthermore, firms have to maintain the compliance with requirements of quality-management systems like ISO, HACCP, ACC, British Retail Consortium (BRC), and International Food Standard (IFS). Foreign joint-ventures, state-owned enterprises, and private companies are also involved in processing and supplying for export and domestic markets. The number of processing plants has been growing in both total output and technological sophistication, trending toward wider diversification of products and greater attention to value-added products. In 2008, Vietnam had 470 fishery product-processing plants, of which 269 plants were qualified to export to the EU.

Many of the larger plants have acquired the food safety certifications of their major trading partners (GAP, BAP, etc.), and 370 companies have applied product quality controls like HACCP and Good Manufacturing Practices (GMP). The biggest challenge to processing and exporting firms is food safety and sanitation standards imposed by the countries of import. During the past few years, shrimp exported to Japan and the U.S. have been rejected due to the presence of chloramphenicol. More recently, the concentration of trifluralin in shrimp exported to Japan has been identified as higher than permitted. This issue has its roots at the farming stage, where farmers — intentionally or unintentionally —use products containing chloramphenicol and trifluralin. Middlemen also contribute to the impurity of shrimp by illegally increasing shrimp weight.

India

India is the third-largest producer of fish and the seventh-largest shrimp aquaculture producer in the world. With a coastline of more than 8,000 kilometers, the biodiversity of the coastal ecosystem is rich, with a wide spectrum of fauna and flora. The favorable climate supports aquaculture as a year-round activity. An area of approximately 1.2–1.4 million hectares is available for brackish-water aquaculture in India.

Fish production in the country has shown remarkable growth, increasing from 0.752 million metric tons in 1950–1951 to 8 million tons in 2010–2011. Of this, approximately 115,000 tons of shrimp is produced, primarily for export.

Exports of marine products from India during the financial year 2010–2011 was USD 2.67 billion, growing 11 percent in quantity, 20 percent in rupee value, and 26 percent in dollar realization over 2009–2010. Shrimp exports increased considerably during the year, due to production of 10,000 tons of white-leg shrimp, in addition to the traditional production of tiger shrimp.

Frozen Shrimp Export from India (2010-2011)

Country	Values in US$ Million	Quantity in Thousand Tonnes	Value in %	Quantity in %
U S A	328.93	56,245.87	31.7%	33.8%
JAPAN	235.54	32,088.45	22.7%	19.3%
BELGIUM	73.73	11,855.17	7.1%	7.1%
U K	55.88	8,374.55	5.4%	5.0%
CANADA	41.95	7,178.42	4.0%	4.3%
NETHERLAND	32.17	6,038.26	3.1%	3.6%
FRANCE	35.72	5,497.62	3.4%	3.3%
U ARAB EMTS	30.87	4,702.01	3.0%	2.8%
ITALY	18.49	4,497.46	1.8%	2.7%
SOUTH AFRICA	24.17	4,323.09	2.3%	2.6%
SPAIN	18.79	3,326.92	1.8%	2.0%
GERMANY	21.27	2,850.75	2.1%	1.7%
CHINA P RP	11.01	2,265.99	1.1%	1.4%
VIETNAM SOC REP	11.81	2,067.36	1.1%	1.2%
REUNION	9.08	1,348.01	0.9%	0.8%
EGYPT A RP	8.01	1,281.40	0.8%	0.8%
PORTUGAL	6.61	1,263.51	0.6%	0.8%
OTHER	72.01	11,279.99	7.0%	6.8%
Total	**1036.04**	**166,484.83**	100.0%	100.0%

Source: Ministry of Commerce and Industry (http://commerce.nic.in/eidb/ecomcnt.asp)

Table 16: Source: Indian Marine Products Export Development Authority (MPEDA), Report No. 17 (2011–2012)

Coastal aquaculture in India lacks diversity. A single species, tiger shrimp, constitutes almost the entire crop. The farming of giant river prawn has gained increased interest in recent years, due to its high economic value, and an annual production of over 30,000 tons has been achieved through the use of monoculture practices.

Contribution to Economy

The share of fisheries in India's total agricultural GDP has increased from 0.84 percent in 1950–1951 to 4.19 percent in 1999–2000 (Anjani Kumar, 2003).

Indian domestic fish consumption is projected to increase to 0.3 kg in crustaceans and 1.2 kg in high-value fin fish per capita by 2020 (Delgado et al., 2003). With anticipated high growth in Indian personal incomes, domestic consumption of crustaceans may rise to 0.5–0.6 kg and consumption of high-value fin fish may reach 1.5 kg per year in 2030.

