

SMALL SCALE FARMER ADAPTATION TO FARMER'S GROUP DEVELOPMENT AND GOOD SHRIMP FARM MANAGEMENT PRACTICE

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Introduction

The situation of Thailand's shrimp culture in 2007 made most of the shrimp farmers change their operation from black tiger shrimp culture to Pacific white shrimp culture and only 4% of them still operated in black tiger shrimp culture. This is due to the high growth rate of Pacific white shrimp, easily raise and giving high production returns. The increasing trend of Pacific white shrimp production had been derived from a large-scale shrimp culture whose readinesses on capital and management system are high. Small-scale shrimp farmers also lacked of capital for developing their production system, and also had problems on low production and accumulated deficit. Some Pacific white shrimp product were exported to international market which made the production high quality and safety based on traceability system. For Thai's shrimp industry, particularly small-scale farmers, needed to be well-adapted and prepared on good shrimp farm management. Samut Sakorn and Nakhon Pathom provinces are important areas for shrimp industry production. Most farmers in these areas are small-scale farmers. Though there was group of shrimp farmers in the community, the group operation may not yet ready to support the export standard. The development of small-scale shrimp farmers depends on group establishment in order to have power in negotiation and adapt the operation system to good shrimp farm management practice. Group concept acceptance and performance of farmers following the group agreement were in order to achieve the development of aquatic animal production under exportation standards. The purposes of this research were to study the adaptation of small-scale farmers to group development, good shrimp farm management practice, and study factors which affected to

farmers adaptation in order to achieve management approach in strengthening small-scale farmers further.

Methodology

Data was collected from 67 small-scale shrimp farmers using the multistage sampling technique. The representative farmers was selected, first, based on the farms located in the Provinces of Samut Sakorn and Nakhon Pathom. The representative of the cooperative and non-member farmers were selected by stratified random sampling. The sample size was obtained by a sample size table at 95% confidence interval for estimating a population proportion and 5% of permissible error level (Yamane, 1973). Close-ended questionnaire was used to collect data of fishers by interviewing from October 2007 to September 2008.

Collected data was analyzed by the descriptive statistics such as percentage, mean and standard deviation, median and inter-quartile range in order to describe general information, the perception of fisheries and shrimp farming news, knowledge about shrimp farming, the projection of production system, small-scale farmer's adaptation to an organized group and good shrimp farm management practices. In order to determine the factors that affected to farmer's adaptation, correlation analysis between variables was conducted with Spearman's rank correlation coefficient.

Results and discussion

General information

The small-scale farmers were male (71.6%) and 28.4% were female (Figure 1). The average age was 49 years old with standard deviation 10.9 years old. The youngest farmer was 24 years old while the oldest farmer was 78 years old (Table 1). Most farmers graduated in primary school (80.3%) (Figure 2). Main income was from shrimp farming (44.3%), fish culture (4.5%) and agriculture (7.5%). Besides that, other sources of income were derived from vender/selling, employee and housekeeper, respectively.

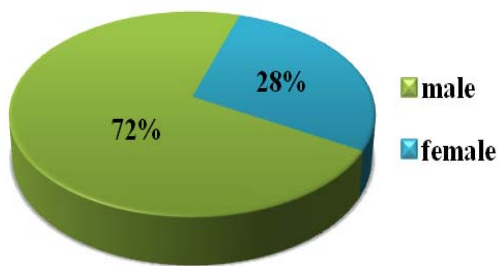


Figure 1 Gender of farmers

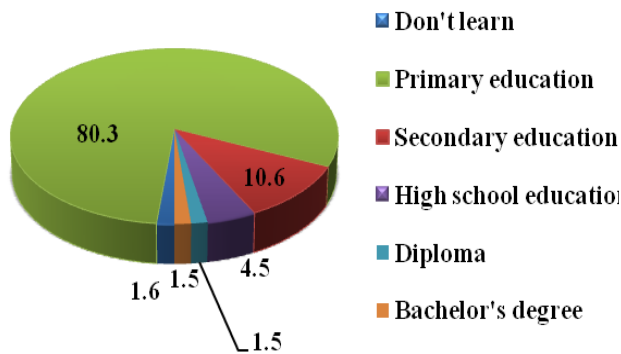


Figure 2 Education of farmers

Table 1 Average age of farmers (years old)

