

# The Conceptual Framework for Fish Quality Management

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**Abstract:** *This paper presents the conceptual framework used for the study. The conceptual model gives a clear picture of the structure of the study and shows how the theory is linked to practice. Then, we present the methods used for the study: case study and questionnaire survey. It is concluded that a combination of qualitative and quantitative approaches provides a comprehensive understanding of how smallholders can be involved in the fish export supply chain. It encompasses the choice of the research design, the methods of data analysis, and credibility of the results.*

**Keywords:** conceptual framework, fish quality management, case study

## 1. Introduction

The literature review shows that food quality management and global value chains are relevant to the organization of the Vietnamese Pangasius industry. It has also shown the role of government, industry and the role of the formal and informal institutional environment in managing food quality and safety among chain actors. Accordingly, our conceptual framework considers relevant concepts and factors related to the organization of the quality management in the Pangasius export supply chain. For this purpose, we developed an integrated conceptual framework aimed at the major problem.

## 2. Fish quality management and smallholders: Conceptual Framework for the study

The conceptual framework shown in figure 1 represents an integrative approach for the study. In contrast to most studies quality management is not studied from a firm perspective but from a chain perspective. Several studies that address quality management at chain level focus on governance structures and business relationships (Lazzarini, 2001; Hobbs, 2001; Han et al., 2006), while others focus on the use of proper technologies in primary processes and quality assurance (Henson and Loader 2001; Unnevehr, 2000; Dolan and Humphrey, 2000). Both approaches address relevant queries but may fail to address crucial aspects of channel design if these are beyond the scope of the chosen partial approach. For example, the quality standards in the export markets will require the introduction of new technologies. However, in order to make these changes successful, the quality management system and the prevailing governance structures coordinating business relationships, have to be fine-tuned simultaneously. The integrated conceptual framework consists of three key dimensions namely quality control, quality assurance, and business relationships between the chain actors. The arrows reflect the relationship between these dimensions.

The first dimension focuses on technological functions and quality control at farm level (1). In this part, we will study how the small farmers access and apply the required technologies for Pangasius quality control. The main primary activities need to be controlled in each Pangasius

production cycle. These include site selection, design and construction, preparation and cleaning, fingerlings and fingerling stocking, feeds and feeding, water supply management, fish health management, and harvesting. The discussion will be based on these elements of the Pangasius culture cycle. Moreover, this study will address financial requirements, as financial constraints are expected to restrict access to proper technologies and the role of the public and the private sector in disseminating proper technologies.

The second dimension focuses on managerial functions and quality assurance at chain level (2). This refers to the procedures and responsibility to ensure that the product fulfills customer expectations. To make the right selection of appropriate quality assurance systems, their effectiveness has to be investigated. This part of the study designs the quality management system within the fish supply chain. The applicability of different quality assurance tools is examined: Safety Quality Food (SQF), Hazard Assurance Critical Control Points (HACCP), Better Management Practices (BMPs). Moreover, the role of the processing firm in the quality management system is crucial – not only in ensuring the quality of the final product, but also in determining the requirements for fish suppliers. The small farmers and other actors in the chain have to fulfill the quality requirements in order to make the chain operational. Luning et al. (2002) stress that – in relation to quality performance – the quality cannot merely be considered as physical quality (intrinsic and extrinsic attributes), but must also include other dimensions of competition (e.g quality, cost, reliability). Imposed by importers, three criteria concerning quality control and quality assurance, apply: product quality, costs and reliability (Noori and Radford, 1995; Slack et al., 2001; Luning et al., 2002, Khoi., 2008).

In the third dimension, we want to analyze the incentive structure of some key relationships at smallholder level that affect quality performance. It analyzes the business relationships (3) between small fish farmers and their partners in the chain. This will help us to understand the role of collective action, vertical coordination, opportunistic behavior in the relationship between small scale farmers and chain actors in the current supply chains. It will also help to identify possible solutions through co-operation and supply contracts.

The chain organization is an open system that interacts with its environment, in particular the institutional environment. For example, the role of (local) authorities in developing and disseminating proper production technologies is important for the performance of smallholder production systems. The same institutional environment determines access to financial markets for smallholders, a prerequisite for the successful introduction of innovative technologies production systems. Therefore, it needs the role of the institutional environment in order to establish regulatory control programs for ensuring food quality at the primary production level. To do this effectively, provincial extension centers and the departments of agriculture and aquaculture are important support channels for training, implementation of instructions and inspection.

