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Designing a cooperative strategy for quality fish export supply chain: the case of PANGA Company in Vietnam

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List of abbreviations

BRC	British Retail Consortium
CCP	Critical Control Points
EU	European Union
FVO	Food and Veterinary Office
GAP	Good aquaculture practices
GHP	Good Hygiene Practices
GMP	Good Manufacturing Practice
HACCP	Hazard Analysis and Critical Control Points
MOFI	Ministry of Fisheries
NAFIQAVED	National Fisheries Quality Assurance and Veterinary Directorate
QAS	Quality assurance system
RDA	Resource dependency approach
SSOP	Sanitation Standard Operation Procedures
SCM	Supply Chain Management
TCA	Transaction cost approach

Abstract

This study focuses on the Pangasius supply chain quality management perspective of a Pangasius processing/exporting firm in the Mekong Delta, Vietnam. It applied networking concept enabling the firm to obtain the required resources from external partners and gather the necessary information about their markets and customers. The formation of inter-organizational networks is essential for fish business firms to overcome current constraints and to be competitive in the global market. The objectives of the study are to provide an understanding of the export strategy that could help the country in competing successfully in the global fish market. This study identifies the major determinants of quality fish in global food business and evaluates the factors that hinder the company's competitiveness in the global fish markets. Finally, it recognizes the effect of cooperative strategy in improving the company's ability of exporting quality fish.

1. Introduction

The Pangasius sector in Vietnam is considered as a significant source of socio-economic development (Binh, 2009). The development of the Pangasius sector in Vietnam is essential for earning foreign currency through the export of fish, providing employment opportunities by encouraging local and foreign investors in the sector and improving the nutritional deficiency in the country by increasing the current low consumption level of fish (Khoi et al., 2008).

The exports of fish by the PANGA Company (PANGACO) mainly targets markets of developed nations, especially in the EU market. Thus, the export performance of the company highly depends on its ability to comply with higher food quality and safety standards in these markets. In order to fully meet the EU regulations of quality and safety, the company needs to overcome its current constraints including the shortage of stores, un-standardized processing plants, ineffective refrigerators and maintenance problems, etc.

The strategic management is essential for dealing with the continuous stream of changes that organizations face (Thompson & Strickland 2001). The rapid increase of food quality and safety standards in developed nations can be stated as one of the major challenges of fish exporters. In this case, it is wise to apply the networking concept, as it enables the firm to obtain the required resources from external partners, and gather the necessary information about their markets and customers.

Therefore, the formation of inter-organizational networks is essential for food business firms like PANGACO to overcome its current constraints and be competitive in the global market.

2. Background of the study

Quality of a product can be defined as its "fitness for use" (Schroeder 1985). This means that, all characteristics of the product must satisfy the customer's stated and implied needs. A great consciousness of the competitive potential of quality in products and services is being felt by businesses everywhere. Regardless of a firm's size or activity, all businesses are increasingly customer driven, so the quality of a product depends upon its ability to fulfill the customer's expectations.

Quality and safety standards, especially in the seafood sector, have been an essential component of food consumption. Similarly, with the increases in income, consumers in developed nations started to be selective on the products they purchase (Mahe and Ortalo 1998, Roberts et al., 1999).

Food quality has dimensions related both to its production process and the final product. Its determinants can be grouped into hygienic properties, nutritional properties, functional properties and organoleptic properties (Abalaka 1999). Health hazards from seafood can arise from the raw materials used, from handling and through the other stages involved in the processing, transportation, storage and the sale of the food. Most seafood quality problems from developing countries is related to poorly

defined inspection and approval procedures, weak technical regulations, and lack of staff for inspection and laboratory testing. Moreover, poor levels of personal hygiene and sanitation, lack of infrastructure for fish marketing and distribution and a poorly defined institutional framework are also the causes for poor quality of seafood from these countries.

On the other hand, importing firms in general and EU wholesalers in particular have tight rules regarding fish imports from developing nations. The exporters of fish from developing countries have to adapt to the new and more stringent rules concerning safety and quality standards, such as the implementation of the Hazard Analysis Critical Control Point (HACCP) system for the EU, USA and other markets, which could have a considerable impact on the volume of products exported in the short-medium term (FAO 1996). The fish exporters may find it difficult to overcome their problems and meet the requirements of their customers in developed nations on their own.

Based on the above stated practical and theoretical discussion, the following research problem is stated:

How could a cooperative strategy be designed, aimed at quality fish exporting?

Specific research questions are:

- What are the determinants of quality in fish exporting?
- What are the major constraints of PANGACO in the fish exporting business?
- How does a cooperative strategy affect quality fish export business in Vietnam?

3. Research methodology

3.1 Research design

Taking into account the depth and intensity of analysis required and to get a proper answer to our research problem, we utilize a case study approach. The main focus of the case study is on seeking insight through the features and characteristics of the object being studied. According to Yin (1994), a cases study is defined as “an empirical enquiry that investigates a contemporary phenomenon within its real life context, especially when the boundaries between the phenomenon and the context are not clearly evident”.

Some of the major benefits of using the case study research strategy are: it copes with technically distinctive situations in which there will be many more variables of interest than data points; it relies on multiple sources of evidence including documents, interviews and observations; and it benefits from the prior development of theoretical propositions.

Our research will be a single-case design, which is a common design for conducting case studies. The single case study is appropriate where the case represents a critical test of existing theory, where the case is a rare or unique event, or where the case serves a revelatory purpose.

The single case study will focus on more than one unit of analysis, thus represents an embedded case study. The specific variables of the study comprise the actors, resources, and activities. Actors include firms or institutions that make a significant contribution to the quality of fish exports. The actors of this research include PANGACO, the EU inspectors (FVO), and NAFIQAVED. Resources incorporate the tangible and intangible resources such as technology, experience, expertise, and knowledge sharing that are owned by the actors. Activities are categorized as transformational activities that change the physical attributes of any raw material, like fish, and transactional activities that aim at the transfer of property rights. The interaction between the actors, resources and the activities determine the quality of fish exported and whether quality standards are fulfilled.

