

PROPOSING A BETTER MANAGEMENT REGIME FOR HARD CLAM (*Meretrix lyrata*) FARMING IN TIEN GIANG PROVINCE, VIETNAM

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ABSTRACT

*The objective of this study was to assess the management status of hard clam (*Meretrix lyrata*) farming practices in Tien Giang province in order to propose a better management package for more sustainability of this industry. A number of methods were used for data collection including document reviews, group interviews with local stakeholders such as farmers and managers. A SWOT analysis was used as a basis for proposing a better management model for the industry, and the proposed model was then evaluated by experts and experienced farmers. Finally, the model was adjusted to be more applicable to the real situation. This paper is going to present the strengths and weaknesses of the current management of hard clam industry at the studied area, focusing on its efficiency in terms of constitutional and economic views. Then a new management model for this hard clam industry was proposed by combining its current strengths and successful experiences learnt from other provinces such as Ben Tre, where a successful hard clam industry obtained a Marine Stewardship Council (MSC) certificate. Results from the evaluation by experts and farmers show that the proposed management model for hard clam industry in Tien Giang was highly applicable in terms of its suitability and promising positive impacts on the environment, economic and social aspects. In addition to the evaluation, some measures for risk elimination have been suggested to ensure that the proposed management model would achieve its goals.*

Keywords: *hard clam farming, Tien Giang, proposing management model.*

TÓM TẮT

*Mục tiêu của nghiên cứu này là đánh giá hiện trạng quản lý nghề nuôi nghêu (*Meretrix lyrata*) ở tỉnh Tiền Giang nhằm đề xuất mô hình quản lý bền vững hơn cho nghề này. Các phương pháp để thu số liệu bao gồm thu số liệu thứ cấp và số liệu sơ cấp bằng cách phỏng vấn các nhóm người liên quan như nông dân và nhà quản lý. Sử dụng phương pháp phân tích SWOT để làm cơ sở cho việc đề xuất mô hình quản lý tốt hơn cho nghề nuôi nghêu, sau đó đề nghị sự đánh giá của chuyên gia và nông dân có kinh nghiệm về tính khả thi của mô hình đề xuất. Cuối cùng mô hình quản lý được điều chỉnh để đáp ứng thực tế sản xuất của địa phương. Bài viết này trình bày những điểm mạnh và yếu của mô hình quản lý nghề nuôi nghêu hiện tại ở vùng nghiên cứu, tập trung vào tính hiệu quả của nó về mặt hiến pháp và kinh tế. Và mô hình quản lý mới cho nghề nuôi nghêu này được đề xuất dựa trên sự kết hợp những điểm mạnh hiện tại với các kinh nghiệm thành công từ những tỉnh khác như mô hình quản lý nuôi và khai thác nguồn lợi nghêu đã được cấp chứng nhận của Hội đồng biển (MSC) của Bến Tre. Kết quả đánh giá của chuyên gia và nông dân kinh nghiệm cho thấy rằng mô hình đã đề xuất cho quản lý nghề nuôi nghêu ở Tiền Giang có tính khả thi cao về sự phù hợp và tác động tốt lên các khía cạnh môi trường, kinh tế và xã hội. Bên cạnh sự đánh giá đó, vài biện pháp hạn chế rủi ro khi thực thi cũng đã được đề xuất nhằm đạt mục đích của mô hình quản lý mới.*

Từ khóa: *Nuôi nghêu, Tiền Giang, đề xuất mô hình quản lý.*

INTRODUCTION

In recent years, a high market demand has created an opportunity for the development of

hard clam farming in Vietnam generally and in many Mekong Delta provinces particularly. Tien Giang was one of such provinces where

