

## **RESTRUCTURING THE VALUE CHAIN GOVERNANCE: THE IMPACT OF FOOD SAFETY REGIME ON FISHERY SECTOR OF KERALA, INDIA**

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### **ABSTRACT**

In this study we have considered the theoretical aspects of Global Value Chain and attempted to empirically validate the concepts by taking up a case study of Kerala in India. While examining the evolution of value chain dynamics, we have found different types of co-ordinations have governed the seafood export chain of Kerala from 1950s onwards. The evolution of Kerala's seafood industry from mid 1950s to late 1960s provides a good example of how captive form of co-ordination can evolve towards inter-firm governance structure. From early 1970s the value chain governance structure shifted from captive form to more or less a modular one. The vertical disintegration and division of labor were striking features during 1970s onwards. Subsequently, a large number of new entrants were attracted to the business until mid 1990s. In the recent international food safety regulations regime, the seafood value chain has been completely restructured. Concentration and consolidation is taking place at the processing node of the chain, wherein the number of exporters has come down and professional players are upgrading their position in the value chain. The pre-processing node of the value chain is getting integrated to the processing sector causing a major restructuring of the existing value chain. The study categorically proves that the international food policies can restructure the entire fish commodity chain of a developed country.

*Key words: value chain governance, food safety standards, fishery exports*

### **1. Introduction**

The proliferation and increased stringency of food safety and agricultural health standards<sup>1</sup> is a source of concern among many developed countries either because these countries lack the technical and administrative capacities needed for the compliance or because these standards can be applied in a discriminatory or protectionist manner. Therefore, it is important to understand the impact of such standards on various agricultural export sectors in the developing countries. Marine products have long been the most buoyant among Indian export lines. The demand for stringent hygienic standards in the production and processing facilities greatly increased, after the stipulation of Hazard Analysis Critical Control Point (HACCP) by United States Food and Drug Administration (USFDA) and European Community (EC) directives (especially EC91/4937). The Government of India responded to these developments by taking important steps to maintain higher quality standards in accordance to the safety regulation requirements of the importing countries. The Seafood Exporters Association of India (SEAI) claims to have spent US\$25 million on upgrading their facilities to meet the food safety regulations of the importing countries. The resultant impact on the structure of the supply chains can have significant economic and social consequences for developing countries.

In the present study we put forth the hypothesis that, the evolving stringent food safety standards imposed by the developed countries will have ripple effect along the entire supply chain originating from the developing country which may cause a possible re-shuffling and re-structuring of the entire supply chain. The study comprehensively covers the entire seafood value chain (including the up-country market) using the theoretical frame work of Global Value Chain. Global value chains (GVC) refer to the set of intra-sectoral linkages between firms and the other actors through which the geographical and organizational reconfiguration of global production is taking place. The GVC analysis highlights the concrete practices

and organizational forms through which a specific division of labour between lead firms and the other economic agents involved in the conceptualization, production and distribution of goods in global industries is established and managed (Gereffi, 1996). The main objective of the study is to find out, how the evolution and changes in Kerala's<sup>2</sup> sea food export value chain governance took place over various time periods, how the food safety standards determining the governance structure of the seafood export value chain in Kerala. The study attempts to analyze the structure and characteristics at each node of the value chain in terms of what kind of activities and functions are performed; how these activities and functions are carried out, how food safety regulations modify them, who are the actors involved, and how value added is distributed along the value chain.

The study is organized into five sections including the introduction. Section 2 discusses the global value chain methodology and evolution of the concept through a brief literature survey. The section also throws light on empirical studies carried out using GVC concept. Section 3 examines evolution and characteristics of value chain dynamics of Kerala seafood export sector during the period 1950s to mid 1990s. The analysis was carried out for two periods and accordingly the section is also subdivided into two. Characteristic of seafood value chain in the food safety regime is analyzed in section 4. Different nodes of the present seafood export chain, revenue distribution along the chain and more importantly the governance structure of the seafood value chain in the context of food safety regime is covered in the section. Section 5 provides a general summary of the study.

## **2. Global Value Chain methodology: A brief literature review**

The analytical register of the commodity chain concept was reoriented by Gereffi (1994), who developed a frame work for the study of what he called Global Commodity Chains (GCC). He viewed these chains as an emergent property of economic globalization. One of the central contentions of the GCC approach is that the internationalization of production is becoming increasingly integrated in globalized co-ordination system that can be characterized as 'producer driven' and 'buyer driven' commodity chains (Gereffi, 1996). Commodity chains are defined as sets of inter organizational networks that reveal the social embeddedness of economic organization and permit an analysis of macro-micro links between processes that are generally assumed to be discretely contained within global, national, and local units of analysis Timothy sturgeon's work on contract manufacturing in electronics hypothesizes that value chain modularity represents a mode of industrial organization that is not only neither market nor hierarchy but more accurately could be described as networks (Sturgeon, 2002). He emphasized on exchange between suppliers and clients where the highly competent supplier offer full set of services to the clients without great deal of assistance from the lead firm. The type of network relationship he explains as 'modular'. Compared with the relational networks modular networks are characterized by lower degrees of mutual dependence and a greater reliance on codified knowledge, where he argues that standards and codifications are synonyms of trust and they produce an outcome that is similar to what may be observed in long term, relational networks.