3.2 Methods of data collection

In order to collect the relevant information for the study, we conducted first an in-depth interview with knowledgeable people and experts of the industry. Following that, all actors who are directly or indirectly concerned with fish quality were interviewed. In this case both unstructured and structured types of interviews were used, for having unstructured interviews could result in the identification of several critical factors in the situation, which could be helpful during the structured interviews for eliciting more in-depth information on them. We also made a direct observation by investigating into certain value chain activities of the fish processing. Respondents include management staff from PANGACO, MOFI, and Fish Inspection and Quality Control division in Vietnam. In addition, we conducted case study interview with FVO which ensures the quality of fish imported to the EU. Alongside collecting the primary data, we also consulted secondary data. These include documentary information, archival records from relevant organizations, library books and Internet facilities.

4. Literature review

4.1 Determinants of fish quality

The term “quality” of a product can be defined in different ways. From the customers’ point of view, quality is often associated with value, usefulness or price, and from the producers’ point of view it is associated with conformance to specification. Generally, quality has been defined as ‘fitness for use’ (Schroeder 1985). This means that all characteristics of the product must satisfy the customers’ needs thus the product is fit for the customers’ use. Fitness for use is related to the value received by the customer and to customer satisfaction. According to this, only the customers and not the producers determine quality.

The traditional view of seafood quality is based on appearance, technical quality and biological quality (Wood et al.1994). Thus food is expected to look good, taste good, and be with no direct harm to its consumers. Recently, this definition has been extended to look at factors relating to cultural, environmental and ethnical values. Cannon (1990) highlights, biological, sensual, nutritional, and environmental factors. Woodward et al. (1990) categorize the major components of food quality as being authentic, sensual, biological, nutritional and ethical. All these must exist within a social, political

and economic environment, and reflect society's increasing interest in the environment, animal welfare and culture.

Each market, each buyer, will have a working definition of quality that encompasses these three characteristics and features, however excluding the environmental and ecology issues, the last characteristic or feature is given an emphasis in this study since it is mostly used as a prerequisite to export for all fish business exporting to most attractive markets like the EU. The producer must know the working definition of the aimed market in order to succeed in business (FAO 1998).

Claiming to meet the above three characteristics or determinants of seafood quality does not promise market for fish in most developed nations. The EU issues regulations that lay down conditions for products produced within the union and also for fish imported from third countries. The introduction of some regulations like the HACCP (Hazard Analysis Critical Control Point) system is also being accepted worldwide and is becoming a requirement in international trade as an effective means of ensuring food quality and safety. One reason for this development is that a number of national food legislations today are placing full responsibility for food quality on the producer (e.g. EEC council directive no. 91/493/EEC).

The HACCP is a system based on identifying hazard³ and controlling risks at specific points of the processing chain, (Zaibet 2000). There are at least two features that characterize the HACCP system. First it deals with the whole system; from receiving of raw materials to the delivery of the final products. Second, it requires the documentation of all the processes (Unnevehr and Jensen, 1999).

To summarize, although the nutritional properties, hygienic properties and organoleptic properties (its appearance, color, integrity, texture and flavor) are some of the determinants, compliance to the EU regulations, including the HACCP system, can also be mentioned as a major determinant of seafood quality. Although the main focus of the system may be considered as safety assurance of food, the safety issue is a pre-requisite for assuring quality of the product. In contrast to the principles in traditional quality programs relying heavily on control of end-products, the HACCP system is a preventive strategy based on the study of prevailing conditions and is much more likely to provide a better guarantee of quality. According to this system, the quality assurance of fish and its products requires an organized way of investigating all the activities in the production process of the product. The thorough analysis of all the activities performed in the processing of fish is essential not only to identify the potential hazard of its quality, but also to discover sources of competitive advantage for the firm.

4.2 The value chain and competitive advantage

A systematic way of examining all the activities a firm performs and how they interact is necessary for analyzing the sources of competitive advantage (Porter 1985). The value chain of a firm is composed of a series of distinct value creating activities including production, marketing, materials management,

³ The potential to cause harm.

R&D, human resources, information system, and the firm infrastructure. According to Porter (1985,1991) firms can gain a competitive advantage by performing these strategically important activities more cheaply or better than its competitors.

The value system concept is more critical and relevant to firms involved in food businesses. The application of the HACCP system, which is being mandated in an increasing number of developed countries, establishes process control through the identification of points in the chain of food production where the loss of control could result in unacceptable food quality and safety risk. Most of the points in the principles of the HACCP require a systematic way of examining all the activities in the vertical chain. The system identifies critical control points in the production process, so that food safety hazards can be prevented, eliminated or reduced to an acceptable level before they occur.

The value chain that shows the total value of the product consists the value activities and margin. Value activities are activities that are physically and technologically distinct to the firm. Margin is the difference between the amount buyers are willing to pay and the cost of performing the activities (Porter 1985). The total value of a firm's product is a function of not only the value chains of a focal firm but also that of its suppliers and buyers. According to Porter (1985) suppliers and channel value chains include a margin that is important to understand the sources of a firm's cost position, since supplies and channel margin are part of the total cost borne by the buyer.

4.3 Assessment of the quality of the raw fish

The methods of evaluation of fish quality can be conveniently divided into two categories: sensory and instrumental methods (Huss 1995).

