

# **Global and local governance of shrimp farming in the Mekong Delta, Vietnam**

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# **Global and local governance of shrimp farming in the Mekong Delta, Vietnam**

**Tran Thi Thu Ha**

## **Thesis**

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## ***Abbreviations***

ASC	Aquaculture Stewardship Council
BCR	Benefit Cost Ratio
BMP(s)	Better Management Practice(s)
CAMIMEX	Ca Mau Frozen Seafood Processing Import Export Corporation
CDARD	Ca Mau Department of Agriculture and Rural Development
ERN(s)	Environmental Regulatory Network(s)
EU	European Union
FAO	Food and Agriculture Organisation of the United Nations
FC	Forestry Company
FGD(s)	Focus Group Discussion(s)
FMB	Forest Management Board
GAqP(s)	Good Aquaculture Practice(s)
GSO	General Statistical Office
GVC(s)	Global Value Chain(s)
ICS	Internal Control System
IMO	Institute for Marketecology
IFOAM	International Federation of Organic Agriculture Movements
MARD	Ministry of Agriculture and Rural Development
Minh Hai Jostoco	Minh Hai Export Frozen Seafood Processing Joint-stock Company
NACA	Network of Aquaculture Centres in Asia-Pacific
NAFIQAD	National Agro-Forestry-Fisheries Quality Assurance Department
NSMD	Non-State Market-Driven
NGO(s)	Non-governmental Organisation(s)
PRA	Participatory Rural Appraise
RESCOPAR	Rebuilding Resilience in Coastal Populations and Aquatic Resources
RIA2	Research Institute for Aquaculture No.2
SEANAMICO	Nam Can Sea-products Import Export Join Stock Company
SFEs	State-owned Forest Enterprises
ShAD	Shrimp Aquaculture Dialogue
SIPPO	Swiss Import Promotion Program
SPS	Sanitary and Phytosanitary
SPSS	Statistical Packages for Social Science
VASEP	Vietnam Association of Seafood Exporters and Producers
VND	Vietnam Dong
WSSV	White spot syndrome virus
WWF	World Wild Fund for Nature





# 1

## General Introduction



Shrimp farming village in Tam Giang commune, Nam Can district, Ca Mau province

## Chapter 1

### GENERAL INTRODUCTION

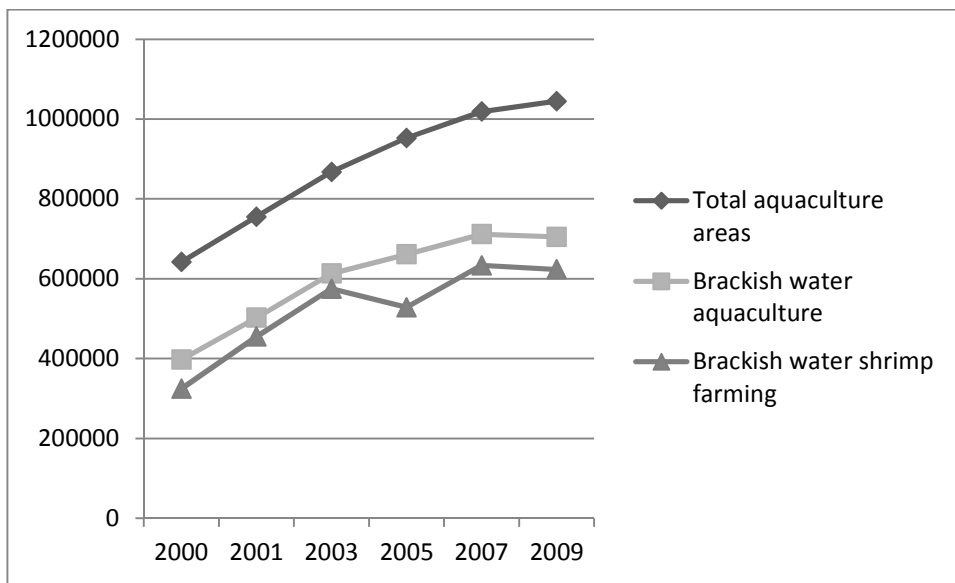
#### 1.1 Vietnamese shrimp aquaculture as a governance issue

Shrimp aquaculture emerged as extensive production systems in Vietnam in the 1970s. In 1974, the UNDP reported that the area dedicated to shrimp culture in the Mekong River Delta was 70,000 ha, while the area of production in North Vietnam in 1975 was estimated at approximately 15,000 ha (Nhuong et al., 2006). It was not until the 1990s, however, that shrimp aquaculture began to increase at a dramatic rate in response to efforts by the Vietnamese government to reinvigorate shrimp production (see Figures 1.1 and 1.2). The programmes implemented shifted producers away from extensive traditional systems to improved extensive, semi-intensive and intensive production models (Anh et al., 2010) classified according to pond size, method of water exchange, feed and chemical use and stocking density. This gradual upscaling of production resulted in the harvesting of 93,503 tonnes of cultured shrimp from 324,100 ha in 2000. Illustrating this continuing trend of intensification, by the end of the decade the area of production had nearly doubled to 623,300 ha, while production had increased by 342% to 413,132 tonnes (GSO Vietnam, 2011).

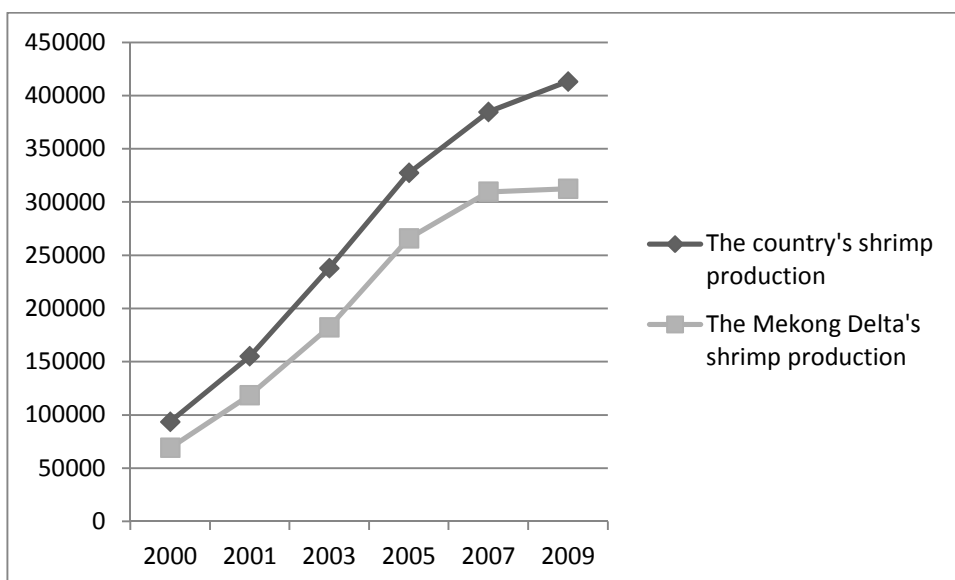
A major driver of the aquaculture sector in Vietnam for the last 20 years has been the implementation of domestic structural economic reforms (referred to in Vietnamese as 'renovation', *đổi mới*) and the reorientation of the economy toward international trade in the 2000s. This resulted in the rapid rise of Vietnam to the ninth position in the world's top ten aquaculture producers in 2000 (FAO, 2004). By 2006, Vietnam had reached third place in terms of quantity and second in terms of growth, with an annual average increase of 16.4% from 1998 to 2008 (FAO, 2006; FAO, 2010). While most neighbouring countries in Asia primarily produce white leg shrimp (*Penaeus vannamei*), 80 to 90% of the production in Vietnam is based on the black tiger shrimp (*Penaeus monodon*) (MARD, 2009). The growth of the industry has been continuous with the exception of the impact of the US anti-dumping case in 2006, and the total value of the industry reached \$US2.4 billion in 2011 (see Figure 1.3). The importance of this growth will continue as the government continues to promote shrimp production as a high value agrifood commodity that is exported to 91 countries; the industry is still dominated, however, by Japan, the US, the EU, Canada, South Korea and China, which together account for 66% of the total shrimp export value (VASEP, 2011).

These figures demonstrate that the Vietnamese shrimp industry is closely linked to global markets and that shrimp farmers are therefore embedded in the global value

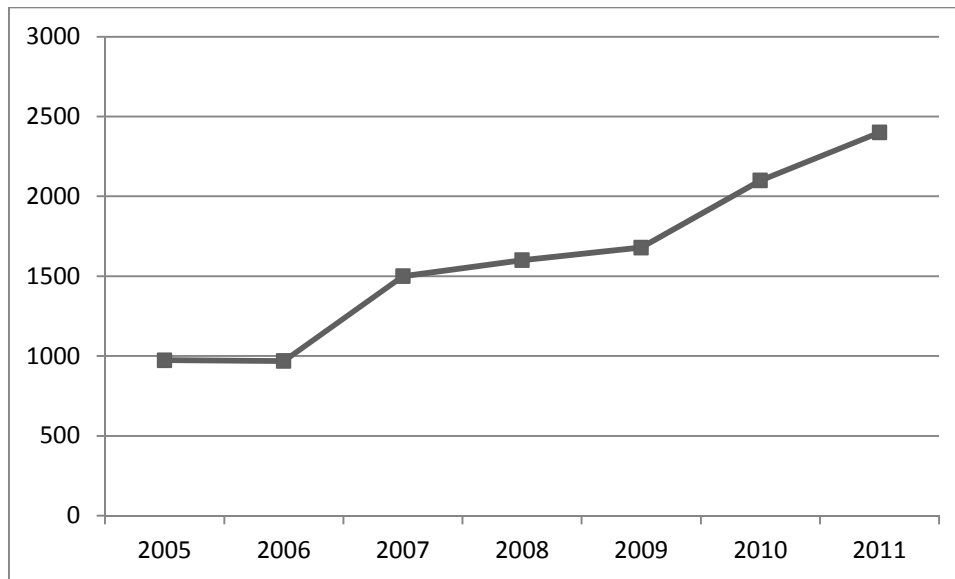
chain. At the same time, shrimp farming in Vietnam remains relatively “under-modernised” compared to other countries in Asia, with the total cultivated area dominated by improved extensive systems. The exposure to international markets coupled with a relatively low capacity to upgrade production has left the industry dependent on small holders who are vulnerable to global market perturbations and changing trade policy. This in turn has led to the reduced resilience of shrimp-based livelihoods in regions such as the Mekong Delta (see Tran, 2012).



**Figure 1.1:** Aquaculture and shrimp farming area (ha) in Vietnam, 2000 - 2009



**Figure 1.2:** Shrimp production (tonnes) in Vietnam and the Mekong Delta, 2000 - 2009



**Figure 1.3:** Vietnamese shrimp export values (US\$ million), 2005 - 2011

While having had an impact on economic growth and poverty reduction, especially in coastal areas, the development of shrimp aquaculture in Vietnam has also contributed to the deterioration of coastal habitats, for example, the loss of mangroves. The natural resource base in many of the coastal areas of Southeast Asia has also been severely overexploited, particularly inshore fisheries. Many high value fish resources have declined, while catches of lower value species have increased; fish volume is also being depleted. Thus, despite the success of the Vietnamese government’s policy of promoting aquaculture to expand the supply to domestic and export markets, there has been no concurrent effort to ensure governance capacity to guarantee sustainable aquaculture production in fresh, brackish and marine environments (Vietnam Ministry of Fisheries and the World Bank, 2005).

The Mekong Delta is one of seven ecological regions in Vietnam and is an essential habitat within the Mekong River Basin. The region consists of 13 provinces from Long An to Ca Mau and along the west coast to Kien Giang and contributes the largest volume and value of Vietnam’s aquaculture production (Vietnam Ministry of Fisheries and the World Bank, 2005). The region is also the biggest shrimp producer, accounting for from 73% to more than 81% of the shrimp production in the country. The annual growth rate for aquaculture in the region has been estimated at more than 10% compare to about 6% for the entire country (Loc, 2006). The development of shrimp farming in the Mekong Delta has created an important source of regional and national income that has given the region the highest economic growth rate in the country at 14%, compared to an average national economic growth of 9% (Loc et al., 2007).

Undoubtedly, aquaculture and shrimp products from the Mekong Delta have become internationally traded, and farmers are therefore increasingly embedded in a global system of production and marketing. While aquaculture farmers and fishers in the Mekong Delta have greater market access and diversification compared to others, they also have a limited capacity to enter and effectively compete in international markets (Bush, 2005). The shrimp industry, with its many stakeholders and fragmented market chains, constrains the implementation of traceability systems and other increasingly stringent requirements for entering international markets (Vietnam Ministry of Fisheries and World Bank, 2005). Coastal resources in the Mekong Delta are increasingly vulnerable to rapid changes in land and resource use as a result of population growth and higher levels of investment following the inception of the government's market liberalisation policies (Adger, 1999). Shrimp farmers in the region also face negative environmental impacts such as water pollution and the outbreak of shrimp disease.

In January 2006, the Prime Minister signed the fisheries sector master plan, effective until 2010, and the development orientation, effective until 2020. These policies have the central goal of reorienting the sector to supply 'large' export markets (the EU, the US, China and Australia) with an improved capacity for high quality products produced in large quantities at competitive prices. Moreover, the policies aim to ensure the social, economic and environmental sustainability of the sector in which the main concerns are the quality and sufficiency of the seed and feed supply, disease control, and the management of environmental impacts. Following the broader rhetoric of the export-led economy, the government also wished to address poverty reduction through the improvement of quality for export markets. However, by positioning the shrimp industry in such a way to increase income, the government has also exposed producers to global market requirements in terms of quantity as well as the quality of shrimp products and the production process. Reducing the risk of negative environmental and social impacts is therefore dependent on improved government planning and management in the context of global markets and trade. Successful governance of the sector is consequently reliant on a complex balance of multiple goals associated with shrimp farming where different state and non-state actors show their interests and play their roles.

## **1.2 Governing shrimp aquaculture – a theoretical framing**

### *1.2.1 The social-ecological resilience of coastal areas*

The wide variety of goods and services provided by the coastal zone account for its many uses, but the opportunities for employment, income and foreign exchange from coastal aquaculture have been overshadowed by negative environmental and social effects. The many uses of the coastal zone include fisheries, aquaculture, agriculture,

human settlement, harbours and navigation, recreation and tourism, and mining and industry. These multiple uses have given rise to conflicts over resource use. Recently, however, some of the most controversial conflicts have been related to the apparent and potential negative impacts of aquaculture (Primavera, 2006). Aquaculture, the farming of aquatic plants and animals in fresh, brackish and marine waters, is very diverse. Aquaculture systems can be classified as (1) extensive aquaculture, involving no intentional fertilisation or feeding; (2) semi-intensive aquaculture, using supplementary fertilisation and/or feeding; and (3) intensive aquaculture, which relies on added feeds. Aquaculture is also very diverse in terms of scale, ranging from poor smallholders in developing and transitional economies to large multi-national corporations. Aquaculture is also a highly complex sector comprised of sub-sectors (breeding, hatchery, nursery, grow-out, marketing and so forth) and interdependent on a wide range of associated industries (feeds, fertilisers, mediation and equipment).

Shrimp aquaculture is considered a development opportunity in many developing countries where it has generated enormous revenues and is promoted by both national governments and international development agencies alike (FAO, 2010). Shrimp continues to be the largest single commodity in value terms, accounting for 15% of the total value of internationally traded fishery products (FAO, 2008). As shrimp farmers are increasingly embedded in global production systems, the control and management of their resources, collectively termed 'governance', has also expanded to include networks of state and non-state actors at multiple spatial and political scales, from local to global (Bush and Oosterveer, 2007). In response to concerns over environmental and social sustainability, the shrimp aquaculture industry, with the support of international NGOs, has responded to public perceptions and market requirements to develop more effective governance mechanisms (FAO et al., 2006). In the past two decades, considerable progress has been made in addressing aquaculture governance issues through both national and international corporate efforts with the common goal of ensuring the sustainability of the sector (FAO, 2010). However, as noted by Boyd (2006), reaching this goal requires a mix of forceful institutions, which involve interactions among institutions both horizontally and vertically to coordinate and cooperate at different global and local scales.

Adger (2000) argues that by creating incentives for sustainable or unsustainable use, institutional arrangements are a central component linking social and ecological resilience. Part of the potential convergence and learning between *vulnerability* and *resilience* comes from a consistent focus on social-ecological systems. The concept of a social-ecological system reflects the idea that human action and social structure are integrated with nature and that any distinction between social and natural systems is

arbitrary (Adger, 2006). In the context of these social-ecological systems, *resilience* refers to the magnitude of disturbance that can be absorbed before a system changes to a radically different state as well as to the capacity to self-organise and to adapt to emerging circumstances (Folke, 2006). *Vulnerability*, in contrast, is usually portrayed in negative terms as the susceptibility of being harmed. It is the degree to which a system is susceptible to and unable to cope with adverse effects (McCarthy et al., 2001). Vulnerability and resilience research therefore have common elements of interest: the shocks and stresses experienced by the social-ecological system, the response of the system and the capacity for adaptive action. As Adger (2006) notes, social and ecological systems are themselves linked, thus the resilience of social systems is related in some way to the resilience of the ecological systems on which the social systems depend.

Social resilience, including institutions for collective action, robust governance systems, and a diversity of livelihood choices, are important assets for overcoming the effects of ecological change and promoting social reorganisation. Effective multi-level governance arrangements are critical for building the capacity to cope with changes such as climate change, disease outbreaks, global market demands, subsidies, governmental policies, and other large-scale changes. The sharing of management authority requires cross-level interactions and cooperation, not merely centralisation or decentralisation (Adger et al., 2005). Therefore, policy interventions to reduce vulnerability must be able to identify vulnerabilities within social-ecological systems, to recognise the mechanisms which cause vulnerability in the first place and to redress marginalisation as a cause of social vulnerability. Further, as Ostrom (2001) and Brown (2003) indicate, policy interventions must recognise the plurality of knowledge types and governance systems that are used throughout the world to manage risks and promote resilience.

### *1.2.2 From government to environmental governance*

*Governance*, a central term in this thesis, is traditionally understood to be synonymous with government. However, recently the term has acquired a new meaning, referring now to new processes, methods and techniques of steering the political, economic and social dynamics of societal decision making in which government is only one of the actors along with civil society and the private sector (Jabeen, 2007). Governance stresses the importance of these 'other' non-state actors and their collective interaction at local, national and global levels (Spaargaren et al., 2006). The terminology "new governance", as referred to by Gunningham (2009), recognises that a shift is taking place in the role of the nation-state from hierarchical top-down, command-and-control regulation to a more decentralised, consensual and network approach, which provides



an opportunity for non-state actors to assume regulatory, managerial and mediating functions.

To take into account the broad shifts in governance, but also explore the potential for innovation in decision making in shrimp aquaculture, this thesis uses the definition of governance from Kooiman and Bavinck (2005). Their work defines governance as the whole of public as well as private interaction taken to solve societal problems and create societal opportunities. They include the formulation and application of principles guiding those interactions and care for the institutions that enable them. The most important element of this governance definition is the term *interactions*, which indicates a specific form of action undertaken by actors to remove obstacles and tread new paths. The definition of governance also refers to the importance of *institutions*, which offer structure, order and predictability to human relationships such that social actors know how to interact, what is expected of them and what they can expect from others. Institutions are social constructs that guide human behaviour. They range from laws, which are formal and to which compliance is obligatory, to informal conventions, where conformance is expected. Therefore, the concept of governance should be examined as a social construct rather than a concrete mechanism in which the actors and their aims and implementations can be identified.

Shrimp farming governance, as one of the sectors that uses natural resources for producing exported products, is often complex, taking into account the interactions between 'vertically' linked actors in the 'shrimp chain' involved in providing inputs (e.g., feed, seed and chemicals) and distributing outputs (e.g., shrimp and organic wastes) from production systems operating at different local and global scales (Thorpe et al., 2005; Bush and Oosterveer, 2007; Islam, 2008). At the same time, shrimp farming is located in complex coastal environments, enmeshed in these landscapes through 'horizontal' flows of water, disease, nutrients, salt and aquatic organisms. It is clear that the management of the sector requires powerful institutions and must involve both horizontal and vertical interactions to coordinate and cooperate at different scales (Boyd, 2006). Thus, a governance approach to the sector cannot focus on the state, the market or civil society alone, but should instead take into account how these three interact. How the shrimp sector, one of the most important sectors driving social, economic and environmental change along the Vietnamese coast, can move toward a more diverse, and therefore potentially more effective governance framework, remains a centrally important question.

### *1.2.3 Situating the state in environmental governance*

There is growing debate, in both theory and practice, about the role of public-private governance arrangements dealing with the perceived 'inefficiencies' and

'failures' of national and international environmental conventions, agreements and regulations. Attention has been given to the potential that has been invested in market-based mechanisms, particularly environmental certification schemes (Palmujoki, 2006). Transnational and domestic non-governmental organisations (NGOs) have been key actors in the creation of what Cashore (2002) refers to as non-state market-driven (NSMD) governance systems to develop and implement environmentally and socially responsible management practices (see also Cashore et al., 2004). Cashore argues that NSMD governance is distinct from other forms of public and private authority due to two important features. First, under NSMD conditions, governments do not create or require adherence to the rules, but act as one of the interest groups. Second, the authority of NSMD arrangements is granted through the market, where price premiums and increased market access play an important role in influencing production practices.

The shift of control away from the state under NSMD governance shows that governments are expressly forbidden from being members or voting in decision-making processes. Instead, governments act as another "external audience" in accordance with NSMD dynamics. According to Cashore (2002), there are a number of governmental activities that are consistent with NSMD: (1) the existing rules and policy established by governments beyond the NSMD program itself play an important role, such as contract law, property rights etc.; (2) governments can act as a traditional interest group attempting to influence NSMD policy-making processes by offering advice or asking to help write specific rules; (3) governments can act as a large organisation by initiating procurement policies and other economic actions that may influence market-driven dynamics; and (4) governments can act as landowners in which public land ownership is a key part of natural resource policy and a common feature in developing countries. Furthermore, the state is one of the four broad sets of organisational stakeholders together with supply-side economic interests (producers that have to implement the rules), demand-side economic interests (customers, suppliers and other organisations in the supply chain who put pressure on producers to accept the rules) and social interests such as environmental groups, the media and labour organisations.

One of the key criticisms of the NSMD perspective has come from Vandergeest's (2007) work on shrimp aquaculture in Thailand. He criticises the notion that regulation is private and that the close interaction of state and market actors makes it difficult to sustain the 'non-state'-'market-driven' divide when examining governance arrangements such as environmental certification. Instead, Vandergeest offers a perspective similar to the interactive governance frameworks outlined above, arguing that transnational certification arrangements are better understood as Environmental Regulatory Networks (ERNs). Through this networked approach, he argues, a more open

and accurate understanding of the authority, motives and practices of state and non-state institutions in reducing environmental degradation, promoting economic growth, facilitating trade and ensuring food safety and quality for export can be created. This perspective is also supported by various other schools of thought, including the agrifood and ecological modernisation literature that is focused on environmental governance (Oosterveer, 2006; Spaargaren et al., 2006); in all accounts, scholars stress the ongoing blurring of boundaries among actors in the private and public sectors.

The government's role in shrimp aquaculture governance remains centrally important for establishing legislation to promote socio-economic development and to prevent (or reduce) potential environmental harm. Moreover, as Islam (2008) concludes, "though shrimp farming is a profitable industry ... it does not reward everyone involved in it" (p. 216); therefore, the role of the government is to balance this gap, and when a country produces a high-valued transnational commodity for wealthy buyers like shrimp, "the more a government work[s] with the market, the more it will gain power" (p.220). The role of the government in governing shrimp aquaculture, however, has changed in the context of rising global private regulatory networks in which the government is a central interested party. In this changing situation, the issue of determining the type and degree of state involvement in establishing or supporting private forms of environmental governance is central to global commodities such as shrimp. Thus, how the government addresses balancing externally led global market demands and consumer concerns for the improved environmental and social performance of tropical shrimp production while maintaining sovereign control over the shrimp industry remains an essential question.

#### *1.2.4 Positioning producers in their (global) market context*

The second feature of NSMD, as outlined by Cashore (2002), focuses on "incentives" and their importance in affecting the decision making of farmers. As Reardon et al. (2009) indicate, farmers' choices are based to a large extent on various market and non-market benefits (or incentives) that they can accrue through the production process. Market incentives for changing production practices to meet environmental goals exist when the relative net price reflects a premium for a given quality of product and the relative operational costs to meet these new requirements are comparable to the traditional channel (Reardon et al., 2009). The implementation of certification, a market-based governance scheme, was originally expected to provide incentives in which consumers were willing to reward producers' practices with price premiums, access to new markets and improved market stability (Hock, 2001). The spread of environmental certification as an NSMD scheme, however, is mainly based on the role and interest of more powerful agents, such as retailers. This situation thus holds

the potential to create unfair situations where costs are imposed on producers without providing compensation through market premiums (Klooster, 2005). In the forestry sector, instead of opening new markets, certification has increasingly become a part of the buyer's minimum expectations of 'quality' and a condition for market entry (Rametsteiner and Simula, 2002). From a managerial perspective, as mentioned by Béné (2005), standards are also thought to provide inadequate incentives for farmers to change their production practices and thus create an imbalance between environmental sustainability and the farmer's economic welfare.

Economic sociological perspectives provide a basis to explore what enables or hinders the realisation of 'incentives' embedded in local markets. How behaviour and institutions are affected by social relationships is one of the main concerns of social theory. Granovetter (1985) stressed the importance of personal interactions among individuals in structures or networks of relationships in generating trust and discouraging malfeasance. Thus, economic activities are embedded in these social relationships (Grabowski, 1998), and markets do not operate in social or political isolation but are instead instituted processes (Granovetter, 1985). Markets, either conventional or alternative, are structured by forms of governance regulating market entry, linking actors as well as the distribution of benefits (Taylor, 2005). Incentives can only be achieved by producers through a fair benefit sharing mechanism, which cannot be decided by the farmer individually, but must look to some type of collective action and external support for empowerment. The effectiveness of governance arrangements in developing a new mechanism for governing environmentally sustainable as well as social equitable production therefore depends on the ability of local producers to participate in the governance arrangements and access the added value from the new governance schemes.

The global value chain (GVC) approach is a powerful instrument for exploring the organisational imperatives giving rise to international industries' diverse network forms (Taylor, 2005). The GVC framework puts these social relationships in the value chain into a wider global perspective, therefore positioning producers in governance networks. This approach adds to ERNs because it recognises the role of the market and its embedded social relationships. According to Gibbon et al. (2008), "GVC refers to the set of intra-sectoral linkages between firms and other actors through which this geographical and organisational reconfiguration of global production is taking place" (p.318). GVC analysis underscores the role of powerful companies, the so called 'lead firms' in global economic governance that serve as the core actors in a segmented system to organise international production networks. GVC analysis also pays attention to the 'value' question, which has two components: first, how and by what processes

value is created, and second, how and by what processes the resulting value is distributed.

Gereffi (1994) clarifies producer-driven and buyer-driven chains that are constituted by different governance arrangements. Producer-driven chains are high-intensive capital and technology industries in which transnational corporations and large enterprises play a central role in controlling production systems. In consumer-driven chains, large retailers and merchandisers build up decentralised production networks that export to Southern countries. Shrimp, as with many agrarian commodities, represent buyer-driven value chains where the governance structures locate the lions' share of power over chain organisation, including the distribution of benefits, in the hand of actors from consuming Northern countries (Taylor, 2005). The success of governing shrimp farming is very much dependent on social relationships and their context, where small-holders such as shrimp farmers and other actors play their roles and show their interest and concerns. Alternative market-based instruments are socially embedded, and their operations are structured by particular governance forms. Successful operation, therefore, requires attention to both the formal and informal ways in which governance is organised (Taylor, 2005). The GVC approach allows us to understand and position small-holders such as shrimp farmers in the global market context.

### **1.3 Research problem and objectives**

This thesis follows in the wake of shrimp farming in the Mekong Delta becoming a 'boom crop' (Hall, 2004), which means that the promise of high returns on investment has gradually been tempered by riskier returns in the global market and increasing levels of social and ecological uncertainty and vulnerability. The shrimp trade is faced with uncertainties and vulnerabilities that are emerging at the complex intersection of changing market conditions, such as food safety and quality standards, and ecological feed-back mechanisms, such as disease incidence and epidemics (Barbier and Cox, 2004; Oosterveer, 2007). The resilience of shrimp aquaculture, defined as the capacity to maintain integrity when faced with external changes and feedback from coastal socio-ecological systems (Holling, 2001), is required to determine the best method for managing shrimp production to ensure ecological and social resilience in coastal areas.