Min	Max	Mean	SD
24	78	49	10.9

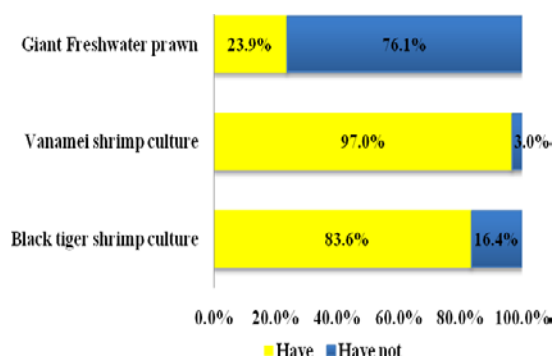


Figure 3 Main occupation of farmers

Farming system

Culture in the study area involved the farming of fish and shrimp. Species founded in the fish farming were *Trichogaster pectoralis*, *Lates calcarifer*, and *Oreochromis niloticus*. The shrimp farming can be categorized as *Litopenaeus vannamei* (Pacific white shrimp), *Macrobrachium rosenbergii* (giant freshwater prawn) and *Penease monodon* (black tiger shrimp). Most farmers had ever operated in the farm of black tiger shrimp, Pacific white shrimp and giant freshwater prawn (97.0%).

At present, most farmers changed their operation to the farming of Pacific white shrimp (98.5%). There was only 16.4% and 6.0% of farmers who had continued farming of giant freshwater prawn and black tiger shrimp, respectively (figure 4).

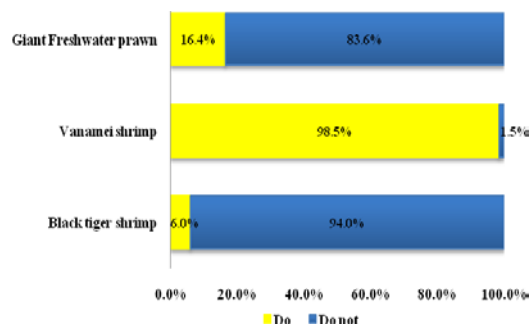
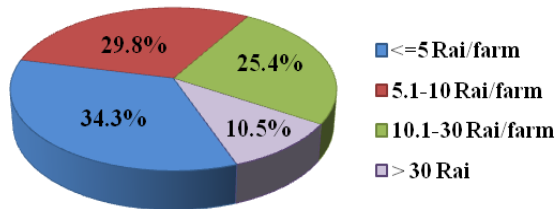


Figure 4 Present farming system

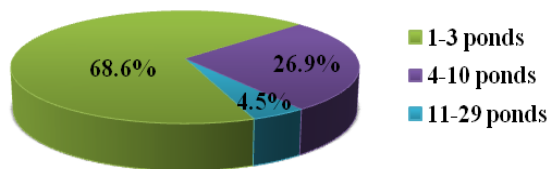
Present farming system

In terms of the farming area, one-third of farmers operated farming in an area of which less than 5 rai (34.3%) (Figure 5) and two-third of them had 1-3 ponds/farm (68.6%). The median number of the shrimp pond was 3.4 rai/pond and inter-quartile range was 2.50 rai/pond (figure 6).



Min	Max	Median	IQR
1.5	13	3.4	2.5

Figure 5 Farming area.



Min	Max	Median	IQR
1	29	2	3

Figure 6 Number of shrimp pond.

From the shrimp production in year 2007, most of farmers (89.6%) had derived the production from farming. The median of production was 6,000 kg/year (inter-quartile range was 14,800 kg/year). More than 75% of the household income of

farmers was obtained from farming (65.5%) (figure 7). For the profit margin of farming, 46.4% of farmers had profit margin in range 25.1-50%, 42.8% of farmers had profit margin less than 25.1% while 10.8% of farmers had profit margin more than 50% (Figure 8).

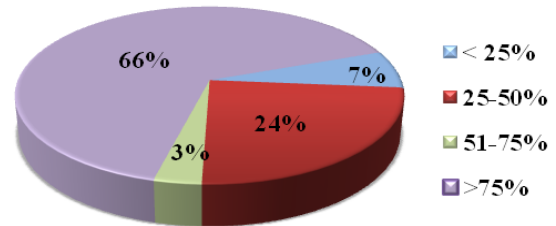


Figure 7 Comparison of total income and income derived from shrimp farming.

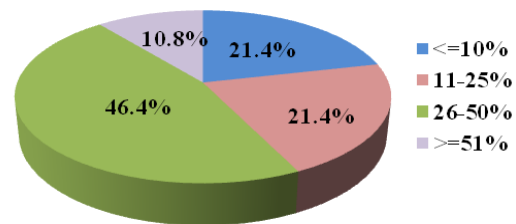


Figure 8 Profit from shrimp culture.