4.3.1 Sensory methods

The sensory evaluation is defined as the scientific discipline used to evoke, measure, analyze and interpret reactions to characteristics of fish as perceived through the senses of sight, smell, taste, touch and hearing (Huss 1995). This is called the organoleptic check. In this case the quality of fish is analyzed through the senses of humans. The sensory process includes three activities of the evaluator; detection of a stimulus by the human senses organs, evaluation and interpretation by a mental process; and finally the response of the assessor of the stimuli. Although this method is the cheapest, easiest and quickest way of assessing fish quality in terms of manpower, time and cost, variations among individuals in the response of the same level of stimuli can contribute to a non-conclusive answer of the test. Therefore, an awareness of these differences is an important issue in selecting and training judges for sensory analysis of fish quality.

4.3.2 Instrumental methods

The instrumental method of evaluating fish quality refers to the use of biochemical and chemical methods. This method of evaluation is related to the ability to set quantitative standards. The establishment of tolerance levels of chemical spoilage indicators would eliminate the need to base decisions regarding product quality on personal opinions (Huss 1995).

To conclude, in most cases sensory methods are useful for identifying products of very good or poor quality. Thus, biochemical or chemical methods may best be used in resolving issues regarding products of marginal quality. Since the consumer is the ultimate judge of quality, most chemical or biochemical methods must be correlated with sensory evaluation methods before being used in the laboratory. However, sensory methods must be performed scientifically under carefully controlled conditions so that the effects of test environment, personal bias, etc. may be reduced.

4.4 Theories related to inter-organizational cooperation

Firms or organizations are the context in which social relations and economic exchange are embedded (Powell 1999). The social relations and the economic exchanges co-exist as drivers of firm strategy, but the rationality assumed in economics, and hence in much of the strategic management literature, needs to be tempered by more focus on the social issues (Granovetter 1993; Uzzi 1999). It may be that the strategic management literature has overly focused on the economic rationale (Grant 1991) and that the industrial marketing literature has focused traditionally on the social issues and what may be needed is an approach combining the two (Ford 1995). Whilst the economic or the social approaches may predominate in the analysis of strategy, and thus in the analysis of inter-firm cooperation and relationships, firm behaviour can exhibit both simultaneously (Powell 1999).

4.4.1 Resource dependency approach (RDA)

Since the early eighties, the RDA has become a very popular theory of competitive advantage in the strategic management literature against other alternative explanatory frameworks (Grant 1991).

This theory emphasizes the importance of firm specific resources and capabilities in the generation and maintenance of a sustainable competitive advantage, which allows a firm to earn abnormal economic profits. This means that the successful performance of a firm depends on certain resources or distinctive competences. These resources, especially for small firms, are controlled by outside actors. Thus firms are linked to their environment by federations, associations, customer-supplier relationships, competitive relationships, and social-legal apparatus that define and control the nature and limits of these relationships as well (Butler and Sohod 1995,).

In summary, the major emphasis of this approach is on the importance of formal and informal relations of a firm with its external environment. Since important resources are controlled by other actors in the environment, a firm must ensure a smooth and predictable flow of these resources through cooperative strategy.

4.4.2 Transaction cost approach (TCA)

The TCA explicitly views the firm as a governance structure. One of Coase's (1937) initial propositions was that firms and markets are alternative governance structures that differ in their transaction costs. A transaction means a transfer of a good or service between technologically separable interfaces (Williamson 1985). The basic premise of transaction cost analysis is that the firm will internalize activities that it is able to perform at lower cost and will rely on the market for activities in which other providers have an advantage. Thus, this theory argues that firms reduce transaction costs through

inter-organizational cooperation. For example, the integration of the quality assurance system is especially important for fish business based in developing countries and exporting to developed countries where food quality and safety standards are rising continuously. In this case, the transaction cost between buyers and sellers have three dimensions: information search for quality assurance and food safety, negotiation cost and monitoring and enforcement costs. Thus, the firms can integrate themselves the quality assurance systems to reduce these transaction costs.

Transaction costs (i.e. the costs of governing the system) tend to be low in highly competitive markets, thus providing little or no incentive to substitute internal organization for market exchange. In contrast, when faced with an inability of markets to impose behavioural constraints and enforce simple contracts, firms are expected to internalize transactions to reduce costs of exchange. A limit on integration is the fact that organizations are not perfect and transaction costs also are present within them.

Transaction costs are very difficult to measure because they represent the potential consequences of alternative decisions. Researchers examining transaction cost issues almost never attempt to measure such costs directly, but rather test whether organizational relations align with the attributes of transaction as predicted by transaction cost reasoning (Williamson 1985).

In summary, the major objective of inter-organizational cooperation according to this approach is the minimization of transaction costs. Firms attempt to overcome transaction costs by vertical integration or by looking for other alternatives to the market. Under conditions of uncertainty, high asset specificity and small bargaining power, firms look for inter-organizational cooperation because of high transaction costs.

4.4.3 Social Network Approach (SNA)

This theory came from anthropological and sociological studies of communities. The theory suggests that all businesses interactions, all economic actions, are embedded in social relations (Granovetter 1995). Thus social ties are crucial for establishing relations or transactions. They create opportunities to identify new business ideas, new products, new markets, etc (Gulati and Gargiulo 1999). Moreover, embedded social ties encourage firms to take risks and innovate, and enhance business success under conditions of uncertainty. According to Granovetter (1995), the problems of uncertainty and distrust that often disturb market exchanges can be solved through the use of social networks. Social networks therefore help to reduce the transaction costs. These ties also provide benefits such as joint problem solving, information exchanging, resources sharing, etc. to actors in the network (Uzzi 1999).

Fish is mostly marketed in its fresh form, but the uncertainty of catches, the geographical dispersion of landing points and consumption centers, preferential habits of consumers, heterogeneity and high perishability of the product are factors that make the trade complex and full of risks, uncertainties and difficulties. With such a highly heterogeneous and non-standardized commodity, inter-organizational cooperation among fish traders based on friendship and mutual trust is crucial for their performance.

