

RESPONSIBLE SHRIMP FARMING IN VIETNAM: CALL FOR PROMOTING AND STRENGTHENING COMMUNITY BASED MANAGEMENT APPROACHES

Tran Van Nhung,
Department of Extension and Socio-economic Studies
Research Institute for Aquaculture No.1, Ministry of Fisheries of Vietnam,
trvanhuong@hotmail.com

ABSTRACT

Shrimp farming has been developing rapidly in Vietnam recently and is facing a number of challenges. These include environmental and socio-economic impacts, volatile international markets and current anti-dumping issues. This paper provides an analytical overview of major problems faced by the industry in Vietnam based on a literature review and experience gained under the UNDP-funded project VIE/97/030 "Environmental management in coastal aquaculture". The dominant characteristic of shrimp farming is its small-scale nature, based mainly on individual households. Development of shrimp farming has occurred through unplanned expansion in terms of number of farms, households, farming area, and - more recently - farming intensification. Traditional practices met constraints in meeting product quality standards in domestic and foreign markets. Demonstration under the project revealed that community-based management is an important way to bring farmers together to adopt responsible farming practices, and improve standards for quality shrimp production. Factors contributing to success of the management approach include: (1) farming communities' willingness to cooperate and provide labour; (2) development of management plans reflecting the practical needs of and benefits for the community; (3) building the capacity of key members; (4) integrating community activities into the state management network. Shrimp farming is very important to Vietnam. For responsible development we recommend that the government should promote and strengthen community-based management approaches. A legal policy document for community-based shrimp farm management should be developed in order to provide specific guidelines for and delegate rights to local authorities and farmers.

Keywords: Vietnam; Shrimp farming; VIE/97/030 project; Community based management; Responsible development.

INTRODUCTION

Shrimp farming has been developing rapidly in Vietnam and is facing a number of challenges regarding negative social, economic and environmental impacts and recently trading competition and anti-dumping issues. The fast transformation of large unproductive rice and salt fields in coastal areas has resulted in a number of difficulties and inadequacies regarding technical know-how, seed supply, environmental and disease management, aquaculture planning and infrastructure development. Development of shrimp farming is spontaneous, unplanned and driven by short-term benefits. Dominating by improved extensive systems, operating by hundred of thousands of small-scale farmers, the shrimp production chain from producers to processors and consumers is inefficient leading to production fragmentation, inefficiency, and low quality and decreased competitive capability of Vietnam's shrimp farming sector compared to that of other countries.

In this and the next decade, shrimp farming will continue to be an important sector, attracting farmers, local and central Government in transforming coastal economic structure. Responsible shrimp farming development requires a lot of efforts and measures, among which promoting community based management approach is one of important goals.

This paper provides an analytical overview of major problems faced by the industry in Vietnam based on literature review and experiences of the UNDP funded project VIE/97/030 environmental management in coastal aquaculture. The paper then continues with a review of experiences in community based shrimp farming management of the project and discusses policy options to strengthen community based management approaches for directing responsible shrimp farming development.

SHRIMP FARMING IN VIETNAM: OVERVIEW OF ISSUES AND CHALLENGES

Figures and data showed that in the 1970s, extensive shrimp culture existed in both North and South Vietnam. For instance, UNDP (1974) reported that the area of shrimp culture in the Mekong River Delta this period reached 70,000 hectares. In the North, by 1975, the area of brackish water shrimp culture was about 15,000 hectares. Shrimp culture for export expanded strongly in early years of the 1990s (Vu Do Quynh, 1989; Pham Khanh Ly, 1999). Development of shrimp culture over this period was driven by many factors such as introduction and successful renovation of technology for artificial shrimp seed production, technology for growth-out shrimp farming, increasing demands in international markets for shrimp and the implementation of Government policy for economic reform (*Doimoi*). In the middle of the 1990s (1994-1995), shrimp culture came to a halt due to shrimp diseases experienced in Mekong Delta, the major shrimp producing area of the country. The fast development of the shrimp industry in Vietnam was marked by the promulgation of the Resolution 09/NQ-CP of the Government dated in year 2000, allowing farmers to convert low productive rice fields, uncultivated areas and salt pans into ponds for aquaculture. The area for shrimp culture increased from 250,000 hectares in 2000 to 478,000 hectares in 2001. Although the growth rate slowed down, during the year 2002-2003, the area of shrimp culture in Vietnam still increased. By the end of 2003, there had been 530,000 hectares of land used for shrimp culture, including area for shrimp and rice farming in rotation. In addition, 26,000 hectares out of 136,000 hectares of mangrove forest were used for shrimp culture as a combination of shrimp and forest. Currently Vietnam is probably one of the countries having the largest area for shrimp culture in the world. Shrimp production also increased sharply from the 1990s (Table 1), and especially after 2000, Vietnam became one of five countries having the highest shrimp production. Most of shrimp culture area in Vietnam concentrated in Mekong delta scattered along estuaries, canals in central coastal regions and in the Red River and Thai Binh rivers delta in the North.