Shrimp farming in the Mekong Delta, as in other areas, is widely recognised as an example of a sector that makes unsustainable use of natural resources for export markets, undermines food security at the local level, reduces prospects for future development and poverty alleviation (Bailey, 1988; Folke and Kautsky, 1992; Stonich, 1995; Primavera, 1997; Vandergeest et al., 1999; Stonich and Vandergeest, 2001; Primavera, 2006; Rivera-Ferre, 2009) and leads to environmental degradation. The

regulatory approach to governing shrimp farming, however, is limited in its ability to enforce the legislation of the government agencies, and economic incentives/disincentives in the form of market-based governance may be more effective in inducing behavioural changes toward the environment. In this situation, there is increasing reference to international policy which led to complex relationships between the state, international development agencies, private firms and local actors managing and exploiting coastal resources. Therefore, the need for a better understanding of the institutional network governing coastal resources has emerged. This will alleviate problems associated with the lack of information and communication among resource users, managers and scientists, which is often mentioned as the reason for difficulties in implementing ecosystem-based knowledge in coastal zone management.

Shrimp farming governance, understood as a set of state and non-state institutions, is important for the use and management of coastal resources. The questions of what is complementary and what is a trade-off between state and non-state governance arrangements governing coastal resources needs to be answered as a contribution to theoretical development and for discerning ways to solve the problems facing the Mekong Delta. As such, a set of governance arrangements that combines government legislation, market-based governance arrangements at higher levels and local governance arrangements consisting of both formal and informal institutions should be established to better respond to resilient social and ecological systems in coastal Mekong Delta areas.

The general objective of this thesis is to investigate different environmental governance arrangements concerning shrimp farming and the interactions between existing state and non-state actors and institutions. Specifically, the research will develop a more informed understanding of how state, market and community-based governance arrangements at different levels influence decision making regarding shrimp farming in the Mekong Delta. The general research question is: How do different material conditions and social relationships affect the effectiveness and responsiveness of different governance arrangements in achieving the multiple goals of maintaining rural livelihoods, environmental sustainability and food quality?

This question is addressed through the following four sub-questions:

- ❖ *First, to what extent has the shift to private transnational regulatory networks changed the role of the government from a regulator to a facilitator of global private governance interests and arrangements?*

The shift from state to private/market-based governance of shrimp production and the changing roles of the state over shrimp governance raises a number of questions



for the Vietnamese government, which will have to reassess its involvement in the (partial) deferral of environmental governance to these transnational networks. This question addresses the on-going shift in the environmental governance in Vietnamese shrimp production by simultaneously focusing on the perceived limitations and failures of the state-centred approach to shrimp aquaculture and the on-going challenges of private governance arrangements in effectively steering producers to comply with quality standards.

- ❖ *Second, if the government continues to use certification to strategically govern shrimp farming, what will be the effect on industry actors trying to balance economic and social goals with ecological goals?*

The research explores the regulatory challenges of using Naturland organic certification as a means of linking farm-level management to the sustainability of coastal (mangrove) landscapes. In doing so, it is driven by two areas of inquiry. First, what are the regulatory challenges of upscaling organic certification to coastal landscapes? Second, what are the (potential) roles and levels of involvement of different government institutions in such certification-based forms of environmental governance? Based on the organisational logic of ERNs, the analysis identifies and explores multiple linkages among actors to understand how these relationships influence practices in areas such as primary production and trade.

- ❖ *Third, what are the abilities and challenges of the shrimp farmer cluster and cooperative models to promoting small-holder upgrading in the context of increasing quality demands in international markets?*

To answer this question, we critique the normative position of upgrading by questioning the extent to which shrimp farmer cooperatives and clusters in Vietnam provide a vehicle for changing production practices to comply with sustainability standards and, in doing so, improving their competitiveness in the value chain. In particular, this question explores whether cooperative forms of production enable producers to improve environmental and quality management and, in turn, facilitate improved bargaining power with processing companies. Farmer cooperatives and clusters are one of the shrimp farming governance arrangements that can be viewed as a community-based mechanism, although because of the history of Vietnamese collectivisation, it remains closely linked to the state. As such, the scepticism of producers in response to different types of state involvement is also addressed.

- ❖ *Fourth, what are the possibilities for creating more incentives for shrimp farmers to plant and protect mangroves in integrated shrimp-mangrove areas to ensure the*

*ecological functions of the forests, while also increasing income for the shrimp farmers?*

The research provides an understanding of the issues surrounding mangrove management and policy implementation where forest production is integrated with shrimp farming to show how changes in the legal rights associated with devolution of forest management are related to actual rights and the distribution of benefits of forest management practices. We then challenge the assumption that mangrove forests cannot compete with more competitive land uses such as shrimp farming. This understanding is valuable for policy makers and managers in reconsidering the effect of shrimp farming and the roles of shrimp farmers in planting and protecting mangroves in coastal areas. Mangrove forest policy and management is one of the state regulations in integrated shrimp-mangrove areas that also directly affects the ecological function of the forests and income generation by shrimp farmers.

Based on these four research questions, this thesis contributes to understanding the role and influence of local and global governance processes in shrimp farming with a specific focus on the sustainable use of resources contributing to long term economic and environmental viability of shrimp production and globally traded shrimp products. The research draws out issues of control and access to local resources and resource users in coastal habitats within the wider context of increasingly globalised markets and policy intervention. The research will provide contextualised information for governance reform consisting of state legislation, certification schemes and community management that takes into consideration local and global processes.

## **1.4 Study sites and research setting**

### *1.4.1 Shrimp farming in Ca Mau province- at a glance*

Ca Mau province is located in the southernmost part of Vietnam in the Mekong Delta region. It is bordered on the north by Bac Lieu and Kien Giang provinces, in the west by the Gulf of Thailand and in the south and east by the East Sea. The total inland area of the province is 5,331.6 square kilometres, and with a population of 1,207,000 people, it has a population density of 226 persons per square kilometre (GSO Vietnam, 2010). The population density of the province is lower than the average for the Mekong Delta of 425 persons per square kilometre as well as the national average of 260 persons per square kilometre. Ca Mau is the leading province in terms of both area and output of shrimp cultivation in Vietnam. In 2009, the surface area of shrimp farming in Ca Mau reached 265,153 ha, the equivalent of 43% of the total shrimp farming area in Vietnam (623,300 ha), and produced 99,600 tonnes or 25% of the country's total production



(MARD, 2009). The natural conditions of the province are very much favourable for shrimp farming and especially for diverse shrimp farming systems.

#### ❖ *Shrimp farming systems in Ca Mau*

There are four shrimp farming systems currently practiced by farmers in Ca Mau: improved extensive, intensive, integrated shrimp-rice and integrated shrimp-mangroves. The integrated shrimp-rice system, however, is not the object of this research because it is not present in the three districts selected as study sites. Shrimp farming began in the province in the early 1980s using the extensive farming system, a natural seed supply and no supplementary feeding; the average annual production reached approximately 250 kg ha<sup>-1</sup>yr<sup>-1</sup> (de Graaf and Xuan, 1998). However, this system is no longer practiced by farmers because of declining natural larvae sources. With support from the government, a series of shrimp hatcheries were started between 1990 and 1992. Since that time, the farmers have stocked artificially propagated shrimp. In 1995, after the introduction of artificial stocking, the extensive system was classified as 'improved extensive', and shrimp productivity increased to 450 kg ha<sup>-1</sup>yr<sup>-1</sup> (de Graaf and Xuan, 1998).

In the improved extensive shrimp farming system, artificial stock is used, but the shrimp feed on naturally occurring plankton. The farmers start their crop in September-October after pond preparation and improvement once a year. At that time, farmers stock shrimp with a density of 2-3 fingerlings per square meter (this is called the main stocking). Every month following, the farmers stock supplementary fingerlings amounting to 10% of the initial stocking. For example, in one hectare of improved extensive pond, a farmer stocks 20,000 fingerlings in September. In October and all subsequent months, the farmer stocks a supplementary 2,000 fingerlings. Four months after the main stocking, shrimp are harvested. Farmers harvest twice each month, with each harvest lasting seven days based on the natural water exchange system. This means that farmers can harvest shrimp roughly 14 days per month. As a result, shrimp production is very fragmented, and the role of collectors becomes important within the shrimp supply chain for the location. The improved extensive shrimp ponds cover a large space, normally two to three hectares, often the majority of the area owned by a household. This system is now the main model practiced by farmers in the province and has the largest area compared to other shrimp farming systems.

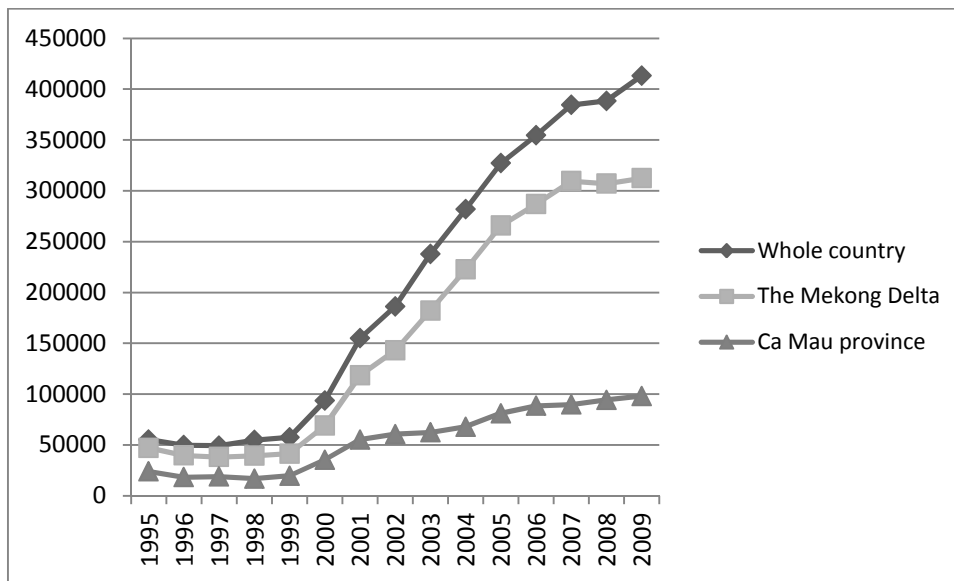
In 1995, a large disease outbreak in Ca Mau led to a decrease in the supply of natural shrimp fingerlings, and farmers started stocking reared shrimp seed in integrated shrimp-mangrove farms. The effects of land use after forest land allocation implementation in Ca Mau not only caused the massive destruction of mangroves that

serve as nursing grounds for natural shrimp but also resulted in negative changes in water quality due to the construction of shrimp ponds and poor pond management practices. The shrimp production in improved extensive coastal areas of Ca Mau Province, such as Nam Can and Ngoc Hien, as assessed by farmers is lower than before and remains in a continuous state of decline. Farmers mentioned that shrimp production is mainly based on the water conditions and shrimp seed quality. Before 1995, shrimp seed was not well managed and had lower quality, but shrimp production was still higher than it is currently; thus, poor water conditions due to the pollution caused by shrimp farming was blamed as the main source for this decline.

By the early 2000s, a more intensive system with high density stocking and a high level of industrial feeding was introduced and practiced by farmers in Ca Mau. The intensive ponds are smaller than the improved extensive ponds with an average of 2,000 square meters. In this system, farmers stock with a density of 20-30 fingerlings per square meter only one time for one crop. Water exchange between the pond and the channel is very limited. After five to six months, the shrimp can be harvested all at once, reaching a productivity of 4,000-5,000 kg ha<sup>-1</sup>yr<sup>-1</sup> (CDARD, 2010). A number of farmers sometimes stock only 8-12 fingerlings per square meter to achieve larger shrimp sizes. In this system, aerators are placed in the ponds to provide more oxygen in the pools (the propellers of the aerators extend roughly one meter deep into the pond). Intensive farmers have to feed the shrimp industrial feed and antibiotics because disease can spread easily in the cramped ponds. Intensive farms are therefore much more expensive to run because they require so much energy, material, and labour. Shrimp farmers who do intensive farming must have a sound financial basis and experience to invest in this system. The introduction of improved extensive and intensive farming systems promoted a dramatic increase in shrimp production in the province, the region and the country after 2000 (*see Figure 1.4*).

These two farming systems (improved extensive and intensive) are currently practiced in the form of monoculture, but farmers in Ca Mau also practice shrimp farming in the form of integration with mangroves. Being one of the few provinces in the Mekong Delta and Vietnam that has large areas of mangroves, the integrated shrimp-mangrove farming system is a special characteristic of Ca Mau. In this system, pond and mangroves are integrated with a mangrove ratio ranging from 30% to 70% depending on the total size of the cultivated land. Except for having mangroves inside of the pond, this farming technique is almost the same as the improved extensive shrimp farming system practiced in the non-mangrove areas. This type of integrated shrimp-mangrove farming model only occurs in the Nam Can and Ngoc Hien districts where mangroves

still exist and grow well. In Ngoc Hien district, this is the only farming system that is practiced by farmers.



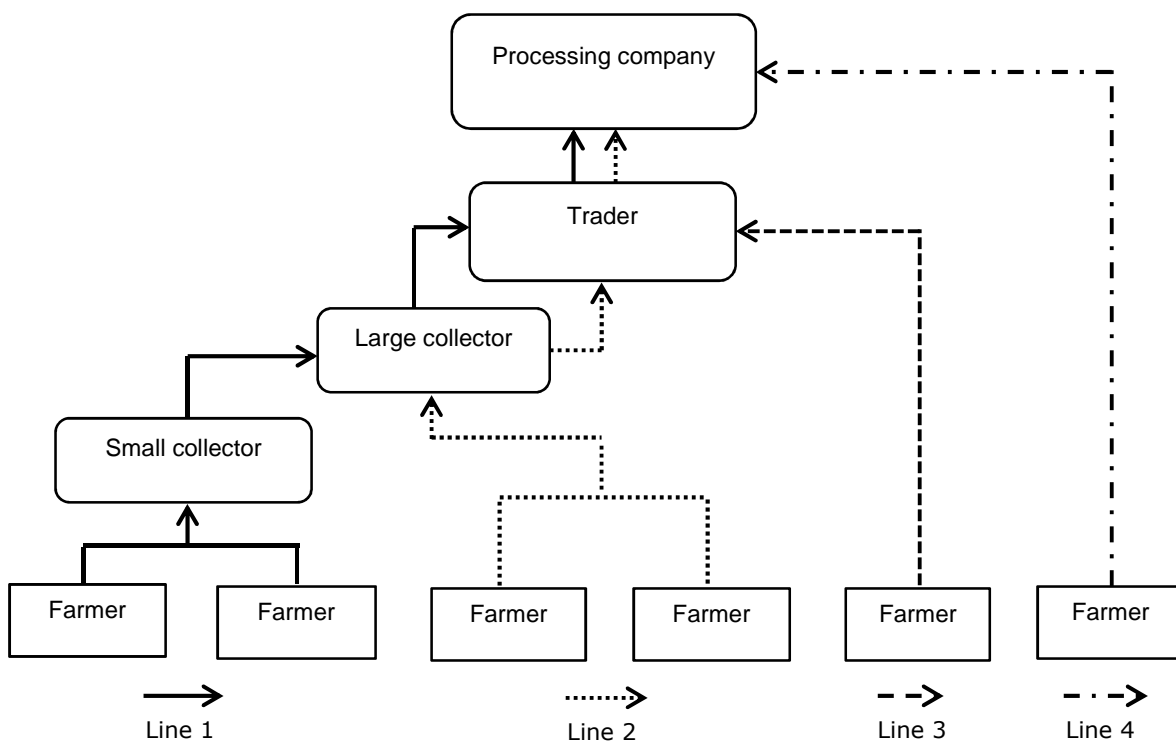
**Figure 1.4:** Shrimp production (tonnes) of the country, the Mekong Delta and Ca Mau province, 1995 - 2009

In 2009, from a total of 265,233 ha of shrimp farming, the improved extensive monoculture system accounted for 65%, the integrated shrimp-rice system for 19.16% and the integrated shrimp-mangrove system for 15% of the total shrimp cultivated areas, while the intensive system only accounted for 0.5% of the total area. Overall, the average provincial shrimp productivity is 356 kg ha<sup>-1</sup>yr<sup>-1</sup>, which is much lower than that in the other provinces in the Mekong Delta (CDARD, 2010) because of the fact that farming systems here are much more extensive compared to other provinces in the region such as Bac Lieu and Soc Trang. The data also shows that shrimp productivity is declining compared to what it was when the improved extensive farming system was first introduced in the province in 1995. To increase shrimp production in Ca Mau, the provincial government planned to expand intensive farming areas from 984 ha in 2005 to 10,000 ha by the year 2010. The plan was too ambitious and did not take into account either the natural conditions or the farmers' ability to upgrade to the intensive system. From 2008 to 2010, the area used for intensive shrimp farming remained stable at 1,300 ha, which was much lower than the objective.

❖ *The shrimp supply chain in Ca Mau*

Shrimp supply chains present different actors and their relationships along the chain starting from shrimp farmers as producers and ending at processing companies as the processor. In Ca Mau, the shrimp supply chains can be divided into four types (see Figure 1.5). Line 1 shows that the shrimp must go through at least three intermediate

actors to reach the processing company. Farmers first sell the shrimp to small collectors who normally collect shrimp from 25 to 30 farmers. Small collectors then sell the shrimp to a larger collector who may collect shrimp from 10 small collectors. The shrimp from the large collector is then sold to a trader located in the town/city or to the nearby processing company and then from the trader to the processing company. This line of the shrimp supply chain is the longest and occurs in monoculture improved extensive and integrated shrimp-mangrove farming areas where production and products are fragmented and far from the market place. Most of the shrimp farms in the Tam Giang commune (Nam Can district) and the Tan An commune (Ngoc Hien district) belong to this type of supply chain.



**Figure 1.5.** The shrimp supply chain in Ca Mau: actors, lines and relationships

In *line 2*, shrimp farmers sell their products to a large collector who will then sell the shrimp to a trader and then to the processing company. This line of the value chain occurs mainly in monoculture improved extensive farms located near a town or market place. Most of the monoculture improved extensive shrimp farmers in the Tan Duyet commune (Dam Doi district) join this line of the supply chain. In *line 3*, shrimp farmers can sell their products to a trader, the only middle step on the way to the processing company. Most intensive shrimp farms belong to this type of supply chain if they do not have a direct selling contract with the processing company, but rather with a trader. In *line 4*, the shortest line, intensive shrimp farmers can directly sell products to the processing company without any intermediate steps. These farmers have a selling contract with the processing company either individually or in groups in the form of a

cooperative or cluster. The last two lines can be found mainly in the Dam Doi district where intensive shrimp farming is popular and the processing company is located nearby.

#### *1.4.2 Research approach and setting*

The aim of this research was to investigate governance arrangements at different levels that influence the use, management and conservation of coastal resources at specific localities. Because governance arrangements at different levels function differently (Young, 1997), the research uses a multi-level, multi-actor approach that incorporates both qualitative and quantitative methods to identify and analyse relevant state and non-state institutions governing the use, management and conservation of coastal resources and their interactions in specific study sites. The selection of the case is guided by its possible contribution to certain conceptual problems and to the improved understanding of the research problem that it promises to deliver.

As the research is problem-oriented and aims at a deeper understanding of existing problems, analysis under the theoretical framework can help us to realise possible solutions for solving problems. To successfully conduct this type of research, qualitative and empirical approaches are useful for understanding and explaining social life (Neuman, 1997). A case study approach is an empirical inquiry that investigates contemporary phenomenon within its real-life context (Yin, 2003), is the main strategy for this research in which a large amount of information on one or a few cases is gathered, going into greater depth and obtaining more details for examination (Neuman, 1997). The major disadvantage of a research design by case studies is that the principles of statistical generalisation do not apply, and thus the results can only be “qualitative”. The current research, however, used some quantitative methods such as a questionnaire and monthly household recordings to overcome this limitation.

##### *❖ Communal sites and selection of case studies*

The study sites were assessed through a three-week field survey in November 2007. Three eastern coastal districts, Dam Doi, Nam Can and Ngoc Hien, were selected as the study sites for the research. The selection of these districts was based on the research objectives requiring that the study sites present all types of shrimp farming systems and governance arrangements. To have a very specific study, four communes were selected from these districts: Tan Duyet and Tran Phan communes from Dam Doi district, Tam Giang commune from the Nam Can district, and the Tan An commune from the Ngoc Hien district.

The research is based on a combination of several specific cases: (1) Naturland organic certification in the Tam Giang commune; (2) Naturland organic certification in

Tan An commune; (3) intensive shrimp farmer cluster in Tran Phan commune; (4) improved extensive shrimp farmer clusters in Tan Duyet commune; (5) forest management in Tam Giang commune; and (6) forest management in Tan An commune. These case studies cover a variety of governance arrangements for shrimp farming and will enable us to draw some general conclusions on the relationships between governance, resilience and the sustainability of shrimp farming (*see Table 1.1*).

**Table 1.1.** Communal sites, shrimp farming systems and governance arrangement selected

<b>Communes</b>	<b>Shrimp farming systems</b>	<b>Governance arrangements selected</b>
Tan Duyet	<ul style="list-style-type: none"> <li>- Improved extensive and intensive shrimp farming systems</li> <li>- No mangroves in the area</li> </ul>	<ul style="list-style-type: none"> <li>- Improved extensive shrimp farmer clusters externally led by the government, NGO and research institute</li> </ul>
Tran Phan	<ul style="list-style-type: none"> <li>- Improved extensive and intensive shrimp farming systems</li> <li>- No mangroves in the area</li> </ul>	<ul style="list-style-type: none"> <li>- Intensive shrimp farmer cluster externally led by the government</li> </ul>
Tam Giang	<ul style="list-style-type: none"> <li>- Integrated shrimp-mangrove farming system</li> <li>- Mangroves under the production forest system</li> </ul>	<ul style="list-style-type: none"> <li>- Naturland organic shrimp certification</li> <li>- Forest management under the control of the Forestry Company</li> </ul>
Tan An	<ul style="list-style-type: none"> <li>- Integrated shrimp-mangrove farming system</li> <li>- Mangroves under the protection forest system</li> </ul>	<ul style="list-style-type: none"> <li>- Naturland organic shrimp certification</li> <li>- Forest management under the control of the Forest Management Board</li> </ul>

In using a case study approach, validity, which refers to the quality of the data and the data collecting procedures and the correctness of an explanation, interpretation or conclusion, has to be guaranteed. This research attempts to maximise the validity of the case studies as specified by Maxwell (1996) by (1) properly selecting the concepts used in analysis; (2) carefully selecting the cases to be examined; and (3) carefully collecting and analysing the data. The data were collected using primarily qualitative methods such as semi-structured interviews, focus group discussions and informal talks. Moreover, the research also used monthly household recordings and household questionnaires to gather quantitative data on some aspects. More details on primary data collection are presented in the next sub-section.

### ❖ *Primary data collection*

Primary data and information gathering began in November 2007 and continued until February 2011 and consisted of 11 fieldtrips by the researcher. A number of data collection methods were used as described below.

- **Semi-structured interviews**

Semi-structured interviews were used to gain an in-depth understanding of different aspects of the field surveys. This method was largely used for gathering information from informants from the time the project started until the end of the research. The interviewees were farmers, local officers from the commune and provincial levels, traders, collectors, processing companies, and NGO staff. The researcher attempted to conduct as many interviews as possible with different stakeholders related to shrimp farming. Interviews were also conducted with a number of government officers at the Ministry of Agriculture and Rural Development (MARD) and Aquaculture Department in Ha Noi. Moreover, some meetings were conducted with the certification bodies and external auditors in Ca Mau province and in Germany. Semi-structured interviews use open-ended questions to provide space for informants to tell their story on related issues. However, a checklist for different interviewees with respect to relevant topics was prepared to be able to have full and concentrated information.

- **Focus Group Discussion (FGD)**

FGDs among key informants and representatives of local institutions facilitated discussion by using open-ended questions. The technique allows the group the opportunity to explain issues in more detail and to clarify common understandings among different stakeholders. It also assists in crosschecking information from other techniques. During the discussion, various PRA tools were used to investigate the actors involved and their interactions when governing coastal resources and to assess the benefits and trade-offs between state and non-state governance arrangements. FGDs were used to focus on the issues of shrimp farmer clusters, Naturland organic shrimp certification and forest management in integrated shrimp-mangrove areas. Six group discussions were conducted with both farmers who joined and did not join the cluster and farmers who were certified or not certified by the organic shrimp certification. Farmers in the integrated shrimp-mangrove areas were also asked to discuss mangrove policy and management issues with the group.



- Monthly household recording

To collect quantitative information about shrimp production in the different farming systems, monthly household records were used for one year from October 2008 to October 2009. Twenty households were selected for a longitudinal study of shrimp production in which farmers completed monthly records; ten households practiced integrated shrimp-mangrove farming, seven practiced improved extensive farming, and three practiced shrimp intensive farming. The monthly record of households provided useful information to compare the economic aspects of different shrimp farming systems such as productivity, total income, total costs and benefits. Furthermore, the information on farm management practices such as input and output marketing, group activities, compliance with state regulations on pond preparation and disease control are also presented in this record.

- Household questionnaires

A household questionnaire was used to collect data at the household level in the integrated shrimp-mangrove areas. Using this questionnaire, we asked about forest income after harvesting and benefit sharing policy, income from shrimp and forest, decision making on mangroves and the reasons for their choices or preferences, and the perception of farmers on carbon payments. Thirty-two households involved in mangrove harvesting activities from 2006 to 2010 in the Tam Giang and Tan An communes were selected for the questionnaire.

- Informal talks

Informal talks were also used to confirm and complement information collected by other methods. The method was useful in terms of establishing trust between farmers and the researcher, which can provide valuable information and data as well as determine the true feelings and attitudes of the farmers. The researcher spoke extensively and informally with local people when staying with them in the villages. Some sensitive issues such as shrimp quality management through the chain, especially when it involves middlemen and traders, the mangrove's benefit sharing mechanism and the conflict between farmers and forest protection management boards and forestry companies that illegally cut the mangroves were investigated through these informal talks with local people.

- ❖ *Secondary data collection*

Secondary data and information on the issues related to shrimp farming and production and forest management in integrated shrimp-mangrove areas were collected from government offices at the district and provincial levels. Data and information were



also collected from national organisations such as the MARD, the Aquaculture Department and the General Statistical Office (GSO) in the form of printed documents, websites and other sources.

#### ❖ *Data analysis*

Two main methods were used to analyse the data for qualitative and quantitative information. First, the Statistical Package for the Social Sciences (SPSS) was used for analysing the data from monthly household recordings and questionnaires to obtain descriptive statistics and test for significant differences. The results of these analyses provide quantitative data to support the arguments. Second, content analytical methods were used to analyse qualitative information from the semi-structured interviews, focus group discussions, informal talks and the internet. This information was categorised into themes tailored to the research questions, and consequently, as papers for publication within the thesis.

### **1.5 Outline of the thesis**

The thesis is presented in a publication-based format in which the four empirical chapters are the articles. Overall, the thesis is presented in six chapters. Following this introduction, chapter two highlights two key transformations in the governance of Vietnamese shrimp aquaculture in the context of emergent concerns about environmental and social impacts. In the chapter, we investigate how the shift to private transnational regulatory networks has changed the role of the government from a *regulator* to a *facilitator* of global private governance interests and arrangements. International environmental and social concerns about tropical shrimp production have led to the emergence of private transnational governance and regulation. The rise of these various schemes has also been part of a shift from quantitative to qualitative policy goals within the Vietnamese aquaculture sector. In turn, this has led to new internal relationships, most notably the re-positioning of private interests and community-based management within the Vietnamese state framework. We conclude that the ongoing transformation of the government's role in environmental shrimp governance requires mechanisms that foster improved participation and compliance between the state and private actors. To achieve this, better efforts are needed to include local government at both the communal and village levels and to strategically use existing global market incentives.

Chapter three attempts to answer the question of how certification can promote ecologically, socially and economically sound shrimp production systems. We analyse the regulatory challenges of using organic certification as a means of linking farm-level management to the sustainability of coastal (mangrove) landscapes. The results show

the importance of farmer perceptions of sustainable farm and landscape management, fair benefit sharing mechanisms in the certified value chain, and legitimate private sector-led auditing. We conclude that the social and economic conditions of production in shrimp-mangrove systems require intervention from provincial and local level governments in private (certification) forms of environmental governance to overcome conflicts of interest and legitimate representation. To achieve benefits beyond the scale of the farm, the role of shrimp producers should be redefined as partners in, rather than targets of, regulation.

Chapter four investigates how farmer cooperatives and clusters can promote sustainable shrimp farming in the context of increasing quality in a competitive international market. The chapter analyses the role of cooperative production models to improve the environmental performance of shrimp farmers and therefore help them to upgrade their position in the global value chain. The results support claims that the cluster model can improve the management capacity of producers for meeting international production standards. However, the success of more flexible cooperative production models, such as producer 'clusters', depends on the type and strength of vertical coordination with other actors along the value chain for both the provision of inputs and market products. We argue that for extensive shrimp farmer clusters to take further advantage of production-oriented quality standards, the Vietnamese government needs to play a greater role in the development of production infrastructure and create a legal framework for private sector coordination of cluster formation.