Through social ties, these firms can solve the problems of uncertainty and distrust, so as to reduce their transaction costs and improve their performance.

In summary, the basic premise of this theory is that firms gather scarce resources from the environment through their personal networks. These resources include not only tangible resources like finance and other material resources, but also intangibles like information, ideas, etc. According to this approach, the inter-organizational cooperation has communication content, exchange content and normative content.

4.4.4 Inter-organizational networking in seafood businesses

It is a current issue for strategy writers to argue that competition is dead (Moore 1996), or that cooperation rather than competition is the way forward (Branderburger and Nalebuff 1996). The basic argument of these authors is that business success will be derived from companies managing the enhancement of the total performance of the relevant organizations, so that it can deliver improved value to customers. Some of the major objectives of the network formation include: gathering of information, response from external environment, canvassing and looking for customers and suppliers, enrichment of own knowledge, psychological significance and sources of finance, exchange of technology etc.

Moreover, networking is a powerful and cost-effective way of sharing information and achieving various other goals that individual organizations cannot achieve alone. The food quality and safety, that is an important issue for seafood businesses is an example of information asymmetry between sellers and buyers. Sellers know the quality and safety attributes of their products much better than buyers, and it is hardly possible for buyers to fully assess these attributes during transaction. With these features, this issue falls into the boundaries of the adverse selection problem (Akerlof 1970), which refers to the fact that buyers may buy low quality or less safe food items because of lack of information. In addition, the existence of asymmetric information increases the transaction costs and hence generates private incentives to decrease such costs (Holleron et al.1999). Akerlof (1970) showed that, institutional warranties such as quality assurance standards play an important role to solve such problems. The food quality and safety standards, which are voluntarily accepted and applied by firms to improve their competitiveness, guide them towards quality assurance systems. Fundamental operations of most food quality and safety assurance institutions include the documentation, third party control and accreditations.

Quality assurance system (QAS) aims to increase the competitiveness by providing confidence on quality and safety in the food production chain (Morris 2000). Hence, the integration of firms in seafood business to quality assurance systems leads to the reduction of transaction costs which may include the information search cost for quality assurance and food safety, the negotiation cost and monitoring and the enforcement cost (Hobbs 1996). In addition, Mazzocco (1996) and Bredahl and Zaibet (1995) show that most of the firms integrated to QAS have experienced not only declines in the cost of transaction but also improvements related to their production process and final product. Among these, increases in productivity, better management, improvements in consumer relations, elimination of

deficiencies in production processes, better adaptation of new personnel, and the conservation of current customers. Bredahl and Zaibet (1995) showed that the total cost of integrating to QAS for the firms they studied was less than the benefits acquired directly or indirectly. Consequently, they state that integrating to QAS with consideration of quality and safety standards is an important strategy for firms. This strategy is especially crucial to seafood business located in developing nations and exporting to developed nations where the food safety and quality standards are rising continuously. In addition, forward integration of firms in food businesses gives them better or more timely access to market information allowing a more rapid or specified adjustment of product characteristics, and backward integration may allow these firms to obtain specialized inputs through which they may improve or at least distinguish their final products (Porter 1985).

To conclude, the cooperative strategy is decisive to seafood business because success of these companies is derived from managing the enhancement of the total performance of all related organizations, so that value to customers can be improved. Networking is useful to ensure seafood quality and safety in that it enables the buyers to fully assess the quality attributes of the products of the sellers during transaction. In addition the integration of firms in seafood business to quality assurance systems leads to an increased competitiveness by providing confidence on quality and safety in the food production chain.

5. Company profile

PANGA Seafood Joint Stock Company (PANGACO) planned to put its seafood processing factory into operation in late October 2005. The factory is located at Tra Noc II Industrial Park, Can Tho City. The building of the factory began in September 2005 with the designed capacity of 500 MT of raw Pangasius per day. Accordingly, the factory will produce mainly frozen Pangasius fillets for export to Europe, the U.S.A, Canada, Hong Kong, Australia and Asian countries.

At present, the company is making great efforts to complete production conditions, train and instruct workers to apply quality management standards such as HACCP, SSOP, GMP, ISO 9001:2000, ISO 14000, BRC, as well as implementing traceability systems to ensure food safety for domestic and international customers at the highest level. All modern and advanced equipment and processing lines installed at the factory are made by renowned firms in Japan, Europe, and America. In addition, to ensure constant supplies of raw material, the company runs two Pangasius farms with a combined area of 40 ha which can supply 20,000 MT of raw Pangasius per year.

According to the company director, PANGACO's target is to produce high quality products which satisfy all international standards on quality, hygiene and food safety contributing to keep the prestige of Vietnam Pangasius products in the global market.

PANGACO aims to be financially sustainable in the medium to long-term and plans to actively promote private investment in the sector. The company aims to distribute fish at a competitive price, so as to meet customers' needs both at the local and international markets.

Currently, PANGACO consists of two processing plants approved by the Fish Inspection and Quality Control Division (Competent Authority) to export to EU member countries, namely PANGA1 processing plant and PANGA2 processing plant, located in Tra Noc and Thot Not, respectively. These processing plants control resources depending on the activities of each functional branch.

5.1 PANGA1 Processing Plant

Essentially focuses on supplying frozen products, mainly fish for export and the local markets. The plant owns refrigeration equipment that is installed for processing frozen product only. It has two blast freezing machines, with a capacity of freezing 1.5 to 2 tonnes of shrimp in 3-4 hours and 2 to 3 tonnes of fish fillet in 5-6 hours. These two freezing machines include a fish products storeroom freezer and a frozen products storeroom freezer.

5.2 PANGA2 Processing Plant

Mostly specializes in processing fresh fish products (fillets, whole round, whole gut), for both export and domestic markets, and fresh fish fillets for the local market. The plant has two chill rooms. The capacity of these machines reaches up to -25°C . However, the temperature of the plant is maintained at 0°C to keep the raw and final products fresh. There are two chill rooms, one used as raw material store and the other as finished product store.