The rapid growth of the sector has generated vast employment opportunities for professional, skilled, and semiskilled workers for different activities, such as construction and the management of farms, hatcheries, feed mills, processing units, and so on. It has been estimated that over 300,000 jobs have been generated in the main and supporting areas for shrimp culture, although information on exact numbers involved in shrimp aquaculture is not available.

Farming

Farming of shrimp is largely dependent on smallholdings of less than 2 hectares, which account for over 90 percent of the total area used for shrimp culture. Large holdings of over 10 hectares account for only 1.54 percent of the total. Most of the farm holdings located in Kerala and West Bengal use the traditional systems of shrimp farming. Out of the total area of 152,000 hectares presently being used for shrimp farming, Andhra Pradesh alone provides 47 percent of the area and contributes 50 percent of the total production (MPEDA, 2008).

To date, many small brackish-water aqua farms are scale inefficient, with low bargaining power for cost-effective purchase of inputs or for a remunerative sale price. Most of the farmers have little access to technological innovations and scientific applications, although they contribute around 80 percent to the total shrimp production. Due to poor organization, lack of skills, and inadequate information, small farmers are vulnerable to numerous risks and hazards. Furthermore, about 60,000 hectares of shrimp-farming area is estimated as abandoned due to the recurrence of White Spot Syndrome virus and adverse trade terms like lean credit flow, inflated input costs, and low farm gate prices.

A major policy effort has been undertaken to horizontally integrate farmers based on geographical locations to form cooperative societies. These societies have legal standing and are registered with the National Center for Sustainable Aquaculture. The key benefits include improved shrimp yields, less impact on the environment, improved product quality, and better purchase and selling power with other actors in the supply chain. Group farming takes advantage of scale of operation in input sourcing, building in sound environmental-management plans, and attaining higher farm gate prices. It also mobilizes farmers toward collective compliance with best practices and guidelines, such as a combined bio-security approach, implementing common reservoir and common wastewater treatment systems.

Figure 14: Value Chain of Indian Farmed Shrimp. Source: MPEDA (2008).

Exporters

The exporter node is the most sophisticated part of the Indian supply chain. Concerns with HACCP first emerge at the exporters end; the rest of the chain is mostly unaware of export-import regulations and safety issues.

The exporter is the price setter: Prices follow the downward pressure from the exporter to the trader, to the agent, and then to the farm. The level of transparency is very low between each of these groups.

Even suppliers are unaware of the selling price of exporters. Due to lower margins and a drop in global prices in 2004, small Indian exporters were facing strong competition from global counterparts that were often more than 100 times their size. Subsequently, 8 of the 68 seafood-processing units in Kerala have decided to merge into a single, large public-limited company.

The minimum cost of a EU-certified plant is USD 1.8 million. The net worth of companies that are certified to export to the EU ranges between USD 18 million and 70 million. The Indian Marine Products Export Development Authority (MPEDA) is active in ensuring that exporter facilities are able to comply with international standards. Exporters are particularly concerned about the handling methods at the bottom of the chain, that is, at the farm level, where hygiene and food-safety infrastructure is inadequate. Both absolute waste and the cost of compliance could be substantially reduced with adequate training of farmers and a minimum infrastructure at the beginning of the chain.

Labor Conditions

Working conditions are very poor in preprocessing plants. Small children, women, and some men process shrimp in groups of four while squatted on the floor. The ground is wet, cold, and without cushions, and there is little space between workers. There is no provision for organized labor. A contractor or agent is appointed to supply daily labor requirements, and nearly all workers get daily wages without any social security. Farmers, traders and preprocessors do not receive adequate attention from MPEDA, and their performance often goes unchecked.

Employees in export units, on the other hand, are well-trained, with good hygiene facilities. Staff has access to clean toilets, clean uniforms, and protective gear, and enjoy a comfortable work environment. Most importers and buyer representatives visit export facilities on a regular basis, especially when the importer is planning a long-term purchasing contract.

Indonesia

Indonesia is an archipelago with more than 17,000 islands and a coastline of about 81,000 kilometers. About 26.6 million hectares of coastal area carry potential for aquaculture development. Aquaculture could play an important role in reducing Indonesian unemployment. In 2003, some 2,284,208 households were involved in the aquaculture industry, representing around 40 percent of the total number of people employed in the fisheries sector (FAO, 2005).

In 2005, white shrimp were introduced to move away from the dominant tiger shrimp culture. This move came in response to an outbreak of virus and disease that hampered tiger shrimp farming in the earlier years of the 2000s. Since the success of white shrimp culture in 2007, almost 90 perrent of Indonesian shrimp aquaculture production is white shrimp.

