Enhancing farmers' perception on fish quality management systems

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DOI: 10.29322/IJSRP.9.10.2019.p9483
http://dx.doi.org/10.29322/IJSRP.9.10.2019.p9483

Abstract- In order to ensure and improve quality in the agro-food sector, quality systems have to undergo constant change: simple end of the pipe monitoring is being replaced by management-oriented regimes (Enneking et al., 2007). Increasing, farmers, too, are required to implement quality systems. A variety of quality assurance systems has been developed for use at the primary production level over the last few years. They differ widely, however, with respect to their requirement levels, regional scope of application, degree of integration into the supply chain or their institutional supports.

The supposition that certified farmers' perceptions for participating in the various systems are not necessarily identical for this study. The aim of this study is to ascertain non-system specific factors that influencing the acceptance of quality systems. This article provides an overview of evaluating three Pangasius culture systems namely ponds, cages and net-pen enclosures at the farm level.

Key words: *agro-food, Pangasius, culture system, small-scale farmers*

I. INTRODUCTION

Pangaisus are cultured in freshwater ponds, cages and net-pen enclosures in the diverse habitats of the MRD. The design and construction of the different systems is very dependent on the location and farm configuration. The productivity of these systems depends on the stocking densities that are over 60-80 fish/m^2; 100-150 fish/m^3; 80-120 fish/m^2 for cages, ponds and net-pen enclosures, respectively (Dung, N.H, 2006). At present (2006), many farmers like to culture Pangasius in pond due to being easer for control water quality and fish disease. Feed used in Pangasius culture are either commercial pellets, home-made feeds or the combination of both depending on culture location and the farmers' experiences. According to MOFI (2006), it is estimated that Pangasius production will reach up to about 1 million tonnes in the MRD by 2010. However, because the *Pangasius* culture development has been explosive without a controlled long-term Government development in place, it would appear that this overly rapid increase in production now exceeds the capacity of processing firms and the export demand (Hao, 2006). The rapid and improperly planned development of this industry in the MRD raised also other issues related to fingerlings, feeds, credits, markets and legal measure, etc. Therefore, recently, it

was recommended that Pangasius production should not exceed 600,000 tones by the year of 2010 (VASEP, 2007).

II. IDENTIFY, RESEARCH AND COLLECT IDEA

Ponds farming

The use of ponds for Pangasius culture is dominating and is increasing rapidly (figure 1). Ponds range between 350 and 10,000 m^2 and larger farms may operate several ponds at the same time, however, the majority of the Pangasius are produced in small-scale ponds, in systems of great diversity (own survey, 2007)

The ponds are designed rather simply without water storage or reservoir. Water is exchanged continuously during the culture period by pumping from the river and water quality control is easier than in open systems like cage and pen. However, the same canal is often used for water discharge and supply.

There is no water discharge treatment, which increases river pollution and disease transmission. After every harvest time, the accumulated waste on the pond bottom is often removed and either released into the river or treated and used for agriculture fertilisation or to reinforce the pond banks (own survey, 2007). In most places pond culture is not yet been planned. Ponds are located near river banks and islands with an average distance to river bank of around 30-50 m, however, in some cases, the pond is far away from the nearest water source which leads to difficulties in water exchange and fish quality control

Cages farming

Open systems, like floating cages are designed to keep a continuous water exchange environment by utilize as much as possible the river water current. In comparison with ponds, cages allow higher fish densities and have a higher productivity. Cages vary from 100 – 1500 m^3 and are normally submerged in the river close to the riverbank. The distance between cages is very near, i.e. 2-3 m (if the cages belong to one household) and 5-10 m (if the cages belong to different households). The density of cages is especially high in the area where there is strong water current. A disadvantage of cage culture is that they also produce more waste than ponds systems as uneaten feed and faeces are directly drifted away with the water current. (own survey, 2007)

Moreover, cage culture requires a relative high initial capital investment, hence, this type of culture system is mainly applied by the rich farmers in the past. Now, the Pangaisus cage trends to decrease and disappear in the future due to some issues that will be explained below in the case studies (Expert discussion, 2007)