### 3. Application of Conceptual Framework to our Study

The research is based on the conceptual framework in figure 1. First, the value chain of Pangasius export will be

described, the activities of chain members will be identified, together with their roles and relationships. In order to structure the performance measurement, the performance criteria as defined by Slack et al., (2001) and Khoi (2008) have been used: quality, reliability, and cost. The requirements of the EU importers regarding the performance criteria have been taken into consideration. The legal aspects of EU markets and fish export from Vietnam are analyzed to see how quality assurance system is organized at chain level. The quality requirements of importers have their effect further down in the chain. Exporters have to meet these requirements. From the quality requirements of exporters, this will analyze first the Pangasius quality control at farm level. The relationships between farmers and their chain partners are analyzed as well. Subsequently, the gaps in quality assurance will be examined in order to point out measures necessary to improve and assure fish quality at farm level. Finally, farmers' awareness and willingness to close the gaps will be assessed and feasible solutions for quality improvement are the result of this assessment.

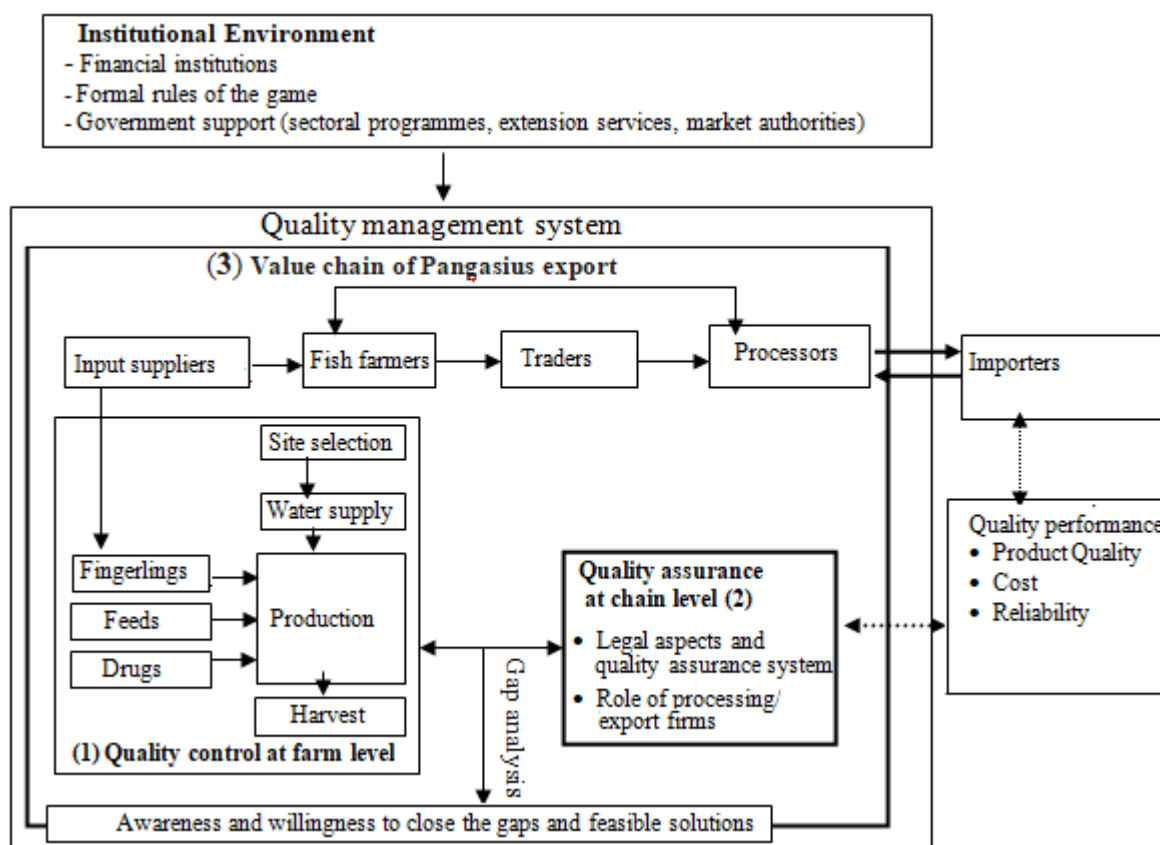


Figure 1: Conceptual framework for study of fish quality management (Reilly and Kaferstein., 1997, Luning et al., 2002, and further moderated by author)

