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VALUE CHAINS AND STANDARDS IN SHRIMP EXPORT[1]

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Abstract

This study analyzes the food safety compliance performances of different stakeholders in value chains of Bangladesh and Thailand from mother shrimp collection to consumers' plate. Data and information collected through field surveys, interviews, and interactions with different stakeholders in Bangladesh, Thailand and Japan were analyzed and used as the basis of the paper. The results reveal that the competent authority monitors the hygiene and sanitation condition of the buyer-driven value chain activities, whereas processors-cum-exporters implement HACCP procedures about 85% to 90% in all stages of production, distribution, processing and export of shrimp to assure the quality standards. 'Shrimp suppliers certificate' and 'farmers and region code' in Bangladesh while 'movement document' and 'fry movement document' in Thailand are used as traceability tools. Both the countries have already started working for certification, eco-labeling and sustainable seafood trade. However, it is recommended to ensure chain traceability together with improved management to increase products' competitiveness.

Keywords: Value Chains, Standards, Comparative Study, Shrimp, Bangladesh, Thailand and Japan.

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Introduction

Shrimp as a fisheries commodity represents a great importance in the international trade (Xinhua, 2008). It's a popular food item consumed through out the globe, although once it was considered as a luxury foodstuff by many people. Developed nations such as USA, Japan and European countries are the major importers of shrimp products, whereas, developing nations, especially South East Asian countries, act as the main shrimp suppliers of the world.

Shrimp is considered significant to both Bangladesh and Thai economy. In Bangladesh, the production of shrimp by aquaculture method is a 100% export-oriented activity producing an average output of 53,000 tons and earning US$ 530 million, which is some 8.0 per cent of the country's total exports in the 2007-08 fiscal year (July 2007 to June 2008). Shrimp is the second largest foreign exchange earner after garments. The sector employs nearly 1.3 million rural people in forward and backward linkage activities like hatching, nursing, producing, harvesting, processing, exporting and other logistic support services. It has the highest potential for further development, enough to culture shrimps to earn US$ 1.5 Billion by 2010 (BFFEA, 2007). Bangladesh is already among the top 10 exporters of shrimp in the world and accounts for some 3 percent of global production. The EU (45%), USA (35%) and Japan (4%) are the world's major importers of shrimp from Bangladesh.

In Thailand, the contribution of shrimp farming sector has been very impressive. Thailand has emerged as one of the largest seafood suppliers to global market and at present, the sector accounts for 30% of the world trade in shrimps. Thailand's shrimp production was about 600,000 tons and export value was US$ 2.28 billion in 2007 (www.fisheries.go.th). The major markets for shrimp are the USA, Japan, EU, Canada and South Korea.

Now-a-days, import countries have developed standard criteria and a full certification system for the shrimp production line, from farm to table. In view of the liberalization of global trade and increasing demand by consumers in developed countries, the food industries have been confronted with the challenge of competitiveness in quality-oriented international market where commodities, production areas, and brands compete with each other. Competitiveness in food production in the near future will be

more dependent on the reliability of the safety and quality of the food and acceptability of production procedures (Rouf, 2004).

On the international level, buyers and consumers are increasingly demanding that shrimp is produced in compliance with recognized codes of conduct regarding food safety, human rights, fair labor practices and environmental protection. Contemporary regulation of food safety incorporates principles of quality management and systemic performance objective (Ponte, 2007). However, the export of shrimp to developed country markets is becoming increasingly difficult because of the emerging sets of food safety and agricultural health standards, along with buyers' changing requirements (Ito, 2005). Evidently, the importance of the EU market for this particular export sector of Bangladesh is indeed very high. Any disruption in this market was bound to have severe and important implications for this export-oriented sector of the country, and negative multiplier impact for the national economy (CPD, 2006).

However, there is an abundance of literature on the food safety standards and regulations in shrimp industry in the world, but there have been no attempts particularly to compare quality standards and emerging challenges in shrimp exports to Japan practiced through the value chains in both Bangladesh and Thailand. Therefore, this study deals with-Japan's shrimp imports and its trends; and measures of different stakeholders in shrimp industry in Bangladesh and Thailand in order to comply with the safety standards of Japanese importers and buyers.