Table 1: The area and production of shrimp culture in Vietnam (ha)

Region	1990	1995	2000	2001	2002	2003
North (ha)	1,985	8,150	9,136	21,489	25,179	41,372
North Central (ha)	421	4,109	8,211	12,271	9,826	12,304
South Central (ha)	3,100	8,091	8,402	16,388	16,311	16,499
South* (ha)	88,038	196,307	209,748	422,279	427,270	476,582
Total area (ha)	93,544	216,957	235,497	478,800	478,785	546,757
Total production (tones)	32,746	55,593	103,845	162,713	193,973	

Source: Annual reports of fisheries sector, Ministry of Fisheries (1990-2003)

Notes: * The South is often divided into the South-east and the South-West

Main shrimp species for culture in Vietnam are *Penaeus monodon*, *P. merguensis*, *P. orientalis* and *Metapenaeus ensis*, among which *P. monodon* is the most important in terms of production. Recently (2000) the South-American white-leg shrimp (*P. Vannamei*) has been introduced to Vietnam, but production is still low. Regarding farming methods¹, the extensive system based on natural seed during the 1970s has been replaced by improved extensive one at the end of the 1980s. In the 1990s, tiger shrimp farming developed rapidly and now comprises of extensive, improved extensive, semi-intensive and

intensive farming systems. Up to date the improved extensive farming system remains dominant in Vietnam, however there is a strong transformation of improved extensive into intensive farming systems. According to a study conducted by ADB (1996), the ratio of extensive (improved), semi-intensive and intensive farming in Vietnam in 1995 was 80:15:5. Despite an increase in absolute area after year 2000, the relative ratios of semi-intensive and intensive farming areas have decreased because new converted areas mainly practice improved extensive farming methods. This caused a reduction in the average productivity although Vietnam's production of farmed shrimp after 2000 went up strongly.

Shrimp farming development in Vietnam has brought about great social and economic benefits as well as generated jobs, created income for coastal communities, improved local infrastructure and earned foreign currency for the country. It is especially important for coastal communities where there are few livelihood options exist. Farmers involved in low productivity salt and rice production are therefore allowed to shift to aquaculture by the Government policies, diversifying livelihoods, enhancing people's living standards and reducing pressure on natural resource exploitation. Shrimp farming also promoted development of rural infrastructure, and backward and forward industries such as seed, feed supply and processing industry to offer more jobs for coastal people.

Paralleling with highly acknowledged benefits, many experts are concerned with challenges faced by the shrimp farming industry (Lebel et al, 2002; Nhuong et al 2003; Tam et al 2003). The development of shrimp farming in the last few years mainly dealt with area expansion. The large areas occupied by shrimp monoculture systems reduced biodiversity of coastal ecosystems due to loss of mangrove forests, natural breeding grounds of aquatic organisms and other coastal wetlands. In addition, a trend of increasing farming intensity has been experienced in Vietnam, however infrastructure development in shrimp farming areas is prominently low and poor in quality that induces high risk for producers. The consultations of the project of United Development Program on Environmental Management in Coastal Aquaculture (VIE/97/030) with stakeholders involved in shrimp farming in the North Central of Vietnam have revealed the following specific challenges faced by the shrimp industry:

1. Threats of environmental degradation and pollution due to many uncontrolled polluting sources outside farming areas such as agriculture, industry and human wastes. In addition, the fast increase in farming areas and intensification, and lack of community behavior spirit has exacerbated the environmental problems in shrimp farming areas. Farmers mainly manage pond environment based on their eye observations, do not use monitoring equipment. And by now there still lacks a responsible agency for environmental monitoring in shrimp culture and lacks of equipment and financial resources to enforce environment management systems in shrimp aquaculture.
2. Coastal shrimp farming development in Vietnam developed spontaneously, lacked of planning and therefore is out of control of the Government. There are no separate buffer zones among important shrimp farming areas, and there are not enough spaces for storing or, treating wastes after farming seasons. As a result, most of wastes are discharged directly into rivers, and contaminated the environment. In many places, just in one area, these people take part in aquaculture while others keep their interests in rice production. Lack of planning has led to many risks in coastal aquaculture (Ministry of fisheries, 2002; 2003). In reality, the Government and provincial authorities have carried out planning for aquaculture development. However, this planning lacks of a practical and scientific base, and without highlighting guidelines and orientations for sustainable development in the long-term. In addition, most plans were launched by higher authorities in order to get the top-down targets of social and economic development, and less on the involvement of local people, and therefore resources were not mobilized to carry out the plans. If the national budget is not ensured, the plans usually go bankrupt.
3. The management of input supply services such as shrimp seed, feed and chemicals appears to be the most third serious challenges of shrimp development in Vietnam. Although seed production

has developed throughout the country, main hatcheries primarily gather in the Central provinces, the majority of Northern and Southern provinces are unable to produce a sufficient amount of seed and have to import seed from different sources without being quarantined. In addition, because of the scarcity of broodstock shrimps, many hatcheries have to buy low quality broodstock shrimps from outside to breed or increase the number of breeding times per broodstock. This led to a reduction in the quality of shrimp seed. The issues of shrimp seed together with irrigation infrastructure development are considered as the “two keystones”, but have not been well addressed (Report of Ministry of fisheries, 2003). In addition there are a variety of feed, chemicals and products sold in input supply markets with poor control of the Government and lack of clear guidance to frustrate shrimp producers.

4. Farmers have low technical know-how and poor environmental management skills despite of efforts of Government and volunteer extension services. The fast transformation from rice and salt farmers into shrimp farmers resulted in many people involved in shrimp farming without basic knowledge of shrimp culture. In addition low educational attainment of coastal people and poor infrastructure development also constraint the process of technological transfer.
5. Farmers lack investment capital to ensure successful shrimp farming crops. They only able to mobilize about a maximum of 30 percent of total investment requirement. For the rest, they have to seek from Banks, relatives and local money lenders. Complicated procedures of offering loans, short time and small loan size as the Banks often viewed shrimp farming as a risky activity. Relying on local money lenders, farmers have to pay higher interest rate, resulting in lower farming benefits.
6. High market fluctuation and farmers have weak power to negotiate the price. They are price takers. The market chain from producers to buyers, processors and consumers are not well established, causing difficulty in ensuring final product quality. Especially with recent anti-dumping case raised by US shrimp producers, the farm gate price will decrease and thus decrease the profit margin of shrimp farming activity, causing a lot of difficulties for farmers. This challenges efficiency farmers to survive and a lot of small scale and poor shrimp producers probably have to move out of the industry and seek for other livelihood options.

All above mentioned challenges have increased risk in shrimp farming in terms of economics gain and caused negative impacts on the environment. Due to risk and uncertainty, there are evidences that shrimp farming has increased the poverty gap between the rich and the poor in coastal communities, and potentially increased social conflicts. Without appropriate interventions, the winners will become richer and the losers will fall in a poverty circle. However it is important to emphasize that what ever challenges and difficulties faced by the industry, with strong desires to get richer as well as to move out of poverty, abundance of labor and few livelihood options in coastal areas, in this and the next decade, shrimp farming will continue to be an important sector, attracting interests of farmers, investors as well as local and central Government. Under such a development context, the most challenge of shrimp farming development in Vietnam is the weak management capacity of involved stakeholders, especially the handicap of the Government management networks from the central to grassroot level. In addition, perception on sustainable shrimp farming development varies among stakeholders, unclear delegation of responsibilities in management, poor organization of producers as well as poor link among stakeholders involved in the shrimp industry chain are also critical.