### 4. Research Design

This section describes the research design that has been developed to answer the research question regarding the involvement of smallholders in fish export supply chains in Vietnam. The research design is the framework of the study, providing useful guidelines for collection and analysis of data. Our research design is problem solving in nature. To collect the necessary data, both qualitative (case study) and

quantitative (survey) research methods have been utilized. Research design can be divided into four stages (see figure 2)

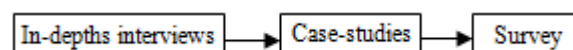


Figure 2: Four stages of research design

At the beginning of the research, we did a pilot study (in-depths interviews) that concerned stakeholders in the

Pangasius industry. The results of this pilot study showed the general picture of the Pangasius value chain and gave us the insight issues which we should focus on later.

After having evaluated this, we developed the conceptual framework. With this conceptual framework, we continued to go on to the second stage of the project that involved a multi-case study of smallholder fish farming systems. The multi-case study confirmed and established the conceptual framework that use for our thesis. Then, the third and the fourth stages of research design was survey to set up the quantitative part for our empirical research.

#### **4.1 In-depth interviews**

*The first stage* has been devoted to an appraisal of stakeholders in the Pangasius industry. In-depth interviews with knowledgeable people and experts of the fish industry have been carried out to gather information about the major issues in the supply chain. The author interviewed actors in the Pangasius supply chain including hatcheries, fingerling traders, fish farmers, traders, retailers, processing/export companies, fishery associations, and researchers. Furthermore, institutions in Can Tho City, in the province of An Giang, and in the province of Dong Thap were approached as these regions supply the most cultured Pangasius in the MRD. In addition, many documents related to fish culture ranging from operations at primary production and processing to distribution have been studied.

These interviews were based on convenience sampling meaning that persons were selected that was likely to give useful information. It should be clear that the resulting sample shouldn't be regarded as a representative cross section of the population. People working in the Pangasius sector on a daily basis were approached. Interviews were semi-structured and often involved focus group discussion. These discussions deliberately took place in public meeting places in the provinces or villages giving them an open and accessible character. During these discussions, names of informants who play an important role in the Pangasius industry were suggested by other participants and extension agents.

#### **4.2 The case study**

Case study research is especially useful to investigate real life situations and provide rich insights into a research object (Miles and Huberman, 1994). This method helped us to "investigate a contemporary phenomenon within its real-life context, as the boundaries between the two were not clearly defined" (Yin, 2003). The case study method enabled us to gain access to various data sources, and to cope with an extensive variety of material, such as documents, artefacts, transcripts from interviews, and observations.

Moreover, case study research is a suitable method for gaining insights into areas which little research has been conducted so far. Therefore, this approach enabled us to thoroughly examine the small-scale farming practices within Pangasius value chain

*The second stage* has been conducted and we used multiple case studies as our data collection strategy. A small group of 6 farmers has been followed for a period of 6 months: the length of one production cycle. Every 2 weeks they were interviewed to discuss their primary activities. During this period a larger group of 20 farmers was interviewed twice in order to cross check the information. These farmers were living in An Giang, Dong Thap, or Cantho provinces with long experiences in Pangasius industry and the willingness to invest time for in-depth interviews. A structured questionnaire had been prepared, addressing primary activities, the technologies applied, and the business relationships with suppliers, buyers, and fish quality management. The author regularly visited the specific farms during the field research periods. Issues that emerged from observation during these visits were used to guide interviews and discussions with fish farmers. The case protocol was used to investigate the elements of the theoretical framework. Each interview was lasted, on average, one hour. The transcripts of the digitally recorded interviews were analyzed for each farm.

#### **4.3 Case study design**

A section discusses the approach used to collect data in the Pangasius supply chain focus small-holder level. The case study was designed based on methods provided by Yin (2003). Yin (2003) explains that multiple - cases should be used whenever we are uncertain whether external conditions will produce different case study results. This method will help us to compare and contrast farms within the same segment and between different segments in the value system. Within the Pangasius supply chain, the cases selected include some segments namely small-scale fish farmers, input suppliers, fish traders, private and state-owned processing/export firms, fishery cooperatives/associations and also organizations which monitor and test quality of Pangasius export to the EU such as MOFI, VASEP, NAFIQAD. According to Yin (2003), a case study design depends on the unit of analysis. The unit of analysis can be an individual, a firm, a decision or a program. In our research, the unit of analysis refers to small farmers and their relationships with other organizations.