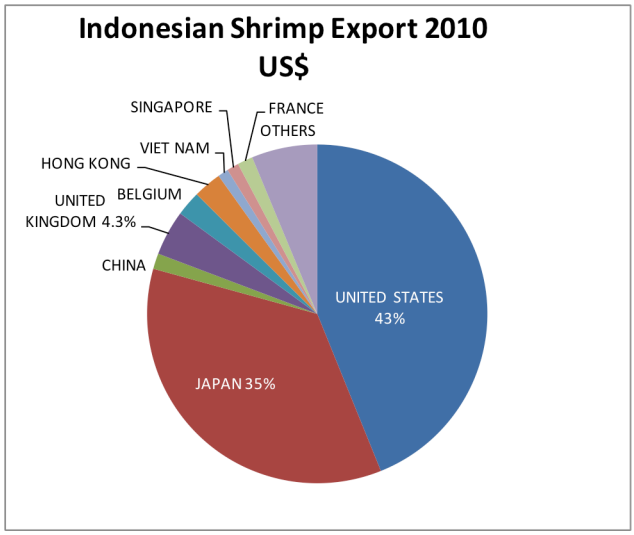

Figure 15: Indonesian Shrimp Export Destinations (2010). Source: Indonesia Ministry of Trade.

Shrimp is the prime fisheries commodity for export, contributing 52 percent by value and 16 percent by volume in 2003 (FAO, 2005). Shrimp production decreased considerably in 2009, however, due to the rise of shrimp diseases infecting the white-legged shrimp. The Indonesian shrimp industry exports 78 percent of its shrimp to just two countries, the United States and Japan.

Contribution to the Economy

Aquaculture has been playing an increasingly significant role in the Indonesian economy by improving household food security and the living standards of poor rural communities. Beyond contributing about one-fifth of the country's estimated total fish production, the aquaculture subsector provides employment to some 2.2 million people.

About 90 percent of the country's total fish production is consumed domestically by an estimated 240 million Indonesians. Fish is a relatively inexpensive staple food item in the diet of Indonesian families, providing two-thirds of the total domestic animal-protein supply.

Hatcheries

Approximately 90 percent of the shrimp fry sold in Indonesia are produced in hatcheries. Although shrimp fry are still collected in the wild, they are generally sold to growers who have traditional or extensive culture operations. Shrimp larval quality is considered a key factor in establishing a successful shrimp culture. Shrimp health management has become the main focus of improving production and minimizing infectious diseases in shrimp ponds.

The Aceh region is known for quality black-tiger-shrimp brood stock, supplying to hatcheries in Aceh and elsewhere in Indonesia. The collection of brood stock has been affected by the tsunami in 2004; of the 223 shrimp hatcheries in Aceh, a total of 193 were extensively damaged, amounting to an 85 percent reduction (Phillips & Bhudiman, 2005). However, it should be noted that most of the hatcheries had been closed down prior to the tsunami, because of the countrywide collapse of black tiger production due to disease. The introduction of white shrimp has also affected the viability of these hatcheries.

Demand for white-leg shrimp seed has outpaced the growth rate of brood stock. As a result, the use of local brood stock from shrimp culture cannot be avoided. In response to this need, the Indonesian

government has established the National Brood Stock Centre and Regional Brood Stock Centres (RBC) for shrimp, grouper, tilapia, and seaweed.

The brood stock supply of white shrimp does not come from the wild, as it is not a native species of Indonesia. When the government of Indonesia released Ministerial Decree No. 4/2001 in 2001 to allow importation of Pacific white shrimp for culture purposes, brood stock production expanded and is now produced by local hatcheries in Lampung, West Java, Central Java, East Java, and Bali.

Farming

Since 1993, the decline in giant-tiger-prawn culture in Indonesia has stimulated some shrimp farmers to import white and blue shrimp, claimed to have better performance than tiger shrimp. With intensive aquaculture technology, white-shrimp cultivation has resulted in greater resistance to disease, faster growth, and improved tolerance of environmental fluctuation. Blue shrimp was also declared a superior shrimp by the government in May 2002. However, unlike white shrimp, farmers did not respond well to it. Blue-shrimp aquaculture has grown slowly and in some areas did not develop at all. Technically, blue shrimp cannot be cultured in as high a density as white shrimp, but blue shrimp grows more than twice as fast.

The primary production techniques are extensive and semi-intensive. The majority of Indonesian shrimp farmers apply the extensive production system. However, pressure from the EU and the U.S. for improved food safety and production standards means practices will need to change.