Chapter five investigates how the devolution of rights over forestland and benefit sharing mechanisms are related to actual rights and the distribution of benefits of forest management practices. The current forest allocation and subcontracting policies of the Vietnamese government with respect to the devolution of forest management and participation of local people in sustainable forest management reflect both environmental and economic concerns. The findings show that farmers' decision making over mangroves is very much influenced by shrimp farming because the income from mangroves is very low compared to that from shrimp. Farmers' decision making relative to the forest is very much influenced by the way in which the benefit-sharing policy is implemented by the state-owned forestry companies and management boards. However, their attitudes toward mangrove plantations and protection are far from negative. The study supports the claim that shrimp farmers may well be able to plant, protect and manage mangroves if they have more rights and responsibilities over forests and are able to benefit more from the production of mangroves. In this way, more sustainable management of mangrove forests may be promoted.

Chapter six presents general discussions and conclusions. The main challenge of governance in general, and governance over coastal resources in particular, is its diversity, complexity and dynamics. Governance solutions, therefore, must be numerous and able to work at different spatial, institutional and disciplinary scales. The research therefore analyses power, access and the influence over coastal resources at the intersection of all global, national, and local levels. Together with the four empirical studies conducted, three main discussions are presented in the last chapter: (1) the shift from government to governance and the changing roles of the state; (2) value chain governance and upgrading small producers; (3) shrimp farming governance and the social-ecological resilience of coastal areas. Taken together, the research will provide understanding of governance over shrimp farming in the wider context of the resilience of coastal areas such as the Mekong Delta.

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# **Transformations of Vietnamese shrimp aquaculture policy**

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## **Abstract**

International environmental and social concerns about tropical shrimp production have led to the emergence of private transnational governance and regulation. Using cases from Ca Mau, we investigate how the shift to private transnational regulatory networks has changed the role of the government from a *regulator* to a *facilitator* of global private governance interests and arrangements. The rise of these various schemes has also been part of a shift from quantitative to qualitative policy goals within the Vietnamese aquaculture sector. In turn, this has led to new internal relationships, most notably the re-positioning of private interests and community-based management within the Vietnamese state framework. We conclude that the ongoing transformation of the government's role in environmental shrimp governance requires mechanisms that foster improved participation and compliance between the state and private actors. To achieve this, efforts are needed to better include local government at both communal and village levels and to more strategically use existing global market incentives.

**Keywords:** *Aquaculture policy, market-based governance, transnational regulatory networks, shrimp farming, Mekong Delta*



## Chapter 2

### TRANSFORMATIONS OF VIETNAMESE SHRIMP AQUACULTURE POLICY

#### 2.1 Introduction

The government's role in the global agrifood system remains central for establishing legislation to promote socio-economic development and to prevent or reduce the potential harm of production systems, such as shrimp aquaculture. Across Southeast Asia, however, regulatory approaches are fraught with a limited ability to enforce legislation because the delineation of legislative responsibilities amongst government agencies, especially in coastal shrimp farming areas (historically dominated by *Penaeus monodon*), remains vague (Huitric et al., 2002; Primavera, 1997; 2006; Vandergeest et al., 1999). In response to this (perceived) institutional failure, a series of private forms of governance, including branding, contracts and certification, have emerged within global agrifood networks (Busch and Bain, 2004; Henson and Reardon, 2005). The shrimp aquaculture industry has been at the forefront of this move to privatise governance as a way to meet the growing (predominantly Northern) consumer concerns and interests around food safety and quality, including 'credence' issues such as the sustainable use of coastal resources (Bush et al., 2010; Lebel et al., 2008; Oosterveer, 2006; Vandergeest, 2007).

In Vietnam, this 'shift' from state to private governance of shrimp production is partial and incomplete. At least seven standards or 'best management practice' schemes have been developed by government departments in partnership with non-governmental organisations (NGOs) and retail and intergovernmental organisations, which are still in various phases of implementation (Corsin et al., 2007). The rise of these various schemes has also been part of a shift from quantitative to qualitative policy goals within the Vietnamese aquaculture sector. Shrimp aquaculture expanded enormously in the 2000s, with area expanding 97% (from 324,100 ha to 638,614 ha) and production increasing 269% (from 93,503 tonnes to 345,336 tonnes) (GSO Vietnam, 2008; Vietnam Aquaculture Department, 2009). However, the government has become gradually aware of the risks associated with maximum growth targets, as evidenced by the increased incidence of disease (Johnston et al., 2000), extensive mangrove deforestation (de Graaf and Xuan, 1998; Tong et al., 2004) and import bans due to banned antibiotic residues (Lebel et al., 2008). The response has been a delicate balance of supporting a sector that has proven to be a significant source of local employment and income (Nhuong et al., 2006; Thong et al., 2004) while at the same time managing exposure to high-risk international markets that have driven ecological degradation

(Lebel et al., 2002; EJF, 2003; Bush et al., 2010) and opening up to private food safety and quality regulatory networks.

The shift to private transnational regulatory networks has changed the role of the nation state in environmental governance, forcing governments to incorporate a much more decentralised and consensual approach at multiple levels (Gunningham, 2009). In particular, it raises a series of challenges and questions for the Vietnamese government, who, after many years of centralised control, will have to reassess its involvement as part of the (partial) deferral of environmental governance to these transnational networks. To what extent will the Vietnamese government ‘retreat’ from its position as a *regulator* to one as a *facilitator* of global private governance? Further questions remain about whether and how shrimp producers can be meaningfully incorporated into these global networks. What role will the state continue to assume in designing and facilitating the inclusion of small-holders in the global agrifood system and managing their exposure and compliance with transnational regulatory networks? Alternatively, can small-holders negotiate access to and compliance with quality standards in the absence of the state, through NGOs or community supported collective action?

**Table 2.1.** *Shrimp farming in Vietnam and Ca Mau province from 1999 to 2007*

Indicators	Year				
	1999	2001	2003	2005	2007
<i>Whole country:</i>					
Area (ha)		454,900	574,900	528,300	625,600
Production (tonnes)	57,457	154,911	237,880	327,194	384,500
<i>Ca Mau province:</i>					
Area (ha)	90,511	217,898	248,028	248,406	264,522
Growth rate (%)		42.1	3.6	0.1	5.0
Production (tonnes)	19,720	55,330	62,443	81,100	94,876
Growth rate (%)		56.4	3.0	19.4	7.3

*Source: Vietnam General Statistical Office (2008)*

We examine the ongoing shift in the environmental governance of Vietnamese shrimp production by simultaneously focusing on the perceived limitations and failures of the state-centred approach over shrimp aquaculture and the on-going challenges of private governance arrangements in effectively steering producers to comply with quality standards. We illustrate this shift through cases from Ca Mau, the leading province in the country in terms of both area and output (*see Table 2.1*). Our analysis first examines the wider shifts within government policy from quantitative to qualitative production goals and the recent investment in compulsory ‘best management practices’

for improving the environmental and social performance of shrimp production. We then turn to two cases that illustrate the shifting role and function of the state and private regulatory networks. The first case examines the challenges faced by Naturland organic certification in enrolling small, individual farmers with extensive shrimp-mangrove systems. The second case explores the challenges of enrolling state and NGO supported farmer 'clusters' as a platform for facilitating compliance with quality standards. As outlined in the following section, the paper contributes to our understanding of transformations of government policy over the shrimp aquaculture sector in Vietnam and the extent to which these transformations open up alternative approaches towards more sustainable shrimp farming.

In the study we draw on an extensive review of government policy, supplemented with the results of semi-structured interviews with key informants, from the municipal to the national level, conducted between November 2007 and March 2009. Field-based research employed a series of techniques, including focus group discussions with farmers in the Tam Giang commune in Nam Can district, the Tan An commune in Ngoc Hien district, and the Tan Duyet and Tran Phan communes in Dam Doi district, all of which are located on the east coast of Ca Mau province. These discussions were essential to increasing insights into historical changes and contemporary practices. The farmers are also the focus of research for an on-going and more elaborate case study on the challenges of shrimp aquaculture governance. Finally, field research was complemented by literature and online sources to expand information on the status of the shrimp farming industry at the local, provincial and national levels.

## **2.2 Quality, transnational regulatory networks and the role of the state**

Within the global agrifood system, quality has emerged as a central organising principle for economic competition in addition to price and quantity (Goodman, 2003; Henson and Reardon, 2005; Hatanaka and Busch, 2008). Whereas quality once referred to the characteristics of a product, it is now used to define the process of production, including a range of credence issues such as social and environmental sustainability (Reardon et al., 2001). As consumers, retailers and governments alike seek greater assurances over the quality of products, global systems of verification have emerged, including private standards, branding, contracts and certification to organise competition based on quality (Busch and Bain, 2004). This trend is particularly notable in the global agrifood system, as Northern food retailers have been joined by civil society actors in qualifying, standardising and certifying Southern producers through transnational regulatory networks (Renard, 2005; Hughes, 2000; Mutersbaugh, 2002).

The rise in global private regulatory networks has been accompanied by a concurrent transformation of the capacity of states to regulate agriculture and industrial

food processing. It has been stated that government regulatory bodies have not been able to keep pace with the globalisation of agricultural trade and the expansion of product qualities, in part because of reductions in state budgets and rollbacks in state responsibility as a result of neoliberal policies (Reardon and Farina, 2002; Hatanaka and Busch, 2008). Nevertheless, governments, the private sector and civil society actors alike recognise the need for regulatory regimes to be transnational in nature given the networked systems of provision that link producers and consumers in global space (Konefal et al., 2005; Marsden, 2004; Oosterveer, 2005; Reardon et al., 2001). The regulation of quality has therefore been redefined within the wider process of globalisation and the shift from state government to multi-actor and multi-scaled governance arrangements.

The shift from 'government to governance' has led to what has been referred to as an ongoing political modernisation of the state, emphasising the redundancy of governmental steering and party politics and the recognition and devolution of responsibilities to civil society and private sector actors (Arts and Van Tatenhoven, 2006; Jabeen, 2007). In recognition of the market as an alternative institutional setting, Cashore (2002) termed this governance shift 'non-state market-driven' (NSMD) to characterise the role and function of regulation led by transnational and domestic NGOs when developing and implementing environmentally and socially responsible production. Similarly, Hatanaka and Busch (2008) define governance as a joint activity between the state, corporations and private regulation organisations, such as certification and accreditation bodies and activist NGOs. However, they note that the devolution of state authority and responsibilities does not mean that the state has retreated from the realm of regulation altogether. Instead, government bodies maintain direct oversight and responsibility for monitoring and regulating food and agriculture.

Determining the type and degree of state involvement in establishing or supporting private forms of environmental governance is central to global commodities such as shrimp. Following Evan's (1995) notion of 'embedded autonomy', we are drawn to questions of *what kind* of involvement the state should have in supporting private sector participation in industrial transformation. Embedded autonomy is based on the idea that the ideal 'developmental state' (i.e., a state that plays a central role in industrial transformation) is made up of a corporate and coherent bureaucracy that is embedded within wider societal networks. How effective the state is in balancing these goals will determine the success of industrial development. In a similar vein, Sonnenveld and Mol (2002) argue that the effectiveness of environmental governance under the conditions of globalisation, through any number of market-based modes, still relies on an effective state. Their questions remain relevant for the ongoing development of private global

agrifood-led governance mechanisms for shrimp farming in Vietnam. What effect does globalisation have on the promotion and implementation of environmental regulatory mechanisms? What tensions or complementarities exist between command and control and market or civil society-based mechanisms? Or, as Islam (2008) asks about the Bangladeshi shrimp industry, do new governance mechanisms supplement and support state goals, or will new regulatory networks be perceived as undermining and subordinating state capacity and sovereignty?

The emergence of NSMD-like governance arrangements to regulate the environmental and social performance of production is widely seen as a path to more democratised, fair, and even empowered producers in the South. As Hatanaka (2010) argues, transnational alternative agrifood networks, including organic certifications, are generally thought to “enhance the viability of alternative products in the marketplace, and thus promote socially just and sustainable agriculture and safe and healthy food” (p. 1). Using the case of organic shrimp in Indonesia, Hatanaka provides a strong critique of the extent to which Southern producers can be empowered through these networks given (1) the discontent of producers who feel their knowledge and practices are ignored; (2) the unequal division of labour and responsibility leading to producer distrust of northern consumers; and (3) the third-party relations that mediate consumers and producers often confound any mutual understanding or moral obligation. From a managerial perspective (Béné, 2005), this leads to inadequate incentives for farmers to change their production practices and creates an imbalance between environmental sustainability and the farmer’s economic welfare. From a more critical standpoint (*ibid.*), this can be interpreted as entrenched power asymmetries between Southern and Northern actors and the marginalisation of farmers in decision making.

Whether and how producers are able to meaningfully engage with global agrifood networks is clearly an important determinant of the effectiveness of quality-based governance arrangements. The difficulties associated with enrolling shrimp farmers into these regulatory networks has led to questions around effective means of inclusion: individually, through the government, or through alternative collective action strategies, such as farmer cooperatives, clusters or groups. Based on work in Thailand, Vandergeest (2007) argues that, contrary to the hard divide within the NSMD discourse, local government can and does play an important role in facilitating the participation of farmers in the largely market-based transnational ‘environmental regulatory networks’ that exist around the shrimp industry. In addition, he argues that to include farmers in any meaningful way into these networks, greater attention needs to be given to

community-based (natural resource) institutions. These institutions are often connected to local government.

Recognising state-community-farmer linkages within global agrifood networks reflects Evans' assertions about the importance of social ties between the state and local entrepreneurs to facilitate successful policy implementation. Put differently, it reflects the wider trend towards promoting government and community-led collective action in global agrifood networks to facilitate compliance with (environmental) quality standards, pool resources and reduce costs (e.g., Bacon, 2005), implement shared cleaner production technologies (e.g., Franks and Mc Gloin, 2007), or negotiate the terms and conditions of incorporation in global trade (e.g., Gibbon, 2008). However, questions remain as to whether and how new spaces of interaction (see Bush, 2010) might be opened up between farmers and transnational regulatory networks to better include local interpretations and practices of sustainability – especially in the political context of Vietnam. How can certification schemes meaningfully include shrimp farmers? What opportunities are there for different forms of collective action for farmers to better negotiate their position in global agrifood networks? How can individual and collective approaches to farmer inclusion overcome 'misunderstandings' and 'inequalities'?

## **2.3 The transformation of state policy: From quantitative to qualitative production goals**

### *2.3.1 Land use policy*

By the beginning of the 1990s, the Vietnamese government considered shrimp a high-value export product with the potential for increasing national export earnings. In response, the government set up the Shrimp Aquaculture Export Promotion Program, aimed at enlarging the capacity of the industry as a whole.<sup>1</sup> The most important and influential policy within this programme was the support given to converting land to shrimp ponds. The success of the programme is clearly illustrated by the case of Minh Hai province (later divided into Ca Mau and Bac Lieu provinces), where land use conversion focused on the allocation of mangrove forests. The data shows that 66,253 ha of mangroves were converted to shrimp ponds in Minh Hai, expanding the area of shrimp production from 3,000 ha in 1980 to 76,036 ha in 1995 (Buu and Phuong, 1999).

The effects on land use after the forest land allocation implementation in Ca Mau led not only to the massive destruction of mangroves, which serve as a nursing ground for natural shrimp, but also to negative changes in water quality due to the construction of shrimp ponds and poor pond management practices. Shrimp farming in Ca Mau

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<sup>1</sup> Decision 347-CT, signed on 14 December 1987, about solutions to speed up shrimp aquaculture production for export.



province first started with the use of extensive farming systems, with natural seed supply, no supplementary feeding, and an average annual production of about 250 kg ha<sup>-1</sup>yr<sup>-1</sup> (de Graaf and Xuan, 1998). With the introduction of artificial stocking, the government classified a new 'improved extensive' production system with production of 450 kg ha<sup>-1</sup>yr<sup>-1</sup> (de Graaf and Xuan, 1998). The shrimp production in improved extensive coastal areas of Ca Mau province (such as Nam Can and Ngoc Hien) in 2008 was approximately 250- 350 kg ha<sup>-1</sup>yr<sup>-1</sup>, much lower than before and continuously declining.

The aquaculture development programme, approved by the government in 1999, was one of the documents that strongly influenced the development of shrimp farming in Vietnam, especially in Ca Mau province.<sup>2</sup> The overall goal of the plan was to increase the country's aquaculture production to two million tons and the export value to US\$2.5 billion in 2010. The plan aimed to increase the area of black tiger shrimp farming to 260,000 ha, producing a total of 360,000 tonnes of shrimp with an export value of US\$1.4 billion. To reach this goal, the government launched two important policies. The first allowed farmers to convert low-producing rice fields, uncultivated areas and saltpans into ponds for aquaculture. The second policy focused on financial support to poor farmers without collateral.

According to government statistics, the increase in the area of shrimp aquaculture in Ca Mau province after this policy came mainly from the conversion of rice and arable farmland to ponds between 1999 and 2000. However, before this time many farmers had already converted their rice fields to shrimp production. The main drive for this first wave of growth was demand from the international market. There was a boom in shrimp farming, with profits from shrimp production surging to 10 and 15 times higher than that of rice cultivation. The development plan largely sought to co-opt the existing growth within government policy, thereby justifying the growth. The implementation of the policy compounded the expansion of ponds by supporting farmers in converting agricultural land. By 2008, the total black tiger shrimp farming area in Ca Mau province was 264,500 ha, 4,500 ha higher than the 2010 national target for the entire country. In hindsight, instead of promoting sustainable growth, the policy led to a rapid, spontaneous increase in shrimp production outside of the control of the government.

### 2.3.2 *Species diversification policy*

The fisheries sector in Vietnam had one of its most challenging years in 2008, due to the combined forces of globalisation and the world's economic downturn (EU, 2009). The export market for shrimp started to decline in 2008, and demand for black tiger

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<sup>2</sup> Decision 224/1999/QĐ-TTg to approve Period 1999-2010 Aquaculture Development Program.

shrimp is expected to further decline (VASEP, 2009). To make up for this decline, the Vietnamese government reversed an earlier decision to ban the production of Pacific white leg shrimp (*Litopenaeus vannamei*), thereby continuing a trend across Southeast Asia (e.g., Lebel et al., 2010). This change was in direct response to changing market demands as well as a lower risk profile for white leg shrimp, which can be grown at higher densities and, until the recent reports of an outbreak of Taura syndrome virus in Vietnam (Vietnam Aquaculture Department, 2009), had not demonstrated the same susceptibility to disease as black tiger shrimp. The government formalised this shift in species through a new government decree allowing the cultivation of Pacific white leg shrimp in the Mekong Delta, where only former black tiger-intensive farms are allowed to grow Pacific white leg shrimp. In Ca Mau, a plan was made and approved by the Chairman of the People's Committee in September 2008 with the goal of setting up an area of 10,800 ha for Pacific white leg shrimp in 2010. This could be considered an ambitious plan. Presently, Ca Mau has 1,115 ha of intensive shrimp farming, which can be easily changed from black tiger to white leg production. However, for the remaining 9,685 ha currently under various forms of extensive production, the transition poses serious challenges in terms of cost and management.

Moreover, the environmental and natural conditions seem to have been overlooked by the government when setting up the plan. In Ca Mau, especially in the Nam Can, Ngoc Hien and Dam Doi districts, the natural conditions are suitable for black tiger shrimp production in improved extensive systems. Farmers in these districts have considerable experience in black tiger shrimp farming and have accumulated considerable wealth. They are also quick to note that that it is more profitable and safer to practice improved extensive shrimp farming than to 'upgrade' to intensive farming systems. Another source of anxiety for farmers in the move from black tiger to Pacific white leg shrimp is the inability of the government to monitor shrimp seed and feed quality – an essential regulatory role in intensive farming. In addition, small-scale shrimp farmers in Vietnam will find it hard to compete with Thai Pacific white leg shrimp, which accounts for 90% of the total world production (EU, 2009). Yet despite these concerns, the shift in policy has had limited impact until now, with the area and production of Pacific white leg shrimp remaining relatively small compared to that of black tiger shrimp. According to the Aquaculture Department in 2008, the cultured area and production of black tiger shrimp for the whole country was 557,836 ha and 288,834 tonnes, while only 1,399 ha of ponds produced 8,155 tonnes of Pacific white leg shrimp.

Government policy has been consistent in promoting shrimp aquaculture as the main source of export income and poverty alleviation in coastal areas. With the introduction of improved extensive systems since 1995, there has been a gradual



transformation in shrimp aquaculture from extensive to intensive practices. In addition, government policy has actively sought to minimise the industry's exposure to market fluctuations by diversifying to Pacific white leg shrimp, thereby responding to changing market demands and further intensifying production. However, despite these interventions by the Vietnamese government, the main force behind shrimp production in the Delta has clearly been the market, driving both the uncontrolled growth in the late 1990s and species diversification when the demand fell for high-priced black tiger shrimp in the financial crisis of 2008 (VASEP, 2009).

### *2.3.3 GAqP and BMP mandatory implementation policy*

The new frontier of market control now appears to be the governance of more qualitative aspects of production, as demonstrated by the rise in market-based food quality and safety standards in the 2000s. In recent years, the government has played an important role in promoting quality control in seafood products, from primary production to distribution, with a large number of directives and regulations related to fisheries' safety and hygiene, environmental protection, antibiotics, and veterinary and medical use in aquaculture. As one of the first four countries to implement the FAO Code of Conduct for Responsible Fisheries, the Vietnamese government has designed a national set of Good Aquaculture Practices (GAqPs) as practical norms for food safety, disease control and the minimisation of environmental pollution for both intensive and improved extensive systems (NACA, 2008). However, the implementation of these standards comes at a cost. They impose very high technical prerequisites on farmers that are prohibitive for small-scale shrimp farmers. To solve this problem, Vietnam, Thailand and India, with technical assistance from the Network of Aquaculture Centres in Asia-Pacific (NACA) and financial support from the Australian government, have developed alternative Better Management Practices (BMPs) standards. These alternative standards aim to provide a set of practical norms that can be applied by small-scale farms as well as aquaculture clusters/zones with inadequate infrastructure conditions. They aim to ensure food safety, minimise the incidence of disease and reduce environmental pollution.

In the Mekong Delta, GAqP started as a research programme before being implemented by processing companies in large-scale intensive shrimp farms. In the Ca Mau province, BMP was also implemented in three pilot hatchery farms and extended to grow-out farms through the state aquaculture extension department. Despite these plans, however, the new techniques have not yet been carried out by farmers in Ca Mau. Farmers argue that they have been unwilling to invest in the changes required by the BMP standards because of the high cost of implementation. According to the report from the National Agro-Forestry-Fisheries Quality Assurance Department (NAFIQAD, 2006),

to meet BMP and GAqP standards farmers have to make an additional investment in improved pond preparation, screen water intake and treat water to ensure it is disease-free and check certified post larvae for white-spot syndrome virus (WSSV). This increased cost is about VND13,700 per kg (US\$0.76) of produced shrimp, which is equivalent to 20% of total production costs (Tien and Griffiths, 2009). However, the most important reason for non-compliance mentioned by farmers interviewed in Ca Mau is the uncertainty as to whether they will receive any price premium for shrimp meeting these standards.

To speed up the implementation of these guidelines, the government released legislative Decision 56/2008/QĐ-BNN,<sup>3</sup> shifting from voluntary to mandatory compliance. The itinerary of this programme, applied to both black tiger and Pacific white leg shrimp farms, is divided into three categories, each with different imperatives. First, intensive and semi-intensive farms founded after the signing of this Decision must implement the GAqP standard immediately. Second, intensive and semi-intensive farms founded before the signing of the Decision must implement GAqP from the 1 January 2009. Finally, improved extensive farms have to comply (at least) with BMP standards from the 1 January 2010. It appears the plan may still be too ambitious, given that international integration of these standards has not yet been scheduled. It is even less likely to occur with improved extensive shrimp farms given their large number and lack of government capacity to implement and enforce certification--not an easy task, considering the 606,612 aquaculture farms in the Mekong Delta and the 122,946 shrimp farms in Ca Mau province alone. In short, the difficulties faced by mandatory standards requiring punitive enforcement appear to indicate that farmers are unlikely to comply with production standards if they are not given incentives for self-regulation.

## **2.4 Private governance arrangements**

### *2.4.1 Naturland organic shrimp certification*

Whereas the situation of implementing BMP/GAqP illustrates the government's concerns about emerging international conventions for sustainable aquaculture, Naturland organic shrimp certification in Ca Mau province provides a good example of the government's adoption and adaptation of private international standards and the influence of global consumerism. In 2001, the Swiss Import Promotion Program (SIPPO) designed a trade promotion programme to assist small and medium-sized enterprises from developing and transition countries in gaining access to the Swiss and European markets. The Vietnam Association of Seafood Exporters and Producers (VASEP), in cooperation with the Ca Mau Department of Fisheries, took advantage of this

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<sup>3</sup> Ministry of Agriculture and Rural Development, Decision 56/200/QĐ-BNN about Regulations on monitoring and certifying sustainable farming issued on 29 April 2008

programme to build the country's first organic shrimp farming model. After a long field survey process, they selected a group of farms in an integrated shrimp-forest area in Tam Giang commune, Nam Can District, controlled by the state-owned 184 Forestry Fisheries Enterprise, to implement Naturland organic shrimp standards. The programme was joined by the Institute for Marketecology (IMO), a specialist in quality assurance of eco-friendly products that remains the principle auditor for Naturland in Vietnam, and the Ca Mau Frozen Seafood Processing Import Export Corporation (CAMIMEX) as the retailer of this organic shrimp product.

Tam Giang is the first and only organic shrimp certification site operating in Vietnam and, as such, has drawn the attention of the government as well as retailers and traders from Switzerland and other European countries. However, initial government permission and support was not unanimous. While many government staff at the provincial level and especially VASEP supported the idea, others opposed the implementation of Naturland certification because it was a private standard, which, they believed, would diminish the government's sovereign control over the industry. According to the Vice Chairman of VASEP, its implementation so far should therefore be viewed as a success if we consider this contradiction. Moreover, Vietnamese black tiger shrimp was the first product to be recognised as organic among other shrimp producers. The Vice Chairman also mentioned that its implementation benefited the image of shrimp farming internationally because it showed that Southeast Asian shrimp production does not inevitably lead to the destruction of mangrove forests.

The programme started with 14,000 kg of organic shrimp with 143 certified households in 2002 and gradually increased to an estimated 687,000 kg from 784 certified households in 2009. This has led to an increase in the export value of organic shrimp to COOP supermarkets, from US\$271,500 in 2002 to more than US\$3 million by 2006 (Singh, 2007). Although it represents only 0.3% of the province's total shrimp production, organic shrimp continues to expand in Nam Can, and the government has drawn up plans to extend the Naturland model to neighbouring districts. A central tenet of this model is the design of an Internal Control System (ICS), which incorporates novel forms of collaboration between members of the processing company (CAMIMEX), the state forestry company (184 Forestry Fisheries Enterprise), the farmers and the collectors.

The Naturland programme may well be judged a successful shrimp certification model if we consider these results. However, considerable differences in opinion exist regarding its success and stability. Staff from central, provincial and local government organisations, as well as processing companies and the IMO, are optimistic about the potential of this model to promote more sustainable shrimp farming by changing

farmers' practices. They are also optimistic about the potential for scaling it up to include a larger coastal area with a wider variety of coastal mangrove habitats in Ca Mau province. However, a number of more proximate concerns are expressed by these actors about the capacity of a continually growing number of farmers to comply with the standards. In particular, the IMO and the CAMIMEX, who are directly accountable for regulating the certification process, are concerned that farmers are unable to adequately record their inputs and practices to meet traceability requirements. Furthermore, they are concerned that the market for organic shrimp products will remain small and will not support the demand necessary for widespread adoption of the standards.

Many farmers are also sceptical that the Naturland model provides them enough incentive to invest in standard compliance. The more contentious concerns surround the consistency of inspection and auditing of farming practices. First and foremost, farmers have a different perception about what constitutes a 'forested' area. Based on more collective land management within family units, farmers calculate forest area as a percentage of the total family farming area. They complain that Naturland standards, which require at least 50% mangrove forest cover, are not realistic because they are assessed on an individual farm basis. This demonstrates a clear division between farmer practices and externally defined and regulated quality standards. Second, farmers do not trust that the collectors, who are selected by the processing company, control the quality in an open and transparent way. Although their contracts are consistently paid, extra fees imposed by the processing company reduced their overall premium for organic production from the contracted 15% to around 6% or 7%. The lack of trust that farmers have in this imposed trade relation means that they are less willing to sell their already certified product to the processing company.

Despite the continued investment in organic certification as a means of governing 'value-added' sustainable shrimp production, a series of challenges remain. The most critical of these challenges is the perceived lack of transparency between farmers and other actors in the regulatory network that supports the implementation of certification. Until now, the government has not intervened in the apparently deteriorating networked relations. As argued elsewhere (Bush and Oosterveer, 2007), in order for the government's quantitative goals of extending of the area under organic certification to be met, qualitative aspects of trade and market relations will have to be understood and addressed in a meaningful way. Put simply, equitable economic benefits for farmers and transparent information exchange between farmers and other actors are likely to determine the success of organic certification. Given the various conflicts of interest and the conflict observed in the shrimp industry of Vietnam, determining whether and how the government mediates is critical.