Materials and methods

Data and information for this study were collected from both primary and secondary sources. In Bangladesh, primary data were collected in 2007 from General Managers, Executive Directors of processing plants and shrimp farmers in Khulna district following random sampling. Semi-structured interviews were also conducted with personnel of other stakeholder organizations such as Bangladesh Shrimp Farmers Association, Bangladesh Frozen Foods Exporters Association, Department of Fisheries and Export Promotion Bureau and a researcher. In Thailand, primary data were gathered by personal interview in 2008 using semi-structured interview schedule with parties actively involved with the value chain of shrimp industry. Information has also been gathered through individual discussion with the Thai coastal and freshwater fisheries officers, labor department officials, Thai Frozen Foods Association and University Professors. In Japan, a university professor, one research personnel, one representative

from a fish import company and a number of shrimp buyers were interviewed in 2008. Besides, secondary data and information from various organizations as well as from published and unpublished sources of government agencies and trade organizations in Bangladesh, Thailand and Japan in the type of documents, reports, handouts, notifications, etc. having relevance with this study were also consulted. In addition to these, follow-up telephonic discussions were conducted with other knowledgeable personnel. The data and information from all these field surveys, interviews, communications and discussions were summarized which were analyzed and used to write this paper.

Seafood safety standards and measures implemented by different stakeholders

As food safety is receiving increased attention in the international markets, it is essential to maintain appropriate quality of the exported food items through proper quality control and monitoring measures of respective public-private stakeholders. IFPRI (2003) mentioned 'food safety is affected by the decisions of producers, processors, distributors, food service operators, and consumers, as well as by government regulations'.

In the seafood industry, as in other food industries, the food safety management system known as HACCP (Hazard Analysis and Critical Control Point) has come to be widely adopted in the US, EU countries, Canada and, to a limited degree, Japan (Ito, 2007). During the 1990s, developed countries made a strong shift toward requiring the HACCP approach to assuring food safety. Under HACCP, companies are responsible for analyzing how hazards such as food-borne pathogens may enter the product, establishing effective control points for those hazards, and monitoring and updating the system to assure high levels of food safety (IFPRI, 2003). It is designed to prevent hazard through inspection at multiple points in production processes, representing a departure from point inspection of end-products (Cato, 1998).

In response to the increasingly emerging food safety requirements, the government and the private sector are jointly implementing a series measures to protect shrimp industry in Bangladesh. As a member of Codex Alimentarius Commission (which states that countries should promote responsible fish trade in such manner and environment that is hygienically acceptable, safe and also meets quality requirements) together with the agreements like SPS (Sanitary and Phytosanitary, to apply measures necessary to protect human, animal and plant life and health), S&D (Special and Differential provisions, to

call developed countries to take into account the special needs of developing countries in the preparation and application of SPS measures) and TBT (Technical Barriers to Trade, to prevent the use of unjustified technical barriers to trade and it includes measures to protect consumer against deception and economic fraud), Bangladesh has undertaken stringent measures to improve quality assurance practices as well as management practices by strong compliances of HACCP guidelines to produce safe fish and fish products. Declaring HACCP as a new mandatory procedure for export-oriented shrimp processing plants in March 1998, the government has strengthened the Fish Inspection and Quality Control wing of the Department of Fisheries (DoF) to provide statutory support to the processing plants, to monitor processing and quality assurance activities and to fulfill the HACCP requirements (DoF, 2005-06).

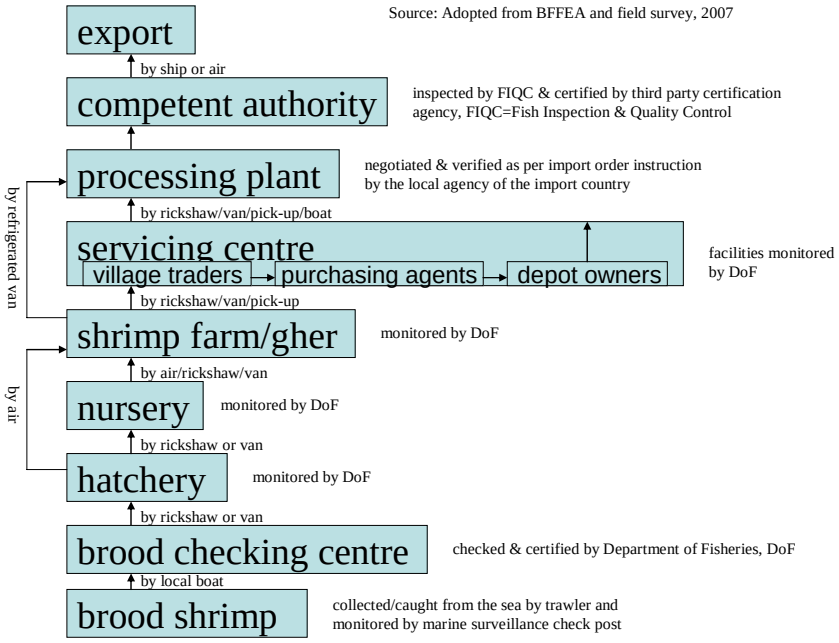
Bangladesh shrimp industry practices standard in compliance of HACCP to produce safe and quality products. It is evident that Bangladesh shrimp industry implements HACCP procedure about 85% in all stages of production, distribution, processing and export of shrimp in order to supply safe and quality products to the importers and consumers.