When there is an excess supply of fish, the freezing process of the excess products is done by keeping the products in a refrigerated container outside the processing plant. This process takes up to 72 hours to freeze 4-5 tons of fishery products. As a result it has a very harmful effect on the quality of fish since it does not give the required temperature and also takes more time than the standard refrigeration process.

There is also a mini-laboratory in the processing plant for testing small samples, like bacteria count, but for big samples the testing process is done in the central health laboratory. In addition to this, the human capital of the plant consists of 40 working staff and 22 technical staff.

6. Fish inspection and quality control division (NAFIQAVED)

The National Fisheries Quality Assurance and Veterinary Directorate (NAFIQAVED) is an institution under MOFI, in which the ministry delegates an authority to the institution to enforce the fishery product regulations. The major objective of NAFIQAVED is implementing quality management throughout the local government, provincial aqua-cultural departments, processing/export companies and other relevant institutions and organizations, not only in primary production but at other stages in the chain as well. Moreover, NAFIQAVED is responsible for the approval and for the supervision of processing plants for the certification for export to the EU (FVO report, 2007).

Every year, NAFIQAVED makes its aquaculture plan. When deciding which substances (drugs residues testing to include in the plan, the results from previous years, test results by importing

countries, substances authorities in aquaculture in the country and information on the usage of veterinary drugs are taken into account. The plan is approved by the MOFI at the beginning of each year and is submitted to the Commission and provided to the regional (branches) and local authorities of NAFIQAVERD.

6.1 Inspection unit

To this unit, quality is made and the inspection starts right from the beginning where fish is harvested. Checking the final product cannot guarantee quality. Accordingly, this unit ensures the implementation of fish inspection, plant inspection and pre-shipment inspection programs. The division collaborates with international agencies and authorities in importing countries in inspection to create confidence in Vietnam's products and upgrade the quality control system to minimize the need for extensive sampling. In addition, it keeps records of misconduct committed by establishments, undertakes appropriate measures and gives recommendations and issues of certification.

6.2 Post harvest research, standards and training unit

This unit has an important role in ensuring the quality of food to the final customer. As it is clear from the name of the unit, it primarily focuses on carrying out post harvest researches, establishing, developing and improving national standards accordingly, and arranging and conducting training programs for professionals involved in harvesting, processing and marketing of seafood products. Whenever there is a change in the standard regulations of the importing countries, the unit is responsible for informing the relevant bodies. The quality manuals set by the processing firms are controlled and evaluated by this unit of the division. It also undertakes training programs to fish inspectors, quality controllers, traders on implementation of the HACCP principles and Codes of Best Practices.

6.3 Coordinator

This unit essentially focuses on coordinating and controlling the activities of the other two units. It inspects the activities of the Inspection Unit during the routine checks and reviews the research results obtained and the standards developed by Post Harvest Research, Standard and Training Unit. The subdivision also reports the audit outcomes to the head of the Division to take an appropriate corrective action if there are any irregularities, and assists the head of the division in the overall activities of the division.

7. The food and veterinary office (FVO)

The EU Commission, in its role as guardian of the Treaties of the European Community, is responsible for ensuring that Community legislation on food safety, animal health, plant health and animal welfare is properly implemented and enforced. As a commission service, the FVO plays an important role in fulfilling this task. The EU's Food and FVO oversees national implementation of binding EU level laws on food safety, animal health, animal welfare and plant health. The FVO carries out on-the-spot inspections on food safety controls in the member states as well as in countries exporting to the EU. Thus the FVO's main activity is to carry out inspections in member states and third countries and to

verify the implementation and enforcement of EU legislation by competent authorities. The findings of these inspections are written in inspection reports, together with conclusions and recommendations.

The FVO's objectives aims to promote effective control systems in the food safety and quality, veterinary and plant health sectors, to prove on compliance with the requirements of EU food safety and quality, veterinary and plant health legislation within the European Union and in third countries exporting to the EU, to contribute to the development of EU policy in the food safety and quality, veterinary and plant health sectors and to inform stakeholders of the outcome of evaluations.

To conclude, the food manufacturers, farmers and food operators have the primary responsibility for food safety. The competent authorities monitor and enforce this responsibility through the operation of national surveillance and control systems; and the Commission concentrates on evaluating the ability of competent authorities to deliver these systems through audits and inspections at the national level. In this case it need to be clear that the task of the FVO is not to evaluate the performance of individual plants or establishments but to assess and report on how the relevant authorities in member states or third countries discharge their responsibility in ensuring that the Community legislation is properly implemented in their territories.

8. The export requirements of EU countries

The EU is the largest single market for fish in the world. It relies on imports from the rest of the world to meet a large part of its requirements. This means that, the EU is highly dependent on imported fish to meet its domestic demand.

The EU is the most important target market for Vietnam's fishery products mainly because of the high demand and an attractive price of fish in the market. Moreover, there is a direct transportation link with Vietnam through which the export activities to the country can be facilitated.

The EU Commission issues regulations that lay down conditions for products produced within the union and also for fish imported from third countries. The introduction of some regulations like the HACCP system for fish and fish products, particularly in the EU and the USA, has triggered the need for production under the HACCP system in most fish exporting countries.

In an attempt to establish equivalence regarding fish and fishery products, the concept of equivalence is included in the EEC Council directive 91/493/EEC. According to this directive, imports of fishery products from third countries should be at least equivalent to those governing the production and placing on the market of community products. In order to ensure the uniform application of this directive or to verify the conditions of production, storage and dispatch of fishery products for export to EU countries, experts⁴ from the Commission and the EU member states make inspections on the spot. In determining the import conditions of fishery products of the third country, particular emphasis is given to the following parameters: the availability of fishery legislation in the country, the competence

⁴ These experts are appointed by the commission.

of the competent authority, and the assurance that the third country can give regarding compliance with the standards in the EU directive.

