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**The Distributional Effects of Compliance
with Food Safety and Agricultural Health Standards
on Small Producers in Developing Countries**

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Introduction

The expansion of export markets for agricultural products plays a crucial part in poverty reduction strategies of many developing countries. Although traditional products such as coffee and tobacco are subject to high risks associated with fluctuating prices and demand, non-traditional agricultural products, such as fresh and processed vegetables, fruits, fish, and meat, are thought to possess growing potential for developing-country exporters. In fact, these non-traditional agricultural exports already comprise more than half the total agri-food exports from developing countries (WB 2005).

However, the export of these non-traditional agricultural products to developed country markets is becoming increasingly difficult because of the emerging sets of food safety and agricultural health standards, along with changing buyer requirements. Among these standards are mandatory ones set by official bodies in industrialised countries, and others developed through private initiatives. Buyer requirements include those concerning product quality, as well as those involving processing and packaging procedures. Meeting these standards and buyer requirements poses a big challenge to the agri-business sector in developing countries. Although food safety and agricultural health standards are meant to prevent the spread of plant and animal pests and diseases and the incidence of microbial pathogens or food contaminants, it is a well-known fact that they can also be used as non-tariff barriers to trade. There is growing concern within the international development community that standards are threatening to undermine the progress made by some developing countries, while serving as barriers to new entrants into high-value food markets (WB *ibid.*).

This paper examines the effects of compliance with food safety and agricultural standards in export-oriented, non-traditional food industries in developing countries. In particular, it focuses on the distributional implications of compliance with the standards for small producers in these countries. As case study, it investigates the effects of compliance with the general principles of Hazard Analysis and Critical Control Point (HACCP) on small prawn farmers in Bangladesh. The paper argues that the introduction of the ever more complex standards in low-income countries where effective value chain management is yet to be developed can lead to the consolidation of the supply base in ways that reduce small farmer involvement.

1. Global value chains and standards

The problems facing developing countries trying to participate in high-value international food trade have been analysed recently from the perspective of ‘global value chains’. The concept of value chains is defined by Sturgeon (2001:11) as “the sequence of productive (i.e. value-added) activities leading to and supporting end use”.

Various value chains “often share common economic actors and are dynamic in that they are reused and reconfigured on an ongoing basis” (ibid. 10). Those who use this concept claim that international trade in goods and services cannot be understood merely in terms of arm’s-length market-based transactions. According to Gereffi and others (2001), integration in international markets becomes possible not only through “designing, making and marketing new products” (p.2) but through “international design, production and marketing networks consisting of many different firms” (ibid.). Thus, understanding the ways in which these chains of activities are structured and managed is crucial for potential entrants keen to participate in the international markets. Here the issue of governance plays a key role. Various activities that comprise value chains need to be coordinated in order for industries to enhance their competitiveness. A chain without governance, according to Humphrey and Schmitz, “would just be a string of market relations” (2001:20).¹

Difficulties involved in understanding and strengthening the governance of the existing networks, or value chains, are compounded when new sets of standards are introduced into the markets. It is particularly difficult when standards set by industrialised countries require compliance by various agents in developing countries who are carrying out a range of economic activities at different points along the value chains. Compliance requires good coordination and cooperation between these agents in the chains, but it is not always easy to ensure them.

Emerging export-oriented food industries in developing countries are especially vulnerable, for hygiene and other food safety standards formulated in industrialised countries are complex, and their applications can be arbitrary. Thus, food industries in developing countries struggling to enter high-value agricultural trade are obliged to constantly upgrade their skills, infrastructures and supporting services necessary to comply with the evolving standards and buyer requirements (WB, ibid.). The views on the cost of compliance differ, depending on how one measures the long-term benefit, as well as on how the benefits will be distributed between different agents along the value chains. What is clear is that the proliferation of standards as well as the efforts to comply with them have important implications on the ways in which the benefits of economic integration are distributed to small producers at the bottom end of the value chains.

Previous studies on global value chains have tended to emphasise the changing roles of lead firms and retailers located in industrialised markets. This paper focuses instead on the ways in which compliance with new sets of food safety standards are reorganising the activities of small producers and processors along the shrimp/prawns industry value chain, and their implications on rural poverty reduction in a low-income country.

¹ Gereffi, Humphrey and Sturgeon (2005:78-104) offers a typology of global value chain governance in their recent work that attempts to build a theoretical framework for global value chain analysis.