#### 2.4.2 Cooperative development policy and farmer cluster management practices

The Cooperative Law signed on 26 November 2003 by the Chairman of the Parliament is one of the more important policies in agriculture and aquaculture following the collapse of the old form of the cooperative model in Vietnam (Beresford, 1990; Fford and Huan, 2001). With the goal of developing and improving the efficiency of the cooperative economy, the government launched a support programme to promote the development of cooperatives and other forms of cooperative economy.<sup>4</sup> Taking into account the dependence of the shrimp aquaculture on hundreds of thousands of small-scale shrimp producers in Vietnam, cooperative development has been widely recognised as a possible solution to increase the collective and individual competitiveness of the industry (WWF, 2008). There is also growing attention to the potential of these cooperative structures to foster collective improvements in shrimp farming practices, such as water use and sanitation, shrimp seed quality management, and feed provisioning, all of which (the government and international organisations hope) will improve traceability practices for entry to international markets.

The Vietnamese Cooperative Law defines a cooperative as any private sector organisation, household and legal entities that have common needs and benefits and voluntarily provide capital to collectively support improved efficiency in production. Larger, state-sponsored forms of cooperatives (*hợp tác xã*) have not proven popular under the new law given their long history of failure (e.g., Kerkvliet, 1995). In their place, the government's Decree in 2007 on the organisation and operation of cooperative groups relaxed the state's control over cooperatives, giving legal space for these smaller cooperative groups operated "by three individuals or more who jointly contribute assets and labour to carrying out certain works for mutual benefit and responsibility" (Decree No. 151-2007/ND-CP, 2007). Many aquaculture producers see the benefits of this formalised cooperation for building closer (contractual) ties to processing companies and access to credit (e.g., Khiem et al., 2010; Lem et al., 2004). These new-style, service oriented cooperatives (referred to variously as *tổ hợp tác* or *tổ liên kết*) have been taken up in the shrimp aquaculture sector as a platform to improve compliance with BMP, GAqP, and other international safety and quality standards. In Ca Mau province, both cooperatives and farmer clusters are being heavily promoted by the government. However, faced with the limited management capacity of farmers, state and non-state organisations working to support collective production have paid more attention to the establishment of farmer clusters.

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<sup>4</sup> Vietnamese Government, Decree 88/2005/ND-CP, signed on 11 July 2005, about supported policies to promote development of cooperatives and other forms of cooperative economy.

To speed up the establishment of farmer clusters, the Agriculture and Rural Development division at the district level supports farmers through training courses on financial management and shrimp farming techniques. Financial support for those who participate in these clusters is provided through the Agriculture and Rural Development Bank. In Tan Duyet commune, for example, with a total of 11 clusters consisting of 325 household members and 83 ha of intensive and improved extensive shrimp farming, participating households received start-up support of nearly VND 2 billion (US\$112,359) from the Agriculture and Rural Development Bank, with a subsidised interest rate of around 12% per year. They also get technical training organised by the agriculture extension office. Within this framework, a number of farmer clusters have been established to try new methods of shrimp farming, in particular a high-yield improved extensive system designed to increase the yield of production while meeting BMP water quality standards.

Although farmer clusters were initially promoted by the government, they have also been identified as an approach to improved production by the World Wildlife Fund (WWF), which is active in promoting environmental standards through their Shrimp Aquaculture Dialogue (ShAD) – a process to facilitate the development of performance-based standards that will contribute to the recently proposed Aquaculture Stewardship Council (ASC). To date, one farmer cluster has been set up in the Tan Long hamlet that receives technical support through commune-level technicians funded by the WWF. The aim of the cluster is to improve the effectiveness of production management schemes among small scale farmers while also improving their vertical linkages in the value chain, both of which are recognised as major barriers to the improved environmental and social performance of production. The long-term goal of the cluster is to enable a collective form of production, which will enable small-holders to be certified by the new ASC.

Despite the attention to these collective forms of production and their perceived benefits for improving the environmental and social performance of shrimp aquaculture, their numbers appear to be declining. According to farmers, this is because clusters do not really create economic benefits or the benefits farmers expect after joining the group. Some of the difficulties mentioned by farmers are shortages of financial resources to keep the cluster running and a lack of leadership by farmers. However, the most important reason, echoed in other aquaculture systems in the country (Khiem et al., 2010), is the limited ability of the clusters to improve trading partnerships with traders and processing companies to reduce costs and ensure more profitable production. Despite the legislative changes and investment from both the government and the WWF, it appears that external financial and technical support do not provide the necessary



incentives to promote the development of farmer clusters. It therefore remains questionable whether and how cooperative forms of production can support improved environmental production performance for improved extensive systems.

In contrast, intensive production appears to be more suited to cooperative forms of production. One clear example of such success in Ca Mau is the case of the Nhi Nguyet shrimp farming cluster. A group of 66 intensive farming households formed this cluster, 70% of which have already shifted to culturing Pacific white leg shrimp. The group has direct contract with Minh Hai Export Frozen Seafood Processing Joint-stock Company (Minh Hai Jostoco), which lends farmers money with the proviso that they sell their shrimp exclusively to the company. Because the cluster was an early adopter of Pacific white leg shrimp in Ca Mau, the farmers have been able to maintain a high economic return compared to farmers outside the cluster. The cluster has therefore been successful because they have been able to gain support unavailable to improved extensive farmers. They have a contract with the company, access to a high quality of fingerlings because of an economy of scale large enough to invest in collective nursing management, and they have institutionalised shared learning between members. The high degree of organisation and their strong private sector connections allowed them to adequately respond to the 2008 economic crisis by shifting production from black tiger to Pacific white leg shrimp.

There are clear advantages of intensive production over improved extensive production when it comes to cooperative production, most notably the scale and timing of harvest and potential economic gains in input provisioning. However, intensive production comes with considerably higher production risks, including disease and poor water quality, and remains marginal in Vietnam in terms of the number of farmers involved. Maintaining lower risk and more resilient shrimp production may therefore be more likely under extensive conditions. In turn, this gives further impetus to determining how cooperative forms of production might assist (improved) extensive farmers in complying with production-oriented quality standards. Like the Naturland case, determining how the government (perhaps, but not necessarily, in collaboration with NGOs) can facilitate improved horizontal collective action between farmers, as well as vertical collaboration with key actors in the shrimp value chain, remains a critical area of research and development.

## **2.5 Discussion**

State involvement in the governance of shrimp in Vietnam continues to be subject to what we identify as a series of transformations. The first was an internal policy shift from quantitative to qualitative state-led production goals. The early quantitative goals of the 1990s were successful in terms of opening up once marginal and isolated coastal

areas, but the disease and market risks associated with intensification has meant that Vietnamese shrimp production remains one of the most extensive in Southeast Asia (Anh et al., 2010). In addition, market demand drove the majority of the expansion rather than any coherent centralised planning. Government departments were rewarded for increases beyond set baselines, but they did not have the capacity to monitor farmers' practices in a coordinated fashion (cf. Hue and Scott, 2008; Luttrell, 2001). As a result, shrimp farming in isolated regions such as Ca Mau underwent a period of rapid, unplanned development, leading to what are now regarded as 'typical' side effects of shrimp aquaculture across Southeast Asia, including substantial mangrove loss, declining water quality and outbreaks of shrimp disease.

The transformation from quantitative to qualitative policy goals of the government in Vietnam appears to indicate the failures of the state-centred approach to shrimp farming in the context of market liberation and globalisation. The market forces driving the growth of shrimp production and cultivated areas appear to have proved stronger than the capacity of the government to implement and enforce state policy. Illegal mangrove clearance and rice field conversion for shrimp farming has been significantly increased in the Mekong Delta, but this trend was already apparent for several years before the policy was launched in response to market demand for shrimp production. The lesson of how to balance state goals with market dynamics was not initially transferred to the implementation of qualitative policy goals. It has taken a second transformation in shrimp governance to incorporate private actors and market dynamics into improved production practices.

Recognising the distinct inability of the state to implement and enforce regulation, the second (continuing) transformation is characterised by a shift of responsibility to private forms of governance. This shift has seen considerable experimentation in state-private sector relations in Vietnam, balancing the tensions and complementarities that Sonneveld and Mol (2002) argue exist between the goals and modes of command and control and market-based governance mechanisms. Both the Naturland and farmer cluster cases in Ca Mau illustrate the kind of state involvement that might prove successful in establishing or supporting private forms of environmental governance. Both cases continue from the first internal governance transformation. They therefore represent a maturing of policy from production growth to quality improvement by gradually increasing the role of non-state actors such as NGOs (WWF), private certifiers and auditors (Naturland and IMO), retailers (CAMIMEX), traders (COOP) and local middlemen. They also signal a return to voluntary participation and a turn to market incentives as the main driving force for compliance with new production standards. Responding to the concerns of Islam (2008), these new



mechanisms therefore appear to supplement state qualitative goals of sustainable production and to address wider concerns about the meaningful incorporation of shrimp farmers by providing incentives for self-governance. However, in practice a number of challenges remain.

In the case of Naturland organic shrimp certification, it appears that the wholesale deferment of control of the shrimp-forestry system to the private sector has led to a conflict of interest between farmers and market actors. Farmers have undergone a complete transition from state control to their current exposure to a commodity chain that extends directly to international markets and involves a range of private actors. Reminiscent of Vandergeest's environmental regulatory networks, the involvement of private actors has not yet led to farmer empowerment and effective self-governance. Instead, the farmers find themselves the objects of monitoring with little (if any) bargaining capacity. The only incentive they receive is the right to sell (or not to sell) their product to the processing company. They believe that the close relation between market actors—particularly processing companies, certifiers and middlemen—means there is little, if any, independent oversight of the regulatory network. In addition, established market relations with middlemen, who are embedded within existing social relations of production such as credit provision (see Bush and Oosterveer, 2007), do not provide them adequate incentives for self-governance.

Following Vandergeest's observations in the case of GAqP standards in Thailand, the farmers' participation in the regulatory network remains largely performative – recording and reporting has had little impact on their production practices, and there is little if any feedback in terms of amending the practice of certification or the content of standards. This, in turn, has meant that farmers are largely relegated to objects of 'social responsibility' rather than being involved in standard setting and decision making in the certification process. Such a situation also fails to move the debate around the efficacy of private forms of shrimp governance beyond the 'misunderstandings' and 'inequalities' inherent in third-party certification outlined by Hatanaka (2010). As long as producers feel their knowledge and practices are ignored in the process of setting and implementing standards, it appears unlikely they will be able to better negotiate their position in global agrifood networks.

The government's ability to bridge what is essentially a lack of trust and independent oversight in the shrimp chain may therefore open the door to more substantive state involvement. Revising the role of the state is particularly necessary given the provincial government plans to extend the Naturland model to other coastal districts in Ca Mau. This would lead to the wider involvement of state-owned forest enterprises and provincial forestry boards as the central arbiters in environmental

regulatory networks. Based on the example of Tam Giang, it is unlikely that these companies can maintain any independence in the certification process, given that they are directly dependent on timber production and therefore do not represent farmer interests. To avoid a return to the compulsory implementation of what are rhetorically labelled 'voluntary' standards, as seen in the first transformation in shrimp governance in Vietnam, the role of local government at the communal and village levels in providing objective oversight needs to be strengthened.

The development of farmer clusters in Vietnam may prove useful in providing an intermediary step to more inclusive participation of farmers in market-based forms of governance, allowing them to more meaningfully negotiate their position in the global agrifood network. However, this is again only likely if state involvement is more clearly defined. Taking the Naturland and farmer cluster cases together, we see considerable potential for group certification. Clusters may well provide a collective platform for establishing cost savings associated with standard compliance, including the establishment of internal monitoring systems, upgrading of communal infrastructure and reaching more efficient economies of scale for improved bargaining capacity (e.g., Umesh et al., 2010). Group certification may also provide a basis for certifying larger ecological units, thereby responding to the concerns of the Naturland farmers that mangrove forests are best considered across landscapes rather than individual farms. However, we argue that while the case of Naturland certification highlights the case for more government oversight, the cluster models promoted by the government and the WWF show the role of market networks in facilitating more meaningful inclusion of farmers in global agrifood networks.

The attempts of both the government and the WWF to establish farmer clusters have succeeded in creating management structures under which producers can legally associate. Reminiscent of the compulsory state-led implementation of GAqP and BMP standards, however, they have thus far failed to address market incentives by involving traders and processing companies. This is one of the reasons for the decline of farmer clusters in Ca Mau and threatens the goals of group certification. As also noted by Khiem et al (2010), direct relations with traders and processing companies are increasingly important in Vietnam as aquaculture systems are moving towards more vertically integrated and concentrated value chains in response to heightened quality standards. The case of the Nhi Nguyet intensive shrimp farmer cluster clearly demonstrates this point. Whether and how clusters of 'small scale' extensive or improved extensive producers can maintain their position in these chains is likely to depend on how they can negotiate improved connectivity to the private sector. However, unlike the intensive farmers of Nhi Nguyet, improved extensive farmers remain spatially fragmented and

sceptical of the benefits of even the most basic of service-oriented cooperation. As such, NGOs and the government play important roles in promoting cluster formation and as intermediaries in facilitating negotiations with processing companies.

The results also indicate that special attention must be paid to the role of market incentives in fostering participation and compliance in both state and private sector-led governance arrangements. Given that profitability is one of the most important driving factors of farmers' decision making (Thong et al., 2004), it is clear that incentives for changing production practices are required throughout the market. Both the organic shrimp certification and farmer cluster cases support this point. If farmers are not able to improve market access or an increased price for their product, they are unlikely to continue on a certification path. Similarly, farmers involved in clusters cite the need for continuous economic benefit after joining the group; indeed, this was a key reason for the failure of clusters in Ca Mau and elsewhere in the Mekong Delta (Khiem et al., 2010).

The second transformation in shrimp governance in Vietnam therefore illustrates an ongoing process of political modernisation, within which the role of government *vis-à-vis* private actors in emerging environmental regulatory networks is being renegotiated. The two cases of private governance illustrate current attempts to innovate environmental governance in Vietnam, where state sovereignty and capacity are being continually renegotiated. The widely perceived limitations of state-based governance over shrimp farming in Vietnam therefore need to be seen in terms of *complementarities* with the private sector and communities of producers alike. This goes beyond Hatanaka and Busch's argument that state authority in global agrifood networks should be one of oversight and responsibility for monitoring and regulating food production. Instead, we argue that the role of state remains central not only in facilitating private regulation, but also as a third-party arbiter. Given the close relation of the state and private sectors in Vietnam, this mode of regulation is illustrative of a wider process of 'embedded autonomy' of state-led industrial transformation, with a corporate and coherent bureaucratic framework embedded within wider societal networks. However, following Vandergeest (2007), we also argue that the incorporation of community-based processes, either through collective cluster models or market networks, should be emphasised in the process of implementing the environmental regulatory networks inherent in the governance of sustainable shrimp aquaculture.

## 2.6 Conclusion

In this paper we have highlighted two key transformations in the governance of Vietnamese shrimp aquaculture in the context of emergent concerns about environmental and social impacts. The first transformation, an extended period of growth and expansion, showed the failures of the state-based governance and top-down

approach to regulation of this sector. In spite of the rhetoric of centralised control, the aquaculture sector in Vietnam has directly responded to international markets. The second, ongoing transformation is also in response to market demands but is directed to the emergent 'quality' concerns about the environmental and social impacts of tropical shrimp farming. Our results indicate that this second governance shift has created a new set of challenges for the Vietnamese government, which, within the context of global market and (environmental) advocacy networks, is now promoting regulation of environmental quality through private certification and farmer cluster practices as community-based mechanisms. These parallel transformations therefore present a complex balancing act between externally-led global market demands and consumer concerns for the improved environmental and social performance of tropical shrimp production. At the same time, these transformations draw on the Vietnamese government's interests in maintaining sovereign control over the shrimp industry.

To overcome these challenges, the Vietnamese government should continue to position itself as a *facilitator* of global private governance arrangements, especially as farmers and global market actors are engaged in transnational regulatory networks operationalized at local scales. In the case of certification, the role of the state is still central in terms of facilitating private regulation and as a third-party arbiter. In doing so, the role of local government at the communal and village levels is essential and needs to be strengthened to bridge a widely perceived lack of trust and independent assessment of the shrimp chain. The role of the government then becomes that of a facilitator of negotiations between producers and processing companies--both of whom have, until now, negotiated their incorporation in global production networks in the absence of the state. However, the state needs to give far more attention to market incentives for fostering the participation and compliance of farmers in these transnational regulatory networks. We therefore argue that the goals of non-market arrangements, such as the state BMP standards, should be reconsidered.

Finally, our results contribute to the ongoing debate surrounding the role of the state and the private sector in the environmental governance of shrimp in Vietnam. In doing so, we have problematized the widely perceived failures of state-oriented approaches and the rise of private sector involvement by arguing for a more *complementary* understanding of each in environmental regulation under conditions of globalisation. Balancing state and private interests is a highly negotiated process, as companies and farmers seek to gain and maintain access to global markets. As standards for high-value export products such as shrimp become more ubiquitous in agrifood networks, more attention is needed to understanding *how* actors within global environmental regulatory networks--including processing companies, middlemen,

standard owners and auditors--can promote farmer compliance while also meeting the interest of governments. Such challenges will remain central to Vietnam's on going market transition, especially under the current rhetoric of export-led economic development.

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# **Regulatory challenges of certifying organic shrimp production**

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## **Abstract**

The Vietnamese government aims to expand the scale of Naturland certified organic production in integrated shrimp-mangrove farming systems across the coast of Ca Mau province by 2015. In doing so the division between public and private regulation has become blurred. We analyse the government's goal by examining the regulatory challenges of using organic certification as a means of linking farm-level management to the sustainability of coastal (mangrove) landscapes. The results show the importance of farmer perceptions of sustainable farm and landscape management, fair benefit sharing mechanisms in the certified value chain, and legitimate private sector-led auditing. We conclude that in order to overcome conflicts of interest and legitimate representation in organic certification, the social and economic conditions of production require regulatory intervention from provincial and local level government. To achieve benefits beyond the scale of the farm, the role of shrimp producers should be redefined as partners in rather than targets of regulation.

**Key words:** *Certification, organic shrimp, Naturland, shrimp farming, Vietnam*

## Chapter 3

### REGULATORY CHALLENGES OF CERTIFYING ORGANIC SHRIMP PRODUCTION

#### 3.1 Introduction

The aquaculture of tropical shrimp in coastal areas has been an important source of export income to Southeast Asian countries, as well as a source of economic risk and environmental impact (e.g. Barbier and Cox, 2004; Huitric et al., 2002; Primavera, 2006; Vandergeest et al., 1999). Asian shrimp producers are now firmly embedded in a global agrifood system of production and consumption, within which networks of state and non-state actors at multiple spatial and political scales have increasing control over the management of local resources (Bush and Oosterveer, 2007; Islam, 2008; Vandergeest, 2007; Vandergeest and Unno, 2012). The great diversity of production systems across Southeast Asia, has meant that regulating shrimp is not only dependent on prevailing production conditions but also on the organisation of domestic industries (Hall, 2004). In Vietnam, shrimp aquaculture is dominated by small-holders due to physical and economic constraints of intensifying production. In an attempt to improve the international image of Vietnamese shrimp production the government has sought to promote organic production in shrimp-mangrove aquaculture systems as a means of conserving the coastal landscape and reducing the production risk of farmers.<sup>5</sup>

Small-holder aquaculture farmers in transitional economies such as Vietnam are increasingly drawn into global organic networks by virtue of their low input farming practices, making it (at least in principle) easy for them to meet standardized requirements (Nigh, 1997). Third party certification is seen as a tool for improving their market position while also achieving environmental and social policy objectives. But it has also come under increasing scrutiny, especially when applied to small holders in developing countries (Hatanaka, 2010b; Konefal and Hatanaka, 2011). Questions remain over auditing and traceability in information-poor economies (Bush and Oosterveer, 2007; Mol, 2009), the illogic of global standards in the context of locally defined practices (Muttersbaugh et al., 2005), and the modes and structures of hybrid state-market environmental regulatory networks (Vandergeest, 2007).

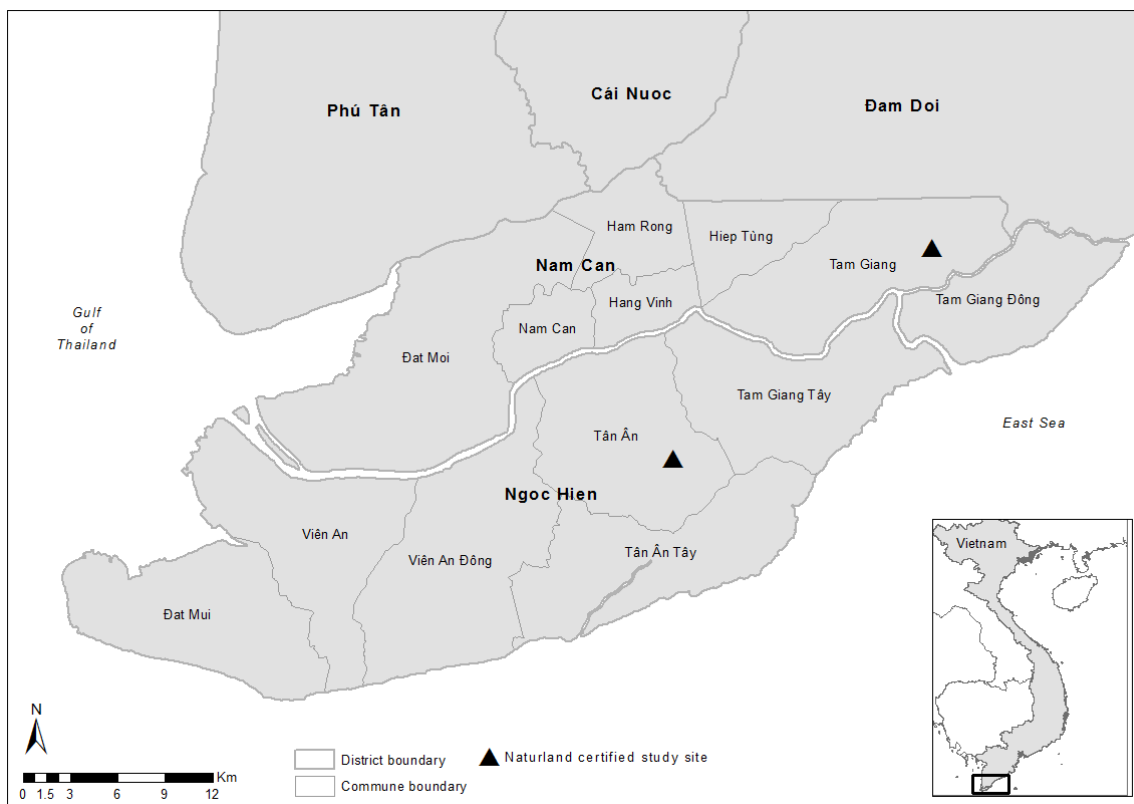
After 10 years of successful implementation in Nam Can district, the Vietnamese government wants to upscale Naturland certified organic production to all integrated shrimp-mangrove farming systems along the southern coast of the Ca Mau peninsula by 2015. Such aspirations for developing an 'organic coast' reflects the high production

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<sup>5</sup> Organic production in Vietnam lags behind many other Southeast Asian countries, but is one of the fastest growing agricultural sectors in the country, driven by exports and domestic retailers marketing safe foods to a growing urban middle class (see Scott et al. 2009; Hoi et al. 2009).

risks associated with intensification (Joffre and Bosma, 2009; Kautsky et al., 1997) and the growing international demand for improved environmental practices in aquaculture production (Bush et al., 2010; Vandergeest, 2007). The realisation of an 'organic coast' also demonstrates a clear shift in the governance of aquaculture in Vietnam over the last decade, by incorporating market oriented voluntary standards as a means of incentivising farmers to upgrade their production practices, as well as their position in global value chains (Ha and Bush, 2010). As a result, the Vietnamese government has begun to redefine its role from a central purveyor of regulation, to a partner in what Vandergeest (2007) has labeled a global environmental regulatory network (ERN).

This paper investigates how scaling up organic certification, as a new form of ERN, can balance the goals of ecologically, socially and economically sound shrimp aquaculture in Vietnam. More specifically we explore the regulatory challenges of using organic certification as a means of linking farm-level management to the sustainability of coastal (mangrove) landscapes. The research is driven by two key questions. First, what are the regulatory challenges of up-scaling organic certification to coastal landscapes? And second, what are the (potential) roles and levels of involvement of different government institutions in organic certification as an ostensibly privatised form of environmental governance?



**Figure 3.1.** The map indicate Tam Giang and Tân An communes

Research was conducted from 2007 to 2011 in Tam Giang and Tan An communes of Ca Mau province; an area dominated by integrated shrimp–mangrove farming system (*Figure 3.1*). A total of 130 semi-structured interviews were conducted with farmers, collectors, traders, government officials, processing companies and an external auditor. Follow up interviews were conducted in Europe with the Naturland Association for Organic Agriculture. Most of the interviewees were visited more than once to monitor changes in their perception and practices between years and seasons. In addition, a year-long monthly survey of 20 households provided information on shrimp production. Focus group discussions were conducted with both certified and non-certified shrimp farmers to validate research findings. Supplementary data was gathered from project websites and reports produced by certification and auditing bodies.

We now turn to an explanation of certification as a new form of environmental regulatory network and identify key ‘clusters of conflicts’ in the practice of certification compliance and regulation. Section three then introduces integrated shrimp-mangrove farming systems in Ca Mau province. Section four and five elaborate on the organic shrimp ERN, analyse the challenges of regulating organic production and trade in Ca Mau, and discuss how governmental organisations are involved in the certification process. Finally we reflect on the Vietnamese government’s aspirations for developing an ‘organic coast’ and how organic certification can contribute to obtain such a goal.

### **3.2 Certification as Environmental Regulatory Network (ERN)**

The growing prominence of market-based governance, such as third-party certification, has redefined responsibilities for regulating a range of environmental and social problems in global agrifood production. How standards are defined and enforced, as well as what combinations of actors are involved in both steps, has led to widespread discussion over the roles and power of state and private sector actors. State-centric models argue that governments are centers of policy making authority and have a steering role in societal decision making. Alternatively, market models emphasize a sidelining of the state (Rhodes 1994), and a shift of authority to private actors and economic processes. Cashore (2002), siding with the latter, frame certification as a ‘Non-State Market Driven’ (NSMD) environmental governance arrangement, emphasising the diminished role of governments in create or enforce adherence to ‘rules’, and their role as one of many participating interest groups. Moreover, NSMD arrangements gain authority through the market, in which price signals and access shape the behavior of producers.

The rise of NSMD certification schemes in global agrifood networks is a contested but widely perceived positive move to overcome the limitations of state-based regulation of environmental and social performance of primary production (Cashore,

2002). Within specific niche or alternative agrifood networks, such as fair trade and organic, NSMD certification is criticized for fulfilling an increasingly unrealistic number of expectations; from safe and healthy food to the promotion of environmentally sustainable production practices, and the empowerment of small-holder producers (e.g. Hatanaka, 2010b; Konefal and Hatanaka, 2011). Supplanting state regulation with private certification may therefore be a too simplified view of 'market driven' governance (Auld et al., 2008; Rönnbäck, 2003). The literature on standards and certification clearly outlines a continued role for governments in creating basic guarantees in certification arrangements, especially for small-holder producers in transitional economies (e.g. Giovannucci and Ponte, 2005, Klooster, 2005, Auld et al., 2008). As Eden and Bear (2010) argue, NSMD certification has as yet only been able to supplement rather than supplant government regulation, and should be thus understood as a "precarious balancing of different interests and forms of authority" (Eden and Bear, 2010: 103).

Based on research on shrimp aquaculture in Thailand, Vandergeest (2007) conceptualises certification as an environmental regulatory network (ERN) in which wider groups of actors (including state institutions, certification bodies, environmental groups, development agencies, international organizations, trade agreements, consumers, retailers, traders and farmers) participate in a relational form of governance that includes, but also expands on, linear notions of value chain regulation. Actors in these certification ERNs are driven by multiple motives and competing agendas, including reducing environmental harm, promoting economic growth, facilitating trade, and ensuring food safety and quality.

Seeing certification as an ERN allows us to identify multiple linkages between actors and understand how their relations influence practices related to primary production and trade. Questions of state involvement in certification ERNs remain extremely pertinent. The formulation, implementation and regulation of (environmental and food quality) standards is influenced by multiple actors and networks. In Vietnam, a country in an ongoing transition from a centrally planned to market economy (Beresford, 1990; Kerkvliet, 1995), the government is exploring ways to balance sovereign control over farmers with the growing influence of intergovernmental organizations and market actors, all of which have a different perspective of how to regulate sustainable shrimp production (Ha and Bush, 2010). This is clearly evident in the decision by the Vietnamese government to upscale organic shrimp production in Ca Mau by 2015, and opens up questions about the ways in which the Vietnamese state interacts with and is involved in global certification ERNs.