In continuation Gereffi, et al. (2005) proposed the theory of 'governance structure' between the poles of hierarchy and market: captive networks, relational networks and modular networks. As compared to the latter two, the first category describes relationships that are more asymmetrical, as lead firms that have invested in developing the skills of their suppliers seek to lock them into a relationship, thus making them captive. Relationship networks are likely to find when firms need to exchange complex information that cannot be codified, thus requiring frequent, face to face interaction.

Research on firm upgradation across value chains suggests that upgrading at times act as process of exclusion, particularly in developing countries (Gibbon, 2001). A study on Kenyan horticulture and Indian textile chains carried out by Dollan and Tewari concluded that, changes in both value chains associated with process upgrading on the part of the largest firms severely circumscribe the future

upgrading prospects of smaller players (Dollan and Tewari, 2001). The regulatory context in which international production networks are established and operate is an important element affecting the extent to which developing country exporters in particular benefit from their participation in commodity chains. Gereffi et al. (2005), emphasize the modular governance structure of the fresh vegetable value chain in explaining the relationship between African exporters and European importers. On the other hand, Chris Stevens's analysis of the EU market for agricultural products shows that trade policy rents in this sector influence the value chains linking suppliers to the EU markets (Chris Stevens, 2001).

Stefano Ponte (2002), documents, how changes in the International Coffee Agreement regime have negatively affected developing country exporters; from a balanced contest between producing and consuming countries within the politics of international coffee agreements, power relations shifted to the transnational corporations. A relatively stable institutional environment, where proportions of generated income were fairly distributed between producing and consuming countries turned into one that is more informal, unstable, and unequal.

In their study of the Chilean salmon farming industry Phyne and Mansilla (2003) demonstrates that the relationship between the different links in the commodity chain, and in particular the organization of work in Chile's salmon firms, reflect in large measure the historically derived social relations in the Chilean salmon farms. They analyze the importance of class structure and local power relations in explaining both organization of export oriented aquaculture industry and the extent to which domestic capital and labour have benefited from expansion of salmon farming.

Humphrey (2006) observes that, the global agrifood business is increasingly dominated by value chain relationships in which lead firms exercise vertical coordination. In many parts of the business, lead firms have taken on the characteristics associated with modern manufacturing; including driving product differentiation and innovation, a shift from quality control, based on inspection and testing towards quality assurance based upon risk management and process controls (the hazard analysis critical control point). Studies of agribusiness refer to these types of linkages as 'vertical coordination' to distinguish them from arm's length market relationships or the vertically integrated enterprise (Van Roekel et al 2003).

On the other hand, most of the value chain literature does not regard the actors in the different nodes of chains as players who can generate power or changes, unless they represent the coordinating and controlling lead firms. Rammohan and Sundaesan (2003) argue that this could lead to a dedicated production path with no attention made to how the nature of the value chain is shaped by social relations and human interactions. The horizontal network relations are often neglected in value chain analysis since studies mainly focus on flows and input-output system of the chain. Therefore the analyses tend to ignore the nature of the specific nodes and also how the flows and input output system of the chain are linked in horizontal network relations which carry the attributes of actors in each specific nodes of the chain. Although, the GVC framework of analysis captures some important elements that determine the form of co-ordination between actors at different functional positions in a GVC, it has only limited explanatory power to determine the overall form of governance. GVC may be characterized by different forms of co-ordination in different segments. In the coffee value chain for example market relations characterize the link between retailers and roasters, captive relations the link between roasters and international traders, and hierarchy or vertical integration is observed in international trader- exporter link. Yet the overall value chain is buyer driven (Ponte, 2002).

Harilal et al., (2006), studied the India-UK cashew value chain and analyzed the specificities of the export chain and its implications for workers in the processing industry in India. The authors examine the consequences of buyer-driven chains, in the changing global context, for cashew producers and

processors in India. The analysis indicates that concentration and consolidation in the power of retail giants tend to drive down the terms on which in-country suppliers and other even less powerful actors engage in the production and processing of cashew nuts. They also have observed that in response to the increasing concentration at the retail level, the penultimate node (food processing and distribution) has also been trying to consolidate and establish countervailing power by way of takeovers, mergers and acquisitions.