2. Fish and food safety standards

Global production of fish and fishery products has been growing rapidly since 1970. The total supply of food fish from capture fisheries and aquaculture reached about 101 million tonnes in 2002, according to the Food and Agriculture Organization (2004). This volume of supply is nearly three times larger than in the early 1960s. The Economist has recently highlighted the growing importance of fish farming in its feature article (August 9th-15th 2003). It predicts that it will bring about a 'Blue Revolution' comparable to the Green Revolution in agricultural production. According to its forecasts, aquaculture could supply most of the world's marine products in the next three decades, thereby helping reduce poverty and food shortages in poor countries.

Coinciding with this trend is a significant shift that is occurring in production sites. Major producers of fish and fishery products are nowadays found among developing countries, away from industrialised ones. While many of the developing countries were net importers thirty years ago, they are now net exporters (Henson, Saquib and Rajasenan 2005). They collectively account for about half of world fish exports, up from around 35 percent in the mid-1970s. On the other hand, industrialised countries account for about 80 percent of world imports of fish and fishery products (WB 2005:101).

It is not surprising then that fish and fishery products are subject to a range of increasingly rigorous food safety standards set by relevant authorities in industrialised countries. There are also various buyer requirements intended to enhance consumer satisfaction in luxury food markets. Rules to avoid environmental and ecological damage are further added to these sets of standards and requirements. Among these various sets of rules and conditions, a food safety management system known as Hazard Analysis and Critical Control Point (HACCP) has come to play an increasingly important role.

HACCP was first developed in the 1960s by a US company for providing assurances of the safety of food to be used in the United States space programme (Yeap 1999). In 1993 the Codex Alimentarius Commission (CAC), an international organisation working to ensure harmonisation of food standards, recommended the adoption of HACCP in food processing plants, in cooperation with FAO and WHO. This marked a significant event in international food trade since the role of Codex in setting food safety standards was given considerable attention in the subsequent WTO's agreement on the Application of Sanitary and Phytosanitary Measures. It meant that members of the WTO engaged in food trade had to take the decision of the Codex Alimentarius Commission seriously, and were expected to implement it nationally (Doedhar 2003). In the seafood industry, it has come to be widely adopted in the United States, EU countries, Canada and, to a limited degree, Japan. According to Yeap (ibid.46), the HACCP system is "a scientifically-based and systematic food safety management system that

identifies specific hazards and the measures for their control to ensure the safety of food”. It is designed to prevent hazard through inspection at multiple points along the value chains, representing a departure from point inspection of end-product (Cato 1998).

3. The shrimp/prawns industry in Bangladesh

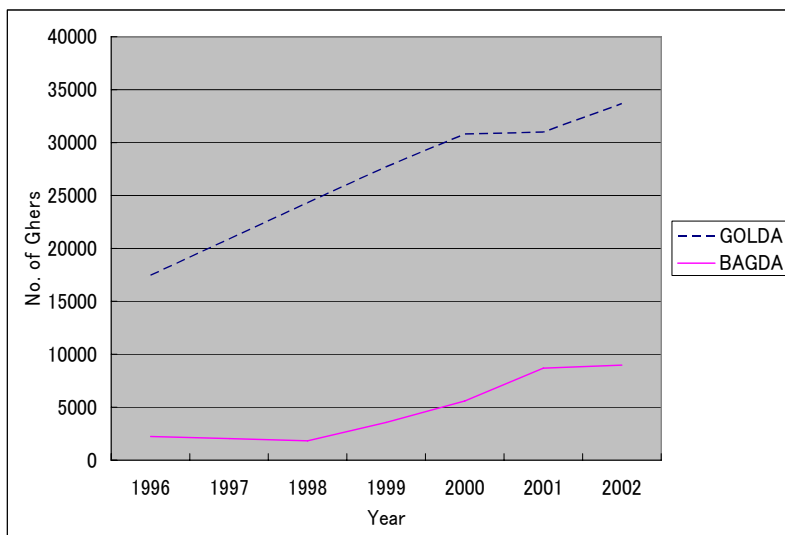
Of the expanding production of fish and fishery products, shrimp and prawns constitute one of the major foreign exchange earners for developing countries, particularly in Asia. The export of frozen shrimp and prawns to luxury markets in Europe, North America and Japan is a rapidly growing industry for many Asian producers. Thailand is by far the biggest Asian exporter. Indonesia, India, and Vietnam follow Thailand’s lead, while China and Bangladesh are trying hard to increase their production shares (Barraclough and Finger-Stich 1994). Although Bangladesh is a relative newcomer in this trade, its participation is significant because it marks the beginning of its insertion into a global agro-food system. Shrimp and prawns currently constitute the second-largest export commodity in Bangladesh after ready-made garments (BBS 2002), thus having high potential for its economic growth and poverty reduction. The country exports about 35,000 metric tonnes of shrimp and prawns each year, earning Tk14,756 million.² Of the total volume of exports, 85 percent are cultured. Half of them are freshwater prawns (*Macrobrachium rosenbergii*), and the other half brackish-water shrimp (*Penaeus monodon*). The former is locally known as *Golda*, and the latter known as *Bagda*.