Based on the inspection results, the third countries are categorized as List I and II. List I comprises of countries and territories which have been approved to export to the EU following an inspection by the Commission Services. List II comprises those countries which have submitted satisfactory dossiers and pending an inspection by the commission services. At the moment, Vietnam is on list I for the harmonized countries and can export into every country in the EU (prerequisite condition).

In addition, imports from third countries must be accompanied by health certificates, and be from a list of approved establishments or factory vessels in which the licensing of these establishments or factory vessels is carried out and monitored by the recognized authority in the country concerned. An approval of establishments by the competent authorities of the third country is a result of compliance with the requirements equivalent to those laid down in the directive and monitored by an official inspection service of the third country. For identification purposes, the exporting firms are given registration numbers. Thus, imports from third countries carry an identification mark with the license number of the establishment so that the source of the fishery product can be easily traced.

The EU directives require the HACCP approach as a basis for food safety. This means that, although HACCP is not the only requirement from a regulatory point of view, fishery products safety equivalence can be determined based on regulations that incorporate the HACCP system as one of their basic characteristics.

To conclude, the EU market, which is highly dependent on imported fish to meet its domestic demand, is an attractive target market for Vietnam fishery products. In addition to the high demand and high price of fishery products of these countries, the EU market is also attractive due to direct transportation links with Vietnam. However, exports of fishery products to the EU countries have to meet the EU regulations that lay down conditions for products produced within the union and also for fish imported from third countries. The EU Council directive 93/431 EEC on foodstuffs hygiene also urges all food businesses to develop an HACCP system. The HACCP based regulations of importing countries provide working procedures to determine the equivalence of processing conditions and document the compliance.

9. Strategy policy for fish quality of the PANGA Company

While it is apparent that traditional quality control is unable to eliminate quality problems, the quality policy of PANGA mainly focuses on a preventative strategy of assuring quality based on a thorough analysis of prevailing conditions. The policy of fish quality of PANGA is based on the belief that “customers’ satisfaction through quality products and competitive prices is of paramount importance to the continued success of the company. The quality system of this company, which complies with the Vietnam Fishery Product Regulation, also considers the recommendations of the competent authority of the MOFI.

The employees of the organization are identified as a major component of its strength; therefore every employee has management support and is fully trained, and is totally aware of his/her responsibility. In addition, the management body has a responsibility of monitoring the quality system at appropriate intervals to ensure effectiveness and consistency, and the quality manager has direct responsibility of implementing and maintaining the objectives of the quality policy.

9.1 General quality statement of PANGACO

The management of PANGA is of the opinion that HACCP is not a stand-alone program and for HACCP to function effectively, it needs to be accompanied by the prerequisite programs, the Code of Best Practices. These programs address operational conditions providing the foundation for the HACCP system. Hence, the "Quality In Action Manual" of PANGA includes the Codes of Best Practices (Good Practices) structured in nine categories: Good raw material practices (GRMP), Good plant water control and maintenance practices (GPWMP), Good pest control practices (GPCP), Good cleaning and disinfecting practices (GCDP), Good hygiene practices (GHP), Good storage practices (GSP), Good transport practices (GTP), Good manufacturing practices (GMP) and Good waste disposal practices (GWDP).

9.2 Safety policy of the PANGACO

In fishery products business, the safety issue is a pre-requisite for assuring quality of the product. To ensure the safety of their products, the PANGA processing firms apply the HACCP plan. In contrast to the principles in traditional quality programs relying heavily on control of end-products, the HACCP system is a preventative strategy based on the study of prevailing conditions and is much more likely to provide a better guarantee of quality. The management of PANGA COMPANY holds the opinion that HACCP is not a stand-alone program but is one part of a large system of control procedures, thus it is built upon a firm foundation of compliance to their quality in action manuals.

9.3 Relationship between the PANGACO and NAFIQAVED

PANGACO is a profit-oriented organization, which aims at maximizing its profits by increasing its sales volume. But in order to do this, the company needs to have a market where it can sell its product at a reasonable price. As it is discussed in the previous sections, the EU market which is the largest single market for fishery products have strict food quality and safety standards to be followed by firms such as PANGACO. NAFIQAVED therefore acts as an agent for EU inspectors through which they control the performance of PANGA in terms of its compliance with their standards. In Vietnam, NAFIQAVED act as the competent authority (CA).

The CA through inspection services carried out at appropriate intervals controls the overall performance of the processing firms. There are some inspection activities carried out once a month by the CA, in addition to the daily organoleptic checks of raw materials received in the processing firms. These activities help the CA to collect the general background information of the plant/equipment to be inspected and the degree of its compliance with the requirements.

9.3.1 Establishment inspection

In this case, the CA evaluates the details of the site, the processing activities, approved activities of the establishment, and brands and packaging materials description. It also takes account of other categories like production in terms of quantity of raw materials used, rejected etc., production capacity, and average production in tones. Finally, imported products such as raw materials, the destination of exported products for the last three years, and the quality system used in the establishment are also recorded in the first part of the establishment inspection activity.

The establishment inspection also gives the CA a detailed information of the company's (1) buildings: layout, construction, maintenance; (2) water: potable water and processing water (chlorination level); (3) practices: raw materials control, storage conditions, manufacturing, personal hygiene, etc. (4) documentation: approval certificate, establishment layout plans, etc., and (5) implementation of documentation, quality control and assurance systems, staff training, traceability etc.

Finally the CA investigates the application of good practices established in directive 91/493, which lays down the health conditions for the production and the placing on the market of fishery products. The main categories include the production premises, social premises, facilities in all working rooms, availability of water supply, hygiene, pest control plans used, use of chemicals, personnel cleanliness and disposal of wastes. In addition, the processing and handling of fresh products, conditions concerning parasites, storage practices, identifications marks, and use of HACCP plan are inspected rigorously.