For the marketing, 10.9% of farmers intend to produce shrimp to support international market while 64.0% of them intend to produce shrimp for domestic market. On the other hand, 26.1% of farmers did not have a clear target market or interest on the market.

For the requirement of exportation, 29.9% of the small-scale farmers knew or had awareness on the requirement of exportation e.g. the certificate permission

from the Department of Fisheries (DOF), a
movement document (MD), traceability

system, antibiotics and chemical residue test, organizing the farm based on good shrimp farm management practice and shrimp size specification in production process. More than half of them thought that their farms could pass exportation standard (53.7%) and 11.9% of them thought contrary. More than one-third of them did not sure that their farms could stand up to the farm standard (34.3%) due to uncertainty of the production, marketable size of shrimp, and their aim of production was not for international market.

About than half of farmers were member of Tacheeen Shrimp Farmer Cooperative (50.7%). The rest of farmers were member of Bang Lane shrimp farmer group, Ban Rong Kae farmer group and others group. Most farmers who were a cooperative member applied to participate in cooperative by themselves while the rest of farmers applied to cooperative by suggestion of cooperative official and their neighbors. The reasons they gave were that they needed to use cooperative system to help their group organizing their farm in sustainable way and to apply loan and to bring the concept of good shrimp farm management practice to manage their farm. The reasons of non-cooperative member gave were that their farm could not meet the conditions of the group, they wanted freedom to sell their product, they had few shrimp ponds and they had problems with price and shrimp size.

Knowledge on project of contact farm and Pacific white shrimp farming

Knowledge on Pacific white shrimp farming

The knowledge on shrimp farming in the study was involved the issues of pond and water preparation and the marketing of shrimp. The knowledge on pond preparation concerned pond depth, sludge management and optimal property of soil for shrimp farm. The knowledge on water management involved issues of water preparation, water treatment during disease outbreak and techniques on seed stocking. The result showed that half of farmers had lacked of knowledge on those issues when most farmers had knowledge on the avoidance of shrimp farming in winter or less density stocking in that time. Farmers of 13.4% had overall knowledge on Pacific white shrimp farming at low level (<33%) when 52.2% and 34.4% of them had overall knowledge at medium (34-66%), and high level (>66%), respectively.

Knowledge on project of contact farm

For knowledge on contact farm system, 37.3% and 29.9% of small-scale farmers had knowledge at low (<33%) and medium level (34-66%), respectively. 32.8% of them had knowledge at high level (>66%). They have to purchase shrimp seed and feed from coop, including perform farming following procedure and agreement of coop. However, they had no knowledge that seed provided by coop need to be from standard farm. Farmers also lacked of understanding on GAP permission duration.

News and information perception on fisheries and shrimp farming

News and information perception of fishers on fisheries and shrimp farming was derived through several channels e.g. DOF officers, community leader, neighbors, family members, newspaper, journal, book/document, television, and radio. News and information perception on fishery was mostly obtained from man media e.g. neighbor (55.1%), and DOF officers (44.8%), respectively.

One third of farmers (38.8%) had frequency of perception on fishery from DOF officer the most when 17.9%, the next below was from community leaders (sub district administrative organization/village chief) (17.9%), and neighbor and officer from other institutes (11.9%), respectively.

For news and information on shrimp farming, and advice and benefit gained from that news, farmers of 55.2% perceived news and information from neighbors who operate shrimp farming nearby the most. The next below were from family members (47.8%), television (44.8%), store and reseller of shrimp farming production factor (13.3%), and sell representative (22.4%), and journal (22.4%), respectively.

Opinion on farmer group development and good shrimp farm management practice

Group establishments in the study area were in form of saving group, woman product group, young people group, community group, conservative group, Thacheen agriculture cooperative group, Thacheen shrimp farmers group, and aquaculture group. Small-scale farmers agreed that Thacheen shrimp farmers group is the strongest group (41.8%), the next below were Thecheen agriculture cooperative group (25.3%), and saving group (22.4%),

respectively. Most farmers agreed with groups establishments (85.1%) and thought that groups should be in form of shrimp culture group, and coop (52.6% and 43.8%, respectively). In respect of the adaptation of farmers, the result found that 34.4% of farmers are well-adapted to organized groups and manage their farms based on good farm management practice. The rest of them were able to adapt themselves at medium and low level (49.2% and 16.4%, respectively).