Net – pen enclosures farming

Pen culture is another potential system for Pangasius culture. The pen is a fixed enclosure built on the river embankment, in which the bottom is the bed of the water body. There are several common points between the two systems cage and pen culture especially in the environmental set-up of both systems, affecting site selection and culture operations. However, pen is more cost-saving than cage. The reason for the cost-saving aspect of the pen compared to cages is lower feed losses: part of the feed is likely to be lost uneaten, and drifted away in the current, but the loss here would be less than in floating cages, as much of it sinks to the bottom of the river, and can be eaten by the Pangasius which is a bottom feeder. Because of these characteristics, pens are now a popular alternative to cages for Pangasius culture. To culture in enclosures, nets or fences are used to isolate a section of the river, starting from the riverbank. The ground of the enclosure is the river floor, which contributes to the reduced need for construction material. These factors explain the growing popularity of production in enclosures. Figure 1 shown the development of Pangasius culture systems in the MRD

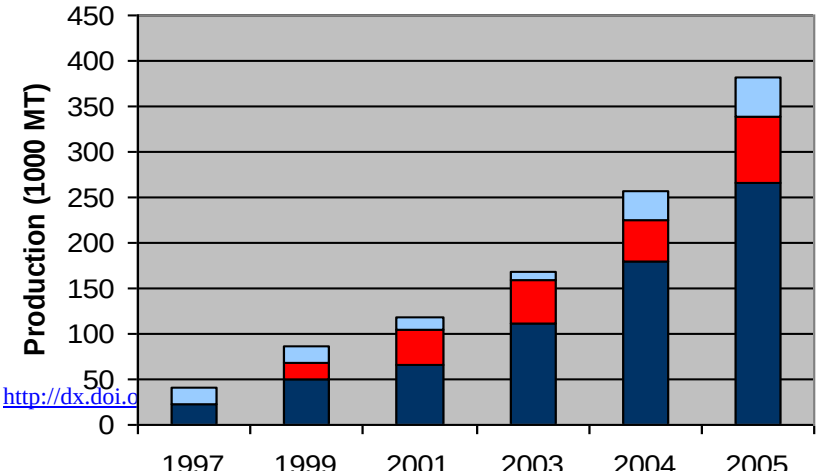

Figure 1: Development of Pangasius culture production systems 1997-2005 in the MRD (VASEP, 2006).

Comparisons of Pangasius culture systems

Description	Pond	C
- Stocking density	60 -80 fish/m^2	100 – 150 fi
- Fingerlings size	2- 2.5 cm	2.5 – 3.0 cm
- Farming cycle	6 months	7 – 8 months
- FCR	2.5	3.0 – 3.2
- Feeds	Home-made feeds + commercial feeds	Home-made commercial
- Yield	250 – 300 tonnes/ha	100 – 120kg

Source: VASEP, 2006

III. RESULTS AND FINDINGS

3.1 Evaluation of the three culture systems

Reasons for participating

At the beginning of the interview, interviewees were asked a closed question requiring them to select one out of four motives for participating in the respective system. Figure 2 show that for pond farming, the safeguarding of sales potential (52%) and product image gains (35%) are important reason for participation. As regards the cage farming, higher sale revenue (41%) and product image gain (31%) are the main motivating forces. For the net-pen enclosure farming, it is more efficient farm management weighs strongest (40%), followed by safeguarding of sales potential (32%).

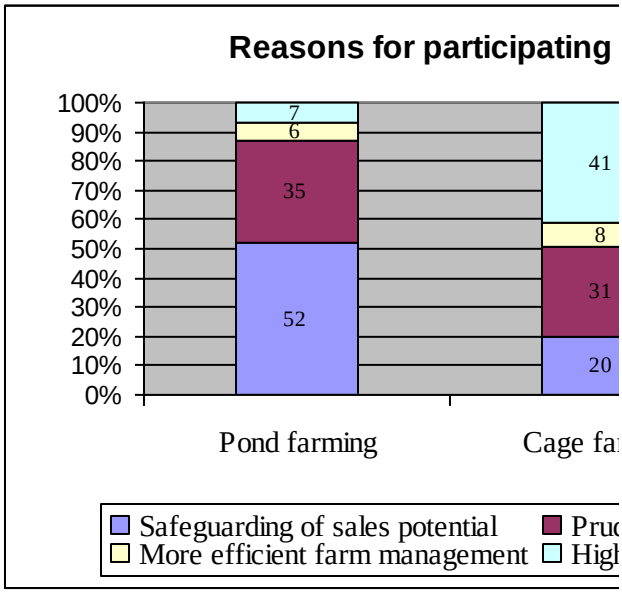

Figure 2: Main reasons for participating quality systems (own computations, 2007)