9.3.2 Vessel inspection

The vessel inspection activity by the CA collects the vessel inspection background data, which provides them with general information about the vessel in terms of its name, registration number, approval reference number, etc. It also gives information on the general construction properties of the vessel (type of engine, shelter, sleeping facilities, etc.), hygiene control, protective clothes use in the vessel and use of ice. In addition, the hygiene conditions on board of the fishing vessel are also assessed. The CA inspects the general hygiene conditions applicable to the fishing vessels designed and equipped to preserve fishery products-on-board under satisfactory conditions for more than 24 hours.

9.3.3 Ice factory inspection

In this case, the CA gathers information on the site details of the ice factory, processing, approved activities, production capacity and quality systems used. Information on the buildings, water (potable water, and processing water), practices (ice storage conditions, manufacturing etc.,) documentation, and implementation of the documentation is also collected during this activity. Finally the competent authority makes an assessment of the general conditions for ice making.

9.3.4 Truck inspection

General background information about the truck is collected and detailed information of the vessel follows that includes the availability of sections/ separations, internal surfaces of the cargo, drainage systems, etc.

In addition to the above monthly inspections, the CA also makes a daily inspection of the raw materials received in the company. Through the daily inspection activity, the CA checks the temperature at landing, adequacy of ice coverage of the fish, the species of the fish, and other organoleptic criteria.

10. Relationship of NAFIQAVED and the EU inspectors

In the network model of the fishery industry, all the actors perform a number of interrelated activities, and mostly each activity is more or less dependent on the performance of the other activities. NAFIQAVED acts as a CA to which delegation of authority is given by the EU Council. A competent authority refers to the central authority of a member state or a third country competent to carry out veterinary checks or any authority to which it has delegated that competence.

NAFIQAVED has a direct relation with the FVO in the EU. This division has a responsibility of collaborating with authorities in importing countries to create confidence in Vietnam's products, and upgrade the quality control systems in the fishery industry. In order to do this, the division undertakes fish inspection, plant inspection and pre-shipment inspection activities. It has also an authority of taking appropriate measures for transgressions committed by the establishments.

The EU inspecting body makes inspections of the third country exporters, which is called an "FVO Mission", once every three or four years. The objective of this mission is to carry out an evaluation of the control system of fishery products originating from the third country and intended for export to the EU. They give a particular account to the legislation of the fishery products in the third country, in terms of its compliance or equivalence to the EU requirements laid down in the directives. The inspectors also give particular attention to the organization of the competent authority of the third country - its inspection services, the powers of such services and the supervision to which they are subject. Based on the results of the evaluation, the FVO writes recommendations. Therefore, every activity of the actors within a network is dependent on other activities in the sense that the outcome of an activity is dependent on how other activities are performed. In addition, the EU inspectors assist NAFIQAVED in drafting the local legislation on fishery product regulation.

The EU inspectors also evaluate the human skills in the CA. The CA of the country formally requests the EU to send a delegation to assess the situation of the fishery sector of the country in general, and the competent authority in particular. If agreed, a project is set up by the EU and an assessment is carried out by the project's coordinator. The coordinator drafts Terms Of Reference (TOR), and based on it experts from the EU visit the CA of the country and give training sessions to local CA staff which helps them to upgrade their skills. The training could be in the form of on-the-job training and/or workshops. The EU covers the total budget of this project.

Based on the results of the above inspections, the CA arranges and conducts training programs for the staff members of the processing firms like PANGACO.

As mentioned earlier, every export to EU markets from the processing firms needs to be accompanied by health certificates. This certificate contains the detailed information about the product, its species, scientific name, type of the product (fresh /frozen which could be fillet, whole gutted, whole rounded), type of packaging, weight, license number of the approved establishment, required temperature, consignor's name and address, consignee's name and address, means of transportation, etc. This certificate is prepared by the C.A staff and is received by the inspectors of the destination country. The exported fish is received by the importers (wholesalers or retailers) only after it passed the inspection process at the checkpoint / quarantine section of the importing country.

Finally, the CA staff acts as a mediator in conflicts that may arise between the quality manager and production managers due to difference in their goals. A production manager is oriented towards production maximization and the quality manager has a goal of assuring the safety and quality of all products produced. Thus NAFIQAVED acts as a mediator to reconcile the interests of the two managers in a way that doesn't hurt the overall objectives of the company.

11. Constraints of PANGA Company in quality fish exporting

As discussed above, the quality issue in terms of compliance to the EU requirements is crucial for the fish exporting business especially those largely dependent on exporting to the EU countries. This is because, in order for a company to be recognized as fish exporter to the EU countries, it needs to have a reasonable compliance level to the EU community regulations regarding fish quality. There is no 100 % fulfillment of all the requirements since the regulations are too strict to be totally fulfilled. Although PANGA is doing its best to increase its compliance level and the FVO mission of 2007 has evaluated the company as generally good, currently there are some constraints that need to be overcome so that the long-term company objectives can be realized.

- According to the EU requirements, the working rooms of the fish processing firms need to be of sufficient size for work to be carried out in a logical sequence and under adequate hygienic conditions. The raw materials store in PANGA processing plant is small compared to the finished products store. Therefore, when there is a large supply of raw fish, the finished products store is used for the purpose of storing the raw materials. This leads to the likelihood of contamination of the finished products, consequently deteriorating its quality. In addition, the EU requirement of the availability of adequate amounts of hot water in the processing firms for cleaning purposes is not fulfilled in the plant either.
- The trucks to be used for the transportation of the fishery products need to be constructed and equipped in such a way that the required temperature can be maintained throughout the period of transport. The internal surface of the vehicles also needs to be smooth and easy to clean

and disinfect. Although the company used to own two Renault vehicles that totally met the EU requirements and were approved by the CA, currently both are out of order. As a result, the company is using two Isuzu trucks – one for the offal of wastes and one for transporting finished products. These trucks are insulated and have mechanical cooling systems, but lack ramps⁵. A ramp is essential for loading and unloading of fishery products in such a way that infectivity is excluded. The use of these vehicles for transporting fishery products creates a one to two meters distance between the buildings and the vehicle and this free area can be a source for contaminants. Thus, unless other ways are used to preclude the chances of contamination, the use of these vehicles for transporting the fishery products has a risk of final products' quality deterioration.