On the part of good shrimp farm management practice, farmer agreed that there is opportunity of farmer adaptation in water preparation, disease control, and pets and birds control. The issues with less opportunity were record of financial account, and daily record of production factors. About two-third of farmers (66.1%) thought that shrimp production has high important due to the product need to be tested to make sure that there is no residue. These made farmers know the source of problems and can prepare the damage prevention in order to achieve good quality product with traceability system. 90.8% of farmers thought that there is opportunity for operating their farm following hygienic standard and drug and chemical free because they operate their farms based on biological concept without drug and chemical, and follow advices from DOF. However, 48.5% of farmers thought that there is no opportunity of group's negotiation on marketing. Though there was a group in the community, there were still lacks of participation of group members, lacks of the government's leader who would support and enhance their understanding, and the limitation on differentiation of shrimp culture systems. However, 51.5% of farmers thought that they have readiness on group participation in order to negotiate in the market.

Factors which affected to successful of group development and good shrimp farm management practice were production in which meet the security standard (88.1%), drug and chemical free (90.8%), knowledge of farmers on marketing (90.1%), cooperative of farmers in aquaculture practice following the standard and agreements (80.6%), and the strength of group leader (77.6%).

Factors affected to the adaptation of small-scale farmers to a agricultural group development and good shrimp farm management practice.

More than three-fourth of small-scale farmers thought that group leader has interaction with members at high level (78.4%) when farmers of 10.8% and 10.8% thought the interaction

were at low and medium level, respectively. The reasons they gave were that the leaders are more informed and communicated news with members, having a well-disposition, helping and introducing about shrimp farming with members. Furthermore, the opinion of farmers on interactions between group leaders and members had a positive significant correlation with the opinion on the possible adaptation of culture operating following good shrimp farm management and group's agreements ($p = 0.000$, $r_s = 0.438$). Small-scale farmers with a positive opinion about their leaders' interaction, sees more possibilities to operate their farm following good shrimp farm management and group's agreements.

Perception of shrimp farming news of small-scale farmers showed that two-third of them had news and information perception at low level (67.7%) and the frequency of perception was 1-3 times/year. While 27.7% of them had news and information perception at medium level (27.7%) and the frequency of perception was 4-6 times/year and 4.6% of them had news and information perception at high level and the frequency of perception was more than 6 times per year. The sources of shrimp farming news were man media, publication, and audio visual materials. The perception on fishery and shrimp farming news of small-scale farmers had a significant correlation in the positive way with the opinion on opportunity in farm practice following good shrimp farm management and group's agreement ($p = 0.000$, $r_s = 0.418$). This indicated that the enhancement the perception of fisheries and shrimp farming news, both in term of the variety of media and the frequency of perception, makes small-scale farmers see more successful opportunity in operating their farms following the good shrimp farm management and group's agreements.

About one-third of farmers had knowledge on Pacific white shrimp farming at low level (34.3%) and medium level (37.3%) and another one-third of them had knowledge in this issue at high level (28.4%). Knowledge on Pacific white shrimp farming and knowledge on contact system project had significant correlation with successful opportunity on farming practice following the good shrimp farm management and group's agreement in the positive way ($p = 0.013$, $r_s = 0.316$ and $p = 0.000$, $r_s = 0.513$, respectively). This showed that the enhancement the knowledge of farmers on shrimp farming and on the contact system project makes the farmers see more successful opportunity in operating their farms following the good shrimp farm management and group's agreement.

Conclusion

Based on concept of good shrimp farm management practice and operation following the projection of production system, the important factors that helped farmers to join a group or cooperative were perception on concept and farmers operation. This led to the way in producing good quality product which meets the agreements for export and safety. Though some small-scale farmers were not cooperative members, they were members in other groups. Thus a group or cooperative system had been used to organize the small-scale farming in order to enhance the perception farmers on good shrimp farm management practice, traceability and farmers operation is/are following the requirement of projection of production system.

Factors significantly affected the adaptation of small-scale farmers to a group development and good shrimp farm management practice were required knowledge supporting on Pacific white shrimp farming and the projection of production system, enhancement the perception of farmers on fisheries and shrimp farming news both in term of variety of media and the frequency of perception, knowledge sharing, and opportunity building on information exchanging. The operations of groups or coop should be performed under a good interaction between leaders and members. Furthermore, the operations must sharply focus on member's benefit, not business benefit, including the enhancement of knowledge to members. The group operation of committees and leaders need to be strengthening in issues of group coordination, report of work performance, opportunity distribution to members, and network transparency and evaluable.

References

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