3.2 Strengths and weaknesses of fish culture systems

An open question regarding the strengths and weaknesses of the fish culture systems offered interviewees an opportunity to mention and include aspects of their own not investigated by the closed questions. At the same time, the answer provided an initial assessment of the fish culture systems.

To some extent, the strengths ascertained in this way varied quite considerably from the system to system. Table 7 shows the five most frequent responses for each system. Regarding of cage and net-pen enclosure culture systems, the most prominent criteria are largely matching, e.g. the safeguarding of sales potential, greater transparency, increase product image and higher sales revenues. These aspects are further supplemented by positive assessment of documentation and quality control. In contrast, the pond farming system underscored systematic documentation as a key factor. Observance of all valid statutory requirements, more efficient and transparent farm management and the system administration services were seen as positive aspects. Although structured documentation was seen as a positive factor in all systems, market information – related benefits are the main criteria with respect to the cage and net-pen enclosure systems, whereas with pond farming system, farm management advantages tend to play more important role.

With respect to system weaknesses, participate in the cage and net-pen enclosure systems, largely agreed that the additional time and documentation effort without commensurate financial reward (i.e. higher prices) was a negative effect of system participation. The main weakness according to the pond farming system was lack of financial reward. Cage and net-pen enclosure quality systems were frequently seen as too theoretical and impracticable. The pond farming system participants also criticized the lack of effective practicable. The weaknesses of fish culture systems can be seen in table 8

Table 7: Strengths of fish culture systems (own computations)

Ranking	Strength
Pond farming system	
1	Systematic, complete documenta
2	Observance of all valid statutory

3	More efficient farm management	10
4	Improved quality control transparency	8
5	Services provided by input suppliers	7
Cage farming system		
1	Safeguarding of sales potential	18
2	Transparency/product image gains	15
3	Safeguarding of prices/higher sales revenues	14
4	External control/quality control	8
5	Documentation/traceability	7
Net-pen enclosure farming system		
1	Safeguarding of sales potential	19
2	Transparency/product image gains	19
3	Higher sales revenues	17
4	Documentation/traceability	11
5	Cross-chain quality assurance	9

Table 8: Weaknesses of fish culture systems (own computations)

Ranking	Strength	No. of responses
Pond farming system		
1	Documentation effort/bureaucracy	18
2	Additional time effort	14
3	No additional revenues/no acknowledgement	11
4	Binding contracts with processing firms	10
5	Additional costs	8
Cage farming system		
1	No additional revenues/inadequate financial reward	17
2	Cut-off data control too imprecise	9
3	Lack of advices at quality controls	8
4	Too theoretical/too complex	6
5	Obligation to purchase plans	5
Net-pen enclosure farming system		
1	No additional revenues/inadequate financial reward	16
2	Documentation effort/duplications	14
3	Lack of advices at quality controls	11
4	Time effort	9
5	Impracticable/inefficient	7

V. CONCLUSION

Involvement of farmers is a prerequisite for sustainable management of the sector. The Vietnamese Pangasius industry is characterized by hundreds of thousands of farmers. The large number of small-scale producers in Vietnam could be at a particular disadvantage, and special measures will most probably be necessary to ensure their continued participation in the increasingly stringent international quality standards in trading environment for aquatic products. Furthermore, management measures will be more effective when decision makers understand the norms, traditions and motives of the farmers. The results of this study show that quality management systems are not generally rejected by fish farmers because of higher costs or organizational effort. Effciency improvements, gain in image and sales may compensate for costs associated with the introduction of quality systems. As such, higher demands may even motivate farmers to continue participating in quality systems. The possibility of improving acceptance of the quality assurance systems by an add-on quality management module should therefore be investigated. Finally, farmers must be convinced of the benefits of any quality assurance system.

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