hard clam farming has become an economically important sector that raises high income and thousands of job opportunity for local people. Go Cong Dong district was the most important area for hard clam farming of this province. According to the provincial Department of Agricultural and Rural Development, there was 1,800 ha of hard clam farms, involving 184 households in this farming in 2015 (DARD, 2015); and with its productivity ranging from 15-20 tons/ha, this industry could produce approximately 30,000 tons annually. However, it has been believed that this farming industry was facing various difficulties such as protecting its production, or/and risks of economic loss due to unstable market price, which threaten its sustainable development. According to the local people's point of view, these difficulties derived from the current weak management regime. Possibly, this management regime might only benefit some certain people groups but not the common communities, thus there were conflicts among local stakeholders. As a result, un-expected harvesting of clam occasionally occurred. In addition, unexpected fluctuation in market price would lessen farmers' profit, and this issue was also believed to be partially due to a weakness in the current management, for example a lack of co-operation among local stakeholders. These beliefs need to be certified with clearer evidences. Therefore, it is essential to assess the current status of this farming industry focusing on its management strategy in order to propose a better management model for a more sustainable development. This

study aimed at analyzing the strengths and weaknesses of the current management of hard clam farming industry in Tien Giang province, and then composing a more appropriate management model for this industry.

METHODOLOGY

This study focused on Go Cong Dong district, where the most important area for hard clam farming in Tien Giang province located (DARD, 2013), for data collection. In order to compose an appropriate management model for this industry, the study conducted firstly an analysis of the current management regime of hard clam farming there and a comparison with a successful model of a similar industry in Ben Tre province to learn their strengths and weaknesses. Secondly, a synthesis of expectation raised by local stakeholders for improving their industry sustainability was proposed. Particularly, the analysis was on the current policies and law issues in terms of their structures and mechanisms, and effectiveness and validity. Data used for this analysis came from both secondary and primary sources. The primary data were obtained by face-to-face interviews using a questionnaire, PRA group discussion and field observation. Both qualitative and quantitative analyses were applied, of which ranking and scoring methods were used to support the quantitative one.

The diagram of data collection, analysis and proposing a new management model for hard clam farming is presented in the following figure:

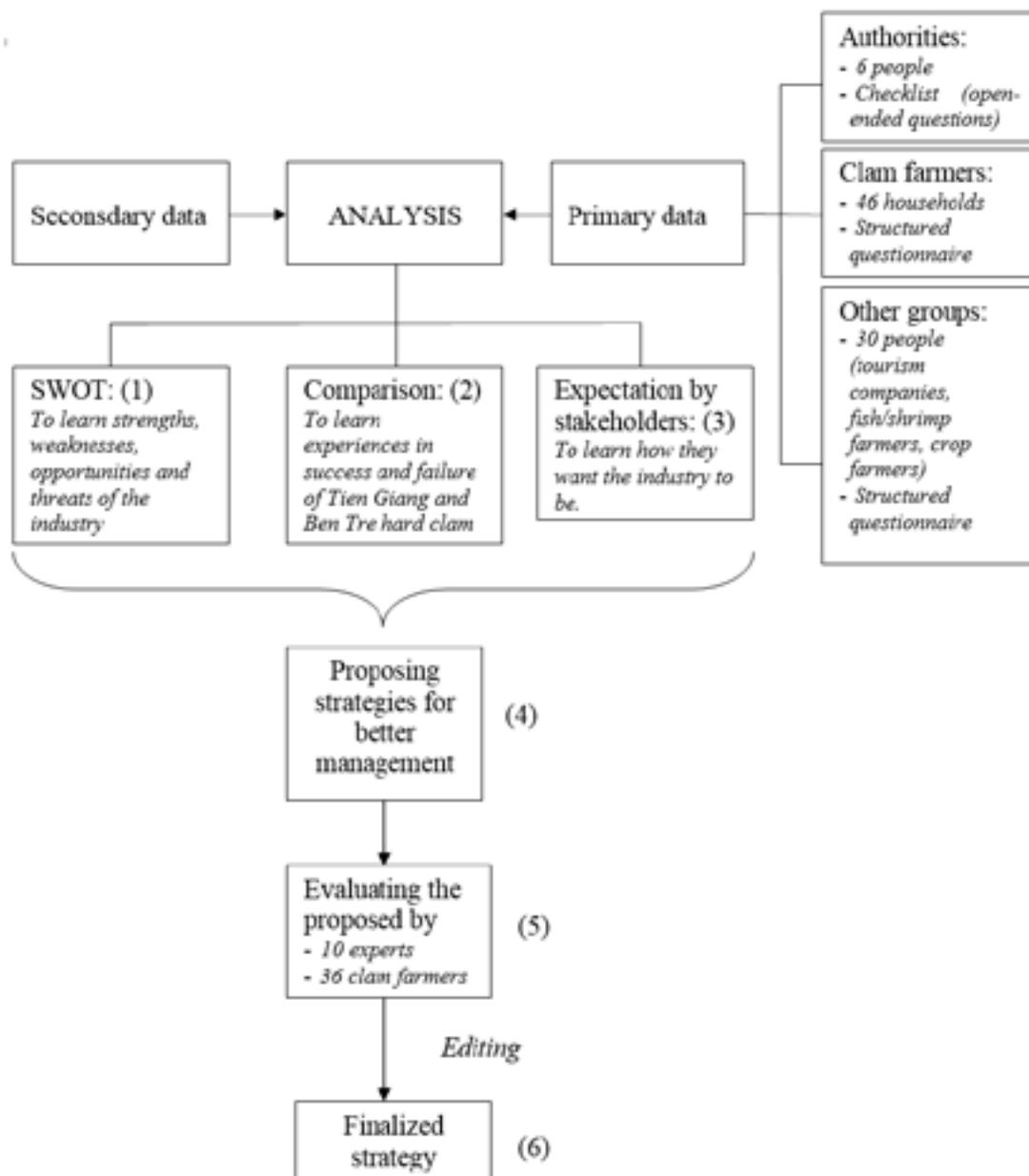


Figure 1. Data collection, analysis and proposing a new management strategy for hard clam farming in Tien Giang Province.

Notices: Details of the Figure 1 are given below:

- 1) SWOT analysis was to learn the strengths, weaknesses, opportunities and threats of the hard clam farming industry in Go Cong Dong district, Tien Giang province in terms of its current management strategies.
- 2) A comparison between hard clam industries in Ben Tre and in Tien Giang was conducted to learn from their successes and failures, focusing on some key issues in management effectiveness such as via criteria like the occurrence of unexpected outsider's harvesters (thieves), the active participation of clam farmers in developing management strategies and making decision, the level of law understanding of clam farmers, etc.
- 3) Individual interviews with local clam farmers and other groups of stakeholders in Tien Giang were conducted to learn their expectations for an improvement of successful management strategy.

- 4) A draft of new management strategy was proposed according to the analyses from (1), (2) and (3) steps, and this new management model was evaluated by local stakeholders.
- 5) 10 experts and local managers, and 36 clam farmers and other groups of stakeholders were invited for interviews to this evaluation. They were requested to give scores following given criteria, which were developed by the researchers, for ranking the proposed management in terms of its suitability and acceptability to the local situation. A scale was developed by the researchers to be used for ranking the proposed management based on average scores given by involved experts and other local stakeholders. Specifically, if the score is from 80-100: to be ranked as highly applicable to the local situations (suitable and acceptable); from 60 – less than 80: applicable but with some risks and need to be improved; and less than 60: inapplicable (not suitable and acceptable).
- 6) The proposed management strategy was then adjusted based on the outcome of the previous evaluation for a finalized management strategy.

RESULTS AND DISCUSSION

Characteristics of current management for hard clam farming in Tien Giang

Key strengths, weaknesses, opportunities and threats (SWOT) of the management of hard clam farming in Go Cong Dong is presented in Table 1.

Table 1. Identifying strengths, weaknesses, opportunities and threats of hard clam management in Go Cong Dong district, Tien Giang province.