Based on the literature, we identify three ‘clusters of conflicts’ within certification ERNs that are relevant to organic shrimp production and regulation in Vietnam. Governing these conflicts directly influences the willingness and capacity of local producers to comply with organic standards. The first cluster emerges around the diverging epistemologies of ‘organic’ farming between actors in certification ERNs. In her work on organic shrimp producers in Indonesia, Hatanaka (2010a, 2010b) illustrates the consequences of diverging understandings of ‘sustainable’ and ‘organic’, either because it is lost in translation or because there is no consultation with farmers in standard formulation. Hatanaka (2010b) notes an uneven division of responsibility, where producers are expected to comply regardless of the level of technology availability, technical expertise or economic capacity. While organic certification networks are successful in forging a partnership in ‘product outcome’, Hatanaka argues they are not as successful in developing ‘partnerships in process’; a point that is reiterated in various other studies (e.g. Giovannucci and Ponte, 2005; Islam, 2008; Neilson and Pritchard, 2007; Vandergeest, 2007; Ponte, 2012). Such a ‘product’ focus also raises concerns over the scale of responsibility. The market paradigm has placed the burden of proof of on farmers, which limits the scale at which the impact of improved production practices can be seen (Muttersbaugh, 2005). Questions then emerge over whether such farm-level organic certification can be helpful for the Vietnamese government to govern coastal landscapes.

The second cluster focuses on trading practices in what Bush and Oosterveer (2007) label the ‘black box’ of global value chains: the segment linking producers and processors. In contrast to practices at the farm level and on factory floor, this value chain segment is poorly understood, with poor assumptions often made about the existence of direct and traceable linkages between producers and exporters. In reality, Farmers are embedded in a complex patron-client trade networks (Ruddle, 2011; Anh et al., 2011). These relations facilitate services to producers that are often not otherwise available, including informal credit, technical expertise and social welfare. Over the long term these services are often more highly valued than farm-gate price maximisation. However, in organic certification, which depends in large part on price signals to incentivize changes in production practices (Johannsen et al., 2005; Muttersbaugh, 2006; Reardon et al., 2009), such social relations can also be constraining. Understanding value chain relations therefore helps to determine whether and how price premiums are negotiated and transferred to farmers, as well as the extent to which equitable benefit sharing can be fostered by the private sector and/or the state.

The third cluster focuses on third party auditing practices. Audits are responsible for verifying that standards are implemented, certificates are issued to products, and

credibility and legitimacy is assured through periodic site visits. The credibility of the audit system is maintained by the differentiation of regulatory and technical responsibilities, and by independently verifying compliance against pre-determined indicators (Hatanaka, 2010a). To lower costs auditing is divided into periodic external audits, and continual monitoring through internal control systems (ICS). In an ICS producers are required to document activities that are verified on a regular basis by an internal party. Despite being outwardly objective in their design, there is growing critical awareness of the subjectivity of such auditing practices. As outlined by Power (1997), auditing is widely perceived as a coordinated series of technical steps, but is in reality a socially embedded set of practices and perspectives. Understanding the role that social relations play in the audit process opens up questions of legitimacy and credibility which are so fundamental to private forms of governance. What role governmental organisations can play to 'mitigate' concerns of legitimacy and credibility in certification auditing is therefore a centrally important question.

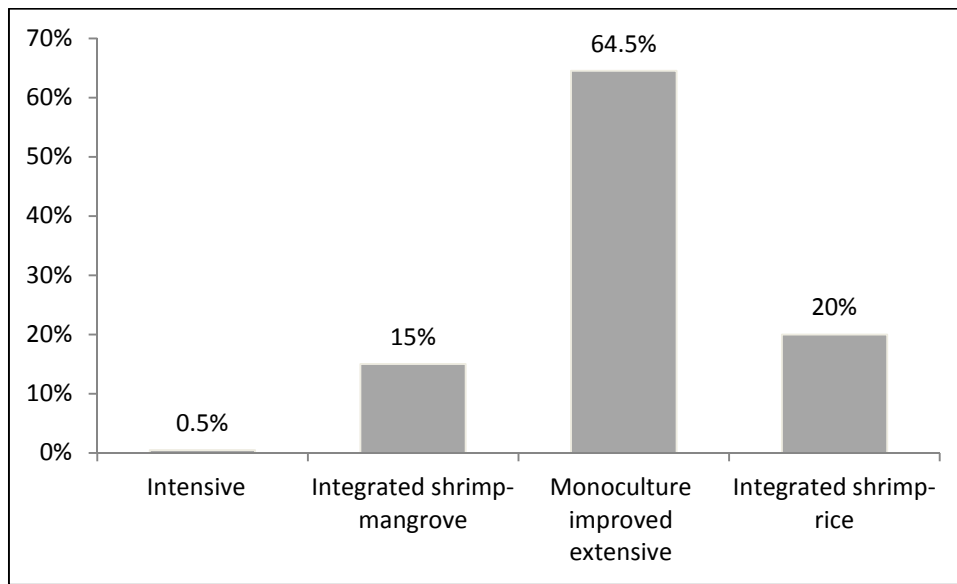
### **3.3 The evolution of integrated shrimp-mangrove farming systems**

Ca Mau is the leading province of Vietnam in terms of both area and output of shrimp cultivation. In 2009, 265,153 ha of shrimp were being cultured - equivalent to 48% of the total shrimp farming area in Vietnam - producing 99,600 tonnes or 25% of the country's total production (Vietnam Aquaculture Department, 2009; CDARD, 2010). At the same time Ca Mau is home to half of the remaining mangrove forest in the Mekong Delta and a third of what is left in Vietnam (MARD, 2008). The government is therefore under pressure to balance wider aspirations of an export-led economy with the conservation of the remaining mangrove forests. Against these competing agendas integrated shrimp-mangrove systems have emerged as an opportunity to maintain production while ensuring a minimum area of forest cover.

Integrated shrimp-mangrove systems can be considered a traditional form of extensive aquaculture that has been practiced along the Ca Mau peninsula since the early 1980s (De Graaf and Xuan, 1998). Extensive systems are characterised by the natural recruitment of larvae through tidal exchange, the absence of artificial feeding during the entire grow-out period and low levels of production of around 250 kg ha<sup>-1</sup>yr<sup>-1</sup>. In the 1990s the government supported the intensification of shrimp farming by subsidising mangrove clearance, as well as investing in state owned hatcheries and feed mills (Buu and Phuong, 2000). By 2000 production was only increased to 450 kg ha<sup>-1</sup>yr<sup>-1</sup> (De Graaf and Xuan, 1998), still well below other Southeast Asian countries, but mangrove cover had declined by to 48%. Today shrimp aquaculture in Ca Mau is more diversified than in the 1990s, but remains dominated by improved extensive systems, which include shrimp-mangrove integrated systems, characterised by low density



artificially stocking (1-3 fingerlings per square meter) and no supplementary feeding (see Figure 3.2).



**Figure 3.2.** The proportion of different shrimp farming systems in terms of area in Ca Mau

Although making up only 15% of the total pond area in the province, integrated shrimp-mangrove systems have remained attractive to farmers and policy makers alike given their low cost, lower virulence of diseases such as white spot syndrome (Dieu, 2010), and the need to protect mangrove forests (MARD, 2008). Shrimp mangrove integrated systems have therefore become one of the only clear examples of how the government might fulfill its wider goals of developing environmentally responsible shrimp production (Ha and Bush, 2010). How environmental improvements should be achieved remains unclear, but is closely linked to the reduction of disease incidence, maintaining farmers' livelihoods, and securing the ecosystem services that mangrove forests provide in low lying fluvial coastal areas.<sup>6</sup> It is also exactly these production aspects that have made the shrimp-mangrove system amenable (in theory) to organic certification.

As shown in *Table 3.1*, only a small difference in productivity between the integrated and non-forested improved extensive systems is evident, indicating relatively a low economic barrier to maintaining mangrove cover. But perhaps making integrated shrimp-mangrove systems more attractive to farmers, policy makers and organic

<sup>6</sup> Mangroves have been shown to play an important role in coastline protection, mitigation of wave and storm impacts, local climate stabilization and as a source for wood, fuel and feeding and nursing areas for many aquatic species (Primavera, 1998; Lebel et al., 2002). The Vietnamese government has recognized these as valuable environmental services given their importance in the fluvial environment of the Mekong Delta and the Ca Mau peninsula (Viet Nam Environment Protection Agency, 2005).

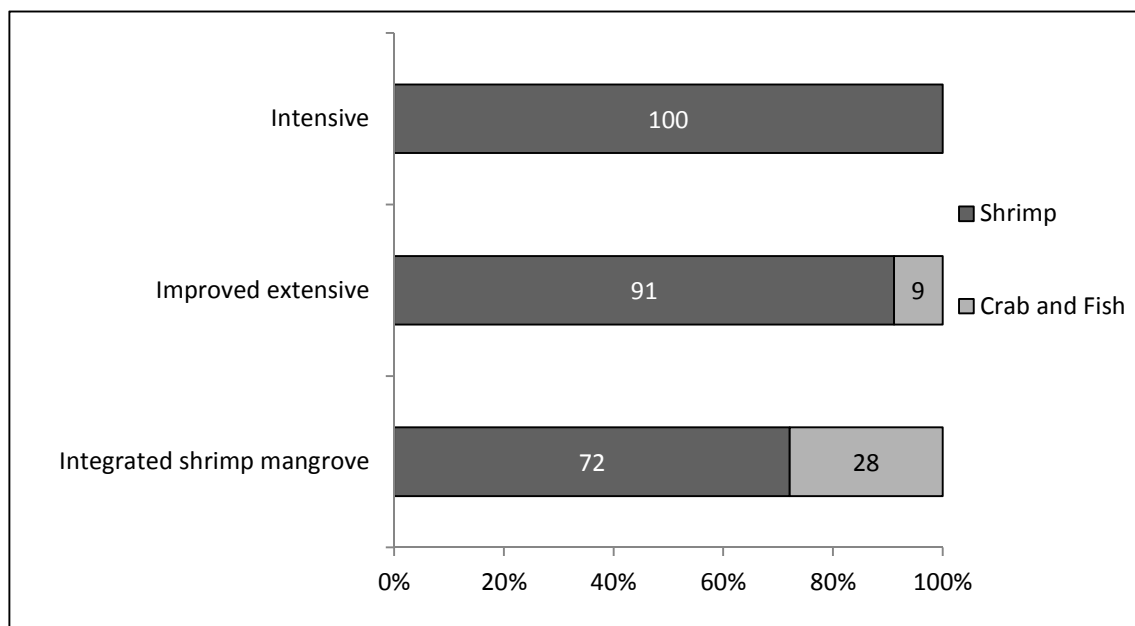
certifiers alike is also their inherent stability compared to the non-forested improved extensive system. Moreover, the results show that households in the integrated system have extra income from fish and crab (nearly 28% of total income), while farmers in the non-forested system only obtain 9% additional income (see Figure 3.3). From an organic production perspective, this is appealing as it illustrates the more bio-diverse nature of production of shrimp-mangrove farming. The improved extensive systems also have lower investment costs than the intensive systems, and a higher economic efficiency. Integrated shrimp-mangrove systems are therefore comparatively a lower risk form of farming for the majority of farmers in Ca Mau.

**Table 3.1.** Economic analysis of different systems of shrimp farming in Ca Mau province

Indicators	Integrated shrimp-mangrove (N=10)	Improved extensive monoculture shrimp (N=7)	Intensive shrimp (N=3)
Shrimp productivity (kg/ha)	228	218	4,366
Income from shrimp*	18,280	22,669	498,300
Income from fish & crab*	4,864	2,001	0
Total income*	23,143	24,670	498,300
Total cost*	5,886	3,631	251,584
Net income*	17,257	21,039	246,716
Benefit Cost Ratio (BCR per ha)	2.92	5.79	0.96

(Note: \* unit: VND 1000 per ha. (1 US\$ = 20,000 VND))

Source: Household recording from October 2008 to October 2009, this study



**Figure 3.3.** Proportion of income from aquaculture of different farming systems

The prevalence of shrimp-mangrove farming in Nam Can and Ngoc Hien, two of the most forested coastal areas in the country, have made them the focal point of the organic coast policy. As Naturland organic certification has been drawn into the aspirations of the Vietnamese state, it has become an important arbiter of coastal landscape management by regulating small-holder producers inhabiting these forested areas to maintain mangrove cover. The remainder of the paper examines how and to what extent the organic certification ERN combines private and public actors in to achieve an upscaling of organic production along the coast of Ca Mau.

### **3.4 Regulating organic shrimp production and trade through certification**

#### *3.4.1 Organic Environmental Regulatory Network*

The development of an export-led economy has played a major role in the environmental governance of agrifood production, including shrimp aquaculture. The transition from a centrally planned to a market economy has not only opened up Vietnamese producers to international trade, but resulted in the introduction of third party certifications such as Naturland, in which diverse actors with a range of interests, norms, knowledge and values move governance beyond the monopoly of government institutions.

The organic certification of integrated mangrove-shrimp production systems draws together different state regulation to protect mangrove forests and promote responsible aquaculture production, with private Naturland organic standards. The initial impetus for organic certification was given by the Vietnam Association of Seafood Exporters and Producers (VASEP), which, according to its director, was looking to demonstrate that shrimp farming was not necessarily damaging to the environment. VASEP then brought together the Ca Mau Department of Fisheries, and sought funding from the Swiss Import Promotion Program (SIPPO). Tam Giang was selected as a project site because it had integrated farming in a production forest area managed by the State-owned 184 Forestry Fisheries Enterprise (which later became 184 Forestry Company). Once implemented the organic certification network expanded to include an external auditor, the Institute for Market Ecology (IMO), and the Ca Mau Frozen Seafood Processing Import Export Corporation (CAMIMEX) to export the shrimp to Co-op supermarkets in Switzerland.<sup>7</sup>

The initial proposal for upscaling came from the 184 Forestry Company in response to the challenge of administering a rapidly growing number of farms. As the number of farms grew to about 1,200 the company suggested certifying the entire area

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<sup>7</sup> Located in Ca Mau city, CAMIMEX was initially a state-owned company that was transformed into a joint-stock corporation in 2008

under their management. The basis for this suggestion was to reduce the burden of farmers in meeting auditing requirements for certification and the observation that as long as the overall pond mangrove ratio was 50:50, the area could still be considered 'organic'. However, the proposal was rejected by IMO because they were concerned about free-riding by individual farmers if auditing was at the group level. The result is that although the government's goal, as expressed through the forestry company is to maintain landscape coverage of mangrove, the responsibility for management remains at the individual household level.

**Table 3.2.** *Naturland organic shrimp production in Tam Giang, 2002 to 2009*

Year	Number of households certified	Volume of organic product by certified households (tonnes)		% of certified households sold shrimp to the project
		<i>Black tiger shrimp</i>	<i>Other shrimp</i>	
2002	143	10	4	40-50
2003	336	47	12	50-60
2004	694	365	125	50-60
2005	850	450	170	50-60
2006	854	467	190	60-70
2007	850	480	225	60-70
2008	817	490	214	70-80
2009	784	485	202	70-80

*Source: Ca Mau Frozen Seafood Processing Import Export Corporation, 2010*

The consistent growth of certified farms in Tam Giang since 2002 (*Table 3.2*) led the government to expand organic certification to Tan An commune in Ngoc Hien district in 2009. There 335 farms, on 2,100 ha, were enrolled in the program in partnership with the Nam Can Sea-products Import Export Joint Stock Company (SEANAMICO), funded by SIPPO and certified by IMO. The site represented a new model for the government because instead of a State-owned forestry company, the production forest as part of a wider area of mangrove was managed by the Kien Vang Protection Forest Management Board. The role of the management board is similar to that of 184 Forestry Company in Tam Giang commune: it is responsible with the processing company to organize and implement certification schemes in the field. Buoyed by the success to date, the Ngoc Hien district People's Committee plans to enlarge the organic certification site to all 19,500 ha of integrated shrimp-mangrove systems by 2015. Like in Tam Giang, landscape management will remain at the farm level.

The organic ERN is considered a success by the government, primarily because of the steady increase of the number of certified farms and production since 2002. Some

government officials also see the success of organic certification as strengthening both landscape and farm level sustainability goals. Despite questions over the level of responsibility for management, the state-owned Forestry Company enterprises and Forest Management Board are deemed to be effectively maintaining 50% forest cover, meeting the requirements of landscape level forestry management. Farmers, at least on paper, are seen as being rewarded for following farm level production practices through a price premium. Furthermore, the wider government goal of ensuring socio-economic development of forest users has been promoted through the market orientation inherent to organic certification. As a combination of state, private and farm level interests, the organic ERN has therefore received widespread support by the provincial and district government, as it appears to meet environmental, social and economic development aspirations.

### *3.4.2 Farmer practices and compliance to the standards*

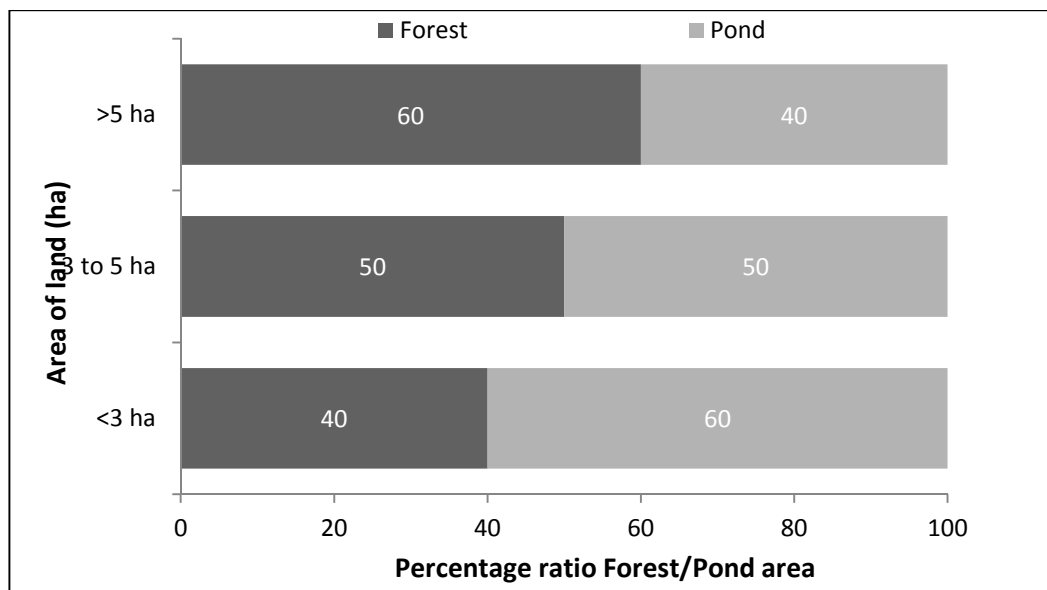
The success to date of promoting organic certification in Tam Giang and Ngoc Hien can be largely linked to the lack of epistemological conflicts between farming practices and the organic standards. Because of their pre-existing compliance shrimp-mangrove integrated farmers have been coopted into the organic production system by virtue of their low input farming techniques (cf. Nigh, 1997). Their production system is also compliant to the regulations of the government; they use a low density of artificial fingerlings and there is no supplemental feed or chemical use. As outlined above, farmers have maintained these extensive systems not only because of a desire to comply to government regulation, but also because they recognize the unstable productivity of improved extensive production in the absence of mangroves.<sup>8</sup> As one farmer expressed, “all shrimp farming practices and shrimp products in integrated shrimp–forest areas here are organic, so why do we need certification for it?”. This raises the question about the legitimacy of the existing system by the Naturland standards because the integrated mangrove–shrimp production systems here could be considered ‘organic’, or at least having organic farming characteristics, before Naturland certification arrived.

The level of mangrove forest cover, however, does reveal an epistemological conflict. According to the Naturland standards, the “former mangrove area in property of the farm shall be reforested to at least 50% during a period of maximum 5 years” (Naturland, 2010: 23). The standard is generally in line with the regulation set out in Decision 24/2002/QĐ-UB on the forest – shrimp pond ratio with the exception of farms with a total area less than three ha (*Figure 3.4*). As forest cover has become the most

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<sup>8</sup> The only way in which farmers currently fall short of full compliance to the Naturland standards is their failure to stock organic certified seed because there is no certified organic hatchery in the region, despite plans by the government and CAMIMEX.

important (and most visual) indicator for certification it has become a point of controversy. According to a report from IMO's staff, 19 households were not certified after auditing in 2009 because they did not comply with the Naturland standards despite meeting the government's requirement for 40% forest coverage. Interviews revealed that farmers with plots less than 1-2 ha were less likely to comply because they have chosen to maximize their pond area as income from shrimp is larger and more consistent than income from forestry (Ha et al., 2012). The 10% 'deficit' between the Naturland standards and the government regulations therefore appears to disadvantage small-holders in the Naturland program.



**Figure 3.4.** Ratio of forest to pond area as set out by the provincial government

Data from CAMIMEX shows that most of the certified farms meet Naturland's requirement for 50% forest coverage and that a number of farms have up to 70% coverage. The apparent success of maintaining forest by these farmers can be explained by the implementation of government policy and management activities of the forest company, as well as the farmer's attitude towards protecting forests (Ha et al., 2012). Farmers, however, argued that the assessment of certification should not be based on individual farms, but rather, in line with the claims of the forestry company, collectively. If a number of farms in the village have less than 50% forest coverage they should be 'compensated' by those farms with 60% and even 70% forests coverage, so that both can be certified. Non-compliance of small-holders to the Naturland standard on forest cover therefore appears to be both a question of different perceptions about what constitutes a 'forested' area as well as (in)flexibility of standards that have predefined units and scales of measurement. Farmers complain that Naturland standards are not realistic because they assess individual farms, while the real 'organic' effect of forest cover is realised at a larger scale.

### 3.4.3 Value chain practices - premium payment and benefit sharing

A key conflict that appears to undermine the certification ERN is the difference in the farm gate price and premium payments applied in Tam Giang and Tan An communes. In Tam Giang, the farm gate price of certified shrimp is VND 8,000 per kg (US\$ 0.4) lower than the market price for non-certified shrimp. This is an explicit policy applied to organic shrimp by CAMIMEX in order to discourage mixing non-certified with certified product. The standard price of shrimp is based on 20 pieces per kg. If there are fewer pieces per kilogram, meaning a larger size of shrimp, the price increases by VND 10,000 (US\$ 0.50) per kg. After export a guaranteed 20% of the value of the shrimp flows back to the production site and is distributed into four parts: (1) 5% for CAMIMEX; (2) 6% for the farmer; (3) 2% for collector; and (4) 7% to a fund to insure against downward fluctuations in market price. However, the payment to the farmers normally takes at least two to three months depending on the time of export, and the 6% farmer share has been reduced over time from 15% at the start of the project. In addition, farmers complain that the 7% insurance is never used in periods of downward prices and instead is accrued to CAMIMEX, making their share double of what farmers receive.

In Tan An, the farm gate price of organic shrimp is VND 10,000 per kg ( $\approx$ US\$ 0.5) lower than the price for non-certified shrimp, but this is compensated by a flat price given to shrimp ranging from 20 to 40 pieces per kg. Theoretically, this benefits farmers, but in practice the size of shrimp in Tan An ranges from 10 to 20 pieces per kg. If farmers sell their shrimp to collectors working outside the organic value chain they can get up to VND 10,000 per kg more for the product. Certified farmers are also promised a 20% premium above the market price. But unlike Tam Giang, the premium is divided into 5% for the development fund managed by SEANAMICO and 15% for the farmers. The main concern of the farmers is that they must wait for up to three to four months before being paid the premium because of the long delays in exporting shrimp to Europe and the slow payment schedule of downstream actors in the chain.

As these two cases illustrate, the payment of equitable (and contracted) price premiums is the biggest concern of certified farmers. In both communes, farmers receive the same (or a little more) from certified organic shrimp compared to non-certified products. Reflecting experiences in other aquaculture systems in Vietnam (Khiem et al., 2010), farmers are disadvantaged by payment delays – a stark contrast with payment terms for non-certified shrimp. As a result many certified farmers are increasingly reluctant to sell their product to organic shrimp collectors. The risk for Naturland and the government is that farmers are withdrawing their enrollment in the program. In 2009, 145 new farms were certified, but in 2010 155 certified farms were not audited because they had not sold shrimp as organic to the processing company. The farmers are



increasingly questioning the economic benefit of being certified, but many remain associated with the system in the hope of improvements in the system.

#### *3.4.4 Auditing practices - Internal Control System (ICS)*

The selection of organic shrimp collectors by CAMIMEX plays a key role in the functioning of the certification scheme. Thirty collectors were enrolled in Tam Giang commune, with an average of three collectors per hamlet, each servicing 25 to 30 organic farms. These collectors were already active before the organic project started in 2001 and, while maintaining the same clients, are now regulated within the ICS of the CAMIMEX. During harvest periods (about 14 days per month) collectors are personally responsible for collecting shrimp and handling payments. They first categorise shrimp into different sizes, then weigh and fill in the forms provided by CAMIMEX. Collectors directly pay farmers based on the grade and size of shrimp, which is also set by the processing company. The shrimp are then re-checked at the CAMIMEX collection station by a company officer. Within 24 hours after harvesting the shrimp must enter the processing company according to food safety standards.

An Internal Control System (ICS) was set up in 2008 by CAMIMEX, the 184 Forestry Company, farmer representatives and collectors. The organisation is under the direct control and management of CAMIMEX and operates following the regulations detailed by the International Federation of Organic Agriculture Movements (IFOAM). The main function of the ICS is to monitor farming and traceability through the trade chain in accordance with the Naturland standards. Because the ICS is recognized as an internal mode of auditing, IMO (as an external auditor) uses the data generated as the basis of their annual auditing. To improve their own efficiency they only randomly visit audited farms to check whether ICS information and documents are correct.

Although the ICS operates smoothly and contributes to the auditing process, there are doubts about the effectiveness and efficiency of the system, especially with respect to the collector's activities. The problem is that collectors not only collect organic shrimp from certified farms but also buy other aquatic products (black tiger shrimp, other shrimp and fish) from both certified and non-certified farms in order to increase their income. Farmers are also in favor of this practice as it provides a ready market for their other aquatic products and it is an important way for collectors to maintain relations with farmers in their social network. The farmers, however, reported that some collectors, if not many, mix non-certified with certified products in order to maximise their 2% bonus based on the value of the farm gate price and the volume of certified shrimp transported to the collecting station.



Managing collectors is seen as the most difficult task for ICS. Those directly involved in the ICS recognise that they should not only rely on farmers for auditing information, but are restricted by the costs that further monitoring would entail. By the same token these 'middlemen' play an important role in the supply chain due to the fragmented character of shrimp production. The local government is noticeably absent in making any attempt to improve the quality of the ICS. As government staff pointed out, the government has made a decision not to intervene in deteriorating network relations. The net result is that although auditing and supply chain management are important functions of the Naturland system, the current make-up of the ICS appears to be hindering the sustainability of the certification scheme. The results also indicate that the ICS system risks not being objective because all the actors have an interest in increasing the volume of organic shrimp.

### **3.5 Regulatory challenges of 'organic coasts': A discussion**

Our analysis demonstrates that Vandergeest's understanding of organic certification as an environmental regulation network opens up a more nuanced view on the role of state and private actors with their different norms, values and practices. Governments, intergovernmental organizations, NGOs and industry play different roles in the certification ERN. Although Naturland has come a long way in facilitating interaction between these diverse actors, concerns remain about the ongoing incentives for farmers to be involved in the system should it continue to be scaled up through government policy. We now return to the three 'clusters of conflicts' to explore the regulatory challenges faced by the government's goal of certifying an organic coastal landscape by 2015.

The shrimp-mangrove integrated system benefits from existing 'organic' practices of producers in Nam Can and Ngoc Hien. The only point of contention is the protection and re-forestation of mangroves. The 10% 'deficit' between the Naturland standards and the government regulations on the allowable proportion of farm area under mangrove forest for farms less than three hectares disqualifies many small-holders from Naturland certification. The proposal made by farmers to also consider forest cover over 'clusters' of farms demonstrates an alternative understanding of the relationship between farm and landscape management that would allow their participation in the program. The different definitions of forest cover are therefore not only administrative but also represent an epistemological divide over what constitutes landscape connectivity that holds direct implications for the participation of small-holders. This is in line with Hatanaka's (2010b) observations on the tensions between farmer practices and externally defined and regulated standards.

The farmer's proposal for group certification as a means of certifying larger ecological units holds some credence, and would respond to the concerns that mangrove forests are best managed at the landscape rather than farm level. There is growing evidence that a cluster based approach can save on certification costs, as well as enable improved internal monitoring systems, upgrading of communal infrastructure, improved economies of scale in production and improved bargaining capacity in the value chain (Kassam et al., 2011; Umesh, 2010). Such an approach would also respond in some degree to Vandergeest's (2007) call for more cohesion of certification processes with community-based natural resource management institutions. However, as found in other studies on Vietnamese aquaculture (Khiem et al., 2010; Anh et al., 2011; Ha et al., Forthcoming), successful cooperation requires closer support from government agencies in providing technical input and closer regulatory oversight.