Bangladesh provides an interesting case for examining how in a low-income country where value chain governance is very weak, the introduction of a complex food safety system such as HACCP affects various stakeholders along the value chain. To look at freshwater prawn farming would be particularly interesting because it involves many small and landless farmers unlike brackish-water shrimp farming. As can be seen from the two charts below, the number of *ghers*³ for freshwater prawns (*Golda*) is more than three times as many as those for brackish-water shrimps (*Bagda*) in Bagerhat District, one of the central locations for shrimp and prawns farming (Chart 1). On the other hand, the area of land under prawns and shrimp cultivation is in inverse relation to the number of *ghers* for the two species (Chart 2). The average size of a *gher* for freshwater prawns (*Golda*) is 0.44 hectares, or 1.1 acre, while that for brackish-water shrimps (*Bagda*) is 3.86 hectares, or 9.7 acres.

Chart 1. The Number of *Ghers* in Bagerhat District

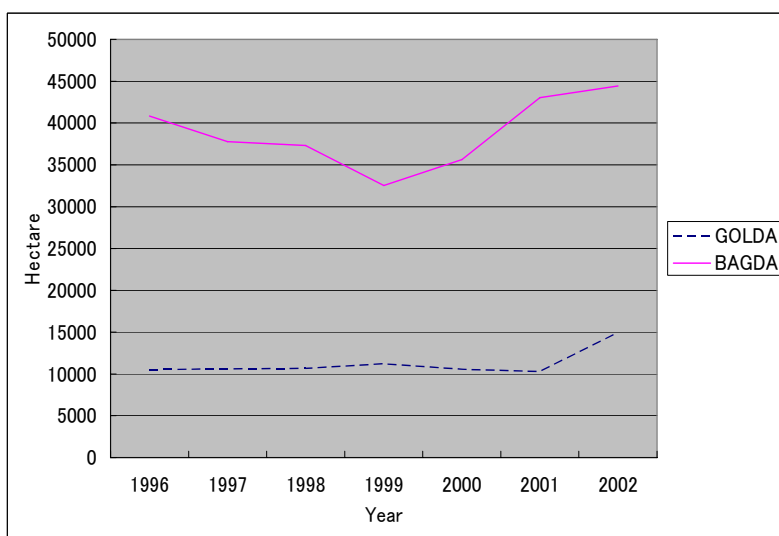
² One US dollar is equivalent to 58.65 Taka as of April 2004.

³ A *gher* is an artificially created, dyked enclosure for shrimp/prawn farming.



(Source: Department of Fisheries, Bangladesh)

Chart 2. Area under Ghers (ha)