Certainly responsible shrimp farming development must be addressed at all levels in order to develop sound and sustainable management measures, bringing practical economic profits to farming communities as well as all stakeholders involved in the industry. At farm level, the success or failure of shrimp farming households does not only depend on resources and capability of the household but are also affected by many other factors such as market, aquaculture planning, disease outbreaks, environmental pollution, conflicts among producers, communities and sectors. Each household individually owns and operate their

ponds, but depends on and shares common environment resources and risks such as water, disease outbreaks with others. Water quality depends much on farmers' management skills and behavior, and on designed systems of ponds, supply and discharge channels. Agricultural production does not depend much on water quality, but in shrimp farming, good water quality is strictly required to ensure a successful crop. In addition aquatic diseases are often disseminated in the water environment. Lack of community behavior of a shrimp disease affected household could cause disease outbreak to surrounding ponds and affect in large areas. Because of these characteristics, though shrimp producers economically operate their individual ponds, there is a strong need among involved producers to practice *community based management approaches* to manage externalities in shrimp farming activities.

SEARCHING FOR COMMUNITY BASED MANAGEMENT APPROACHES

The "*community based management approach in shrimp aquaculture*" was adopted by the UNDP funded project "Environmental Management in Coastal Aquaculture" in 5 pilot communes in 3 poor coastal provinces in the North Central region of Vietnam namely Thanh Hoa, Nghe An, Thua Thien Hue during a three year period, from year 2001 to 2003.

1. The initiative was first started with participatory aquaculture assessment in year 2001. The project has facilitated shrimp farming communities and local authorities to assess their own aquaculture status, identify challenges and explore roles and responsibilities of stakeholders involved in shrimp farming activities. Participatory assessment tools used by the project and local people include focused group discussion, wealth ranking, problem tree analysis, Venn diagram, historical timeline and transect walk. Assessment results showed that environment in aquaculture has been getting worse because of fast expansion of farming area, increase of farming intensification together with weak and poorly coordinated government management networks as well as separate, small scale and individualistic operations, and lack of community spirits of farmers. The project has initiated action plans to demonstrate community based management in shrimp aquaculture, together with improve environmental management at farm level, improve planning and build management capacity in aquaculture management for farmers and local officials.
2. Based on participatory assessment, three following criteria were used by the project to select farming communities for testing community based management approach: (1) farming areas that are facing urgent environmental and management problems; (2) farming areas where involved farmers and local authorities are interested in demonstrating the community based management system; and (3) farming areas where there are existing community groups/organizations in aquaculture management but tangible benefits have not yet achieved and need to be strengthened. Five pilot communes in three provinces of Nghe An, Thanh Hoa and Thua Thien Hue namely Hoang Phong, Xuan Lam (Thanh Hoa province), Quynh Bang (Nghe An province), and Vinh Giang, Phu Đa (Thua Thien Hue province) were selected to participate in the community based management project.
3. Depending on interests of farmers, and natural, socio-economic and environmental conditions of the farming areas, the community based management systems were initiated in forms of self managed groups and aquaculture unions. The difference between self-managed groups and self-managed unions are in group structure and number of participated members. A self managed group represents a small farming area, with a number of participated households ranging from 15 to 35 households. The self-managed group was facilitated by a group leader and a vice-leader voted by all members. An aquaculture union is formed to represent for a larger farming area, facing interdependent environmental and management problems that require community actions of a number of self-managed groups. Members of an aquaculture union are not necessary to have shrimp farms in the same physical area. Under the aquaculture union a number of self-managed groups are formed based on physical farming areas, or functional and social characteristics identified by members of the union.