With respect to conflicts around trade practices in the organic ERN, our analysis shows that the role of market incentives is vital in fostering farmer participation and compliance with any private sector-led governance arrangement. If farmers do not get better market access or a premium for their products, they are unlikely to change their practices to pursue certification (e.g. Hatanaka, 2010b; Muttersbaugh et al., 2005; Raynolds, 2009; Reardon et al., 2009). The certified farmers in Ca Mau are not satisfied with the benefit sharing mechanism applied in the Naturland program as there is no significant difference in farm gate price between certified and non-certified shrimp. The government's orientation towards organic shrimp farming in Ca Mau is therefore oriented towards environmental sustainability, but unless greater regulation ensues, will continue to neglect social and economic dimensions of production.

Small-holder shrimp farmers in Vietnam, by virtue of their remote location, low production levels and weak organization, have extremely low bargaining power relative to other actors along the chain (Bush and Oosterveer, 2007). In the Naturland organic chain this low bargaining power might be enhanced by the involvement of the local government via the 184 Forestry Company and the forest management board. In practice, however, forestry companies and management boards are primarily interested in guaranteeing timber production rather than shrimp production. This reflects an institutional decoupling of shrimp and forest production although they are directly dependent on each other (Ha et al., 2012). The result is that the interests and concerns of the shrimp producers have been marginalized. As outlined by Belton et al. (2009), this reflects a wider bias in aquaculture certification towards environmental sustainability, neglecting equitable access of participants to a sustainable livelihood. The future success of the existing Naturland system and the aspirations of the government to upgrade the

system to a wider area therefore appear to be strongly dependent on the ability of farmers to capture the full share of their contracted 20% premium.

The third and final set of conflicts in the ERN relate to reporting and enforcement. The current make-up of the Naturland ICS in Ca Mau also appears to hinder the sustainability of the certification scheme. Reflecting the observations of Vandergeest (2007) in Thailand and Hatanaka (2010b) in Indonesia, farmers find themselves the objects of, rather than partners in, monitoring with little (if any) input to the form and function of reporting. The only means of objection and resistance they have is to not sell their shrimp to the processing company – by far the most influential and powerful actor in the system. The ICS system also risks not being objective because all the actors have an interest in increasing the volume of organic shrimp. This opens up a central contradiction of private-sector-led third party certification such as Naturland. Although characterized by its claims of objectivity (Hatanaka and Busch, 2008), a distinction has to be made between organizational and operational independence. As actors in the Naturland chain pursue their own benefits, operational independence is being slowly eroded. Supporting Rönnbäck's (2003) review of Naturland shrimp in Indonesia, the risk of misinformation and cheating is considerable when external auditing is based on information provided by stakeholders whose benefits depend on the exploitation of small-holders.

Faced with these regulatory challenges of organic certification the question of where, when and how the state can be brought back into networked forms of environmental governance remains highly relevant. The government, however, is not an homogenous entity. Different government departments at multiple levels have different goals, abilities and interests in supporting organic certification. Determining which institution can best intervene depends on addressing conflicts of interest and questions of legitimate representation within the ERN and their influence over steering towards an 'organic coast'.

Following Anh et al. (2011), Muttersbaugh (2005) and Vandergeest (2007), we suggest that local government at communal and village level is best positioned to support farmers in the translation of standards and price bargaining. As we argue elsewhere (Ha et al. Forthcoming), improved farmer organisation through clusters can also be supported by local government or existing state sponsored farmer associations, but success is more likely if they are led and 'owned' by producers. If these clusters are supported by technical government services they can be more effective in steering and monitoring the shrimp supply chain (Khiem et al. 2010), which in turn can balance the existing regulatory difficulties experienced by the Naturland ICS. We also see a clear role for the provincial government to not only scale up the number of farmers enrolled in the

system, but also to promote organic products both internationally and domestically, and to provide stronger enforcement over existing benefit sharing contracts between producers and processing companies. However, government involvement is not an absolute solution for ensuring conflicts of interest are avoided and legitimate representation put in place. Instead multiple actors in the ERN need to develop their capacity for negotiating their terms of incorporation and the final outcomes of organic certification.

### **3.6 Conclusions**

The decision of the government to upscale organic certification in Ca Mau province by 2015 raises a series of challenges about the role of the state in NSMD forms of environmental governance. Organic certification in Vietnam is not a fully privatised form of governance, as the state remains a key actor. Our analysis has shown how the government has blurred the lines of the state/private divide by using organic certification to govern the sustainability of coastal landscapes, where shrimp aquaculture and mangrove forests have historically conflicted. However, we conclude that although private governance holds the potential to supplement state-led regulation, it does not supplant the role of government. In that sense, we concur that Vandergeest's concept of environmental regulatory networks better reflects the dynamics of implementing organic certification than the concept of Non-State Market Driven governance. But in order for organic certification to achieve sustainable and equitable shrimp aquaculture in mangrove forests a series of regulatory challenges need to be addressed.

Organic certification in shrimp-forest integrated farming systems in Ca Mau holds the potential to link farm-level management to landscapes sustainability, especially because these systems already hold organic qualities. However, ensuring that farm level regulation can have an impact on the landscape level goes beyond questions of ecological scalability. Expansion of organic certification is also dependent on the improvement of social and economic conditions of production. Realizing 'organic coasts' therefore begins with the involvement of farmers as partners rather than targets of regulation when determining (1) how to best scale up forest protection; (2) the extent to which economic benefits are shared between actors in the certified value chain; and (3) the level of legitimacy given to private sector-led auditing systems. These conflicts within and beyond the farm level need to be resolved before producers will equitably, and therefore willingly, invest in the government's goal of organically certified coasts.

These regulatory challenges faced by implementing Naturland certification might be overcome through a more precisely defined involvement of the state. Based on our analysis of local scale value chain, auditing and farmer practices we conclude that more

direct involvement of provincial and district government would improve the representation of producers in organic ERNs. More specifically, state interventions should include greater legislative enforcement over contract arrangements along the value chain and support for improved farmer organization that can support a scaling up of environmental regulation and certification from the farm to the landscape level. Following the suggestion of both the local government and farmers this might be achieved through producer-led clusters across ecologically linked landscape units. Doing so would partly redefine the role of producers as partners rather than targets of regulation, assist in achieving benefits beyond the farm, and move the government further towards their aspirations of an organic coast.

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# 4

## **Questioning the role of cooperative shrimp aquaculture**

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## Abstract

This paper analyses the role of 'clustering', as a form of cooperative production, to improve the environmental performance of shrimp farmers and facilitating them to upgrade their position in the global value chain. Through a comparison of intensive and extensive shrimp farmer clusters in Ca Mau province, Vietnam, we explore how this form of cooperative production can enable small-holders to upgrade both functional and relational dimensions of production to meet new requirements of participation in the global shrimp value chain. The results show that by facilitating horizontal coordination between producers clusters can improve the management capacity of both intensive and extensive producers for meeting international production standards. However, the success of clusters also depends on the type and strength of vertical coordination with other actors along the value chain for both the provision of inputs and marketing of outputs. The paper concludes that for improved extensive shrimp farmer clusters to take further advantage of production-oriented quality standards the Vietnamese government needs to play a greater role in the development of production infrastructure and create a legal framework for private sector coordination of cluster formation.

**Keywords:** *cooperatives, clusters, shrimp, aquaculture, value chain, upgrading, Mekong Delta.*

## Chapter 4

### QUESTIONING THE ROLE OF COOPERATIVE SHRIMP AQUACULTURE

#### 4.1 Introduction

Shrimp farmers are increasingly being challenged to ‘upgrade’ their production by meeting a range of (environmental) production standards required for entry to international markets, while at the same time managing their vulnerability to economic, regulatory and environmentally related production risks (Vandergeest, 2007; Islam, 2008; Hatanaka, 2010; Bush et al., 2010). Despite more than 30 different sets of standards available to shrimp producers, including government-led Better Management Practices (BMPs) (Corsin et al., 2007), adoption by small-holders remains limited because individual practices are often not (if ever) reflected in collective practices such as common water usage (Mohan and De Silva, 2010). As outlined by Kassam et al. (2011), organising small-holder aquaculture farmers into some form of cooperative production is therefore seen as an effective means of fostering a requisite level of financial and technical capacity needed to cope with ever more stringent (environmental) production requirements (see also Umesh, 2007; Mohan and De Silva, 2010), as well as the new demands of record keeping and product traceability (e.g. Zhang et al., 2010).

Cooperative production is generally seen as a means of improving the poor economies of scale that limit small-holders capacity for improved product quality, bargaining power, capital investment and management skills (Coles and Mitchell, 2011). Recognising these benefits, the Vietnamese government has promoted cooperative production through the 2003 and 2006 amendments to the Cooperative Law; both of which promote the organisation and operation of so called ‘new-style cooperatives’. In doing so the government explicitly aims to transcend the connoted failures of collectivisation (*hợp tác xã*, see Fford and Huan, 2001; Nghiem, 2008) by tailoring new style cooperatives to improve the economic and managerial performance of producers through ‘service oriented’ small-holder ‘clusters’ (*tổ hợp tác*). However, the promotion of shrimp farming clusters does not reflect the failed experience of similar forms of cooperative production in other sectors and countries (see Chirwa et al., 2005; Stringfellow et al., 1999; Valkila and Nygren, 2010). How Vietnamese style clusters can promote economic and environmental performance of aquaculture producers therefore begs further analysis.

Through a comparison of intensive and extensive clusters in Ca Mau province this paper analyses how ‘new style’ shrimp farmer clusters in Vietnam provide a vehicle for

'upgrading' production practices to comply with emerging demands set out by private and state production standards, and in doing so improve their performance in global value chains (GVCs). By doing so we respond to Kassam et al. (2011) who call for input to the nascent global debate over the value of group formation for commercially oriented small-holder aquaculture.

Our analysis takes its lead from Ponte and Ewert (2009) who argue that upgrading should not only refer only to a normative notion of 'moving up' the chain, but should also include a wider set of strategies and enabling conditions for firms to enhance rewards and/or reduce risk in global markets. Analytically, the process of upgrading then includes a range of relational strategies, including vertical and horizontal forms of coordination that influence the performance of production (Bolwig et al., 2010; Gibbon, 2001), and functional strategies, including the integration or specialisation of production functions (Bolwig et al., 2010; Giuliani et al., 2005; Humphrey and Schmitz, 2002). Vietnamese new style cooperatives, and in particular farmer clusters, are therefore expected to combine both relational and functional dimensions of upgrading small-holder aquaculture farmers: by stimulating a form of horizontal coordination they are expected to improve the capacity for complying to private and state production standards, which in turn improves vertical access. Using the concept of upgrading we explore how small-holders are able to meet these combined goals through the kinds of clustering currently being promoted by the government and international organisations alike.

The following section provides further detail on global value chain literature and upgrading small-holders. The paper then gives a short history of aquaculture cooperatives and clusters in Vietnam before presenting the empirical case studies of intensive and improved extensive shrimp farmer clusters in Nhi Nguyet and Tan Long hamlets respectively. Finally the paper turns to an analysis of the challenges and possibilities of clustering for promoting sustainable shrimp farming.

## **4.2 Upgrading and collective production for small-holders.**

### *4.2.1 Collective action and farmer cooperatives*

Opportunities for small-holders to raise their income from primary production and therefore alleviate poverty depends in large part on their ability to successfully participate in domestic and international markets (World Bank, 2007; Markelova et al., 2009; Fischer and Qaim, 2012). However, small-holders typically face a range of challenges including high transaction costs and low bargaining power that limit their ability their market access. To overcome this situation various types of collective action have been promoted which allow them to compete with large producers and

agribusiness (Thorp et al., 2005; World Bank, 2007). In general terms collective action includes any initiative taken by a group in pursuit of members' perceived shared interests (Marshall, 1998). In economic terms producer cooperatives are forms of voluntary collective action taken by a group of individuals, who invest time and money to pursue shared objectives (Markelova et al., 2009).

The economic rationale for collective action by small-holders derives from two features of the market (Reardon et al., 2009; Rao and Qaim, 2011). First, collective action can create economies of scale in production and marketing that reduce transaction costs and information asymmetries. Second, collective action can build up countervailing market power for small-holders in the context of high degrees of concentration in upstream and downstream markets. Small-holders are also increasingly faced with more intensive use of purchased inputs and higher degrees of commercialization, and the increased modernization of supply chains through high process-related quality and food safety standards (Fischer and Qaim, 2012). Together these factors increase transaction costs and further aggravate power asymmetries thereby giving greater relevance to collective action to improve market access for small-holders.

Collective action designed to facilitate cooperative production is widely promoted as a means of improving the economic performance of small-holders, as well as their ability to participate in global value chains (Kassam et al., 2011; Narrod et al., 2009). Through shared decision-making and improved self-regulation small-holders have been shown to improve pre-harvest, production and post-harvest and marketing (Narrod et al 2009). However, contrary to the received wisdom of collective action, which emphasizes the willingness and ability of individuals to create positive group dynamics, the various forms of cooperative production are often conditioned by external support from government, NGOs or the private sector (Fischer and Qaim, 2012). Understanding the conditions under which cooperative forms of production are successfully developed, for whom, and through what benefit sharing mechanisms therefore remain key questions, especially for aquaculture where very little empirical evidence is available (Fischer and Qaim, 2012). Moreover, questions remain around how collective action can facilitate small-holders to upgrade their position in value chains by meeting the new demands of quality and sustainability in the global agrifood system.

#### *4.2.2 Upgrading small-holders in global value chains*

Upgrading is most commonly defined as a process of making better products, by either producing them more efficiently, or by moving into more skilled activities within a wider set of institutional conditions (Huphrey and Schmitz, 2002). The goal of 'doing things better' is then a matter of improving the ability of firms to generate greater profit and thus extract more value from the chain (Gibbon, 2008). The wider understanding of

upgrading has been developed in globally oriented industrialised sectors in the global North, where doing things better is strongly associated with accumulating knowledge and skills to 'move up' the value chain in response to globalisation and competition (Gereffi, 1999). However, in the context of developing countries a more nuanced approach to studying upgrading is needed that takes into account the multiple dimensions and strategies of firms (Ponte and Ewert, 2009). This is especially relevant to sectors such as shrimp farming in Vietnam, which is dominated by low investment small-holder production now trying to maintain access to global markets by complying to a range of global certification schemes.

The GVC literature has traditionally focused on four types of upgrading: product, process, functional and inter-sectoral (Humphrey and Schmitz, 2002). *Product* upgrading refers to moving into more sophisticated products with increased unit value by developing and applying new knowledge, skills or design principles. *Process* upgrading is defined as achieving more efficient transformation of inputs to outputs through the reorganisation of productive activities. *Functional* upgrading refers to acquiring or abandoning the skill content of a productive activity and *inter-sectoral* upgrading involves applying skills and competencies acquired in another sector or chain. Each of these forms of upgrading has been linked to different markets structures. Process and product upgrading are most likely to occur in chains where producers are locked into 'captive' relationships, often with the assistance of buyers (Schmitz, 2006). Whereas functional and inter-sectoral upgrading is likely to occur in market rather than captive transactions and involve small buyers and/or domestic markets.

Ponte and Ewert (2009) argue that although a helpful starting point, the four-type classification of upgrading becomes difficult to apply in many situations, largely because they assume a discrete separation of strategies, which often does not exist in reality. In the agro-food sector (which includes shrimp aquaculture) process upgrading often leads to new categories of products such as organic or 'sustainable'. Similarly, if process upgrading is narrowly defined as increasing efficiency, then activities like compliance to environmental standards that 'improve' production, but not necessarily lead to higher efficiency, will not be observed. They also point to cases where compliance to social/environmental production standards, and the new functions they imply, might lead to a product with intrinsically better qualities but not necessarily of higher value to the consumer, making compliance a condition of market entry rather than the narrow goal of extracting more value from the chain (cf. Gibbon, 2008). The ambiguity of these classifications raise questions over the extent to which these upgrading classifications can help to draw out the effectiveness of small-holder strategies in dealing with the challenge of globalisation and competition, and in

particular, compliance to new forms of regulation such as food safety and environmental standards.

To overcome these limitations, a wider definition of upgrading has emerged that goes beyond firm level strategies to emphasise the wider relational aspects of value chain coordination. In value chain terms, coordination refers to the how actors set, measure and enforce the parameters that define participation and operation in the chain (Humphrey and Schmitz, 2002). More specifically, coordination can be defined as an “effort or measures designed to make players within a market system act in a common or complementary way or toward a common goal” (Poulton et al., 2004 p. 521, cited in Bolwig et al., 2010). Bolwig et al. (2010) classify these coordination measures as either vertical or horizontal – extending the notion from earlier work on commodity chains (e.g. Fine et al., 1996; Bush and Oosterveer, 2007) – to create a framework to think strategically about the inclusion of small-holders in value chains. In doing so they extend the four type classification of process, product, function and inter-sectoral upgrading to a wider concept of “desirable change in participation that increases rewards and/or reduces exposure to risk” (p.177). Importantly they define rewards and risks beyond financial terms to include outcomes related to poverty, gender and environment.

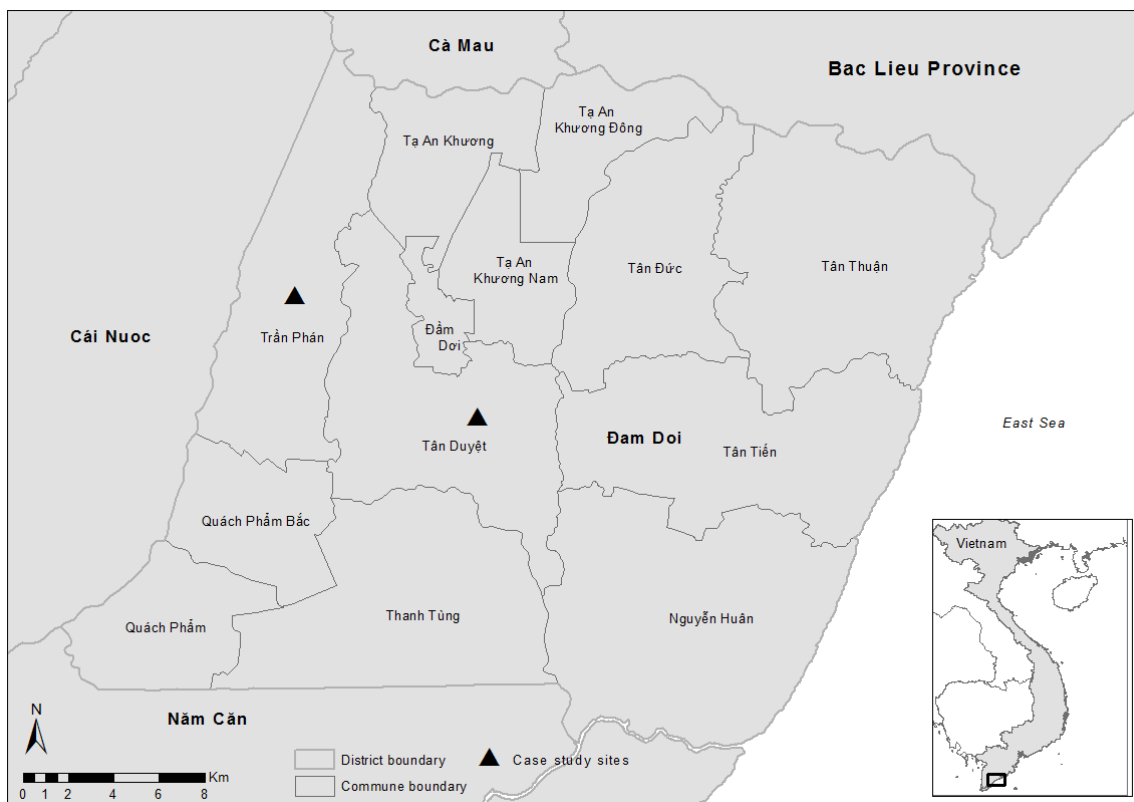
Horizontal coordination refers to arrangements between actors in the same chain node that reduce costs, increase revenue or share risk by cooperating over production inputs, marketing, regulation, credit and insurance (Bolwig et al., 2011). The extent of such coordination can differ, either being limited to producers of a particular product (e.g. shrimp), an industry association (e.g. aquaculture) or, as outlined by Vandergeest (2007), community-based natural resource management institutions (e.g. water management committees). Vertical coordination includes changes to the ‘structures of rewards’ available to suppliers within a chain and the ‘concrete roles’ of upstream actors in releasing these rewards to downstream actors (Gibbon, 2008). The expectation of much of the cooperative literature is that investment in horizontal coordination will lead to coordinated functional upgrading, such as complying with production quality standards (Francesconi, 2007), which in turn will lead to vertical coordination in the value chain. Improved vertical coordination is subsequently expected to play a critical role in coordinating the activities and interests of small-holders (Sykuta and Cook, 2001), such as improved price bargaining (Coles and Mitchell, 2011), access to technical and market information (Bush and Oosterveer, 2007), and ultimately reduce the risk they face in participating in global markets (Bogetoft and Olesen, 2004).

In the rest of the paper we apply these relational (horizontal and vertical) and functional dimensions of upgrading, and the interaction between them, to determine how cooperative forms of production in Vietnamese shrimp aquaculture can facilitate

changing production practices to comply with sustainability standards and in doing so improve their performance in the global value chain.

### 4.3 Methodology

A comparative case study approach was adopted for this research to investigate cooperative production in its empirical context (Yin, 2003; Neuman, 1997). In doing so, we compare an intensive shrimp farmer cluster in Nhi Nguyet hamlet, Tran Phan commune and improved extensive shrimp farmer clusters in Tan Long hamlet, Tan Duyet commune (*see Figure 4.1*). Both cases are in many ways unique, given the lack of functioning aquaculture cooperatives in Mekong Delta, but at the same time are representative of the models that are being promoted by NGOs and intergovernmental bodies (e.g. Kasam et al., 2011). As the research is problem-oriented the case study methodology developed a ‘thick’ description of the upgrading strategies adopted by the different groups, and subsequently links these findings back to possible solutions and improvements.



**Figure 4.1.** The map indicates Tran Phan and Tan Duyet communes

Data was then collected from 2008 to 2010 through seven field trips lasting from two to three weeks. A total of 98 formal semi-structured interviews were conducted with farmers, local officers from communal to provincial levels, traders, collectors, processing companies. To investigate the dynamics of horizontal contractualisation



three focus group discussions were held with farmers both involved and not involved in cooperative farming to discuss longitudinal quantitative data on farm management practices that they had filled in over the two year period. Finally, observations and informal talks with farmers during the two to three week visits to the sites over the research period were used to validate and complement information. In addition, secondary data from commune to provincial level government, as well as national organisations such as the Ministry of Agriculture and Rural Development (MARD), the General Statistical Office (GSO) and World Wild Fund for Nature (WWF) in the form of printed documents, websites and other sources.

Both qualitative and quantitative data analysis was done to compare the various cases in terms of the characteristics of the farming systems, the formation of the clusters, the management activities of the clusters, and the factors behind their success and failure. An analysis of costs and benefits was conducted based on both price factors such as income, membership fees and voluntary contributions and non-price factors such as improved access to inputs and outputs and access to information and technology. Other factors such as time investment was not calculated. Combined, these data provide evidence that can enable argumentative-interpretative analysis (Giddens, 1993) on the role of clusters in facilitating small-holders to upgrade their position in the global value chain.

#### **4.4 Shrimp farmer cooperatives and clusters in the Mekong Delta**

Vietnam has one of the fastest growing aquaculture sectors in the world, having expanded at 16.4% p.a. from 1990-2008 (FAO, 2010). The shrimp industry, which makes up 25% of total aquaculture production, is dominated by small-holders. In the Mekong Delta 292,522 households contribute 81% of the total shrimp production of the country, 72% of which have a pond area range from 0.2 ha to under 2 ha (GSO Vietnam, 2007). The predominance of small-holders has meant that cooperative and cluster development has remained a central strategy of both the government and non-governmental organisations (NGOs) to increase the collective and individual competitiveness of the industry (Ha and Bush, 2010). Following the approval of the 2003 Cooperative Law, the government also put renewed effort into tailoring the form and function of cooperative groups to avoid connotations with collectivisation, and also facilitate improved managerial capacity for upgrading production to meet BMP and other international production standards.

The Cooperative Law distinguishes two forms of cooperative production. *Cooperatives* are defined as a collective economic organization formed by seven or more individuals, households and/or legal entities who have mutual needs and benefit

voluntarily contribute assets and labour to carrying out certain works for increasing production efficiency and improving living standard of members. Cooperatives operate as a business, have legal status, autonomy and self-responsibility for financial obligations within the scope of charter capital, accumulated capital and other sources of cooperatives accordance with the law (Cooperative Law 2003). *Clusters* are defined as an economic organisation based on a cooperation contract under authentication of communal People Committee which is formed “by three individuals or more who jointly contribute assets and labour to carrying out certain works for mutual benefit and responsibility” (Decree No. 151-2007/ND-CP, 2007). Although the principles of cooperative and clusters are similar the main differences are in terms of organisation and management levels; cluster can then be seen a simpler form of a cooperative with less legal liability for members.

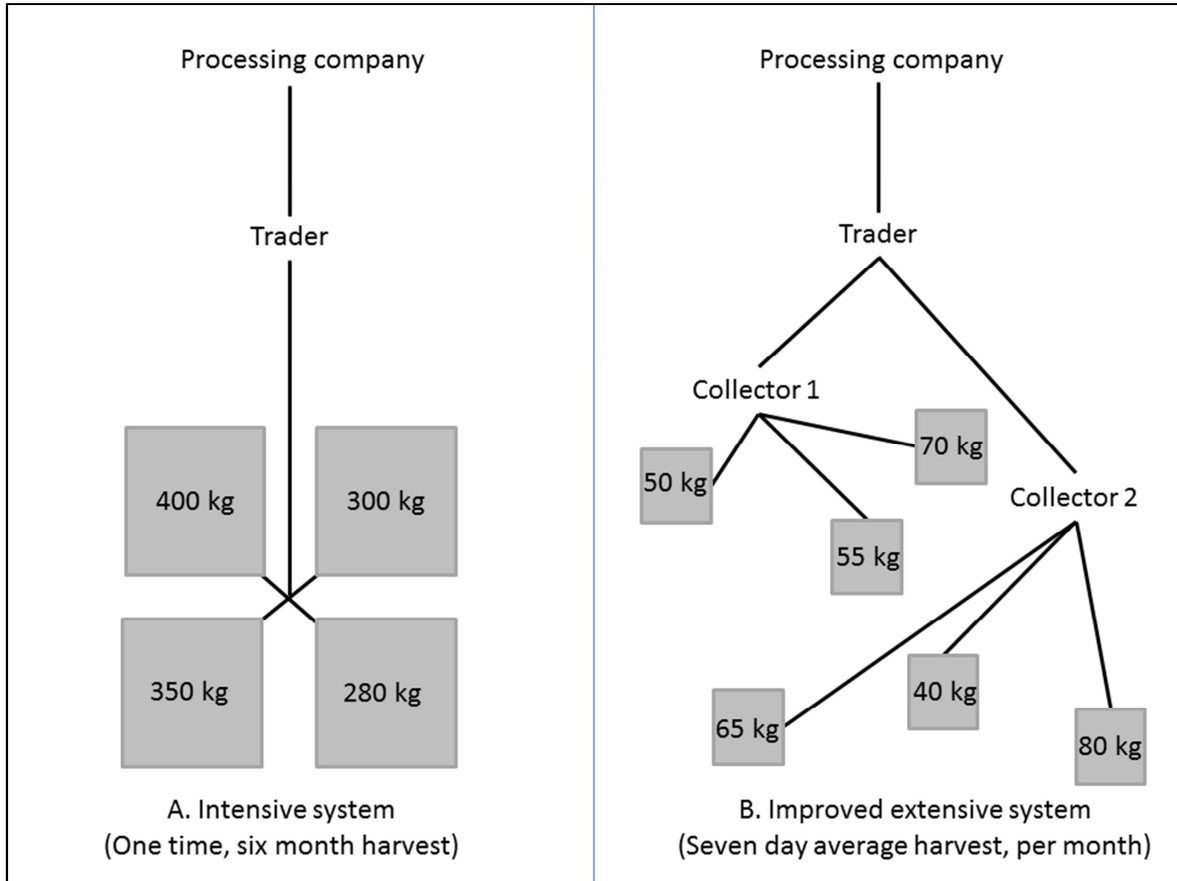
Shrimp farming in Ca Mau province has been a concern of both government and NGOs, who have both been active in promoting cluster formation to promote upgrading. The province has an annual production of more than 300,000 tonnes spread over 122,144 households, of which 67% have less than two ha of pond (GSO Vietnam, 2007). Only 0.5% of shrimp farming area is intensive - defined by the use of artificial feeding and stocking with a relatively low density ranging from 12 to 30 fingerlings per square meter (see Anh et al., 2011). The productivity of intensive shrimp farming ranges between 3,500 kg to 4,000 kg per ha per crop, with one crop taking six months. Investment in intensive systems - including feed, seed and biosecurity measures to prevent disease outbreak - costs 200 million to 250 million VND per ha (US\$ 10,000 to US\$12,500). Dieu (2010) characterised these systems as having low disease prevalence but higher virulence, resulting in a greater need for mutual insurance given the high investment costs. As illustrated in Figure 2, the higher and more spatially/temporally concentrated productivity can be considered more suitable for a more organised production cycle and a more direct connection with processing companies.