Thai Ministry of Agriculture and Cooperatives through the Department of Fisheries (DOF) implemented a voluntary HACCP fish inspection program in 1991 for the first time, which was finally become mandatory in fishery establishments in 1996 (www.fao.org/decrep/008). Now all processors under DOF approval implement about 90% HACCP procedure which increases consumers' confidence in quality and safety of Thai seafood. The implementation of HACCP in Thailand shrimp industry has helped processing factories to upgrade their operations, develop better plans, and handle fish more systematically.

Value chains of shrimp in Bangladesh and Thailand

Shrimp's value chain involves a combination of different actors (located along different points of the shrimp industry) with their institutional arrangements and actions from brood shrimp collection to end use. The value chain, according to Kaplinsky and Morris (2001), describes the full range of activities which are required to bring a product or service from initiation, through the different phases of production (involving a combination of physical transformation and the input of various producer services), delivery to final consumers, and final disposal after use.

Flow chart 1: Value chain of shrimp, Bangladesh

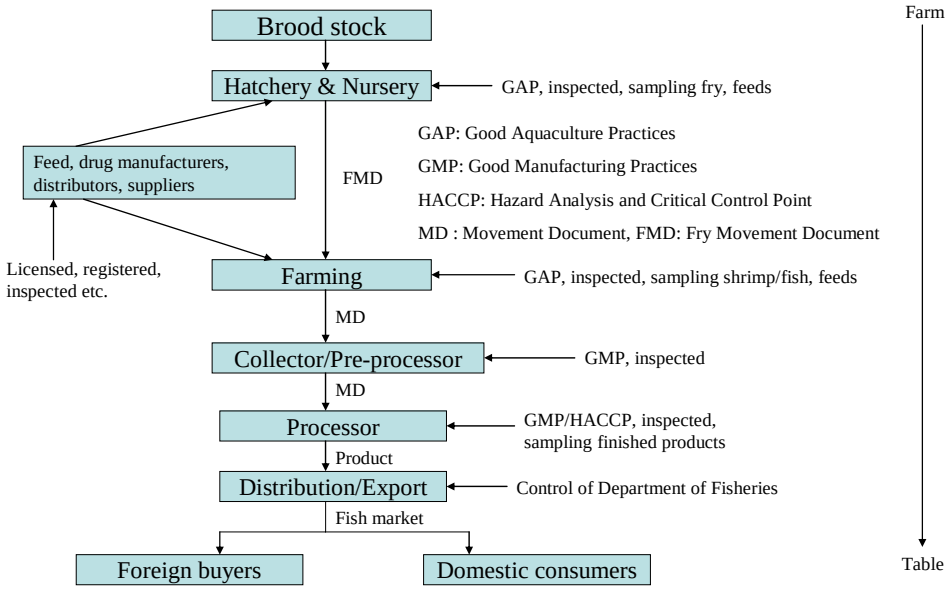


In Bangladesh, shrimp produced in the farm is marketed to overseas consumers through a number of channels that is from farm to village traders, purchasing agents, depot owners and final delivery to the processing plants. All the steps of value-added activities are strictly controlled under GMP (Good Manufacturing Practices) and SSOP (Standard Sanitation Operating Procedure). Competent authority like FIQC (Fish Inspection and Quality Control department under the Ministry of Fisheries, Government of Bangladesh) and some independent international quality assurance organizations specifically France based SGS (Societe Generale de Surveillance), United Kingdom based Lloyd's and Denmark based Baltic Control perform inspection, testing, certification and verification services following the Codex guidelines, code of practice, standards and directives of European Union Food Law, HACCP regulations and requirements of other import countries. To ensure safety and quality of the shrimp, Department of Fisheries monitors the hygiene and sanitation conditions of the food through quality management and process-oriented supervision throughout the shrimp value chain.