<p>STRENGTHS</p> <p>S₁: The natural environment was in favour with hard clam farming and optimal for their biology</p> <p>S₂: Farmers had good experiences in hard clam farming and good perception in conservation of natural resources.</p> <p>S₃: Primary form of co-operation was established/available (collaboration among neighbor households) for farming activities and protecting their productions.</p> <p>S₄: Clear supporting laws were available.</p>	<p>WEAKNESSES</p> <p>W₁: Reasons for hard clam mortality were unknown.</p> <p>W₂: Natural seed and brood-stock of hard clam were not actively conserved.</p> <p>W₃: Role of farmers in decision making process was weak</p> <p>W₄: Role of local government in management was considered as less efficient in terms of law enforcement</p> <p>W₅: The market price was unpredictable</p>
<p>OPPORTUNITIES</p> <p>O₁: The area received active supports from research institutes, universities and NGOs.</p> <p>O₂: Many supporting policies from the central government were available</p> <p>O₃: A successful management model was available in Ben Tre province, which obtained a MSC certificate and highly market acceptance.</p> <p>O₄: Global integration created a larger opportunity for hard clam export from Vietnam.</p>	<p>THREATS</p> <p>T₁: Climate change would have negative impacts in hard clam farming.</p> <p>T₂: Trends of highly competitive market increased</p> <p>T₃: Consumers required higher quality of hard clam products (certified with “Green Label” for example).</p>

From the above SWOT analysis, a strategy for better management was developed and presented in the below matrix.

Table 2. Strategic matrix for better management model for hard clam farming in Go Cong Dong, Tien Giang province.

<p>S-O (Integration between Strengths and Opportunities)</p> <p>$S_{1,2}O_1$: Collaborate with scientists to improve farming technology, which would be more suitable to local conditions.</p> <p>$S_{3,4}O_{1,2,3}$: Apply the policies and laws issued by the Central government and learn experiences from the co-management model in Ben Tre to develop appropriate management model for Tien Giang hard clam industry.</p> <p>$S_{1,2,3,4}O_{3,4}$: Improve the current management and exploitation of hard clam toward achieving a MSC certificate</p>	<p>W-O (Integration between Weaknesses and Opportunities)</p> <p>$W_1O_{1,2}$: Collaborate with research institutes, universities to identify causes of hard clam mortality, and to research for solutions.</p> <p>$W_2O_{1,2}$: Call for supports from NGOs' and provincial government to develop exploiting regulations and to establish protected areas for natural seed and brood-stock conservation.</p> <p>$W_{3,4}O_{1,2}$: Improve the decision making process by involving local farmers into the development of management strategies, referring to the successful experiences from Ben Tre Province.</p>
<p>S-T(Integration between Strengths and Threats)</p> <p>$S_{2,3}T_{1,2}$: Improve the current management for more co-operative among farmers to share experiences and responsibilities in order to actively response to the climate change issues, and to improve their market competition.</p> <p>$S_{3,4}T_3$: Rely on the government support in terms of policies and constitutional framework to establish good farming practice area according to the market requirement.</p>	<p>W-T (Integration between Weaknesses and Threats)</p> <p>W_1T_1: Improve farming technology which could adapt to climate change conditions to minimize clam mortality.</p> <p>W_2T_1: Produce artificial seed to compensate the loss of hard clam resource due to climate change effects.</p> <p>$W_{3,4}T_{2,3}$: Assign clear roles among stakeholders to develop co-management and to implement good farming practices for higher product quality.</p>

Based on the above SWOT analysis, strategic matrix and information obtained from interviews, the following main constraints of current management were defined and need to be changed for a new management model:

Firstly, the current management lacked participation of key local stakeholders like farmers. They should be involved in the decision making process. Whenever they participate in developing management regulation, they would be more responsible in the role of monitoring and protecting their production, natural spawning area and brood-stock of hard clam (Pomeroy and Williams, 1994). Then illegal activities would reduce because the involved people would understand the local regulations better.

Secondly, the current farming practice was based on individual knowledge and experience by farmers, thus the production would be exposed to high risks of economic loss due to various challenges, such as unpredictable water quality at farming areas, fluctuation of market price, and poor farming technology. A new management model should call for more government and expertise supports to deal with such constraints.

Thirdly, export market would be the main focus for Vietnamese hard clam and such market commonly requires products certified with an "ecological label" like MSC certificate (Nguyen Huu Khai, 2005). To achieve a MSC certificate the hard clam production must meet criteria including food safety, sustainable environment

and exploitation, free of disease infection, and social equity (DARD of Ben Tre, 2007). Therefore, participation of local stakeholders into a co-management is necessary to establish a farming zone that meets such requirements.