In contrast, the improved extensive systems make up almost 95% of all farming households, and are characterised by artificial stocking with no additional feeding. Investment is therefore much lower than the intensive system at approximately 3.6 million to 6 million VND ha<sup>-1</sup>yr<sup>-1</sup> (US\$180 to US\$300); mainly used for pond preparation once a year. Productivity is also much lower at 356 kg ha<sup>-1</sup>yr<sup>-1</sup> (CDARD, 2007), or approximately 8 to 10% of the intensive system. One household with two ha of pond can harvest 70 kg of shrimp over two seven day periods per month (for 10 months a year) based on high tide events.<sup>9</sup> This more open or ‘landscape integrated’ system (Bush et al.,

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<sup>9</sup> The first seven days range from the 28<sup>th</sup> to the 4<sup>th</sup> days and the second seven days range from the 13<sup>th</sup> to the 19<sup>th</sup> days of the lunar calendar.

2010) is also characterised by a higher prevalence but lower virulence of diseases such as WSSV (Dieu, 2010). In the context of value chains (Figure 4.2), the temporal and spatial fragmentation of this production system makes the role of collectors particularly important in linking producers with processing companies.



**Figure 4.2.** Schematic comparison of the structure and trade relations of intensive and improved extensive production systems

The different production and risk profiles of intensive and improved extensive production systems means there are different requirements for collective bargaining for cooperative benefits such as mutual insurance, price bargaining and sharing technical knowledge. Despite these differences, farmers operating in both systems have been encouraged to organise into clusters by the government. However, the attention to these collective forms of production and their perceived benefits for improving the environmental and economic performance of shrimp aquaculture is overshadowed by their decline in number in the province over the last decade (see Table 4.1). Faced with this apparent contradiction between policy and practice we now turn to a comparison of intensive and improved extensive shrimp farmer clusters, and the challenges and possibilities of improving the performance shrimp production through improved functional and relational upgrading.

**Table 4.1.** Number of aquaculture cooperatives and clusters from 2001-2008 in Ca Mau

Indicators	2001	2004	2005	2008
<i>Cooperatives:</i>				
Number of cooperatives	76	58	32	25
Number of members	1,014	754	1,020	373
Joint capital (mil. VND)	7,029	5,364	6,000	5,833
<i>Clusters:</i>				
Number of clusters	79	125	115	86
Area farmed under clusters (ha)	948	1,500	1,360	1,530

Source: Ca Mau Department of Agriculture and Rural Development, 2009

## 4.5 The cases of shrimp farmer clusters in Ca Mau

### 4.5.1 Nhi Nguyet intensive shrimp farmer cluster

Nhi Nguyet intensive shrimp farmer cluster is one of the few successful examples of a government-led attempt to stimulate cooperative production in Ca Mau and fits into the provincial plan for developing 20,000 ha of intensive shrimp production by 2015 (CDARD, 2007). The cluster was started in 2005 by an ex-national member of parliament whose position enabled him to attract government support and contracts with input and processing companies. In turn, nine intensive shrimp farmers joined the cluster with the goal of sharing experiences and new techniques, as well as to benefit from the support offered by the government for installing a three-phase electricity system. The following year the group increased to 15 households, and by 2009, sixty-six farmers had enrolled. In 2010, the cluster moved beyond a platform for sharing technical expertise by establishing two enterprises that have contracts with four processing companies, as well as four supply branches with contracts with major suppliers of feed, seed and chemicals. This led to further expansion of membership and by 2011 the cluster had 100 members with a total area of 120 ha, made up of 96 ha of white leg shrimp and 24 ha of black tiger shrimp.

The sale contracts established with four processing companies show a major shift in vertical chain relations directly brought about by the strength and organisation of cluster. The contracts bring direct benefits to the farmers who are prone to the combined risk of fluctuating market prices and disease. However, it is the flexibility of the contract, in combination with more stable pricing arrangements, which generates most benefit for the members. The companies do not fix the prices but provide a more predictable price indication with 24 hours' notice. The contracts also do not stipulate

fixed trading agreements. The members are free to either sell directly to processing companies or through one of the cluster's shrimp trading enterprises. They are also able to sell their products to other processing companies or traders if they get a higher price. The benefits of selling to the companies through the clusters are three-fold. First, the processing companies pay for the transportation cost of 2,000 VND (US\$0.10) per kg. Second, once a contract is signed the processing companies commit to buying the shrimp at the agreed price even if they have contracted a disease. In the event of a disease outbreak the farmers risk is offset by the cluster. Third, the processing companies also provide financial support from 20 to 30 million VND (US\$1,000 to 1,500) per household if requested.

Farmers who join the cluster also receive a loan at current bank rates and only have to repay the loan after three years. The loan is of considerable benefit because the interest rate is set at the Social Policy Bank of 0.57% per month, which is considerably lower than the commercial credit rate of up to 1.7% per month. Moreover, the farmers who are affected by disease can get financial support from the cluster for the next crop and only have to pay the loan after harvesting with the same interest as the banks. This financial support comes from the cluster's own resources which are funded primarily through a compulsory entrance fee of 200,000 VND (US\$10.00) and a one-off voluntarily contribution of 500,000 VND (US\$25). Additional funds are also generated through a 500,000 VND (US\$25) contribution by those members who get a loan from the bank.

The cluster has also improved vertical coordination with hatcheries and feed mills. The contract with the hatcheries has meant that farmers are able to access consistent volumes of higher quality disease-free post larvae. Contracts with feed companies have reduced the cost of production. The four feed distribution branches of the cluster are able to sign independent contracts with the feed mills. This not only improves the efficiency of purchasing and reduces storage, but if payments are made in cash it also brings a 1.5 % reduction in costs for individual farmers; equivalent to 3,000 VND (US\$0.15) per kilogram of feed or up to 23 million VND (US\$1,150) for the total production cycle. The branches then sell feed to the members but only receive payment after harvesting. This reduction is divided into a branch fee 2,500 VND (US\$0.125), a 400 VND (US\$0.02) subsidy for the farmers and a 100 VND (US\$0.005) contribution to the cluster management fund. In 2010, 67 cluster members bought 1,000 tons of feed from the company through the distribution branches. This led to a three billion VND (US\$150,000) net profit, which was subsequently divided into 2.5 billion VND (US\$125,000) for the branch, 400 million VND (US\$20,000) for the farmers and 100 million VND (US\$5,000) for the cluster management fund.

The government's investment in the three-phase electricity system for the cluster, is seen as the most important infrastructure system to support intensive shrimp farming development (CDARD, 2007). The provincial government provided 3.5 billion VND (US\$175,000) to set up three-phase electricity systems to households in the cluster. The data from household recording shows that for the intensive farms in the areas without three-phase electricity, the cost for petroleum and diesel generator is nearly 15% of total production costs. Meanwhile the electricity costs of intensive farms in the cluster with three-phase electricity system is calculated at 1.7% of total production costs. The cost saving from buying feed through the cluster branches is therefore significant because it offsets the cost of electricity (*see Table 4.2*).

**Table 4.2.** Comparison of costs in intensive shrimp farms in and outside clusters

	In cluster	Outside cluster
<i>Total costs (US\$/ha/crop)</i>	10,024	12,108
<i>Cost proportion of intensive shrimp farms (%):</i>		
Shrimp seed	2.99	2.02
Feed	86.73	77.88
Lime	3.43	4.05
Biological products	5.19	1.39
Petroleum		14.66
Electricity	1.66	
	<i>100</i>	<i>100</i>

*Source: Household recording from October 2008 to October 2009, this study*

Farmers also recognise a range of 'non-price' benefits from joining the cluster that also offset their production risk. The very existence of the cluster has led to greater attention from government extension services who provide guidance on techniques and disease control. However, according to farmers, the relations that have been built with feed, seed and veterinary suppliers have proven even more valuable. Technical staff of these suppliers, also responsible for sales in many cases, have strong personal ties with the cluster members, which allows farmers to phone them directly with technical questions. Members also get cheaper and higher quality post larvae since they can share the costs for screening common diseases such as White Spot virus. Together, the technical input from company staff (especially in relation to disease management), provides the farmers with considerable benefits within a wider network of service providers that has expanded out the initial goal of building a platform for exchanging information.

The increase in the number of members over the past five years shows the success of the cluster in making production more efficient, while also reducing economic and production risk. However, the cluster does not plan to upgrade to a cooperative due to concerns over increasing operational costs. Perhaps more importantly, the members do not want to increase economic exposure that would come as a registered business entity. Within a cluster, members are equal in terms of decision making even though voluntary financial contributions are different. However, if they were to upgrade to a cooperative, production activities would entail more financial interdependence rather than the contribution-without-joint-risk possible under a cluster model.

#### *4.5.2 Tan Long extensive shrimp farmer clusters*

Tan Long hamlet, located in close proximity to Ca Mau city, has been the focus of government and NGO projects promoting shrimp farming cooperatives and clusters since 2006. The village has 247 households practicing both intensive and improved extensive shrimp production. Seventy-four improved extensive shrimp farmers have been involved in three clustering projects. The first was supported by Ca Mau Department of Agriculture and Rural Development (CDARD) through the provincial Aquaculture Extension Centre. The second was initially formed by the Research Institute for Aquaculture No.2 (RIA2), and the third was established under the supports from World Wild Fund for Nature (WWF). Each of these projects provides a comparative case to analyse the challenges and possibilities of the shrimp farmer clusters to upgrade small-holders.

The cluster supported by CDARD has enrolled 36 households with 19 hectares of improved extensive farming systems. CDARD introduced the idea of clustering to the farmers as part of the central governments promotion of the Cooperative Law, as a means of providing a platform for the implementation of Better Management Practice (BMP) standards and enable better bargaining power with processing companies. CDARD has focused on the provision of credit through the Social Policy Bank. The department has also provided technical training for members on production and farm management through the state extension service. The cluster set up its own fund for providing loans to its members if needed. Each month every member contributes VND 50,000 (US\$2.50) to the fund. Households that need further funds can apply for a loan directly from the cluster with an interest of 0.1% per month with a maximum term of four months; the minimum length of a production cycle.

The second group of farmers was established with support of RIA2 as a pilot site for a new shrimp farming system they label 'high-yield improved extensive'. This new system is an attempt at upgrading improved extensive systems by introducing higher



seed quality, increased feeding and having a sediment settling pond. At the start of the program, RIA2 selected 18 households to join the group, all of whom had previously suffered financial losses from disease or low productivity. The formation of this cluster was funded and subsequently researched by RIA2, but is essentially implemented by CDARD; indeed these farmers receive the same access to credit provision as the first cluster. RIA2 provides all the related cost such as technical staff who stay in the field, equipment for water condition checking, high quality fingerling and half of the pond preparation costs. If the farmers make a profit after harvest, they are expected to pay back all these cost to RIA2. If they are not successful repayments are waived. The technical focus of the project meant that less effort was invested in a coherent horizontal cluster management structure or improved vertical market relations.

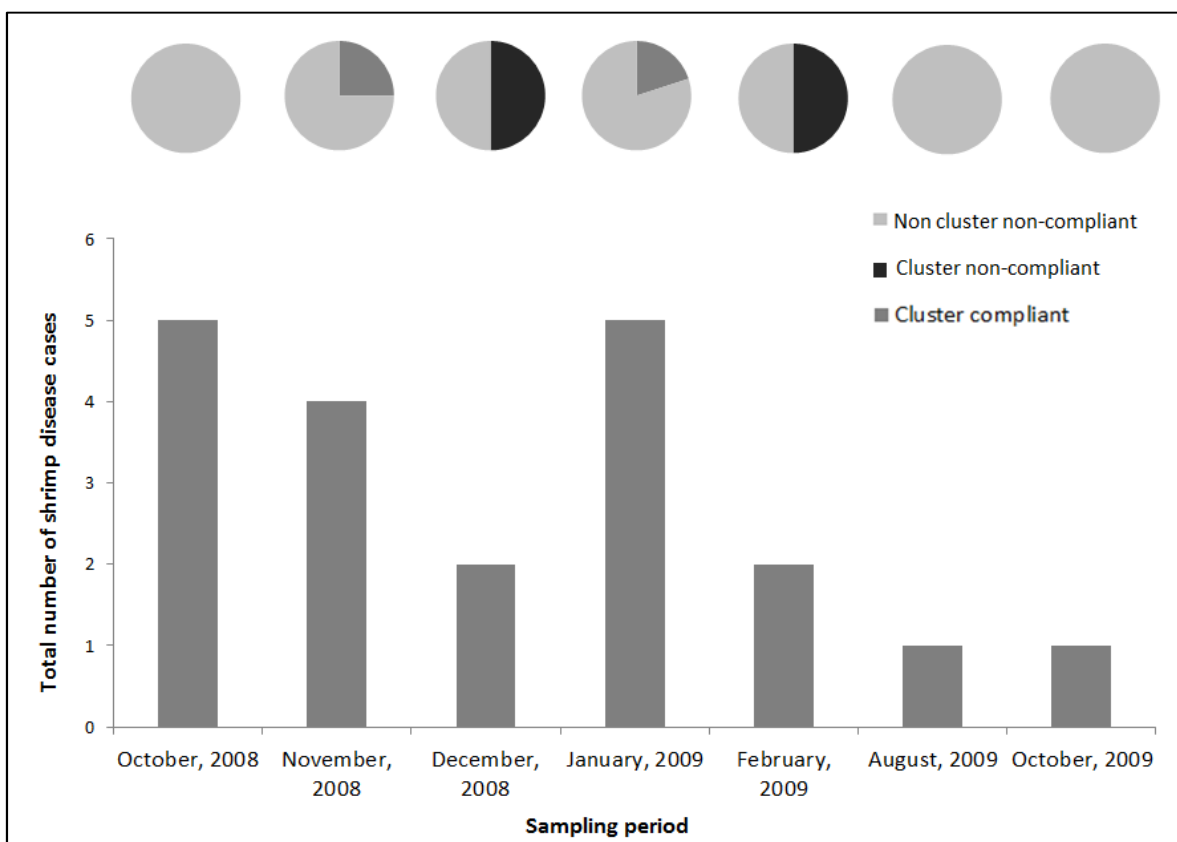
The third cluster in Tan Long involves 20 farmers selected under the framework of the small-scale shrimp farming project, funded by WWF between 2008 and 2010, to improve the effectiveness of production management and bargaining power of small-holders. The long-term goal of the cluster is to apply production standards, starting with BMPs and moving towards the more demanding (and yet to be published) Aquaculture Stewardship Council (ASC) shrimp standards. Although BMPs are not recognised in the market, and therefore provide little economic incentive (Ha and Bush, 2010), the long-term assumption is that ASC certification will eventually bring a premium price for shrimp in export markets. Like the other two clusters in Tan Long, WWF collaborated with CDARD in organizing the cluster and provided training to the farmers through the provincial Aquaculture Extension Centre. A distinguishing investment in the WWF cluster is the provision of technical equipment for households to test water quality and a small budget for the cluster to have meetings every month, enabling farmers to exchange experiences on a regular basis.

The formation of the three clusters in Tan Long is very much externally led, with varying goals set out by the funding parties; CDARD, RIA2 and WWF. In contrast to Nhi Nguyet, where the motivation for clustering emerged from the farmers themselves, the farmers in Tan Long are more passive in their participation, and there is therefore a lower likelihood of continuation after the end of the external intervention. Farmers indicated a number of major reasons for their passive involvement and scepticism for the clustering activities in all three projects.

Farmers indicated that the technical support provided by the project staff do not meet the challenges of improved extensive farming systems. Issues of disease and water quality are the main concerns of the farmers, but these have been largely overlooked in favour of technical support aimed at intensifying production. This was most notable in



the RIA2 project where the 'high-yield improved extensive' system that was promoted by the technical staff requires investment in higher stocking densities and feed; measures which increase productivity but do not directly reduce the risk of disease.<sup>10</sup> Farmers in the WWF and CDARD clusters also indicated that while the production upgrading activities introduced may improve production they do not necessarily reduce the production risk associated with disease that the farmers had experienced in previous years. The only activity that farmers acknowledge contributed to lowering production risk was the access the cluster was given to testing facilities for white spot syndrome in seed. However, how sustainable this service is beyond the implementation of the three projects remains unclear.



**Figure 4.3.** Farmer's compliance the disease control regulations in 2008-2009

All three clusters were successful in providing a platform through which the provincial government could set and enforce coordinated pond preparation, water exchange and stocking. All three activities are regulated at the provincial level in an attempt to reduce the probability of disease outbreaks, and also contain contamination

<sup>10</sup> High-yield improved extensive systems are characterised as a more closed system than improved extensive systems, with water exchanged only a few times over the grow out period. Densities are also higher between 2-3/m<sup>2</sup> to 8-10/m<sup>2</sup>). Feeding occurs at a rate of 0.6kg per day for the first month, and then 3kg per day for the second month for a 0.5 ha pond.

should it occur. The difficulty in improved extensive systems is often the geographically scattered distribution of ponds. The farmers and government alike were very positive about the greater coordination the clusters enabled for dredging and disposing of sediment, recognising the importance of water quality in the growth performance and reduced mortality of shrimp. The cluster also enables farmers to more easily inform authorities about disease outbreaks and therefore minimize discharge of contaminated water directly to the channel before treatment. The information from household recording shows that farmers in clusters follow the regulation on disease control much better than farmers not in a cluster (see *Figure 4.3*).

All three cluster projects, however, placed minimal emphasis on vertical value chain relations. As such, farmers do not identify cluster formation with improved economic benefit. Interviews with traders and processing companies indicated that there are clear disadvantages of improved extensive production over intensive production in term of economies of scale, making it unattractive for processing companies to invest in contracts. Although improved extensive farms are all harvested within 14 days, production remains highly fragmented due to the low level of harvest per night at several kilogram per night. As illustrated in *Figure 4.2*, the role of collectors remains important in these systems, as they take on the risk of high transaction costs associated with geographically dispersed collection. If the government or WWF were to try to promote improved vertical contractualisation, they would have to address directly how the cluster could either engage and cooperate with the collectors, or adequately fulfil this value chain function directly.

The three cases illustrate some of the dilemmas of using clusters for upgrading improved extensive shrimp farming systems. The government, RIA2 and WWF all aimed to establish a cluster to overcome the poor economies of scale of these farmers and also provide technical input to upgrading. However, the results indicate that while some benefits of horizontal contractualisation are apparent, cluster formation alone is unlikely to enable improved vertical coordination and significant changes in functions beyond production as seen in the case of Nhi Nguyet intensive cluster.

## **4.6 A cluster panacea? A discussion**

### *4.6.1 Upgrading intensive vs. extensive production systems*

*Table 4.3* summarises the main characteristics of intensive and improved extensive farmer clusters, showing the factors behind the success and failure of upgrading small-holders through collective action.

**Table 4.3.** Summarising characteristics of two farmer cluster cases in Ca Mau

<b>Characteristics</b>	<b>Intensive cluster</b>	<b>Improved extensive clusters</b>
<i>Farming system characteristics</i>	<ul style="list-style-type: none"> <li>▪ High level of capital investment, inputs and techniques used.</li> <li>▪ High and geographically concentrated productivity.</li> <li>▪ High level of risk in terms of disease and finance.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Low level of capital investment, inputs and techniques used.</li> <li>▪ Low and geographically fragmented productivity.</li> <li>▪ Low(er) level of risk in terms of disease and finance.</li> </ul>
<i>Trigger for the formation</i>	<ul style="list-style-type: none"> <li>▪ A group of nine farmers with initial objectives of sharing experiences and new techniques; government support for three-phase electricity system.</li> </ul>	<ul style="list-style-type: none"> <li>▪ External-led formation of the clusters by the government, NGO and research institute with different objectives of these organisations.</li> </ul>
<i>Role of key actor involved</i>	<ul style="list-style-type: none"> <li>▪ Local elite facilitating contracts with input providers and processing companies.</li> </ul>	<ul style="list-style-type: none"> <li>▪ External-led organisations providing direct financial and extension support.</li> </ul>
<i>Key management tasks</i>	<ul style="list-style-type: none"> <li>▪ Financial fund from multiple income streams.</li> <li>▪ Establishment of two enterprises and four supply branches within the cluster.</li> <li>▪ Signing contract with major input providers and sale contract with four processing companies.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Financial fund from member fees</li> <li>▪ Activities of these clusters depend on supports from external-led organisations.</li> <li>▪ Selling contract with processing companies is problematic.</li> </ul>
<i>Cost of membership</i>	<ul style="list-style-type: none"> <li>▪ Entrance fee and one-of voluntary contribution of VND 700,000 upon joining.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Member's fee of VND50,000 per month (VND600,000 per year).</li> </ul>
<i>Benefits to members</i>	<ul style="list-style-type: none"> <li>▪ Credit and bulk prices from input providers.</li> <li>▪ Reduced cost from three-phase electricity system.</li> <li>▪ Disease-free post-larvae with competitive price.</li> <li>▪ Technical support from private extension services.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Equipment and technical support from state extension services and NGOs.</li> <li>▪ Disease-free fingerlings with low price.</li> <li>▪ Information exchange.</li> </ul>

The case of the Nhi Nguyet intensive shrimp farmer cluster demonstrates a number of benefits from horizontal coordination. The initial benefit of the cluster was as a platform for sharing technical information as a means of avoiding production risk associated with market and price. However, farmers quickly realised that so called 'new style' clusters transcend old cooperative production models. Members remain independent, but are able to benefit from belonging to an innovative group, which developed and disseminated new technical practices, while at the same time maintaining a strong market orientation. Working in this mode, the cluster was able to develop a strong organisation, which in turn facilitated a requisite level of trust. As a direct result the cluster was able to develop both up and downstream contracts with processing companies and input providers. The Nhi Nguyet cluster therefore demonstrates the possibility of horizontal contractualisation among farmers leading to both upstream and downstream forms of vertical contractualisation and thus changing functions of shrimp farmers such as input provision and marketing activities.

In contrast, the various attempts at developing improved extensive clusters in Tan Long were not able to promote vertical contractualisation with other actors along the chain and thus did not support changing functions of small-holder producers. The clusters have also not reduced the risk associated with fluctuating prices. The chain therefore remains under the control of processing companies and, reflecting the findings of Bush and Oosterveer (2007), the strategy of shrimp collectors to work with individual farmers enables them to maintain a large degree of control over the flow of market and technical information. The vertical strategy of contract farming is seen as the solution for small-scale shrimp farmers in improving market performance (Barham and Chitemi, 2009; Markelova et al., 2009) but does not seem appropriate in the case of improved extensive shrimp farmer organisations given their geographically fragmented production. While intensive farmers get direct economic benefits from clustering, the improved extensive shrimp farmers experienced these benefits indirectly through, for example, the improved quality of larvae, which in turn reduces their vulnerability to disease outbreaks.

The intensive shrimp farmers appear to be overall more able to benefit from cluster formation because they are building on a higher existing level of experience, knowledge and financial capacity than the improved extensive farmers. The greater homogeneity amongst intensive farmers also appears to reduce the conflicts between self and mutual interests (cf. Glover, 1987). This is in contrast to the more diverse improved extensive farmers. Traders and processing companies are also more willing to establish contracts with these intensive farmers because of their larger and more reliable harvests, and also because of the relatively easier access to ponds (see Miyata et

al., 2009). Together these advantages for intensive shrimp farmers strengthen the role of cooperative forms of production, and therefore the motivation to form farmer clusters. The results support wider claims that despite producers seeing the benefits of horizontal forms of coordination, co-operative production models can lead to closer (contractual) ties to processing companies and access to input and credit. However, as outlined elsewhere (e.g. Khiem et al., 2010; Lem et al., 2004), this is more likely to be the case for intensive farmers that are already well organised, geographically concentrated and able to maintain some level of bargaining power by providing a higher quantity of shrimp at harvest.

#### *4.6.2 Improving quality management*

Both cases demonstrate that focusing solely on increasing production efficiency is no longer enough to enable farmers to upgrade their position in the global value chain. Producers recognise the need to demonstrate the quality and safety of their products and farming practices, but also need to take into account environment and social issues related to production (Phillips et al., 2007). Intensive and improved extensive production systems differ considerably, but both are fundamentally reliant on good water and seed quality to reduce the risk of disease and therefore determine productivity of shrimp and the sustainability of the sector. These pressures on small-holders gives further impetus to determining how cooperative forms might assist them to comply with production-oriented quality standards, which may also improve market performance.

The results show that investment in horizontal contractualisation is successful for intensive producers because of greater gains in disease management and because quality management creates commercial efficiencies that are rewarded by processing companies. The case of improved extensive shrimp farmer clusters in Tan Long, however, demonstrates there are possibilities for small-holder farmers to change their position along the value chain by coordinating the implementation of BMPs (Kassam et al., 2011; Umesh, 2007). Although the clusters cannot currently set up meaningful forms of vertical coordination, they are able to improve product quality, which may over the long term increase their bargaining power and thus allow them to upgrade their position in the chain. Promoting the group performance of implementing BMPs therefore remains a challenge.

However, as reflected by Anh et al. (2011), the difficulties in implementing quality management through clusters reflects the need for added incentives to stimulate both on-farm measures that collectively will have an impact on water quality. Moreover, one of the main factors preventing farmers to adopt these standards is the absence of

contracts with the processing companies (Loc et al. 2010). The benefits of horizontal coordination for improved extensive farmers therefore is less clear, because on-farm improvements do not lead to clear commercial efficiencies and are not rewarded in market relations with processing companies. The role of external support from the government, NGOs and private actors therefore appears necessary for improved extensive shrimp farmer clusters to be established.

#### *4.6.3 External support – the role of government, NGOs and the private sector*

The two cases also show that different types of farmer clusters require different forms of support from external organisations, be they government departments, NGOs or the private sector. More specifically the results indicate that the success of externally-led cluster development is dependent on the characteristics of the production system, the motivation of producers, and prevailing market relations. The influence external actors can have over promoting shrimp cluster formation therefore depends on the extent to which these three factors are taken into consideration.

The intensive shrimp farmer cluster in Nhi Nguyet clearly demonstrates the influence the government both indirectly, through the species diversification policy, and directly, through investments in infrastructure. The combined effect of white leg shrimp production and three-phase electricity were fundamental in allowing cluster members to maintain a high economic return compared to farmers outside the cluster. However, external government support would not have been effective if the farmers in Nhi Nguyet had not already established a shared learning platform on which the cluster could be built. As outlined above, the need for higher quality production, to reduce the risk of disease, provided the impetus for cooperative production. Based on the initial endogenous motivation for clustering the government was able to better support the group of farmers. Furthermore, although private sector support did not extend to the creation of contracts, they were more willing to engage with these farmers on the basis of an existing organisational structure.

All three of the improved extensive clusters in Tan Long have been established by external parties. In contrast to Nhi Nguyet, the direct financial and technical support by both the provincial government, RIA2 and WWF have not led to viable cluster formation beyond the life of the three projects. Because these clusters have been so closely related to the promotion and implementation of BMPs, these findings support wider observations that farmers are unlikely to comply with external production standards if they do not see the benefit of compliance; either in terms of lower production risk or in terms of incentives for self-regulation in the market. As seen elsewhere in Asian shrimp aquaculture, the role of external intervention remains important in providing technical support for farmer cluster in order to build their capacity for improving production and

complying with international production standards (Mohan and De Silva, 2010). However, without clear financial benefits for doing so, the Vietnamese government's aspirations for creating market oriented new style cooperatives, and WWF's hopes of enabling small-holder involvement in ASC may remain problematic.

The role of external support to new style cooperative or cluster formation in Vietnam therefore needs rethinking. The two case studies also demonstrate that when they see a clear economic benefit small-holder shrimp farmers proactively engage in cooperative forms of production. However, it is more likely in intensive systems where production risks are higher and market linkages more direct. Reflecting the findings of Belton et al. (2011), access to cooperative groups also appears to be strongly influenced by existing social relations of a group of farmers with political and commercial interests. For groups with lower production risks and poor social relations, external support might be more effective if BMPs are recognised by market actors. This would ensure that government support for public certification would give higher incentive for changing production practices (Jia et al., 2010). As observed elsewhere (Chirwa et al., 2005; Hellin et al., 2009; Key and Runsten, 1999), government and NGOs might be more effective in supporting new style cooperatives if producer clusters are given greater legal recognition, so that contract terms can be enforced. This would facilitate the flow of market information and, as illustrated by the case of Nhi Nguyet, allow for investment in key infrastructure.