In Thailand, it is compulsory that all seafood processors and exporters must implement CoC (Code of Conduct), GMP (Good Manufacturing Practices) and HACCP to produce quality shrimp. Thai Department of Fisheries (DOF), as competent authority for fishery products exported from Thailand, monitors the establishments and their products

regularly, administers several programs and activities to ensure that seafood safety is maintained properly through farm-to-table approach. To ensure credible inspection and controls throughout the value chain, competent authority covers all relevant aspects of hygiene, public health and, also animal health. In order to sustain the Thai shrimp industry and to maintain consumer confidence in product safety, it applies standard practices to all sectors of the value chain from primary production to the market place and to apply a single standard for products whether the products are destined for domestic or overseas markets.

Flow chart 2: Value chain of shrimp, Thailand



Source: Department of Fisheries, Thailand and field survey, 2008

Under CoC guidelines, Thai shrimp industry apply best practices at each step of the value chain to meet consumer expectations for quality, food safety, environmental protection and taste. Thai shrimp industry and the government agencies are working hard in hand to guarantee full compliance with import countries' strict requirements and international standards. DOF audits and certifies hatcheries, farms, distributors and processing plants in order to ensure that stakeholders follow the standardized practices. Guideline on GAP emphasizes production of shrimp which is fresh, clean, free of therapeutic agents and chemicals and non-contaminated with diseases and dirt (Thailand Best, 2008). A combination of stakeholders like hatcheries, nurseries, shrimp farms, feed companies and processing plants as well as international marketing companies allow the Thai shrimp industry to develop a well-organized, fully integrated shrimp industry (Wyban, 2007).

Global value chain governance

The global value chain approach places particular emphasis on the coordination of different actors along the chain of activities involved in the production, processing and distribution of products. It highlights the linkages between enterprises, how their activities are coordinated and the role of lead firms in determining what is to be produced, how and by whom (Humphrey, J. 2005). Governance occurs when one firm follows parameters set and enforced (through monitoring and sanctions) by another. At any point in a value chain, the three key parameters to be specified are : (i) what is to be produced-product design and specification, (ii) how it is to be produced-process specifications, and (iii) how much is to be produced and when- production scheduling and logistics (Humphrey and Schmitz, 2001).

Global farm (i.e., import countries/companies or supermarkets) negotiates with the local farm (i.e., processors-cum-exporters/suppliers) on product price, product quality, reliability of delivery, speed of response, product design and product performance/specification standards. Fulfilling such demand specification by local farms in export countries through the collective initiatives by the actors of value chain make local shrimp products more competitive in the market.

Normally, local agents of import countries (companies or supermarkets) inspect the operational culture in the processing plants. They provide specification on color, shape, size, packaging materials etc. Japanese shrimp trading farm also provide precise product specification and ask the exporters to ensure that these specifications are met based on consideration such as quality, design and branding together with safety and standards. The Japanese importers demand the processors-cum-exporters to produce and export following their specifications. However, these refer to an important governing role of the buyers or import countries/companies (as they are regulating the supply network and defining product specifications) on value chain of shrimp of export countries. Although Gereffi (1999), Gammage et al. (2006) argued that shrimp aquaculture in Bangladesh exhibits a buyer-driven commodity chain, Islam (2008) concluded that shrimp commodity chain is neither buyer-driven nor producer-driven, but a twin-driven commodity chain in which the wealthy buyers control supply network, while a third-party certifier and some environmental groups define the regulatory aspects of production, codification, certification, and to some extent management aspects.

Japan's shrimp imports and its trend

Shrimp is the largest import group-both in volume and in value-in the category of imported fisheries products to Japan. Followed by US, Japan is the second largest shrimp buyer in the world. About 70 per cent of the imported shrimp go to the restaurant and catering market, and the other 30 percent is sold by supermarkets for home consumption (Jonker *et. al.*, 2005). Table 1 shows that Japan's total shrimp imports volume have been fluctuating with declining trend in recent years, due to increase in imported cost and price together with the issues of very precise safety and quality requirements. Another reason also pointed out by one Japanese professor that 'recently numbers of aged persons are increasing and they are consuming reduced amount of shrimp'. As shown in the Table 1, Japan's overall import of shrimp during 2007 declined (by 9%) to 275,589 MT as against of 301,078 MT in 2006. In fact, imports in 2007 were the lowest by Japan since 2003. Japan's imports in the form of raw/frozen shrimp are declining since 2005 and at a record low in 2007. There is slightly a positive trend in imports of the prepared/preserved and cooked/frozen shrimps in 2006.