An analysis of empirical works on selected agro food (Citrus, cotton coffee, and chocolates) value chains from Africa (Fold and Larson, 2008, Gibbon and Ponte 2005) highlights that all chains shows a trend toward buyer drivenness and are unipolar, that is the chains are driven by one functional leader. In such chains, lead firms have relatively loose form of co-ordination with their immediate suppliers. However the lead firms have to seek tighter forms of coordination with actors upstream, sometimes even vertically integrate this means that relatively looser form of immediate coordination may coexist with high levels of drivenness which is achieved through the codification and standardization of quality and performance requirements.

We are attempting to visualize the seafood export chain through the lens of global value chain theoretical frame. As far as the value chain structure in the recent food safety regulations regime, the insights obtained from field study conducted in *Eranakulam* and *Alapuzha* districts of Kerala was utilized. During the field survey, we have covered twenty seven processing units and thirty two pre processing centers and great deal of information was collected through informal discussions with stake holders of the seafood export sector. Commission agents of European importers were especially provided detailed information regarding the way of functioning at the downstream end of the chain. Moreover, they have provided the contact details of overseas importers whom with they are dealing. Twelve importers responded positively to our queries and the information provided by them supplemented with our readings on downstream markets become very crucial inputs for the study.

### **3. Evolving characteristics of value chain dynamics**

#### ***3.1. Kerala's Seafood Industry from 1950s to late 1960s: Dominance of captive value chain***

The evolution of Kerala's seafood industry from mid 1950s to late 1960s provides a good example of how captive form of coordination can evolve towards inter-firm governance structure. From 1963 the number of exporting firms increased rapidly. The viability of the industry was well established by then. The profit potential, the nature of market and the growing demand roped in many. The devaluation of Indian rupee in 1966 gave a big push to exports (Shajahan 1987). Financial and technical support from the buyers of USA was inherent in the system of trade carried out with the US importers: This helped to establish the local firms in the trade and develop their contacts and expand their business.

The consignment system of sale was reflecting more or less a patron-client trade relationship between the Indian exporters and the US buyers till 1971. In this contractual tie up each exporter shipped his product to one particular importer. Exporters were given open orders by the importers without specifying quantity and size and, therefore, he did not have to worry about the market. At the time of shipment, the exporters were advanced 60 to 80 percent of the estimated value of the product. This roughly covered the cost and freight charges of the commodity and enabled the exporters to utilize the funds for purchase of raw material. The remainder of the amount was remitted to the exporter after the product was sold in USA. Direct costs, together with the agent's commission would be deducted from the proceeds (Mathew, 1986).

Under the long term contractual arrangement the importers were assured of getting the shipments on regular basis from the same source and hence they kept their exporters furnished with the latest and

protected market reports and trends and also passed on the information on the technical and technological developments in the industry and made suggestions for packaging, improvement of quality, methods and style of packing in order that the product met with specific US market requirement all the times (MPEDA, 1982). During the initial stages of development of the seafood industry, the consignment system indubitably helped a number of exporters to establish their units here and export their products abroad. The buyer often opened a red clause 'letter of credit' enabling exporters to draw money in advance from banks to purchase raw material, process and export. Since the buyer had a heavy stake in the trade, he supported the exporters to the maximum extent possible, there by ensuring regular flow of merchandise to him. Since the exporters did not have undue worry about securing finance for their operations and finding markets for their products, they were able to establish their business on a sound footing. In some cases importers even helped the exporters by supplying machinery like plate freezers. Thus during the nascent stages of seafood export industry in Kerala (during 1960s) the support from US buyers was remarkable, considering there was only marginal assistance from state during the period.

Looking through the lens of global value chain governance it is very much evident that the seafood chain from Kerala during this period has experienced a captive form of co-ordination from the US buyers where the US buyer had the ability to codify in the form of detailed instructions about the highly complex product specifications. On the other hand Kerala's seafood industry was in the nascent stage with low supplier capabilities, thereby the value chain governance tends towards the captive type. This is because the low supplier competence in the face of the complex product specification requires a great deal of intervention and control on the part of the lead firm, encouraging the build up of transactional dependence as lead firms lock-in suppliers from reaping the benefits of their efforts. Captive suppliers are dependent on the lead firm for complementary activities such as design, logistics and process technology upgradation. In the above discussion we have already seen the intervention of US buyers in the aspects of technology and knowledge transfer and financial facilitation through liberal sale system. In the upstream end of the chain we could identify the vertical integration of firms during mid 1950s. It was inevitable for the firms to own fishing fleets and pre-processing facilities because during this period there was negligible autonomous expansion in trawler fleet by fishermen themselves and hence it was essential that these firms invest in boats to augment production and exports.

Most of the firms entered in the 1950s and early 1960s were fully integrated. The proportion of partially integrated and non integrated firms increased towards the later half of the decade. This was largely due to the emergence of unutilized capacity in the industry coupled with the steady growth of production where trawling become more important source of prawns. Table 1 depicts the details on number of exporters and their market share during mid 1950s to late 1960s. It is worthwhile to note that until 1966 the major export share went to USA and by the beginning of the 1970s the presence of Japan has become more apparent with their market share of 30 percent export from Kerala.