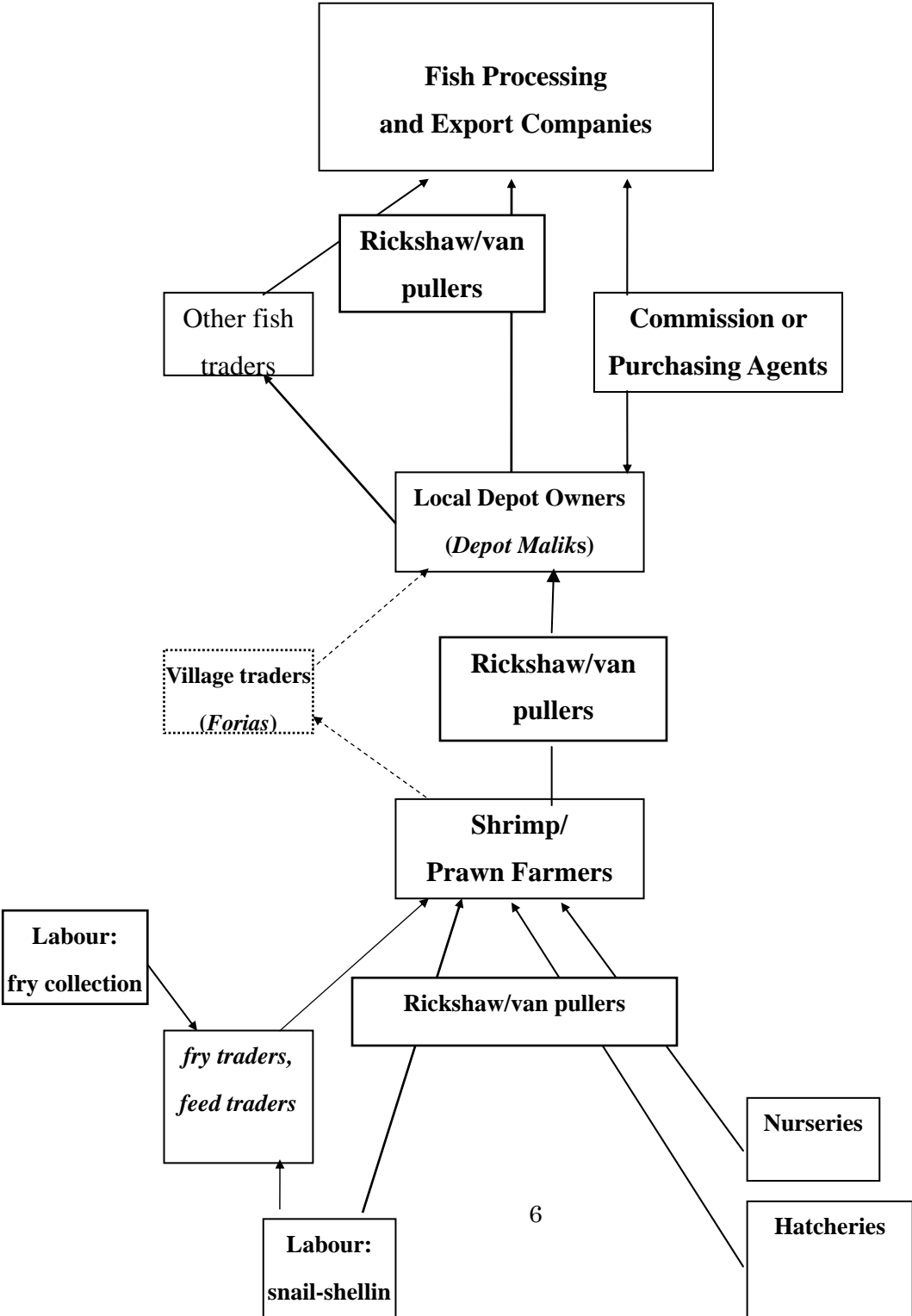
(Source: Department of Fisheries, Bangladesh)

While freshwater prawn farming and brackish-water shrimp farming involve many activities in common, the most significance difference between the two is the extent of small farmer involvement. In this paper I concentrate on the discussion of the value chain for freshwater prawns since the paper is concerned with the impact of standards on small producers.

4. The value chain for prawns

The export-oriented freshwater prawn industry in Bangladesh involves many stakeholders whose activities are loosely linked with each other, and are hierarchically (dis-)organized. These stakeholders include processors-cum-exporters, commission agents, small and large traders, money-lenders, prawn farmers, fry and feed collectors, processing plant employees, hatchery/nursery owners, and transportation agents including rickshaw pullers.

Chart 3. The local value chain for freshwater prawns



We can identify the five main layers of actors. At the top are the frozen fish processing and export companies located in a big town. At the next level are commission agents who buy prawns from local middlemen (depot owners) and sell them to the companies for a commission. Many of these commission agents are city-based wealthy businessmen who have easy access to bank loans. At the third layer are the depot owners, i.e. the storage owners-cum-fish-buyers, who purchase prawns from local producers at the bottom of the hierarchy, often through the local small traders known as *Forias*.

5. Prawn farmers and standards

According to Bangladeshi exporters and Fisheries Department officers (2003, personal interviews), frozen seafood products from Bangladesh suffer from 'image problems'. They fetch lower prices than the same products from Thailand. As a result, some Bangladeshi exporters have resorted to the strategy of re-packaging their products in Thailand. But the real challenge they face is not about the 'image'. In 1997, the European Commission (EC) banned the imports of Bangladeshi frozen seafood into the European Union (EU) on the basis of failing to meet their hygienic standards. The Bangladeshi shrimp/prawn industry was hit very hard by this ban. So were the individual producers in the villages of Bangladesh. The EC ban was followed by the biggest flood in history that hit Bangladesh in 1998. The two devastating events threatened the livelihoods of thousands of small prawn farmers.