4. Development of community management rules. Community management rules were developed by the members of self-managed groups or aquaculture unions with support of the project staff. Each self-managed group may have their own management rules and at the same time share common rules of the aquaculture union that the group belongs to. The written community rules are an important instrument to ensure and remind community members about the existence and implementation of their community based management system. Development of the community management rules is based on and complied with State laws, regulations and policies to encourage farmers to apply responsible farming practices, properly manage and use environmental resources, prevent disease outbreaks and maintain social stability and security.
5. Implementation of community based management. The management plans and rules of the community were implemented in a number of forms, and with regular or ad-hoc intervals depending on the issues need to be addressed. The most common form of community management implementation is to organize periodical community meetings, normally with 1-2 meeting per month and before shrimp seed stocking started to the end of a shrimp cropping season. The community meetings are often focused on exchanging experience and technical issues among its members, learning market price information and disease outbreaks in and outside of the community farming areas, reviewing enforcement of and reminding members to comply with the community management rules.
6. Assessment and amendment of the community based management rules. In each community meeting, the self-managed group leaders always facilitate and encourage the community members to review and assess the enforcement of the group management rules to draw lessons of success and failure for amending the community rules and improving the community based management. With periodical reviews and assessments, the members have increased awareness and ownership of the management systems. The community groups carry out annual meeting to assess the enforcement of community based management systems for improvement.
7. Integrating the community based management systems into the Government management network is also an important activity taken by the community groups with assistance of the project staff. Important community meetings, especially the annual meeting are often attended by representatives of local authorities, mass organization such as women union, farmer union and youth union. The relationship between the community groups of shrimp producers with Government officials, input suppliers and processors are tightened to create an environment of win-win benefits for all involved stakeholders. Especially the community groups could seek supports of local authorities such as approving the community management rules, solving problems that overwhelm the community management boundary and helping the community groups in environment and disease management.

The community based management approaches demonstrated by the project have produced the following remarkable results:

Improving environmental management via collective actions initiated by the community management groups. Solid waste during and after farming crops were gathered in one place for treatment. The members of community groups contribute man-day to maintain and clean common supply and discharge channels, water supply gates and roads assessing to farming areas. The self-managed group promoted campaigns to clean the farming area, identified the place for waste collection after each crop and agreed on calendar for water supply and discharge taking into account tidal regime to ensure that all farms are able to assess to good quality water. Farmers are more aware and responsible for environmental management in their farm areas as well as in the surrounding environment.

Helping each other to enhance technical knowledge. Technical topics such as how to prepare ponds for shrimp culture, where to buy good seed, how to manage and take care of pond, how to feed shrimp and how to deal with disease management, etc are often discussed at the community meetings for members to enhance technical know-how. Possessing better farming knowledge, at the demonstrated communities,

farmers are very keen to adopting responsible farming practices such as: keeping area for treatment ponds, build ponds with technical standards, responsible use of input products and better shrimp pond and environment management.

Improving shrimp disease management. Ponds experienced shrimp diseases, especially white spot disease are voluntarily notified to the community and then the community organize an ad-hoc meeting to discuss measures for treatment before discharging the disease contaminated water into the common environment. For example in Quynh Band and Phu Da communes, self-managed shrimp farming communities have mobilized money from members to buy chlorine for treating the 5 white spot disease affected ponds to stop the disease spreading to other ponds in the community areas. For other normal shrimp diseases the communities arrange meetings for discussion to help the suffered member to find solutions for treatment. The communities often announce disease occurrence to warn members to be careful in taking water into their ponds by showing an agreed signal. For example some communities use flag colors to indicate and announce their members on status of water quality and shrimp disease incidence.

Mobilizing fund to ensure community sustainability. Fund used to treat dangerous disease such as white spot, buy simple environment monitoring equipment and technical materials, and to maintain community management activities as well as share the cost with suffered farmers. As mentioned above community fund is used to treat white spot diseases if it happens. Phu Da experienced the disease in four ponds in 2003 and Quynh Bang experienced one pond in 2002. With collection action of the community members, white spot disease had stopped not create serious loss in large areas. However, fund mobilization varies from community to community depending on members' decision. For example communities in Phu Da commune, members agree to contribute 200,000 VND per ha per crop to raise the community fund (about 15 USD), whereas other communities in Thanh Hoa and Nghe An province agreed to gather fund monthly with a rate of 20,000 VND per month during the main crop period (about 5 months).

Increase productivity and efficiency of shrimp farming activity. During the last three years of project implementation, productivity and efficiency of shrimp farming production in pilot communes have improved significantly. Table 2 provides some indicators in successful communes. In fact tangible outcomes of aquaculture production depends on many management efforts, among which community based management implemented by the self-management groups and unions play important roles.