Finally, lack of capital investment in the current management was a serious problem, and then a co-management would be conditional to attract more investment from different potential partners as well as from government sectors (Pomeroy *et al.*, 2001).

Good experiences from Ben Tre hard clam industry

Co-operation was the management form in Ben Tre, in which local farmers participated as official members and they did develop and agree on the regulation for the co-operation activities (Tran Thi Thu Nga, 2010); They had rights to decide how to manage their farming areas. In this management regime, they had exclusive right to land use of their farming water allocated by the local government. As the resource owners, they were highly active in sharing their responsibility in protecting the common profit from the co-operation of their production. The local government played a supporter role in providing a constitutional framework for the system. In general, Ben Tre hard clam industry applied a co-management regime with an active participation of local farmers acting as key decision makers, with local government acted

as an constitutional supporter. Under this co-operation, the Ben Tre industry had advantages of financial investment or accessing loans from banks. While hard clam farming in Tien Giang based on individual farm or a group of farm management regime is lacking government involvement and hardly getting loans.

In term of conservation on the natural resources, Ben Tre industry regulated the clam-harvesting limit of maximum 80% and a protected area for spawning ground (Tran Thi Thu Nga, 2009). Besides, the conservation of other flora and fauna was also emphasized. These regulations for conservation of natural resources met the specific requirement of MSC certificate that made the Ben Tre clam products accepted by International markets, and more importantly this would help Ben Tre to protect their spawning grounds of hard clam which supplied wild seed by themselves recent years. On the opposite, the Tien Giang industry has not paid much attention on this conservation. As a result, natural seed of hard clam was very limited in Tien Giang, thus it could not supply to the industry here.

Expectation of stakeholders for new management form in Tien Giang

Different groups of stakeholder were asked to suggest their expectation on a new management form for Tien Giang clam industry. Results from these interviews are presented in Figure 1.