Table 1. Exporters in Kerala and market share of USA and Japan in percentage of export value

Year	No of exporters	Market share in percentage	
		United States	Japan
1957	4	100	-
1962	8	92	3
1966	27	78	14
1970	53	47	30

Source: Compiled from Shajahan, 1987 and Mathew, 1986

### ***3.2. Seafood industry of Kerala, 1970s to early 1990s: From captive to modular value chains***

From early 1970s onward the governance structure of Kerala seafood industry highlights the dynamic and overlapping nature of the global value chains. Here, we observe the increasing capabilities

of the supplier had helped them to shape the architecture of the global value chain from captive networks to modular network. As we have already discussed in the earlier, the buyers of United States helped Kerala's exporters to have a strong foot hold in the export sector, and subsequently helped in the development of trade with Japan who paid relatively higher unit prices than US. However, during post 1970s the consignment system of sale replaced with outright sales<sup>3</sup>, wherein Japan who had become the major trading partner preferred the latter system of sale. By that time availability of liberal credit market at home was a boom for exports. Thereby, with the help of buyers from USA, the competence of the suppliers had increased during this period and they were in a position to switch over or rather include another major trade partner who had provided better unit price than the USA.

During 1970s onwards frozen shrimp export market in India shifted completely in favour of Japan mainly because of the higher prices being offered by them. The Japan maintained around 70 percent market share from mid 1970s to early 1980s, while the share of USA came down during this period. The period saw the end of the consignment system of sale and emergence of the outright system of sale. The consignment system of sale discontinued due to the emergence of Japan as the most important trade partner of Indian shrimp, who preferred out right system of sale.

Moreover with the liberal credit policy from 1971 onwards, the dependence of Indian exporters on American buyers has been reduced considerably. Increasing support was provided by the state in the 1970s in the form of loans and subsidies for setting up freezing plants and for the purchase of trawlers. More importantly the credit policy of the commercial banks was liberalized *vis a vis* the seafood export sector. The enhanced prawn production and the phenomenal growth of the value of output in an environment of government support promoted the entry of large number of firms into the seafood export sector. Number of firms was observed to be 224 in 1982 while it was only 53 during 1970 (MPEDA 1982).

The shrimp production which was peak at 85,000 tonnes during 1973 has declined to 27,000 tonnes in 1982. The raw material scarcity coupled with entry of the large number of exporters intensified the competition in the processing node. During the period 1975 to 1983 the top ten percent of export firms increased their share from 38 to 53 percent. The increased concentration was mainly due to the competitive edge of large established firms in regard of procurement, ability to get export orders, and their command over processing capacity. In the procurement market whenever necessity arised, large exporters ensure their export share of raw materials by giving additional incentives to suppliers of prawn in the form of premium procurement prices, and advances for auction. They also enjoyed tremendous credibility with importers due to their promptness in executing the shipping orders. The competitive edge of the established large exporters manifested in the context of their tussle with the large business houses and multinational corporations who eventually had to leave the industry. The local exporters pressurized the MPEDA to come out with policy recommendations in favour of them (Kurien 1978). The MNCs entered the frozen prawn industry from early 1970s. They become a threat to already established large exporters due to their aggressive procurement strategy through their all India procurement networks. More over they adopted indirect procurement through small processing firms with dormant processing capacity, to which they offered interest free loans and commissions. These state of affairs allowed the small processors to compete with the already established large exporters. Consequently, the established firms found it is difficult to compete with the MNCs. Perceiving the threat to their monopoly they made representations to the Government of India through MPEDA to curb the activities of MNCs in frozen prawn industry. As a result Ministry of commerce appointed a committee in 1975 to enquire (MPEDA 1977). Through the committees recommendations government tightened the export policy against the MNCs and consequently, almost all the large business houses and MNCs left the seafood industry by late 1970s. It is very interesting to observe the emergence of a group of large established exporters of Kerala as very influential and powerful actors in the processing node of upstream seafood value chain. In fact

these groups of firms enjoyed major share of export value from Kerala during those time and as we have already discussed they could afford high price procurement strategy to ensure the supply of raw materials. The moment they realized the threat of MNCs they could even create a strong barrier to entry through their political clout.

Even for the fully integrated firms, the total catch at times from their own fleet is much less than their export orders which compel them to procure from other sources. The primary processing were carried out at peeling sheds either by the export firms own labour force or through contractual arrangements. Towards the late 1960s due to the advent of labour welfare measures, exporters started to detach primary processing from their activities. Consequently the suppliers of whole prawns started to set their own peeling sheds and started to supply peeled shrimp. All the firms irrespective of their level of integration procure directly from fishermen, peeling contractors or through agents. The period witnessed the evolution of more disaggregated production and processing of shrimp at the upstream end, with the emergence of independent pre-processors in the seafood industry. From mid 1980s through early 1990s witnessed intense competition between firms in the face of declining prawn production resulted in increasing economic concentration resulting in the exit of a large number of firms from the industry by the mid 1980s. The strongest firms had the control over fresh prawn procurement and the credibility with the foreign buyers.