Table 2: Some indicators of success and failure of aquaculture production in pilot communes

Indicators	Hoang Phong		Quynh Bang		Phu Da	
	2003	Increase compared 2001	2003	Increase compared 2001	2003	Increase compared 2001
Productivity (kg/ha)	580	163	1,081	648	650	233
Percent of success households	80	8	85	85	55	15
Percent of break even price households	11	-1	6	-19	15	-5
Percent of loss households	9	-7	9	-66	30	-10

In contrary to the above mentioned communes, the loss rate in Xuan Lam and Vinh Giang communes has climbed up for 2001 – 2003 period despite of efforts of the project, local people and local authorities. For instance, in Vinh Giang, the rate of 16 percent of crop failed households in 2001 has increased to 42 percent in 2003. The lesson obtained from this failure is that the community based management

approaches does not bring tangible benefits to areas where there are critical environment conditions, poor infrastructure and vulnerable to outside effects even though there are supportive interventions in terms of management measures as well as technical support.

DISCUSSION

For the last two decades, there has been a continuous search for alternative approaches to involve users' participation in natural resource management, especially common pool resources. It is increasingly recognized that the resources can be better managed when users and other stakeholders are directly involved in the management and use rights are either individually or collectively located to them (Pomeroy, 2000). Coastal community issues and problems are multi-faceted and must therefore be addressed in an integrated manner. The advantages of community management have been well documented in various parts of the world (Pomeroy, 1995). For generations, local communities have generated a great store of knowledge and experiences relevant to natural resource management and conservation (Barber, 1996). Systems of rules defined, implemented, monitored and enforced by resource users themselves are performed better than the systems of rules defined, implemented, and enforced by an external authority (Ostrom and Schlager, 1996). A higher degree of acceptability and compliance can be expected in community based management systems as the community is involved in the formulation and implementation of management measures. In contrast to advantages, constraints that undermine the effectiveness of community based fisheries management have also been identified. Pomeroy & Williams (1994), for example listed a number of difficulties in community based fisheries management such as: unwillingness of and/or incapability of community to take responsibility in management; Lack or weakness of leadership within the community to initiate or sustain community based management; Individual participation costs overweigh the expected benefits; Unavailability of political will and lack of socio-economic and/or political incentives; Resource user conflicts due to actions of the outside user groups; Difficulties in implementation derived from resource characteristics; High heterogeneity among members in community; and problems related to delegation of authority.

Community based shrimp aquaculture management discussed in this paper is different to community based fisheries management discussed elsewhere. Community-based fisheries management is a system in which fishers, processors and the communities in which they live and work, all have a significant role to play in the management of the resource (Pomeroy, 1995). The focal point in such management system is to ensure fisheries resource use rights given to community and the community will develop their own management plans to regulate fisheries resource use. In our case studies, shrimp ponds are individually operated. Individual farmers can reap economic benefits as well as bear cost individually. However the costs or benefits could be a function in which community relations should be included as one of important variables as farmers in a particular area depending on each other for water supply, waste discharges, disease outbreaks, technological adoption. One household individually operate his/her ponds could not be successful if he or she does not take into account community relationships. One of the most serious problems is that marginal environmental pollution often occurs in the boundaries of ponds due to individual farmers only take care of their own pond's environment. The community based management in shrimp aquaculture addresses the so-called problem "your house is clean but the street is dirty". Reducing risk, protecting common infrastructure, exchanging and disseminating technologies, complying with aquaculture planning and minimizing environmental pollution have room for community based management to play roles. Community based management together with individual and government management network can help farmers increase efficiency of shrimp aquaculture production.

From the project experiences, following factors have affected the success or failure of the management system:

Firstly community organization is an important factor in community based management systems. There are three aspects of community organization, the number of members, the role of group leaders and the forms of community organization established. A community group with small number of members will be

easier to develop management rules as well as to build consensus therefore are easier to produce tangible benefits of community operation. Apart from that, community based management performance also depends on roles and leadership skills of community leaders. Good and reputable leaders are required to coordinate community activities and direct members for agreed collective actions. However it takes time to build capacity and train such community leaders.

Secondly success of the management system depends on volunteer spirit and self-awareness of farming communities. The existence of community based self-management group is volunteer; its sustainability depends on perceptions of its members. The community does not have rights to exclude other people or punish people from violating their rules. Therefore, development of management plans/rules reflects the practical need and benefit of community is an important condition to ensure volunteerism of participating members. Community has a limited boundary for exercising their management rules. In large areas with pervasive environmental problems related to many adjacent areas, efforts of self-managed groups can not produce tangible outcomes without support from local and government authorities.