Small-scale extensive or traditional farmers typically have less than 5 hectares and are likely to be owner-operated, although some are owned by absentee landowners and are operated on a share basis. Semi-intensive farms are primarily used for the black tiger shrimp. The productivity of traditional, extensive culture is only about 10 percent that of semi-intensive culture. Polyculture is typical within extensive farms with either wild-caught or hatchery-raised milkfish fry, which are stocked after the shrimp have been in the pond for a period of time. The milkfish are consumed and sold both locally and nationally and contribute to local food security.

The investment required for fry, feed, and equipment for semi-intensive and intensive shrimp farming usually excludes the small, local farmer. The majority of intensive farmers have their own teams of technical staff, who are paid a base salary and a production bonus. The use of technicians with experience from other parts of Indonesia or abroad limits employment opportunities for local labor to unskilled and low-paid jobs, such as watchmen or harvesters.

Traders

In most cases, small shrimp farmers do not have access to a wide range of possible buyers and processing opportunities. Private traders, collectors, or agents market most aquaculture products, including fry. Local collectors trade from production site to processing plants and supermarkets. They often belong to the village themselves and work as local agents who supply shrimp to regional collectors. The latter usually provide loans to the preprocessing plants to pay for the raw materials, or extend small-scale credit to small farmers to ensure that the farmers sell to them.

There is an active, organized system of regional collectors (who are in some cases export permit-holders), who manage groups of collectors and buyers, who in turn deal directly with small farmers. The general term for these middlemen is *tokeh*, and they dominate the buying market in the more remote regions in Indonesia. Because of their capital power, *tokeh* often provide microfinance to farmers during production, creating an unofficial contract-farming system, restricting farmers to sell their harvest exclusively to that *tokeh*, usually at an unfair price. In addition, due to expensive post-harvest transportation containers and lack of cold storage, *tokeh* often provide rental or transportation services, thereby increasing their hold on small farmers. Empowering small farmers with direct access to microcredit or loan guarantees could relieve them from the *tokeh* system. Semi-intensive to intensive

farmers, on the other hand, have direct contracts with processing plants or exporters and are usually not affected by the *tokeh* system.

Processors

Shrimp processing in Indonesia varies from low-level to high-level value-added products. Shrimp processors are usually also exporters and are therefore directly faced with increased demands from the U.S. and EU in food safety standards and traceability issues. In 2001, after discovering residual antibiotics, chloramphenicol, and nitrofurans in some products, the EU decided to examine 100 percent of shrimp products imported from Indonesia and elsewhere. The new food safety policy is one of zero tolerance toward these chemical compounds.

Imports into the United States are regulated under federal regulations often referred to as 21 CFR 123. They require that seafood processors operate preventive control systems that incorporate the seven principles of HACCP. The essence of the regulations is that the purchaser/importer of the products should be able to demonstrate to the authorities that the products have been produced in a safe and acceptable manner. This implies that the producers are using a quality-assurance system that incorporates HACCP, standard sanitary operating procedures, and good manufacturing practices. Most seafood processors have indicated a lack of food safety standards and poor post-harvest handling techniques implemented at farm level, ultimately affecting their ability to comply with the standards.

Appendix E: Comparison of Production Streams by Country in Thailand, Vietnam, India, Indonesia, and Bangladesh

Activity	Thailand	Vietnam	India	Indonesia	Bangladesh
Fry Production	Regulated hatcheries and micro-hatcheries	Private and government-run hatcheries	Private and government-run hatcheries	Private hatcheries and seed imports	Predominantly artisan wild fry catching, some hatcheries
Aquaculture	Mostly intensive aquaculture	Strong trend toward intensive aquaculture	Semi-extensive, government incentives for intensive aquaculture	Semi-extensive and extensive aquaculture	Mostly extensive aquaculture
Local Trade	Open market, some contract farming, some vertical integration	Mostly middlemen, some contract farming	Mostly traders and middlemen, often circumventing market pricing	Mostly traders and middlemen, often circumventing market pricing	Exploitative trading practices by a system of multiple middlemen
Processing and Export	Some registered plants, large amount of unregistered plants	Harvesting contractors and middlemen preprocess raw shrimp	Mostly unregulated preprocessing plants owned by middlemen	Mostly unregulated preprocessing plants owned by middlemen	Preprocessing occurs within the system of middlemen
	Registered with Industry association, high standards in processing	Registered with industry association, high standards in processing	Registered with industry association, reasonable standards in processing	Registered with industry association, reasonable standards in processing	Registered with industry association, often questionable standards in processing
Certification	Exist at most nodes of the supply chain	Exist at most nodes of the supply chain	Exist at most nodes of the supply chain	Mainly enforced at the processing and export level	Enforced at the processing and export level