#### **4. Seafood value chain during the food safety regime**

In this section, the present seafood value chain of Kerala in the context of food safety regulations is explained. Here to avoid any ambiguity regarding the chain process, shrimp export chain is analyzed exclusively, shrimp is the major export item which contributes the highest value share of seafood exports from India. The information about the up stream end of the chain was collected from the survey conducted in *Eranakulam* and *Alapuzha* districts. Most information was obtained from interviews and from published information and references. The information about the down stream end of the value chain was mostly collected from commission agents of the European importers. We could also establish some contacts with the European seafood importers through e-mail and the information shared by them were very much helpful for the analysis.

##### ***4.1. Distribution of value added along the chain***

This section examines the distribution of value added along the shrimp export chain of Kerala from fishers to supermarket shelf. As explained earlier here we are considering the export of shrimp from Kerala. The figures provided in the Table 2 are average estimate from the data we have collected from respondents. As far as downstream end (up country market) of the chain is concerned, we have considered the information provided by the commission agents of European importers (buyer's agent) in Kerala and also the information provided by some of the importers through e-mail. Table 2 provides information on the prices paid at key transaction points along the chain, and the price level as a proportion the retail price as shrimp moves from catch to consumption. The landing site price for shrimp is about 23 percent of the final retail price, which increased to 38 percent of the retail prices at the export point. Among the actors operating in the chain the largest value addition is made by supermarket chain in shrimp. We may also observe that the margin realized by the actors keep on escalating as we move downstream of the value chain. More value addition and more profit realization of the supermarkets clearly reflect the power they could exert in the chain.

Table 2. Revenue distribution along the seafood chain

Value chain node		Price (Indian rupees/kg)	Price as proportion of retail price (%)
Landing site	Price paid to the fisherman/boat owner	140.50	23.35
Auction agent	Price paid by peeling shed owner/commission agent	146.50	24.35
Peeling shed	Price paid by exporter/agent (A)	156	25.93
Exporter			1.55
	a) Conversion cost	9.3	2.31
	b) Overhead cost	13.9	3.86
	<b>c) Total cost of production (B)</b>	23.2	0.00
	<b>Selling expenditure</b>		0.54
	a) Packing charges	3.25	1.66
	b) Freight charges	10.01	0.93
	c) Interest on working capital	5.62	0.00
	d) Interest on term loan	0.52	0.09
	e) Other selling expenses	3.9	0.65
	<b>Total selling expenditure (C)</b>	23.3	3.87
	Total cost of export (B+C)	46.5	7.73
	<b>Exporters margin D-(A+B+C)</b>	<b>25.9</b>	<b>4.30</b>
Importer/agent	Price paid to the exporter (D)	228.4	37.96
	Cold chain transport and other expenses (E)	22.4	3.72
	<b>Importer/Importers agent's margin F-(D+E)</b>	<b>38.6</b>	<b>6.41</b>
Whole sale importer	Price paid to the importing agent(F)	289.4	48.10
	Value addition(G)	32.1	5.33
	<b>Importer re-processors margin H-(F+G)</b>	<b>70.10</b>	<b>11.65</b>
Supermarkets	Price paid to the importer-reprocessor (H)	391.6	65.08
	Value addition and branding(I)	60.12	9.99
	<b>Supermarkets margin J-(H+I)</b>	<b>150.00</b>	<b>24.93</b>
Consumer	Price paid at retail outlet (J)	601.72	100.00

#### 4.2. Governance structure of seafood value chain: Changing power relations

Food safety regulations and standards have an impact on value chains in two particularly direct ways: on the extent and codification of information required to sustain transactions and in their impact on supplier competence (Humphrey, 2006). If a standard involves processes and certification, the information requirements may be limited to documentation of compliance with the standard, resulting in virtually no effect on value-chain governance. However, while process standards tend to prescribe how particular outcomes should be achieved and provide systems for verifying that processes are in place to achieve them, product standards usually identify a required outcome. Thus, for instance, EU legislation on MRLs merely specifies that pesticide residues should be below the specified levels, without any indication of how this outcome should be achieved. In the short term, this could mean increased levels of information flowing along the value chain as buyers attempt to monitor and control production practices at points removed from their own operations. Alternatively, buyers may restrict their purchasing to a small number of suppliers whose competence is well established.



The second major impact of standards on value chains, concerns the issue of supplier competence as an important factor in determining value-chain governance. New standards requirements frequently change the level of competence required from suppliers. Suppliers who were competent enough to meet the previous requirements may suddenly find themselves not competent enough to meet the new rules. There are two possible responses to this situation. The first is for the suppliers to be supported by other firms from within the value chain. This is most likely to happen when the new 'supplier incompetence' is widespread, with the result that there are shortages of produce meeting the new standard. The second response is for buyers to switch to suppliers who can meet the challenge. This is the response that tends to marginalize small producers. Marginalization also occurs when the monitoring costs associated with using small farmers are increased as a result of the introduction of new standards.