Table 1: Japan's shrimp imports (all types), 2003-2007 (in Matric Tons, MT)

Product form	2003	2004	2005	2006	2007
Raw/frozen	233,195	241,445	232,443	229,952	207,257
Prepared/preserved	33,361	39,692	42,181	50,013	48,156
Cooked/frozen	13,927	16,745	17,051	18,269	17,893
Dried/salted/in brine	1,977	2,351	2,008	2,035	1,648
Cooked & smoked	453	618	422	414	324
Sushi (with rice)	92	341	263	204	144
Live	293	383	271	184	167
Fresh/chilled	19	33	19	7	0.4
Total quantity	283,317	301,608	294,658	301,078	275,589

Source: Data compiled from Infofish (http://www.infofish.org/marketreports/shrimp)

Market shares of different countries in Japan

Frozen shrimp imports from the major export countries (mostly located in Asia) to Japan is shown in Table 2. Vietnam, Indonesia, India followed by Thailand (ranks as the fourth largest exporter) and China are major frozen shrimp exporters to Japan since 2003. As mentioned by Joseph *et. al.* (2008), the share of Myanmar and Bangladesh to Japan's shrimp imports also dropped mainly on account of the presence of an anti-biotic in shrimp imported from the South Asian region. Only Thailand and China managed to

perform better in terms of shipments to Japan in 2007. However, the value of frozen shrimp import decreased by 6 per cent slipping to 204,661 million yen in 2007 as against of 227,202 million Yen in 2006.

Table 2: Japan's frozen shrimp imports in different years (in Matric Tons, MT)

(January to December)

Country of origin	2003	2004	2005	2006	2007
Vietnam	47,626	55,506	54,573	51,133	40,041
	(20.4)	(23.0)	(23.5)	(22.2)	(19.3)
Indonesia	52,367	48,623	45,574	43,665	37,080
	(22.5)	(20.1)	(19.6)	(19.0)	(17.9)
India	28,191	31,572	26,309	28,546	27,025
	(12.1)	(13.1)	(11.3)	(12.4)	(13.0)
Thailand	16,803	17,192	18,398	20,097	26,380
	(7.2)	(7.1)	(7.9)	(8.7)	(12.7)
China	20,494	22,609	24,092	22,810	23,997
	(8.8)	(9.4)	(10.4)	(9.9)	(11.6)
Russia	8,641	8,911	10,382	9,518	8,903
	(3.7)	(3.7)	(4.5)	(4.1)	(4.3)
Myanmar	5,377	7,630	7,519	8,847	8,021
	(2.3)	(3.2)	(3.2)	(3.8)	(3.9)
Canada	8,938	8,469	8,054	8,665	7,554
	(3.8)	(3.5)	(3.5)	(3.8)	(3.6)
Greenland	9,180	7,683	7,527	6,788	5,427
	(3.9)	(3.2)	(3.2)	(3.0)	(2.6)
Bangladesh	3,004	3,415	3,194	4,001	2,568
	(1.3)	(1.4)	(1.4)	(1.7)	(1.2)
Others	3,2630	29,835	26,821	25,882	20,261
	(14.0)	(12.4)	(11.5)	(11.3)	(9.8)
Total quantity (MT)	23,3251	241,445	232,443	229,952	207,257
	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)
Total value (Million Yen)	225,409	216,820	213,858	227,202	204,661

Source of data assembling: Southwest Regional Office

(http://www.swr.ucsd.edu/fmd /sunee/shrimp)

Note: Figures in parentheses indicate percentages

Imports of frozen shrimp are still dominated in Japan by Vietnam followed by Indonesia since 2004. There are higher imports of raw frozen shrimp (shell-on and peeled) from the top two suppliers - Vietnam and Indonesia in 2004 and 2003 respectively. Imports from Thailand and China (where a shift from black-tiger shrimp farming to *vannamei* or white shrimp is being practiced) are increased. It is noteworthy that Thailand is the second largest producer of *vannamei* shrimp (more than 90 per cent of the country's total shrimp production) in Asia after China. The Nation (2008) cited, however, white shrimp has a lower export price than black-tiger shrimp, which will directly affect the country's total export value even though export value has increased in Thailand in 2007. Thai shrimp and other fishery products would have promising prospects in the Japanese market. Exports of Thai shrimp products to Japan are expected to increase by the end of this year after winning recognition in both quality and standard among consumers as they are confident of the quality and safety standard (Mathaba, 2007).