- In order to make sure that the water coming into contact with fish and/or fish contact surfaces, or used in the production of ice is potable and safe, chlorination process is used in the plant. Other than its inefficiency, this procedure is also another source of contamination because there is a possibility of using unhygienic stirrers during the manual chlorination, and this may have a negative impact for the products quality.
- In the PANGA processing plant, although the processing rooms were supposed to be built in a continuous flow according to the regulation, there is no separation between gutting and filleting rooms. In addition, there is no semi-processed products store, because of this there is a back flow of products, with the possibility of contamination.
- The other major problem that is related to Vietnam fish processing firms as a whole is lack of commitment to quality assurance. This is because the level of compliance to the requirements is mostly high during the inspection periods and may not be consistent afterwards. Although the occasional control procedures by the CA are important for the enforcement of the regulations, there needs to be an equal understanding of quality importance on the side of the processing firms. Otherwise, if the quality manuals and others are only followed for scoring good result during inspections, the sustainability of the advantages gained from compliance may be questionable.

The above problems being related to the individual processing plants and the company as a whole, there are also some constraints which are external to the company. In order to identify the technical assistance and other support needed by each processing plant, there is a coordinating office from the EU inspectors, which occasionally visits the establishments. However, although the FVO mission provides the processing firms with consultant services for training purposes based on the recognized deficiencies of these firms, these firms are mostly not satisfied with the training given by the trainers. This may be greatly because of unqualified trainers for the identified needs, the short time given to the trainees, etc. For example, recently there was such a program organized by the EU inspectors, but the

⁵ A slope connecting the vehicle to the building from/to which the fish is loaded/unloaded respectively.

trainer was a veterinarian and not a fish expert thus too much time was spent for preparation purposes by the trainer and little time left for the actual training program.

Moreover, there is a problem in the timely flow of important information from the EU inspectors to the CA. The recent periodicals and journals related to fish and its quality, which are important for effective performance of the division's activities are not easily accessed because of the lack of fast and effective ways of communicating like the Internet.

DISCUSSION

The EU market, which is highly dependent on imported fish to meet its domestic demand, is an attractive target market for Vietnamese fishery products. However, exports of fishery products to the EU countries have to meet the EU regulations that lay down conditions for products produced within the union and also for fish imported from third countries. In an attempt of complying with these regulations, the quality policy of PANGA mainly focuses on a preventative strategy of assuring quality based on a thorough analysis of prevailing conditions. Nevertheless, the company faces some constraints in complying with the EU, including, insufficient and inefficient process equipments, unstandardized processing plants, inefficient refrigeration machines and maintenance problems, lack of commitment to quality assurance, and a problem on the timely flow of important information from the EU inspectors to the CA.

The interdependence of the objectives of the three actors opens room for cooperation. The formation of networking among these actors is essential for the firm to overcome its current problems and to be competitive in the global market.

12. Conclusion

The developing countries that export products of natural resources seemingly have the most favourable export prospects because demand for such finite resources is expanding among the developed countries, many of which are concerned over the depletion of their domestic resources.

The EU market, which is highly dependent on imported fish to meet its domestic demand, is an attractive target market for Vietnam's fishery products. In addition to the high demand and high price of fishery products, the EU market is also attractive due to direct transportation links with Vietnam.

However, exports of fishery products to the EU countries are required to meet the strict EU regulations that lay down conditions for products produced within the union and also for fish imported from third countries. For instance, the EU Council directive 93/431 EEC on foodstuffs hygiene also demands all food businesses to develop an HACCP system, which provides working procedures to determine the equivalence of processing conditions and document the compliance.

In an attempt to comply with these regulations therefore, the quality policy of PANGACO mainly focuses on a preventative strategy of assuring quality based on a thorough analysis of prevailing

conditions. The two approved processing firms of PANGACO have their own quality system manuals which are documented in accordance with the Vietnam fishery products regulations. The safety issue, which is a pre-requisite for assuring quality of the product, is also addressed by applying the HACCP plan.

This rapid increase of food quality and safety standards in developed nations can be stated as one of the major challenges of fish exporters in developing countries. Some of the major factors that hinder the PANGACO in complying to the EU requirements are insufficient and inefficient process equipments, un-standardized processing plants, inefficient refrigeration machines and maintenance problems, lack of commitment to quality assurance, and a problem on the timely flow of important information from the EU inspectors to the CA.

The concept of the network theory implies cooperative efforts among persons, business firms, government bodies, other organizations, and other entities that are interconnected through activities and resources. The three actors, that is PANGACO, The European Union Inspectors (FVO) and the Vietnamese Fisheries Quality Assurance and Veterinary Directorate (NAFIQAVED), have a significant contribution to the quality of fish exported from Vietnam. The interdependence of the objectives of these three actors opens room for cooperation. This means that the successful accomplishment of one actor's goal is dependent upon its cooperation with the other two. Furthermore, the formation of networking among these actors creates adaptations and knowledge of the parties, which means mutual orientation. Through mutual orientation, the actors can develop a common language regarding safety and quality of fish. A most important aspect of the mutual orientation is mutual knowledge of each other in terms of their resources, strategies, needs and capabilities.

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