In the upstream processing node of Kerala's seafood export value chain we could find that institutional support of the state (Govt. of India) was fairly positive in addressing the changes in the regulatory scenario in major export markets. Faced with restrictions on exports of fish and fishery products to the EU in 1997, the India government responded rapidly with the imposition of quite onerous requirements that were designed to demonstrate that it was to comply by the end of 1997. Similarly, when residues of antibiotics and bacterial inhibitors were detected by EU authorities in shrimp during 2002, the Indian government was quick in imposing strict controls on antibiotic use. These actions have imposed considerable costs on the processing sector (Henson, 2008). At the same time, these controls have undoubtedly been critical in maintaining market access and in preventing additional restrictions from being imposed.

Recognizing the potential impact on the fish processing sector and the constraints that it faced in achieving compliance, the Indian government has differentiated the standards that exporters must meet in supplying the EU and other overseas markets. Exporters to non-EU markets were granted a longer time to integrate preprocessing operations and to source from approved independent preprocessors. This pragmatic strategy focused attention on maintaining access to EU markets while sustaining pressure for upgrading of standards across the processing sector as a whole and to enable effective responses to emerging quality related issues. Significant investments have also been made in inspection and laboratory testing capacity. The sector has witnessed a paradigm shift regarding the way it was functioning. There were upgradations both in the facilities and procedures in the sector. Marine Products Export Development Authority (MPEDA) and Export Inspection Agency (EIA), Cochin are the institutions which are the major actors of the horizontal segment of the processing node of Kerala's seafood value chain. Alongside regulatory measures, the MPEDA has implemented programs to support improvements in hygienic controls and other food safety practices in fish processing. These include subsidy programs for upgrading processing facilities and training managers and workers through the supply chain. Many enterprises made significant investments to upgrade their processing facilities and implement stricter hygiene controls. We have already estimated, based on our survey that, the average compliance cost across the seafood processing firms was found to be US\$0.40 million, which is at least a modest indicator of the investment cost spending per processing unit for maintaining market access to the EU. The changes required to comply with the hygiene requirements varied significantly among fish processing plants. In extreme cases, plants had to be extended or the entire layout needed to be changed. According to the majority of the exporters the integrated pre-processing facility was the major item among the compliance cost components. In fact the integrated pre processing facility is a mandatory requirement according to the Export Inspection Council of India (EIC).

We found that, some export units did the necessary adjustment for compliance proactively, anticipating the need to operate to stricter hygiene standards and building such considerations into the design and operation of new or upgraded facilities. Others waited until the government required them to improve their operations. Some that were unable to fund the required investment either exited the sector or relied

on working capital, compromising their ability to source raw materials. It is widely recognized in the fish processing sector that, for smaller exporters, two or three rejections can close a unit. Therefore, many processors have made efforts to spread their risks by diversifying their market base between the European Union, United States, and Japan. Some have diverted sales to less challenging markets such as China, the Middle East, and Singapore.

Despite the upgrades in facilities and procedures, both EIA and MPEDA were unable to perform all of the tests for residues and contaminants required, especially for exports to the EU. In fact, they are caught up in a seemingly continuous process of equipment upgrade and staff training to keep on top of emerging issues. Keeping up with current requirements is an issue particularly for contaminants for which the limit is set at the Limit of Determination (LOD)<sup>4</sup>. As new testing equipment is installed in export markets, previously undetectable residues become an issue, and the regulatory authorities in India must themselves upgrade their testing capacity to prevent border detentions.

We have observed that, in Kerala, concentration and consolidation is taking place at the processing node of the seafood export chain wherein the number of exporters has come down and professional players are upgrading their position in the value chain (Table 3). The most important aspect of the existing chain is the gradual disappearance of the independent pre-processing sector which has been an important stakeholder of the seafood value chain. The pre-processing node of the value chain is getting integrated to the processing sector causing a major restructuring of the existing value chain. The shift to integrated preprocessing by EU-approved processing facilities led to the closure of a significant number of independent preprocessing operations. At the same time, however, installed capacity has actually increased, reflecting the consolidation of the sector.

