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Quality management in the Pangasius export supply chain in Vietnam

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Document Version

Publisher's PDF, also known as Version of record

Publication date:

2011

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):

Khoi, L. N. D. (2011). *Quality management in the Pangasius export supply chain in Vietnam: the case of small-scale Pangasius farming in the Mekong River Delta*. University of Groningen, SOM research school.

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Summary

This thesis focuses on three focal areas: quality control at farm level, quality assurance at chain level, and the business relationships at farm level. The thesis is divided into eleven chapters. Chapter 1 provides an introduction to the study. It gives the research objectives and the outline of the thesis. Chapter 2 presents an overview of the developments in Vietnamese aquaculture. It describes the role of Vietnam in the World fresh aquaculture market, the Pangasius industry, and the role of smallholders in this industry.

Chapter 3 provides a literature review. The literature includes the theories and concepts that refer to food quality management and the global value chain approach. It focuses on the role of smallholders in global value chains and the potential solutions for smallholders' problems. In addition, the role played by the government and other organizations involved in food safety and food quality is presented. The chapter also reveals some empirical studies concerning successful cases of inclusion of smallholders in export chains. Chapter 4 presents the methods used for the present study: case studies and surveys. A combination of qualitative and quantitative approaches is applied to analyze how small-holders can be involved in the fish export supply chain.

Chapter 5 provides a general description of the actors in the Pangasius value chain. We found that the smallholders in the chain have only weak linkages with input suppliers and processing firms. The inclusion of smallholders in export value chains faces major challenges regarding knowledge dissemination and access to resources (fingerlings, feeds, drugs, finances). Chapter 6 focuses on quality assurance regulations. It reviews the legal aspects for food safety of the EU markets. The results in chapter 6 reveal that quality assurance at the export level and in the processing firms meets the standards of the export markets. However, there is no traceability upstream: the system is not able to trace individual suppliers. This may seriously affect export opportunities to high quality markets in the future. We conclude that the implementation of a fish quality assurance system requires clearly defined rules and standards, the establishment of an appropriate fish control system, and the provision of proper training services.

Chapter 7 describes how the processing companies deal with these requirements and pays special attention to how these requirements affect the relationship with farmers. We found that the processing firms are relatively well developed, as they apply a quality management procedure that is approved by a competent authority (NAFIQAVED) and the importers. However, the major challenge is to

purchase a sufficient quantity of high quality fish products at the farm level. The Pangasius processing/export firms must strictly control the quality of Pangasius not only inside the company, but also covering production at farm level.

Chapter 8 analyzes the pond farming system practice and shows significant differences in farming practices between APPU members, FA members, and independent farmers. Five major issues of production technologies at the farm level are discussed: (1) fingerlings, (2) stocking density, (3) feed and finances, (4) waste-water treatment ponds, and (5) chemicals/ veterinary drugs used for fish disease treatment. We found that the sources of fingerlings used by FA members and independent farmers lack certification. Small-scale farmers use a higher stocking density, which leads to the reduction of fish growth, low survival rate, and more fish diseases if compared with APPU members. The findings also reveal that APPU members use industrial feed for the whole production cycle, while FA members and independent farmers still rely on home-made feed, which is not certified and tested. We found that APPU members applied advanced farming practices such as SQF 1000^{CM}, accordingly they receive the highest price at harvest. FA members receive more training and market information than independent farmers, and they have more motivation to apply advanced farming practices and therefore end up with better quality of fish and better market access than independent farmers. We also found that FA and independent farms have no waste-water treatment ponds. As a result, most of waste is discharged directly into rivers, and thereby contaminating the environment. Moreover, independent farmers mainly manage pond water based on their own visual observations, and do not use monitoring equipment. Therefore, disease outbreak is more common in the pond farming system.

Chapter 9 presents fish disease prevention and treatment practices at farm level. The farmers need proper knowledge of bacterial and parasite diseases. In most cases, fish farmers need the assistance of a trained pathologist to diagnose and treat a disease. The data results show that disease prevention and treatment are considered to be important by all farmers. However, some differences are observed: APPU farmers generally rate the importance somewhat higher (local zoning areas for aquaculture, local regulations of waste-water treatment, fingerlings health, quality of feeds, proper disease treatment following laboratory diagnosis, etc.). On the other hand, traditional farmers identify diseases differently, based on their own experiences. Farmers are aware of the importance of prevention and proper treatment, but they need more training and extension services to assist them in proper disease treatment.

Chapter 10 considers which measures can be taken to improve quality control at farm level. This chapter summarizes the differences in farming practices between small-scale farmers and APPU members. The analysis illustrates that if

the advanced system is completely adopted, the farm's profit improves via a higher selling price (APPU case). The FA members are more willing to adopt the advanced production system, as they are aware of the positive effects of improved farming techniques. We observe that the willingness to invest is high among farmers who are aware of the potential improvements.

Chapter 11 discusses feasible solutions for small-scale farmers to improve their farming practices. It is concluded that the problems of small-scale farmers involved in export supply chains can be dealt with through business relations between chain actors. To establish a well-organized fish supply chain, it is crucial to encourage small-scale farmers to develop horizontal co-operation. Through co-operation, farmers can access inputs and extension services more easily, can improve product quality, increase quantity and achieve economies of scale, and increase bargaining power with buyers. Farmers need to be trained, organized, and willing to innovate. It leads to the improvement of farmers' awareness through increased information and knowledge (i.e. better management practices system).

Similarly, it is vital for small-scale fish farmers to develop business relations with processing/export firms through flexible contract farming. In the *Pangasius* supply chain, the processing/export firms are generally the most powerful stakeholders, playing a leading role in organizing chain quality management. They get the information from the importers of fish quality standards. Government can contribute to provide an enabling environment, including transparent regulations concerning food safety and quality and availability of certified inputs.