Thirdly functioning of the management system depends on efforts of building capacities for key members (group leaders). Development of community based management systems depends on availability of human resources to support farming communities in community organization, community management rules and plan development, to change farmer's behavior of farmers for collective actions. At the moment, there lack of extension workers and development workers who understand participatory approaches and are willing to work in rural areas. Funds are often insufficient; small fund can not expect to solve large scale environmental problems.

Fourth is the support of the government authorities. Community based management is volunteer and by community themselves. However every management approach needs involvement and support from Government authorities in one way or the others. If legal status of community management group is not recognized by Government authorities their existence and management rules will not be strong. Because of that there is a continuing process to bring community based management to integrate with the Government management system to form co-management system. The support of local authorities to promotion of community based management systems depends on perception. In areas where Government authorities view the community based management as an important tool to support them in management of aquaculture, the support is strong and often in form of creating enabling environment for community management development. In contrast, in areas where community management is viewed to compete with state authority management power, there are disincentives to support it. With tangible benefits of community based management, the Government should provide a legal framework and guidance to assist local authorities and farmers to organize their community groups for management. In addition, for promotion of community organization in shrimp aquaculture, the Government and local authorities could use a number of incentives and measures such as give priorities in training, education, offering loans, leasing land to farmers who join in community groups.

Community based management existed in rural areas in Vietnam for generations (in oral or written forms). In traditional wet rice cultivation, each household is independent in terms of economic production, however they depends on each other for successful production such as exchanging labor, mobilizing capital, constructing irrigation systems, protecting flood, etc. Community organization in forms of village, commune, family lineage, age group, etc used to be developed strongly in the past and become a traditional customs of Vietnamese people (Chu Van Lam, 1991). The villages were delegated by the King to manage their own resources and make their own decisions. The saying that "village rules are stronger than the King laws" reflects strength of community based management. In response to such management system, feudal kings stipulated that the village not individual household had to be responsible for their actions. However, such a management system has been neglected possibly due to practice of the central management system (Ruddle, 1998). Recently, traditional management systems have been gradually restored and started to function again. The grassroot democracy issued in 1998, the

decree on development of rules of community and villages issued by the Government are typical examples of Government goodwill to promotion of traditional community based management.

Community based management approaches can not be a remedy to all challenges faced by shrimp farming industry in Vietnam. However under such a current development context, shrimp farming involved hundreds of thousand of small scale households with individual operation, promoting shrimp farming community organization and community based management is important. Vietnam has experienced a proliferation of government management regulations. However government laws and regulations are impossible to regulate behaviors of households in particular farming areas and enforcement costs to maintain an outside monitoring system are very high. For success, shrimp farming strictly requires involved households to follow an appropriate technical procedure. During a period of 4 to 5 months farmers have to continuously maintain a good management system from pond preparation, seed stocking, feeding and pond management, and harvesting. During this period, environmental management, especially water quality management is the most critical issue. Farmers are interdependent on each other for good water supply. Individual farm operation without coordination will lead to a destination of polluting common water environment and spreading disease in large farming areas when one farms experienced the disease and discharge water directly into public channels. This is an other kind of problems described by Hardin (1968) in the famous paper “the tragedy of the commons”. Issues and problems occur at local level should be addressed at that level. This implies that the government should delegate management responsibilities to lower authorities. Especially promoting community based management is wise and important measure to support the state management systems to ensure sustainable shrimp farming development. Challenges in shrimp farming is not only narrow in one area but they are often pervasive therefore need chain actions of all small farming communities to unite in collective actions.

CONCLUSIONS AND RECOMMENDATIONS

Community based management approach could not work well in all conditions and help farmers solve all challenges faced in shrimp aquaculture however it is one of important measures to organize farmers groups for sustainable and reduce burden of management costs of the Government. The farmer group management approach may bring farmers together to adopt better farming practices, and standards for quality shrimp production.

Owing to practical needs, supports of development projects and local authorities as well as possession of traditional factors of village organization, community based approaches in coastal resource management have been developed somewhere in Vietnam voluntarily by farmers. However scale and scope of community development is quite weak and is not popular.

For responsible development the government should promote and strengthen community based management approaches. A legal policy document for community based shrimp farming management should be developed in order to provide specific guidelines and delegate management rights and responsibilities to local authorities and farmers.

The Government and Donor agencies should support studies on: Enhancing community participation in coastal shrimp farming management; Building capacity for community developer, community organizer in the fisheries extension networks and government management systems.