Table 3. Change in concentration of seafood firms in Kerala

<b>Year</b>	<b>Number of firms</b>	<b>Industry (USD million)</b>	<b>Turnover/firm (USD million)</b>
2002-03	216	215	1.00
2003-04	178	243	1.37
2004-05	161	257	1.60
2005-06	146	285	1.95
2006-07	140	339	2.42
2007-08	138	360	2.61
2008-09	132	396	3.00

Source: Authors' compilation based on survey

While examining the major down stream end of the seafood value chain of Kerala, which is Europe, we may observe that over the past 10 years, numerous food scandals occurred in this region. European consumers, who are in general sensitive to food safety, were alarmed by Bovine Spongiform Encephalopathy (BSE) and dioxin problems and scared by, among others, salmonella, listeria, and cholera threats. The European Union responded by imposing tighter food safety requirements, including higher standards, use of HACCP, increased monitoring, product liability, and labeling. The White Paper on Food Safety of January 2000 (CEC 2000) sets out plans for a proactive new food policy. The General Food Law Regulation EC No 178/2002 entered into force on 21<sup>st</sup> February 2002 and is implemented from 1<sup>st</sup> January 2006 outlined requirements for tracking and tracing in the supply chain. More over all the EU member states tightened their own food safety control systems and implemented the European Commission's new food safety legislation and monitoring requirements in their national systems. There has been increasing pressure on EU importers both by EU and National Authorities and the public to ensure that the product they sell in the EU market place is completely safe and constitute as low a risk to

human health as can be technically measured. Private companies, individually as well as collectively, also implemented measures to prevent food safety scandals. The retail sectors in the United Kingdom and the Netherlands have developed their own private standards for food safety and quality, some of which exceeded the public food safety regulations. In 1998, UK retailers cooperating in the British Retail Consortium (BRC) took the initiative to formulate common standards to inspect food suppliers. The BRC standard and other private Codes of Practice (COP) and standards, such as EUREP-GAP<sup>5</sup> and SQF<sup>6</sup>, are now applied by supermarkets and importers all over the world to coordinate supply chain activities and control food safety (Willems, Roth and Rorkel, 2005).

All the respondents we could contact perceived food safety control as one of the highest priorities within the fishery sector. Retailers in particular are held directly responsible by their customers for the safety of food. However, retailers, in turn, pass this responsibility on to their importers and processors by developing strict food safety and quality protocols. According to the respondents, consumers increasingly are willing to pay premium price for safe products. Labeled or branded products are differentiated from other products and guarantee food safety and quality. In the case of private labels or brands, retailers are directly responsible for food safety and keep close contact with all actors in the value chain. This has led to a proliferation of sector oriented Codes of Practice (COPs) incorporating a range of standards relating to all the elements that make up the food management chain (growing, processing, handling etc) (CTA, 2003). With the growth in the number of COPs, has come an associated increase in the power of the large retail chains. Consolidation within the EU in the retail sector has resulted in an increasing concentration of power in the hands of a decreasing number of importers of food produce. Large supermarkets have consistently expanded their range of produce in the recent period to include foods that were previously supplied by small specialist outlets such as fishmongers and butchers. Many of these outlets have now vanished leaving management of the food chain in the hands of large retail chains that are fighting each other for market share. Will and Guenther (2007) observes that that eventually perhaps 15 huge retail chains will control 80 percent of the fresh produce sales to an expanded EU population of 455 million. Such concentration of power in the hands of importers in developing countries major export markets basically moves the primary decision-making away from the developing country to the importing EU bloc.

In some instances, this may not matter but a clear danger exists that in their quest for market share some retail organizations may seek to exercise their power over the chain of supply to impose non-SPS conditions on the various suppliers within it. Examples exist in the UK of supermarkets seeking to differentiate their produce from their competitors by requiring that suppliers also abide by social or environmental standards. Where these are incorporated under the umbrella of a SPS COP to be met by exporters it is clear that extra costs are being imposed that have nothing to do with the characteristics of the SPS Agreement. An additional consequence of the increased pressure for 'safe' products on EU importers is their growing preference to deal only with large production units in developing countries. This reduces the level of risk to the importers, as large producers are more able to undertake the compliance measures than small producers are. Unfortunately, for developing countries, this can result in the smaller producer being totally excluded from its major export market. Which has already happening in the processing node of Kerala seafood export value chain These observed changes in the structure and *modus operandi* of export supply chains, *per se*, are not attributable to the imposition of stricter food safety standards alone. Rather, the challenges of compliance with these standards acted to exacerbate existing competitive pressures that in turn reflected prevailing market and economic conditions.

Proponents of the large retail importers justifiably contend that they assist their suppliers by helping them form cooperatives capable of supplying consistent and quality controlled volume exports and supplying technical training and inspection services. This is obviously to the benefit of those companies that are involved with the importers but the impact on the country and sector may be to effectively stifle any new

entrants to exporting. The results from the field study of the upstream value chain apparently support this argument. We have found that few exporters who were well established and updated with the development of food safety standards of the export destination were well prepared and proactively carried out the necessary precautions. In turn, they were benefited during the crisis by increasing their market share in the export markets. It may also be argued that while the favored exporters are benefiting from this arrangement, the relationship is not one of the equals. These 'first movers' were able to repay their debts at an earlier stage and offset them against greater returns. Very few of the facilities that delayed compliance are performing well; most are struggling to repay loans while operating under conditions of lower margins and struggling to pull together the working capital to source raw material. The exporter has little bargaining power and can be subject to pressure from the importers chain managers to change the production methods, cut labour costs, and impose new social standards etc. so that the retailer can maximize the commercial advantage from the relationship.