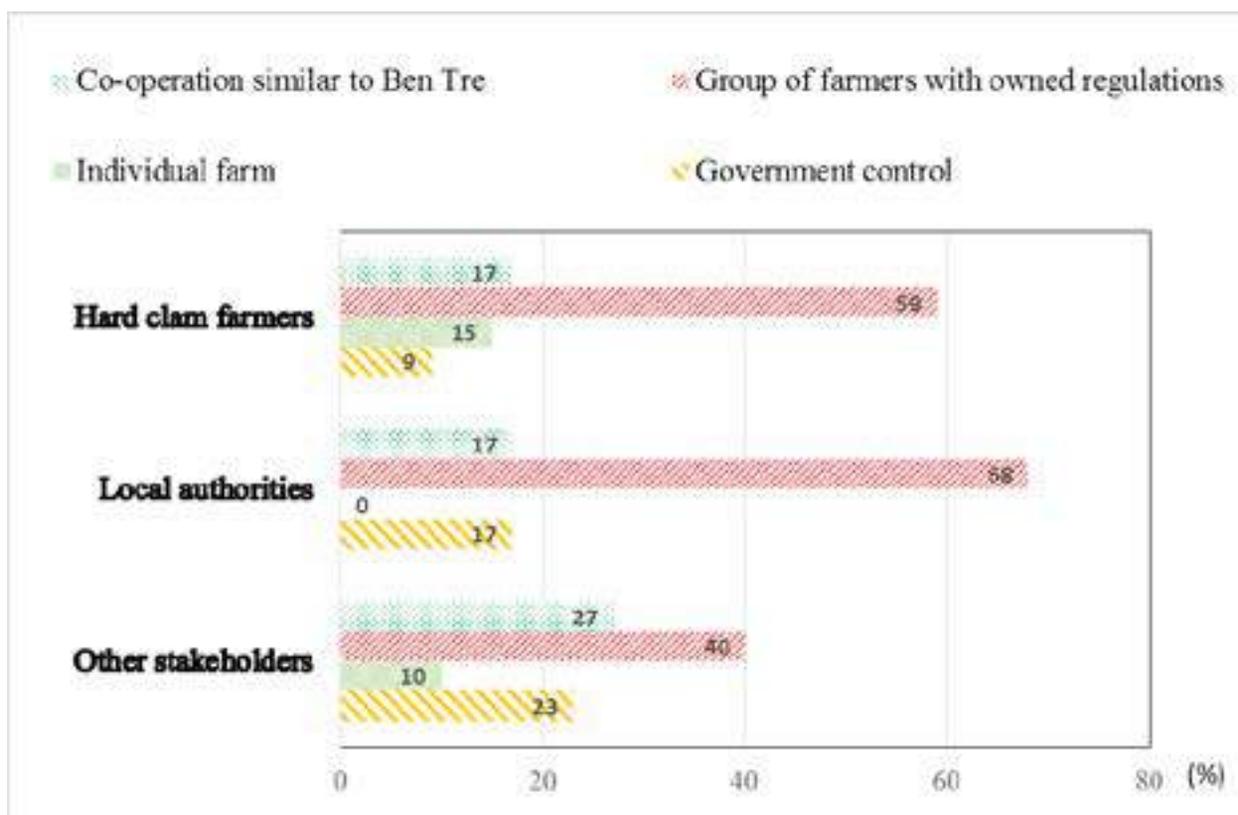


Figure 1. Expectation (% interviewees) by different stakeholders on the new management form for hard clam industry in Tien Giang.

As shown in Figure 1, the majority of informants, including 59% hard clam farmers, 68% authorities and 40% other stakeholders, preferred to have a management form of a group of farmers with their own regulations. This form was like what they were currently doing in Tien Giang but needed stronger supports from the local government. As these informants' opinion, a co-operation like in Ben Tre with a large group of farmers' collaboration would not suit the condition here in Tien Giang. Individual farm or centralized government management was not their choice too. For the authority group, they highly evaluated the Ben Tre co-operation management but they realized at the current time this form would not receive strong support from the local farmers. The aim of the local authority was to develop a form of management that would receive most local stakeholders' support and their active involvement, in order to practise farming in an environmentally friendly manner toward achieving a MSC certificate.

Initial proposal of a new management model

The new management model for hard clam industry in Go Cong Dong district, Tien Giang province should apply a co-management schema, in which local stakeholders including farmers should be key people for making decision (Pomeroy and Williams, 1994; Association for Fisheries Development in South East Asia, 2005). In other words, they should actively participate in developing local regulations for clam farming and exploitation, and the government at different levels would act as constitutional supporters. The aim of this model was to involve local farmers in sharing their responsibilities with the authorities to conserve the natural resources and to protect their own clam production. As expected by local stakeholders, the model here would learn the advantages of the co-operative form in Ben Tre which relies on the involvement of a large number of members, but the difference here was that it will form smaller groups of members (households) that suit the local conditions in Tien Giang. The initial proposed management model is presented in Figure 2.