Japan has long been the second largest (consuming 33 per cent of Vietnam's seafood export) market for Vietnam, after the USA. Both Thai and Japanese firms have invested heavily in Vietnam fishery projects, where shrimp and catfish are the two major export species (www.siamcanadian.com). Vietnam gained US$ 746 million in 2007 in exports to Japan, 21.1% of the country's total seafood export value (www.vasep.com.vn). Vietnam's shrimp exports to Japan have recently been increased by 20-30 per cent (www.fishupdate.com). The Ministry of Fisheries in Vietnam is taking measures to increase the safety of Vietnamese aquatic products in order to meet increasing demand from foreign markets. One of the measures is to develop aquaculture communities throughout the country, whose production processes, from the selection of breeds, feed and medicines to processing and export, will be put under strict supervision.

Value added products and buyers' requirements

In all developed countries food habits are changing. The consumers are no longer willing to depend on excessive time for preparing food. 'Heat and eat' fishery products have proved well to be perfect niche for seafood at the retail level, because these are convenient to the consumers. In catering and retail sectors in the USA, EU and also in Japan, market demand for specific value added products have been rising. Value addition always focuses on market and consumer expectations. Among seafood, shrimp exhibits the widest range and highest degree of value addition. In consideration of health aspect, every food items has been diversifying in developed countries of the world, where caloric counts, dietary plans, nutritional facts, serving size on seafood

packs and recipes in customers language are useful addition to value added products. Inclusion of these will definitely increase the presence of producer's products on supermarkets and other retail outlets of potential markets (BFFEA, 2007).

Aside from meeting the sanitary and phytosanitary requirements of an import country, all parties in the supply chain must meet increasing consumer demand for quality and safety assurance of produce. They must also meet additional requirements of importers and retailers in terms of compliance with the relevant standards of the ISO (International Standard-Setting Organization). The factors important to Japanese consumers responded by different stakeholders of supplying countries are: organic product, uniformity in size, precise grading, accuracy in weight, color separation, freshness, good shape and quality. Jonker *et. al.* (2005) also identified some standards of Japanese customers, such as freshness, quality, visual perfection, taste, stability of supply, and low prices. All stakeholders in the value chain must ensure and maintain these standards as mandatory requirements for Japanese customers. Such compliances eventually will prevent rejection of shrimp consignment as well as ensure product acceptability by importers and ultimately by retailers and consumers. The processing plants in Bangladesh and Thailand are involved in processing value added products following stringent sizing, weight, cleanness, color grading and general quality standards. The quality of such value-added products exported from both the countries is also being appreciated for maintaining taste and meeting consumers' preferences as well.

Traceability requirements in shrimp export

Traceability of food at present emerges as a vital area of competition and a crucial demand trend across the world market. Under EU law, traceability means the ability to track any food, feed, food-producing animal or substance that will be used for consumption, through all stages of production, processing and distribution (European Commission, 2007). According to the ISO, traceability refers to the ability to trace the history, application, or location of an entity by means of recorded information. This principle is known as 'one step up and one step down'. For ensuring traceability, exporters should maintain transparent and credible records of the traded products that he receives from the farmers or suppliers.

Both Bangladesh and Thai shrimp industries have meantime taken a good number of steps to implement this issue through internal traceability (i.e., recording information on

raw materials, intermediate and final products within a fish plant) and external traceability (i.e., making documentation through value chain from fry collection to consumer plate) in order to comply with the requirements of the import countries. Processor will guarantee to the buyers that his products are safe for human consumption and will not pose any health hazards to consumers. Food business operators shall ensure that all stages of production, processing and distribution of food under their control satisfy the relevant hygiene condition.