The EC's action was in accordance with the Agreement on Sanitary and Phyto-sanitary Measures (SPS). The Agreement was negotiated during the Uruguay Round of the General Agreement on Tariffs and Trade (GATT) and was endorsed at the World Trade Organisation (WTO) in 1999. The Bangladesh government, together with the frozen seafood industry sector, dealt with the EC's action by introducing the Hazard Analysis and Critical Control Points (HACCP) programmes with the help of donors including FAO and USAID.

As a result of HACCP requirements, frozen seafood processing plants in Bangladesh are to be inspected and approved by the inspection authorities from the European Commission and the United States before their products enter these countries. It is not an easy task for a country like Bangladesh where production processes are not organised and systematic to implement the management system intended to satisfy the safety standards of developed country consumers. One of the key problems is the weak coordination of different activities involving prawn farming, fry collection and raising, hatching, feed supply, transportation, processing, and exporting activities. Aggravating the situation was the government's random issuance of permission to construct new processing plants, which has led to structural imbalances between production capacity at the farm level and processing capacity at the plant level. At present, there are a total of 166 processing plants in the country, of which only about 25 are in full operation.

This relatively small number of processing plants have been able to successfully implement HACCP, thanks to the concerted efforts by the government, the industry, aid agencies, and development NGOs. According to Cato, (ibid. p.1) an average cost of upgrading facilities to meet the minimum HACCP requirements was US\$239,630 over the period of 1997-98. The industry-wide expenditure is estimated to have been about \$17.6 million. The plants which could not afford the costs closed down their operations.

In the last few years, HACCP has been extended to the farm level, and this is creating significant changes in agrarian institutions. The most visible change concerns the considerable reduction of the number of depot owners and village traders (*Forias*) who mediate between farmers and depot owners. Under the HACCP rules, prawns must be brought directly to depot owners' shop floors by the farmers themselves. The grading of the prawns and the removal of their heads used to be conducted often within homestead compounds. However, with the introduction of HACCP at the farm level, the grading must be done using a standardised grading desk installed on the stone floor at a depot. The removal of the heads must be done only inside the processing plants. The use of bamboo baskets which were commonly used by villagers and *Forias* to carry prawns is now banned; they have to use plastic containers instead.

It is expensive to convert a simple wooden workshop to a concrete modern structure equipped with a standardised grading table and plastic containers. Here again, like the processing plants, only those who can afford this conversion can survive to get a license to operate as depot owners. *Forias* who used to forward an advance (*dadon*) to farmers are officially banned from the trade, though a few of them are trying to survive by building modern concrete workshops themselves nearer the villages to supply prawns to bigger depot owners located in the markets. A few others simply carry on, ignoring the ban, as depot owners do not always bother to inquire whether prawns are brought in by individual producers or not.

The reduction of the number of depot owners as well as *Forias* may have been inevitable in the long run. The increasing competition among them was already reducing their profits even before the HACCP rules were imposed upon them. However, if the extent of this reduction goes above a certain limit, as it seems to be happening at the moment, small farmers' access to an advance (*dadon*) will inevitably be reduced. *Forias* are becoming increasingly cautious in extending an advance to small farmers because of the high transaction costs associated with production risks. If many of them disappear from the value chain, not many of the remaining depot owners would take over the risk of providing it themselves to small prawn farmers.

As mentioned, the HACCP control system requires constant monitoring of all the activities at multiple points along the value chain. The easiest way to ensure this would be for larger processors to strengthen their control and to promote a greater vertical integration of the industry in which processors own and operate their own prawn farms. The exporters' association has already been lobbying for the government's permission to lease in the government's land to start semi-intensive culture, instead of the current extensive one. One of the implications of this switch is that the production system would become more centrally controlled, and that it would gradually go beyond the financial capacity of small farmers. In the long-term, this may create a more vibrant local economy and increase employment opportunities for the rural poor. However, there is no doubt that small farmers and the landless poor would pay a heavy price in the immediate future to cope with the changing production processes.

Conclusion

This paper examined the effects of compliance with food safety standards on small producers in a low-income country, taking the introduction of HACCP in the freshwater prawn farming industry in Bangladesh as a case study. As the various activities comprising the local value chain for freshwater prawns are not well coordinated within an effective governance structure, the introduction of HACCP is threatening to disintegrate the loose linkages between these activities. In its place is emerging the potentially centralized governance structure led by processors and exporters, who are keen to control and integrate the various activities along the value chain. This has the risk of reducing small farmer involvement in production.

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