The main difference lies in the degree of sophistication of the requirements, which get more complex as the coverage of the chain increases. For instance, processing include extensive risk management systems and technical control points such as in the HACCP system. Increasingly importers are exerting their influence over greater part of the chain. This is forcing the hitherto independent players in the chain into closer trading relationship with their importing customer. Whilst obviously positive in terms of reducing food safety risks, overall the situation also can create a dependency on importer, which can be to the disadvantage of elements in the down stream supply chain.

However the present seafood value chain from Kerala can beyond doubt put in bracket of buyer driven chain or directed network. The concentration at the downstream end of the chain has its ripple effect all along the chain. This can al. The most important aspect of the existing chain is the gradual disappearance of the independent pre processing sector which has been an important stake holder of the seafood value chain of Kerala. The pre processing node of the value chain is getting integrated to the processing sector causing a major restructuring of the existing value chain. At the upstream end of the chain we may observe different type of coordination; varying from arm's length transaction to relational co-ordination, and even vertical integration.

## 5. Conclusions

We have initiated this study with the hypothesis that, the evolving stringent food safety standards imposed by the developed countries, will not only affect the export firms alone but also the entire supply chain will be restructured accordingly. The present paper traces, how the evolution and changes in Kerala's sea food export value chain governance took place over various time periods, how the food safety standards determining the governance structure of the seafood export value chain in Kerala. The paper attempts to analyze the structure and characteristics at each node of the value chain in terms activities carried out, functions are performed and how the implementation of food safety regulations modify them.

During mid 1950s to late 1960s, US importers effectively intervened in the downstream end by providing all possible supports in the aspects of technology, knowledge transfer and financial facilitation. The nascent stage seafood export industry has developed as capable exporters during this period. We have also witnessed vertical integration of down stream end where the processors themselves owned the fishing boats and preprocessing functions were also carried out by the processing units. Nevertheless the seafood sector during that period was exclusively dependent on US markets. From the early 1970s, Japan emerged as a competing importer of seafood from Kerala especially shrimp. By this time the exporters has developed the competency and capability and a number of large export houses entered into the business. The switch over cost from US markets to Japanese market was very less, and with the increase in supplier competence the value chain coordination also shifted from captive form to modular type of coordination.

The vertical disintegration and division of labor were striking features during 1970s onwards. Separate pre-processing centers were established and become functional during mid 1970s onwards. A large number of new entrants were attracted to the business until mid 1990s. In recent food safety regulations regime, the seafood value chain has been completely restructured. Most striking feature of the present seafood value chain of Kerala is the absence of the earlier dominant pre processing hubs.

The shift to integrated preprocessing by EU-approved processing facilities led to the closure of a significant number of independent preprocessing operations. At the same time, however, installed capacity has actually increased, reflecting the consolidation of the sector. These observed changes in the structure and *modus operandi* of export supply chains, *per se*, are not attributable to the imposition of stricter food safety standards alone. Rather, the challenges of compliance with these standards acted to exacerbate existing competitive pressures that in turn reflected prevailing market and economic conditions. The study demonstrates the possible sectoral impact of the international policy changes like that of stringency in the food safety regulations on the developing countries. In the present case of seafood value chain from India, a thorough overhauling of the entire value chain was experienced. From the long term policy perspective, India should upgrade the national system for testing, certification and laboratory accreditation so as to be at par with the prevailing international trade regulatory safety parameters. In this regard, it is also important to focus on proactive capacity building activities in the entire seafood value chain of the country.

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<sup>1</sup> A broad definition of standard includes mandatory technical regulations as well as voluntary agreements on the quality characteristics of goods and services.

<sup>2</sup> Kerala is a state in India and one of the major contributors in the marine products export from the country. The case of seafood exports from Kerala provides a manageable case study that throws light on the challenges faced by exporters in India as a whole. At the same time, it highlights the particular challenges faced by the Kerala seafood sector that reflect the distinct manner in which it has evolved.

<sup>3</sup> A system of sale where full amount of the negotiated price is paid by means of a letter of credit

<sup>4</sup> The limit of determination (LOD) is the lowest concentration of a pesticide residue that can be measured using routine analysis (<http://www.pesticides.gov.uk/>)

<sup>5</sup> EurepGAP is a private sector body that sets voluntary standards for the certification of agricultural products around the globe. (<http://www.eurepgap.org>)

<sup>6</sup> The SQF (Safe Quality Food) Institute is a division of the Food Marketing Institute (FMI), established to administer the SQF Program, a leading, global food safety and quality certification and management system. (<http://www.sqfi.com>)