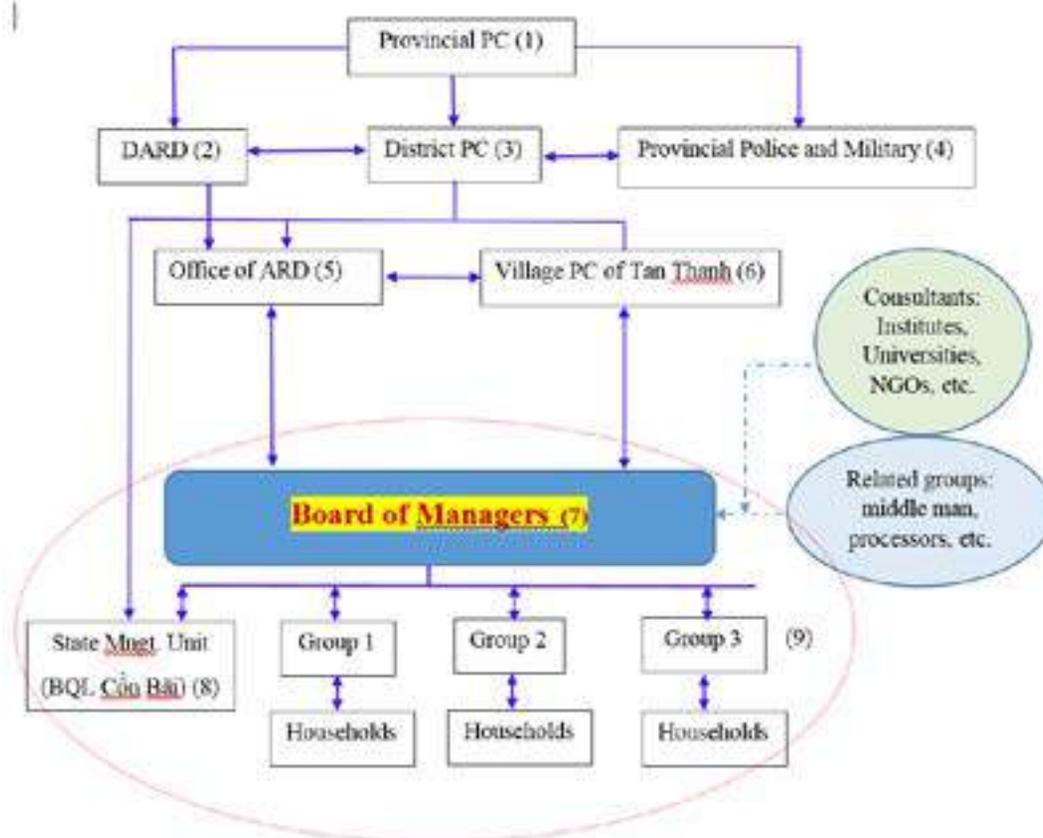


Figure 2. Initial proposed management framework for hard clam industry in Go Cong Dong district, Tien Giang province.

Where:

- (1): The Provincial People Committee (PPC) should act as a general manager, who would support the management system by providing constitutional framework.
- (2): Department of Agricultural and Rural Development would provide technical supports, trainings, market information, environmental issue warning, consultation for the PPC to make policies, etc.
- (3): District People Committee would support in administration and law.
- (4): District Police and Military Force would support in protecting the farming areas against illegal harvesting.
- (5): Office of Agricultural and Rural Development at district level would support the Board of Managers (7) in regularly delivering knowledge in law and local regulation to the Groups of farmers (9).
- (6): Village (Tan Thanh) People Committee would issue the local regulation which was developed by stakeholders including local farmers, authorities, and others.
- (7): Board of Managers would be established at the Village level, with representatives coming from and recommended by farmers and authorities, who would play a key role to represent the stakeholders in interacting with different sectors for planning, conserving and protecting, trading, etc.
- (8): An existing State Management Unit would become one of the farming groups but focusing more on conserving and protecting the natural spawning areas; this Unit would help the Board

of Managers to encourage farmer groups to practise farming in an environmentally friendly manner.

- (9): Farmer Groups would be key actors who will participate in the process of decision making and protecting the farming areas. These groups will be formed of a few neighboring households (not like co-operative in Ben Tre with a large number of households). All groups have to agree and practise on the common local regulations issued by the Tan Thanh Village People Committee mentioned above. As suggested by the local stakeholders, such small groups would be more appropriate to the local conditions because their members would be more active and effective in monitoring and protecting their farm areas.

Beside the above factors, supports from consultants like research institutes, universities, NGOs, and other related sectors such as middle man, processing plants, exporters, fish farmers, tourism organization, etc. (*see Figure 2; The broken lines indicate optional involvement of consultants and other related groups whenever essential or needed. The single lines indicate compulsory activities between stakeholders*) would be needed.

In general, in this proposed management framework, the government sectors at different levels will act as supporters only, and the key decision will be made by farmer groups, following a bottom up decision making approach.

Evaluation on the proposed management model

The evaluation values given by experts and local managers are presented in Table 3.

Table 3. Results of experts and local managers' evaluation on the proposed management model for hard clam farming in Tien Giang (n=10).