In Thailand, ‘movement document (MD)’ is issued by Department of Fisheries at hatcheries, farms through to processing plant to cover all cultured or imported species including ornamental fish, whereas ‘fry movement document (FMD)’ is practiced for delivering fry to buyer in order to trace back to origin when drug residue or disease is detected. Bangladesh shrimp processing plants initially ensure ‘shrimp suppliers certificate’ and ‘farmers and region code’ where suppliers certify that the shrimps are not contaminated by any kind of pathogenic bacteria and no chemical drugs are used during rearing; the shrimps are harvested, preserved and transported in a hygienic manner. Besides, in the processing plants of both Bangladesh and Thailand, all inner carton or polybag and master carton are labeled and printed with all necessary information and specifications such as, approval number, FDA (Food and Drug Administration) registration, place/country of origin, processors name or ID, lot number, date/method of production, etc. for the foreign buyers so that they could be able to trace the origin of each product.

Certification, eco-labeling and sustainable seafood trade

In recent years, the landings of fish from the world’s oceans have gradually declined as stocks have been progressively over fished, and at the same time, demand for seafood has been steadily rising (Greenpeace, 2008). While consumers and supermarkets in the developed countries are becoming more safety conscious and adopting more sustainable purchasing patterns, certification and eco-labeling of seafood provide assurance to meet the needs of future generations.

It may be pointed out that eco-labeling is increasingly perceived as a way to improve the management of fisheries and conservation of biodiversity. If fisheries management improves due to efforts undertaken to comply with certification criteria, the potential benefits to fisheries sector will be much higher. However, the potential usefulness of eco-labeling schemes may be constrained due to the difficulties faced by the low

income countries in terms of compliance, and developing necessary organizational capacity. Though eco-labeling is considered to be an informal international environment-promoting tool and in most cases these are voluntary in nature, its introduction in shrimp exports from Bangladesh needs to be actively considered since many developed countries have already adopted this schemes. The inability or unwillingness of Bangladesh to do this may lead to weakening of its competitive strength and erosion of its global market share (CPD, 2006).

Certification of a seafood product indicates if it was produced in a sustainable, healthy, socially responsible and environmentally-friendly way. It should address four main areas: food safety and quality, social impacts of fish farming on local communities, environmental issues and economic feasibility (FAO Newsroom, 2007).

Governments in both countries strongly prohibit shrimp fry collectors not to catch fry from the sea to control stock status. Strict supervision and monitoring system are needed to protect mother shrimps at the sea and there should be a clear cut law regarding catching of mother shrimp. To maintain biodiversity, trawlers fishing in the sea are using turtle and other non-targeted species excluding device to reduce unwanted by catch and to preventing damage to other species. Governments can make an impact through policy-making, fish farmers can use sustainable techniques in fish harvesting so that future catches and harvest can be assured, and processors-cum-exporters have a responsibility to purchase fish from the sustainable sources. Finally, ecosystem based fishery management approach should be encouraged for sustainable harvesting to ensure fish availability for today and also for future catches and harvests.

For internationally certified organic aquaculture in Bangladesh, SIPPO (Swiss Import Promotion Program) took a pilot project in 2004 at the district of Satkhira, in South West of Bangladesh and next to the national mangrove forest. Farmers produce shrimp by using traditional methods based on the best utilizations of the sun, the rich waters of the nearby Sundarban and large space of land under a unique program of reforestation, without use of any ingredients such as compound feed, chemicals, fertilizers. The shrimp grows naturally just with natural food coming from this fantastic natural food reservoir. With such initiatives, Bangladesh would be able to earn substantially by exporting shrimp to maintain competitiveness in the global market (BFFEA, 2007).

Thai Department of Fisheries has developed specific projects to enhance the shrimp

culture sector by improving various aspects such as environmental quality, shrimp product safety, and trust marketing. One of the projects named ‘seawater irrigation systems for marine shrimp culture’ that produces appropriate quality seawater for shrimp culture, collects effluent from shrimp ponds, and treats the effluent before discharge into natural water. The objectives of the systems are to produce sustainable shrimp culture, maintain environment and balance ecological system (DOF, 2008).

Discussion on comparative features of both Bangladesh and Thailand shrimp industries

Thailand emerges as the world’s leading exporter of shrimp with 30 per cent of the market share. As the buying countries demand that the food must be produced, processed and handled with necessary hygiene maintenance, shrimp standards and safety program in Thailand is maintained by CoC and GAP guidelines. In sharp contrast, Bangladesh produces only 3 per cent of the global production. All the activities from brood (mother) shrimp collection to finished products up to export are strictly controlled under GMP and SSOP.