#### **4.4 The survey**

A survey methodology was employed as quantitative part of our empirical research. It was desired to collect data of respondents' perception on issues like quality management and business relationships. Thus we needed to operationalize behavioral concepts, such as trust and satisfaction. These concepts are dependent on how respondents perceive certain behavior thus being both subjective and perceptual. Previous research has shown the questionnaire to be a viable research instrument for gathering such as data (Claro, 2004; Lu, 2007)

*The third stage* of this research was a quantitative study. A major part of the questionnaire was designed to collect data on fish disease treatment and prevention, and quality management at farm level. We preferred personal interview for several reasons. Firstly, we were planning to collect a data of describing production technology, quality control,

and business relations at the farm level. In total the questionnaire consisted of twelve pages of questions and took about one to two hours to complete, so telephone was not an appropriate way for collecting data. Internet also showed limitations due to the fact that farmers had limited access to computers. Secondly, farmers are not experienced with academic research. Thus, they are not used to filling in questionnaires and would need some guidance. Especially because Pangasius farmers have low education levels and may have problems understanding the questionnaire precisely. Lastly, personal interviews gave us the possibility to collect data in a friendly way and to guide the respondents in case further explanations are needed. Personal interviews ended with a small gift to thank participants for their efforts and enhance the possibility for revisiting later (to validate the results). It should be noted however, that personal interviews also have some shortcomings.

*The four stage* of this research was also a quantitative study. The survey was to verify the perspectives of respondents, we also referred to reports prepared by other organizations and the main findings of the secondary data were integrated in the analysis.

The quality of the data may be influenced by the interviewers' attitude and the understanding of the questions. To minimize this problem, we carefully trained our fieldwork assistants to ensure they understood the research purpose and the questions in the questionnaire.

#### 4.5 Data analysis

In the survey, the questionnaire contains questions about the primary activities, the technologies applied, the business relationships with suppliers and buyers of fish farmers. The questionnaire mostly consists of five-point Likert-scales from "1: negative" to "5: positive".

In a pre-test, respondents revealed no difficulty with the questionnaire. For data analysis, SPSS 14.0 for Windows was used. We presented the frequency, mean and standard deviation of each response. We analyzed the data using several multivariable techniques such as ANOVA test, as well as the common descriptive analysis of the data set in order to identify the main determinants of quality management and business relations of fish chain actors.

#### 4.6 Conclusions

The main objective of this chapter is to present the conceptual framework and research methodology of this thesis. It starts with the discussion of conceptual framework. Subsequently, it is related to research design. The research design comprises a case study followed by survey method. The case-study approach is a multiple-case (embedded) design. For each case, a specific selection guideline is developed. The data collection procedure includes an in-depth interview with knowledgeable people, preparation of open-ended questionnaire, and referring to secondary data.

#### References

- [1] Claro, D.P. (2004), Managing business networks and buyer-supplier relationships: how information obtained

from the business network affect trust, transaction specific investments, collaboration, and performance in the Dutch potted plant and flower industry, PhD thesis, Wageningen University and research center, the Netherlands.

- [2] Khoi, L.N.D. Wijngaard, J. and Lutz, C.H.M, (2008), Farming system practices of seafood production in Vietnam: the case study of Pangasius small-scale farming in the Mekong River Delta, Asean business case studies, No.27, Center of Asian studies, University of Antwerpen, Belgium.
- [3] Lu, H. (2007), The role of guanxi in buyer-seller relationships in China, A survey of vegetable supply chains in Jiangsu province, PhD thesis, Wageningen University and research center, the Netherlands.
- [4] Miles, M.B. and Huberman, M. (1994), Qualitative data analysis, An expanded sourcebook, 2<sup>nd</sup> edition, Thousand Oaks, CA: Sage
- [5] Yin, R.K. (2003), Case study research: design and methods (3<sup>rd</sup> Edition), Sage publication, Thousand Oaks, London, New Delhi

#### Web site addresses

- [6] <http://www.cbi.nl>
- [7] <http://www.fistenet.gov.vn>
- [8] <http://www.worldbank.org>
- [9] <http://www.who.int/publications/en/>
- [10] <http://www.vasep.com.vn>