REFERENCES

Barber, C.V., 1996. Community Based Biodiversity Conservation: Challenges for Policy Makers and Managers in Southeast Asia. In McNeely, Jefferey A. and Sunthad Somchevita (eds.) 1996. Biodiversity in Asia: Challenges and Opportunities for the Scientific Community, Proceeding of the 1996 conference on Prospects of Conservation on Biodiversity Activities (15-19 January 1996, Chiang Rai, Thailand), Office of Environment Policy and Planning, Bangkok. 204 p.

- Chu Van Lam et al, 1991. Impact of Traditional Factors on Forms of Organization in Agriculture in the North Vietnam. Social Science Publishing House Hanoi 1991.
- Hanna S.S, C.Folke and K-G. Maler, 1996. Right to Nature: Ecological, Economic, Cultural, and Political Principles of Institutions for the Environment. Island Press, Washington, D.C.
- Hardin, G. 1968. The Tragedy of the Commons. *Science*, 162, pp. 1243-1248.
- Lebel, Louis, Nguyen Hoang Tri, Amnuay Saengnoee, Suparb Pasong, Urasa Buatama, and Le Kim Thoa. 2002. "Industrial Transformation and Shrimp Aquaculture in Thailand and Vietnam: Pathways to Ecological, Social, and Economic Sustainability?" *Ambio* 31(4): 311-323.
- Mulekom L. O., 1999. An institutional development process in community based coastal resource management: Building the capacity and opportunity for community co- management in a small-scale fisheries community. *Ocean & Coastal Management*. Vol. 42, p 439-456, 18p.
- Nhuong, T.V, T.Q. Tu and B.T.T Ha at al, 2003, "Shrimp Farming in Vietnam: Institutional Arrangement Analysis (IAA)", Individual Partner Report for the Project: Policy research for sustainable shrimp farming in Asia. European Commission INCO-DEV Project No.IC4-2001-10042, RIA1, Hanoi, Vietnam, 31 p.
- Ostrom, E. and E. Schlager, 1996. The Formation of Property Rights. In Hanna S.S, C.Folke and K-G. Maler, 1996. Rights to Nature: Ecological, Economic, Cultural, and Political Principles of Institutions for the Environment. Island Press, Washington, D.C.
- Pomeroy R. S., 1995. Community- based and co-management institution for sustainable coastal fisheries management in Southeast Asia. *Ocean & Coastal management*, Vol. 27, No. 3, pp. 143-162.
- Pomeroy R. S., 1995. Community-based and co-management institutions for sustainable coastal fisheries management in Southeast Asia. *Ocean & Coastal Management*. Vol. 27, No. 3, p 143-162, 20p.
- Pomeroy, 2000. Devolution and fisheries co-management. 38p.
- Ruddle K., 1998. Traditional community-based coastal marine fisheries management in Vietnam. *Ocean & Coastal Management*. Vol. 40, p 1-22, 21p.
- Tam, P.M, T.V.Nhuong et al, 2003. "Influence Analysis of Shrimp Farming Activity on Society and Poverty in Vietnam", Individual Partner Report for the Project: Policy Research for Sustainable Shrimp Farming in Asia. European Commission INCO-DEV Project No.IC4-2001-10042, RIA1, Hanoi, Vietnam, 30 p.

¹ Aquaculture systems are often classified according to pond area, feed and chemical use, and stocking densities. Terminology varies between sources and countries. In Vietnamese context, the following categories are often used:

Extensive: Intertidal areas are enclosed by dikes in large ponds to allow polyculture of naturally stocked crab, shrimp and fish. Shrimp larvae densities are 1-3 / m² and water exchange is by tidal regime.

*Improved extensive: Largely as above; stocking densities range from 1-5 shrimp / m², with additional artificial stocking with crab, fish and shrimp. Fish and shellfish (*Abrina cf. declivis* and *Aloides laevis*) are used for supplementary feeding.*

Semi-intensive: Uses small (1-5 ha) ponds and shrimp densities range from 10-20 individual / m². Ponds are often drained, dried and treated between cropping periods. Feeding and some time aeration are routinely used.

Intensive: Small (< 1 ha) ponds mainly use artificial seed with a stocking density above 25 individuals / m², feeding and aeration to maintain oxygen levels are necessary.