Thailand has developed three open auction markets which facilitate shrimp farmers to get the fair price for their products whereas there is no open auctioning of shrimp in Bangladesh. Normally brokers/agents of traders in Bangladesh buy shrimp from farmers’ field paying farm-gate price, where farmers have less bargaining power.

There are four types of shrimp being exported from Bangladesh, i.e., sea water black tiger shrimp (*Penaeus monodon*-63% of total export) and fresh water prawn (*Macrobrachium rosenbergii*-19% of total export), sea water brown/grey shrimp (*Metapeneaus monoceros*-10% of the total export), and sea water white/pink shrimp (*Penaeus indicus*-8% of the total export). On the contrary, white shrimp (*Penaeus vannamei*- more than 90% of its export) and black tiger shrimp (less than 10% of its total export) from aquaculture are the major fishery commodities in Thailand. Both the countries follow traditional extensive method for shrimp aquaculture.

Thailand has four up to date and well-equipped laboratories for testing and detection of bacteria, virus, antibiotics and heavy metals. They carefully examine the shrimp products prior to shipment to assure optimum quality in accordance with import countries’ requirements and international standards. Recently, Bangladesh has been equipped with sophisticated equipments for all microbiological, antibiotics, heavy metal

and virus tests. Earlier, Bangladesh used to send samples to Thailand and Singapore for the required tests, which are now possible in Bangladesh.

In comparison to 42 large scale modern feed mills in Thailand, Bangladesh has only six large modern feed mills and 20 small scale crude feed producing factories.

In realizing the importance of quality and safety of fish and fishery products, Thai Department of Fisheries, as competent authority, operates several programs to ensure food safety. In addition to FIQC in Bangladesh, SGS, Lloyd's and Baltic Control, as international independent company, perform comprehensive inspection and superintendence both at the company and at shipping ports as per instruction of the import countries to ensure food safety.

While Bangladesh did not explore the possibilities of export diversification and still it remains happy with the export of frozen shrimp only, Thailand is continuing exports with its diversified range of product- frozen, canned, dried and salted shrimps.

Traceability has become an important factor in food safety which also helps to define the responsibilities of food operators. Thailand shrimp industry ensures it through both 'movement document' and 'fry movement document' whereas Bangladesh starts to execute it by 'shrimp suppliers certificate' and 'farmers and region code'.

Conclusions

Both government and private sectors of import countries set standards and requirements for the shrimp exporters. This study analyzes the compliance of exporters of both Bangladesh and Thailand with these standards from mother (brood) shrimp collection and aquaculture farm to the consumers' table. It is concluded that different stakeholders of shrimp industry in Bangladesh and Thailand are working concertedly to comply with the recognized codes of conduct. However, shrimp imports volume in Japan is decreasing since 2003; demand for value-added products is increasing. Therefore, countries with stringent quality assurance programs would also be able to sell more value added products to Japan. Bangladesh has a possibility to expand its shrimp trade with Japan establishing value innovation through export diversification of products and meeting food safety standards properly.

Bangladesh should invest on ways to improve the present status of shrimp trade and make this avenue into the real business sharing and experiencing the knowledge from Thailand. There is a bright prospect of shrimp culture in Bangladesh recovering the illegally occupied government land and distribute those to the real shrimp farmers and to utilize the full capacity of the processing plants in order to augment its production and export volume. In fact Bangladesh can be benefited more from increased shrimp cultivation with the present technology and could fetch more export earnings using its full potential of processing plants and cultivable land. However, in order to minimize the socioeconomic problems and social tension, cultivation must be expanded following a clear land use policy based on land topography, soil quality and other environmental factors. Among others, new technology in shrimp disease prevention, new seed production systems, better management and environmental friendly aquaculture practices for sustainable seafood trade, ensuring chain traceability with effective farm registration system as well as strict supervision and monitoring system at every stage in the export chain are essential to satisfy the safety standards and requirements of developed country consumers.

Recently, Thailand has started to implement a new approach, i.e., ‘shrimp cluster’ integrating together all related supporting industries such as ice producer, cold storage, animal feed, packaging, transport, institution/association etc., to maintain products’ smooth supply with better quality and low cost to the market. It is also recommended to start the feasibility of such approach in Bangladesh to improve management, meet quality standards and increase products’ competitiveness.

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