No.	Criteria to be evaluated	Score	Recommendation	Solutions
1	Criteria 1	86.1		
1.1	Do the roles of different stakeholders were clearly defined?	89.3	-Pros.: It met the expectations by stakeholders. -Cons.: A few people may not be responsible in playing their roles.	Specifying clear responsibility and benefit for particular stakeholders
1.2	Does the proposed model relevant to the local conditions (social economic, farming scale, etc.)?	83.7	-Pros.: It is relevant -Cons.: It is hard to manage immigrant.	- Regular assessing and giving feedback on the social condition would help to manage better
1.3	Does it meet the requirement of the Central Government Law?	89.4	-Pros.: Yes, with clear statement. -Cons.: Not given	- Providing specific policies for hard clam from the PPC
1.4	Have the benefits of local people and their culture, tradition been considered and respected?	81.8	-Pros.: Yes, with clarified benefits -Cons.: It misses some cultural aspects	- Learning more about the local cultural aspects
2	Criteria 2	83.4		
2.1	Does it has solutions for conservation of ecological systems?	82.0	-Pros.: Yes, basically. -Cons.: local policies may take longer time than expected to be made.	- Establishing a quickly responding team to monitor the system.

No.	Criteria to be evaluated	Score	Recommendation	Solutions
2.2	Are technical aspects planned in details?	83.8	-Pros.: Yes, it is clearly allocated. -Cons.: Irresponsibility may occur among local stakeholders	- Providing clear financial policies to encourage local stakeholders to be responsible
2.3	Does it has solutions to harvest selectively the hard clam for better conservation?	86.6	-Pros.: Yes, it does. -Cons.: not given	- The PPC should issue clear regulation on permit size and percentage for harvesting
2.4	Does it care about achieving MSC certification in the near future?	81.3	-Pros.: Yes, developing a co-management model is a key toward meeting the MSC criteria -Cons.: It strictly follows the regulations may be difficult to some members	- Utilizing education and economical tools
3	Criteria 3	80.4		
3.1	Were supports from the government maintained regularly?	80.2	-Pros.: Yes, they have. -Cons.: Financial supports may be limited.	- The Board of Managers should actively search for alternative sources of financial support.
3.2	If the government supports end, do the remaining actors such as local farmers continue to run the proposed system?	79.0	-Pros.: Not sure but it is the only way to meet the needs of international markets. -Cons.: not given	- The farmers should maintain the system to achieve MSC certificate in order to sale their products in international markets with better price.
3.3	Does it clarify collaboration among stakeholders, including roles and benefits?	81.9	-Pros.: yes, it is mentioned. -Cons.: monitoring the collaboration has not been mentioned.	- Specifying the responsibility for monitoring among stakeholders.
	<i>Overall score</i>	83.3		

As shown in Table 3, the overall score given by experts and local managers was 83.3, thus the proposed management model was evaluated as “highly applicable” to the local conditions. However, there were some risk points (Cons.) recommended by the evaluating team as presented in this Table, which need to be improved as suggested under the solutions mentioned in the Table.

Beside experts’ evaluation, local farmers and other related stakeholders were also requested to give their opinion on the suitability of the proposed management. The results were that 69.4% of interviewees evaluated it as “highly

applicable”, 27% as “applicable” but need to be improved, and only 2.7% gave “non-applicable”.

In general, the majority of interviewees agreed that the proposed management model would be applicable to the local conditions but there was a need for some modifications. Therefore, this proposed management would be applied to Go Cong Dong, Tien Giang but it needs high concentration on defining responsibility and benefit for particular groups of stakeholders and they should pay more attention on conserving natural hard clam resources for more sustainable exploitation.

In addition, the Board of Managers should be formed very carefully in term of selecting the right representatives to play their role effectively as expected.

CONCLUSIONS

The current management of hard clam industry in Go Cong Dong, Tien Giang was not involving enough participation of local farmers to share their responsibility and benefit with the government. Therefore, a new management model should focus on calling more participation from the farmers, especially at the beginning of the decision making process, in order for them to be more responsible in conserving natural resources and protecting the productions. Based on the general strategy proposed above, a more detail plan should be developed to concentrate on specifying the roles of particular stakeholder's groups to run the system successfully. Additionally, a pilot test would be essential before any larger scale implementation.

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