#### **4.7 Conclusions**

Faced with the rising pressure of complying quality standards cluster formation appears to be an important activity to support small-holders to upgrade their production and position in global value chains. The new style cooperatives and clusters in Vietnam are expected to combine both relational and functional dimensions of upgrading small-holder shrimp farmers. By stimulating a form of horizontal contractualisation they aim to improve the capacity of small-holders for complying with international and national production standards, which in turn improves vertical access to processing companies that control access to international markets. Clusters therefore bring opportunities for small-holders farmers to upgrade production, but not necessarily move them 'up' the chain or to a higher level of efficiency. In line with Bolwig et al (2010) and Ponte and Ewert (2009), our results show that upgrading through cluster formation instead gives meaning to collective action that in turn provides opportunities to increase rewards and reduce exposure to production risks. In this context compliance with quality standards, that increase the need for shared learning and 'better' practices that lead to often indirect benefits, may provide a new pretext for farmers to collaborate.



The relabeling of 'new-style cooperatives', in the context of an export oriented economy, raises questions about the form and function of clusters and the circumstances under which small-holders can participate. The results show that while clustering is seen as a lower entry form of collective action than more formal cooperatives, they are more suited to intensive rather than improved extensive farmers. The key reasons for this are that intensive farmers are more geographically concentrated, have a higher existing level of knowledge and technical capacity, and have shorter and higher volume harvesting periods. As a result intensive farmers are better able to establish favourable terms in vertical contractualisation with up and downstream chain actors. Improved extensive shrimp farmers on the other hand are less well organised socially, commercially and geographically, making it difficult for them to negotiate improved terms of access to markets and technical support. Underlying the inability of improved extensive farmers is also their weak capacity for capitalising on wider social and political networks. Ironically these factors mean that although improved extensive farmers have the most to gain from new style cooperatives they are least able to develop the capacity for successful cooperation. The results therefore demonstrate a gap between intensive and improved extensive producers in their ability to upgrade based on both relational and functional dimensions of horizontal coordination.

Together these results indicate that cooperative production in aquaculture does not *per se* create benefits for small-holders. Producer cooperatives and clusters are therefore not a 'panacea' for solving the challenges faced by small-increasingly promoted by government and international organisations alike. Furthermore, there appears to be a paradox of external support in establishing cooperation; the more external support that is needed the less successful the clusters appear to be. Although in line with the literature on collective action, this also raises a series of challenges for the Vietnamese government, which is promoting ever greater integration of small-holder aquaculture farmers in international markets, while not providing adequate support for them to deal with the ever greater demands of market access. The government can therefore play a more direct role in facilitating farmer cooperatives and clusters by providing infrastructure and creating a legal framework for contractualisation between farmers and the private sector. Achieving these goals may then enable the formation of cooperative forms of aquaculture production that better meet the needs of a wider group of small-holders trying to maintain and improve their position in global markets.



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# **Forest management in integrated shrimp-mangrove areas**

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## **Abstract**

Large parts of the world's remaining mangrove forest are lost due to the expansion of shrimp farming in coastal areas. Current forest allocation and subcontracting policies of the Vietnamese government with respect to the devolution of forest management and participation of local people in sustainable forest management reflect both environmental and economic concerns. The paper aims at investigating how the devolution of rights over forestland and benefit sharing mechanisms are related to actual rights and the distribution of benefits of forest management practices. The findings show that farmer's decision-making over mangroves is very much influenced by shrimp farming since the income from mangroves is very low compared to that from shrimp. Farmer's decision making over forest is very much influenced by the way in which the benefit sharing policy is implemented by the state-owned forestry companies and management boards. However, their attitudes towards mangrove plantation and protection are far from negative. The study supports the claim that shrimp farmers may well be able to plant, protect and manage mangroves if they have more rights and responsibilities over forests and are able to benefit more from the production of mangroves. In this way more sustainable management of mangrove forests may be promoted.

**Key words:** *forest allocation, mangroves, shrimp farming, benefit sharing, Mekong Delta*

## Chapter 5

### FOREST MANAGEMENT IN INTEGRATED SHRIMP- MANGROVE AREAS

#### 5.1 Introduction

Mangrove forest is one of the primary features of the coastlines throughout the tropics of the world and its substantial areas are found in Bangladesh, Indonesia, Malaysia, Philippines, Thailand and Vietnam (Islam and Wahab, 2005). However, more than 50% of the world's mangroves have been lost and shrimp culture is responsible for 52% of the losses of mangrove forests (Valiela et al., 2001). Shrimp farming started in the Southeast Asia since 1970 and the region has continued to dominate world shrimp aquaculture production (Sá de Abreu et al., 2011) with the hope that shrimp aquaculture will relieve pressure on fishing resources and may cover demand for fish products for a growing human population (Rönnbäck et al., 2002). The consequence of this development in the region is that the establishment of brackish water ponds for shrimp farming has been a major cause of about 50% to 80% losses of mangrove forests (Wolanski et al., 2000). Most of the shrimp farms in Southeast Asia, including Vietnam, Thailand and the Philippines are positioned in mangroves forests and wetlands (Béland et al., 2006; Binh et al., 1997; Flaherty and Karnjanakesorn, 1995; Primavera, 1995). Paradoxically, while shrimp farming is the main reason for mangrove clearance, the productivity and sustainability of shrimp aquaculture is directly dependent on the support of mangrove goods and environmental services (Beveridge et al., 1997; Rönnbäck, 1999). Moreover, one of the major constraints to develop policy and management of mangroves in the region is the lack of relevant information on the value that stakeholders ascribe to such ecosystems and the absence of a balanced assessment of ecological functioning, local people livelihoods and multiple uses (Alongi, 2002). A better understanding of the relation between mangrove conservation and shrimp farming as one of the main livelihood sources for millions of shrimp farmer households in coastal areas is vital for the successful development of aquaculture in Southeast Asia.

In Vietnam, the decline of mangroves over the past decades has been associated with the development of aquaculture especially shrimp farming which has led to deforestation and ecological degradation (Sam et al., 2005). This can be explained by the demand on the global market for shrimp in a situation where government policy and legislation was not able to respond adequately to protect the mangrove forest and regulate the growth of the sector (Armitage and Johnson, 2006). From a managerial point of view, the decline and degradation of mangroves is defined as a result of unsuitable technical, financial and management policies for the planting and the

protection of mangroves (MARD, 2008). As a consequence, farmers and the private sector lacked adequate incentive structures to participate in mangrove protection. Mangroves like other types of forests in Vietnam are under state legislation designed to prevent or reduce harm created by aquaculture. However, as seen elsewhere the regulatory approach is fraught because of the lack of will and ability to enforce legislation. Economic incentives may be more effective than regulatory approaches in inducing behavioral changes (Primavera, 2006). The main issue is how to design policies that promote maintaining mangroves in terms of quality and quantity and improve livelihoods of shrimp farmers at the same time.

Using the case of integrated shrimp mangrove farming system in Ca Mau province, the Mekong Delta the paper aims at investigating how changes in legal rights associated with the devolution of forest management, are related to actual rights and the distribution of benefits out of forest management practices and influence shrimp farmers' decisions with respect to the management of mangroves. It will provide an understanding of the issues around mangrove management and policy implementation in a situation where mangrove production and conservation is integrated with shrimp farming. In doing so, we will challenge the assumption that mangrove forests cannot compete with more competitive land uses like shrimp farming. These understandings are valuable for policy makers and managers in reconsidering the effects of shrimp farming and the role of shrimp farmers in planting and protecting mangroves in coastal areas.

The paper is organised into six sections. The following section briefly reviews literature related to the issues of devolution of forest management, benefit sharing and participation of local people in forest management. Section three provides information on the study sites and methods used in collecting data. Section four presents background information on forest allocation and benefit sharing policies in Vietnam. Section five highlights the results and findings of the research in Ca Mau province and two communes as the study sites. Section six discusses the ability of increasing income from mangroves for shrimp farmers and gives some conclusions and policy recommendations.

## **5.2 Devolution of forest management and benefit sharing - implications for mangroves**

Previously, conventional forestry saw centralised forest management by the state as the recommended strategy for forest conservation and protection while local people were regarded as the main threats to resources like forests (Weeks and Packard, 1997). Since the 1990s, the devolution of forest management to resource users has become a major policy trend in developing countries (Rosyadi et al., 2005). Responsibility and



authority over forest resources are transferred from the state to local people as a response to the failure of centralised bureaucracies to incorporate the needs of forest dependent people (Coulibaly-Lingani et al., 2011). The policy of forest devolution aims to address institutional problems, which have been identified as the major reason behind deforestation and forest degradation in developing countries (Ligon and Narain, 1999). These institutional problems include state ownership and centralized management of forest resources, corruption of staff in the forestry sector, a lack in effective monitoring and enforcement of legislation and policies, and a lack of incentives for local people to conserve and sustainably manage forest resources (Wibowo and Byron, 1999). A number of studies on local forest management emphasises the potential of local people's involvement in improving forest management (Sikor, 2001), and have stressed that the participation of resource users is very much influenced by the property rights they have over forest and land (Coulibaly-Lingani et al., 2011).

Devolution of forest management aims to increase the actual power of local people and their ability to benefit from forests by way of legal acts (Edmunds et al., 2003) and institutional changes (Thanh and Sikor, 2006). Following Thanh and Sikor (2006), we define institutional change as a process of negotiation between differently positioned actors in which they hold unequal bargaining powers because of differences in resources, skills and previous experiences with the state, including its various entities, as the most powerful actor. Based on this, three complementary issues, relevant for investigating the (possible) effects of these institutional changes, emerge: (1) the bargaining power of the farmers involved in forest devolution; (2) the extent to which they consider tree and forest management as part of their agriculture practices; and (3) the ways in which they may potentially benefit from changes in policies and the institutional frameworks in place.

Bargaining power is closely related to the benefits different actors are able to get from forest management. Within the context of devolution of forest management, it is useful to make a distinction between endowments and entitlements. According to Leach *et al.* (1999) endowments are regarded as rights on resources like land or forest for example that social actors have while entitlement refers to specific sets of benefits they can actually get from the resources. Forest endowments do not automatically lead to entitlements and local people need not only endowments but also access (the ability) to derive benefits (Ribot and Peluso, 2003) from forest devolution. As Tan (2006) argues "to make people benefit from forest devolution, the state policy should not only focus on how people get rights to devolved forest but also on how people derive true economic benefits from it" (p. 418). Moreover, when devolution of forest management is likely to generate benefits for local people then it is more important to see how the benefits are

distributed, especially in the context of multiple actors involved. One of the mechanisms that devolution of forest management can provide in addressing problems in the forestry sector is the creation of incentives through the fair and democratic distribution of benefits (Rosyadi et al., 2005). It then follows that participation of local people in any of forest activities is determined by the benefits they obtain from forest (Coulibaly-Lingani et al., 2011; Sikor, 2001).

Silvo-fisheries, a form of land use that integrates low-input brackish water aquaculture with mangrove tree culture, is practiced across Southeast Asia; with mangroves either within or outside the pond system at specific pond-mangrove area ratios (Bush et al., 2010). These 'ecologically integrated' mangrove-friendly aquaculture technologies are amenable to small-scale, family-based operations and can be adopted in mangrove conservation (Primavera, 2006). From the livelihood point of view, the systems in Vietnam are also accessible to poorer members of coastal communities who have only limited access to finance and are largely dependent on open-access resources (Luttrell, 2006). These systems may therefore have the potential to support coastal ecosystem conservation while maintaining high-income potential shrimp aquaculture for coastal communities (Binh et al., 1997). Moreover, in mangrove areas shrimp farming is a very competitive system compared to mangrove production, in which income from shrimp is much higher than from forests. Recognising integrated shrimp mangrove farming as a complex socio-ecological system (Bush et al., 2010), state regulation and market incentives need to be complementary to succeed in their common goal of maintaining adequate forest cover.

Forest allocation to households for long-term use has been implemented in Vietnam over the past 17 years within the framework of policies to devolve rights over forests and forest land to farmers, known as the devolution of forest management process. The policies are regarded as an important strategy to encourage local people to participate in forest planting and protection. They have been implemented in all the regions of Vietnam from upland to lowland forest areas. In accordance with forest allocation policies, a national benefit sharing policy in forest protection and development became operational. This policy is based on three principles aiming at ensuring harmony between: the state and the forest users' interests; economic benefits and the ecological functions of forests; and between short-term and long-term benefits to make sure that forest users can live on forestry (Tan et al., 2008). Forest and forestland allocation to households has been assessed as successful in terms of promoting afforestation and creating economic returns to local people in the Northern upland of Vietnam (Thanh et al., 2010). Implementation of forest allocation, however, has been much slower in the Mekong Delta than other regions of Vietnam. The main

reason is because of the concerns that the government has about farmers cutting down all mangroves to increase shrimp production. State policy on the devolution of mangrove forest in Vietnam therefore faces the challenge of maintaining tree cover as an important ecological function, as well as supporting local livelihoods through the implementation of a fair benefit sharing policy.

### 5.3 Study sites and methods

This study was conducted in Ca Mau province located on the southern tip of the Mekong Delta, Vietnam. The province currently has the largest area and output of shrimp cultivation with 265,153 ha equivalent to 43% of the total shrimp farming areas of Vietnam, producing 99,600 tonnes or 25% of the country's total production (Vietnam Aquaculture Department, 2009; GSO Vietnam, 2010). The province is also the host of the largest remaining mangrove forests in Vietnam, mainly located in the two eastern coastal districts of Nam Can and Ngoc Hien. However, mangrove cover has declined over the last three decades largely as a direct result of the extension of shrimp farming (Buu and Phuong, 2000). In Minh Hai province (later on split to Ca Mau and Bac Lieu provinces) 66,253 ha of mangroves was converted into shrimp ponds between 1980 and 1995. This led to a 2,434 % increase of the shrimp farming area from 3,000 ha to 76,036 ha over the same time (Buu and Phuong, 2000). Shrimp farming is therefore widely recognised as the main factor leading to the reduction of both the quantity and quality of mangrove forest in the region.

Being the province with the largest areas of mangroves, the integrated shrimp-mangrove farming system is typical for Ca Mau. The system is characterised by artificially stocked black tiger shrimp (*Penaeus monodon*) with no additional feeding located within mangrove forests. Shrimp ponds and mangroves are integrated with a mangrove ratio ranging from 30-70% depending on the size of total cultivated land. This kind of integrated shrimp mangrove farming model can only be found in Nam Can and Ngoc Hien districts where mangroves still exist and grow well, while in other districts of Ca Mau province, a similar shrimp farming system called improved extensive is practiced by farmers but in non-mangrove areas.

The fieldwork was conducted from November 2007 to February 2011 in Ngoc Hien and Nam Can districts, Ca Mau province. Secondary data was first collected on the area of mangrove forest allocated and contracted to stakeholders from the government agencies at provincial and district levels. Based on this data further empirical information was collected in two communes on benefit sharing and farmer's decision making over shrimp and mangrove production. The first commune is Tam Giang located in Nam Can district, where mangroves are classified as production forest systems and are managed by the Ngoc Hien Forestry Company. The second commune is Tan An in

Ngoc Hien district where mangroves are classified as protection forest and under the management of the Kien Vang Protection Forest Management Board. A number of 48 semi-structured interviews was conducted with key informants such as shrimp farmers and other stakeholders from communal to provincial levels.

In these two communes, 32 households were randomly selected in February 2011 to fill in the questionnaires in order to collect quantitative data on income from forest and farmer's perception and decision making with respect to mangroves. We first listed households who cut forest from 2006 to 2010 in the study sites and then randomly selected for filling to the questionnaires. Of the 32 households interviewed with questionnaires, 18 have production forest subcontracts with Ngoc Hien Forestry Company, while the others have protection forest subcontracts with the Kien Vang Protection Forest Management Board. *Table 5.1* provides a description of the sampled households according to percentage forest cover on their land. Although the total cultivated area ranged from less than three ha to more than five ha, the shrimp pond areas are not significantly different between households, with an average of two ha of shrimp pond per household.

**Table 5.1.** Description of sampled households according to percentage forest cover

Household (HH) descriptors	Total	Forest cover ratio				
		30%	40%	50%	60%	70%
Number of HHs interviewed	32	3	3	19	6	1
Percentage of HHs (%)	100	9	9	60	19	3
Average of cultivated land (ha)	127.9	2.83	3.63	3.76	5.16	6
Average of forested areas (ha)	65.15	0.85	1.45	1.89	3.07	4
Average of shrimp farming areas (ha)	62.75	1.98	2.18	1.87	2.09	2

*Source: Household questionnaires in 2011, this study*

The research also used monthly household recording taken by 20 shrimp farmer households in three communes consist of Tam Giang and Tan An from October 2008 to October 2009. These monthly household recordings mainly provided information on shrimp farming practices in both integrated shrimp-mangrove and monoculture shrimp farming systems. Income from shrimp was calculated from the monthly household recording for one year. This was considered as a suitable basis to compare income from shrimp with income from mangroves collected from the questionnaires mentioned above.

Two methods were used to analyse the data for qualitative and quantitative information. First, the Statistical Packages for Social Science (SPSS) was used for

analysing the data from monthly household recording and questionnaires to get descriptive statistics and to test whether there were significant differences between the productivity of shrimp farming in the monoculture improved extensive and the integrated shrimp-mangrove systems. The results of these analyses provide quantitative data to support our arguments. Second, content analytical methods were used to analyse qualitative information from secondary data sources and semi-structured interviews. This information was categorized into themes tailored to the research objectives.

#### **5.4 National forest allocation and benefit sharing policy in Vietnam**

The causes of deforestation and forest degradation in Vietnam in the second half of the last century resulted from poor management capacity of the sector and a deficient institutional and legal framework (De Jong et al., 2006). From the early 1960s until the 1990s, forest and forestland in Vietnam were national property and put under the management of a system of state-owned forest enterprises (which later on became state-owned forestry companies). Nevertheless, millions of people remained dependent on forest products for their livelihoods (Thanh et al., 2010). State ownership of forest resources led to *de jure* state property but *de facto* open-access (Bien, 2001). As argued by Thanh et al (2010), local people's interest and insights were not taken into account in forest management and the policy framework led to conflicts between local resource users and state forest organizations such as state-owned forestry companies and forest rangers.

Devolution of forest management started in the early 1990s when the 1993 Land Law and Decree 02/CP in 1994, mandated that management be handed over from state-owned forest enterprises (SFEs) at the central and provincial levels to households, villages and communes for sustainable and long-term use (De Jong et al., 2006; Sikor, 2001). Today forests in Vietnam are classified into special use forests, protection forests and production forests; each with a different forest management policy. Special use and protection forests are under the control of state management boards responsible for forest protection and conservation. Production forests are managed by SFEs (now called forestry company) who exploit them on a commercial basis, and are legislatively responsible for the socio-economic development activities in and around the forests. These state organisations are actually allocated the forests from the government. Production and less-restricted protection forest can also be allocated to households and individuals for long-term use. When forest is allocated to households, they receive a 'red book' forestland use title for up to 50 years, with a bundle of rights consisting of rights of use, transfer, lease, inheritance and mortgage. Leasing forest is also possible under Decree 163/1999/ND-CP but this has been very slowly implemented because of low economic returns from forestry. These allocation conditions apply both to households

and to forestry companies, which were allocated forest or given forestry contracts since in Vietnam there is no private ownership for land and forestland.

Continuing a policy of decentralised forest management, Decree 01/CP allowed state-owned enterprises and management boards to establish contracts with households to plant and to protect forest for up to 20 years, or one production cycle. These contracts provide households with a so-called 'green book' forestland use title, grants the household the same rights as red book title, with a different set of conditions with respect to time of the harvest and benefit sharing mechanism applied by state forestry companies and management boards. The rights and conditions that these 'green book' holders get, directly affect the benefits they receive from forest conservation and use.

Despite being successfully implemented across the country, concerns emerged over the management effectiveness and equitability of the red and green book contracts. In response, the government released a national benefit sharing policy in forest protection and development under Decision 178/2001/QD-TTg. Under this policy, the responsibilities of households for management as well as their right to economic benefits in allocated, leased and contracted forests and forestland arrangements were set out. For production forest allocated to households by the state, benefits include state funding for investment; permission for intercropping; the rights to collect non-timber forest products and timber for housing; and entitlement to a share of the value of timber products after tax. The specific share in the benefits from timber products varies from 75% to 100% depending on the source of investment in the case of plantation or, in the case of natural forest, the state of the forest at the time of allocation.

More specific rights and responsibilities are also set out for households who sign contracts with forestry companies and management boards in mangrove areas. These include the provision of investment funds from the government for planting and protection, the limitation of not using more than 30% of land for aquaculture, an allowance to cut no more than 20% of the forested area and, most relevant to benefit sharing, entitlement to 80-90% of income after tax for households that receive financial support from the government and 100% for those who invested without support (Article Nr. 17, Decision 178/2001/QD-TTg). The national policy on benefit sharing provides guidelines for decentralized legislation and implementation by provincial governments.

In 2007, nearly 80% of the 12.9 million ha of forest in the country was allocated to forestry companies, protection forest management boards and households. Protection forest management boards currently hold 40% of forests, while forestry companies and households hold 23% and 28% of the total allocated forestland respectively (Vietnam



Forest Protection Department, 2008). The Northern upland area is the leading region in terms of allocation of forest and forestland to households. Out of a total of 4.8 million ha of forest in 16 northern upland provinces, more than 3.5 million ha have been allocated, of which 54% are allocated to households, while 29% was allocated to forest companies and management boards. In the Mekong Delta, only 27% of the forest is allocated to households, while about 49% and 20% are allocated to the management boards and forestry companies respectively.

On average one forestry company manages an average of 13,502 ha of forest and forestland (Vietnam Forest Protection Department, 2008). Since Vietnam shifted to a market-oriented economy, the state stopped allocating funds to forestry companies, including financial support for afforestation efforts. Instead, the state now extends credit to forestry companies to enable self-financing of their activities. De Jong et al. (2006) demonstrated that many forestry companies have failed to adapt to this new economic mechanism and are only able to survive by participating in the nationwide forest rehabilitation programmes such as the Five Million Hectares Forest Programme. The majority of forestry companies have failed to manage the natural forest under their control in a sustainable manner because of, among other reasons, excessive logging. They are, therefore, an important contributor to the serious decline of Vietnam's tropical forests. Moreover, almost half of the forestry companies suffered from land encroachment by surrounding communities and spontaneous immigrants. As argued by Thanh et al. (2010), there is a need to consider the efficiency of forestland use between forestry companies and local people under the form of household economy.

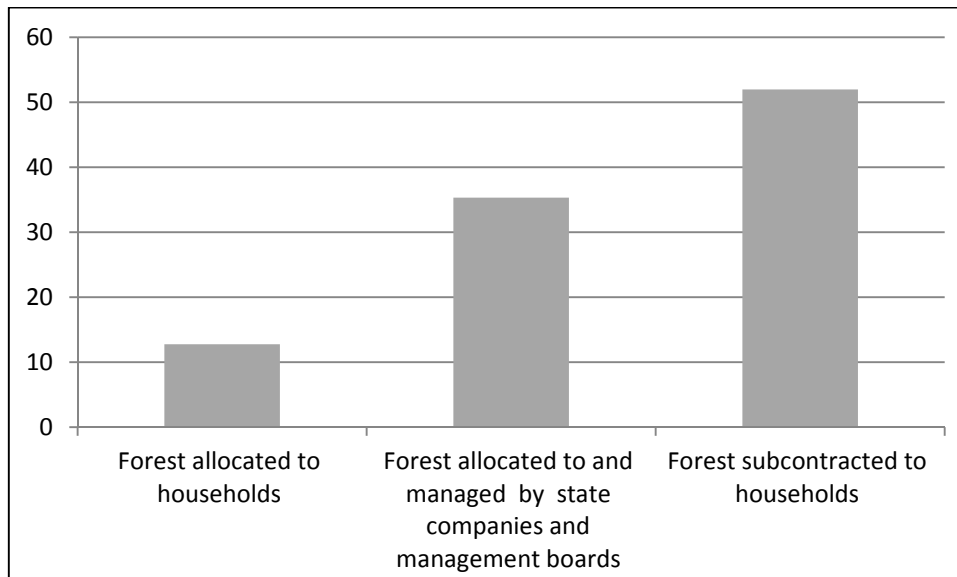
## **5.5 Results**

### *5.5.1 Forest management and allocation status in Ca Mau province*

Presently, the total forest area of Ca Mau province is 108,025 ha, including 96,378 ha of forested areas and 11,647 ha of wasteland planned for reforestation. The province has 66,656 ha of mangroves accounting for 61% of the total and the remainder is *Melaleuca* forest located in western part of the province near the shores of the Gulf of Thailand. Ca Mau therefore has the largest stand of mangroves accounting for nearly 52% of the Mekong Delta and 32% of the country as a whole. These mangrove forests are recognised as playing an important role in coastline protection, mitigation of wave and storm impacts, local climate stabilization and as a source for wood, fuel and feeding and nursing areas for many aquatic species, which have economic value in the Mekong Delta and the Ca Mau peninsula (Viet Nam Environment Protection Agency, 2005).

Ca Mau was one of the first provinces in the country where the forestland allocation programme was implemented, starting with the Song Trem Forest-Fishery

Enterprise in 1988. A further 84,848 ha were allocated to 125 state-owned economic units over a period of 10 years from 1988 to 1998. Direct allocation to households has been considerably smaller, with 1,820 ha of mangroves and 9,070 ha of *melaleuca* plantation allocated to 190 and 2,648 households respectively. From 2000 to 2004, only 445.5 ha were allocated to 297 households. *Figure 5.1* presents the percentages of forest and forestland areas allocated and subcontracted to different stakeholders in Ca Mau province recently. Most households who are forest users in the province have been subcontracted by forestry companies and protection forest management boards. They currently manage 52% of the total forest area. One can therefore say that most of forests and forestland in the province are under control of state-owned companies and protection forest management boards, while daily management is subcontracted to farmers.



**Figure 5.1.** Percentages of forest allocated to stakeholders in Ca Mau province

In Ngoc Hien district, the host of the largest stand of mangroves in the province, 80% of the 38,132 ha of forest and forestland is allocated to the state-owned forestry companies and protection forest management boards, while the number of households with a red book is relatively small. Although approximately 50% of the forest managed by forestry companies and management boards are subcontracted to households with a green book, a large part of forestland remains under the control of these state organizations. At the same time, the demand for forestland and forest products of the rural households is increasing. This led to a situation where forestry companies and management boards are under pressure to curb illegal cutting by local people. The conflict between state forest management board and/or forestry companies and farmers therefore emerged as one of the main problems in forest management in the province.



The benefit sharing policy of the government was only implemented after forest allocation and subcontracting based on the central government policy of 2001 became operational, and was adapted through the Ca Mau Provincial People's Committee Decision 24/2002/QD-UB. This Decision governs contracts between farmers with state-owned forestry companies and protection forest management boards by setting out the specific ratios of mangrove area to shrimp farming. The required forest-to-pond ratio increases proportionally as the size of the plot increases, from 40:60 in plots under 3 ha, 50:50 in plots range from 3 to 5 ha and 60:40 in plots exceeding 5 ha. Through this household or plot level regulation, the government hopes to maintain 50% of the area covered with mangrove in coastal areas. The policy also stipulates that farmers (as contractors) should receive 6% of the benefit from the wood harvests after tax per year to a maximum of 95% in total in case households provide all production costs.

The provincial government's benefit-sharing policy departs from the national policy both in terms of forest-to-pond ratio and benefit-sharing percentages. The provincial Decision allowed for 10 to 20% larger ratios of aquaculture ponds to forests than the national regulation. However, the benefit-sharing percentages that farmers get in practice are lower than the national policy and depend on the number of years forests are conserved. If farmers protect forests for 11 years (minimum time for harvesting) they get 66% of wood harvest. If the time is 15 years and more they get 95% of wood harvest while the remaining is for forestry companies and management boards. In Ca Mau, most of the farmers who sign protection and production forest contracts cover 100% of the investment costs for planting because seedlings can be collected naturally. The question is however, whether, the provincial benefit sharing policy is effective by being more oriented to local conditions in maintaining the overall goal of 50% forest coverage while also supporting the livelihood of contracted farmers? We now turn to this question in the two selected communes.

### *5.5.2 Benefit sharing mechanism and income from mangroves*

A comparative analysis of income from shrimp and mangroves after harvesting shows that the income from shrimp is much higher than that from mangrove cutting (*see Table 5.2*). The majority of mangroves in the province were contracted to households according to Decree 01/CP of the central government. Therefore, most of mangroves in the areas were planted and replanted in 1995. Among the 32 households interviewed, only four started planting during the period from 1992 to 1994 while the others planted mangroves in 1995. The income from mangroves, calculated from the sale of the wood after cutting at the end of the 1995 to 2010 production cycle, would be higher if thinning and domestic use would have been included. The results from the interviews show that the average productivity is 78 m<sup>3</sup> per ha per production cycle. Productivity was

estimated on the basis of information from the questionnaires in which farmers reported the production as calculated by the forestry companies or management boards for benefit sharing. One ha of mangroves yielded US\$ 596 per production cycle of 15 years ( $\approx$ US\$40 ha<sup>-1</sup>), which is less than 3% of the income from shrimp estimated at the average US\$ 1,539 per ha per year from shrimp. This gap would have been even bigger if a discount factor would have been applied.

**Table 5.2.** *Income comparisons between shrimp and mangrove harvests in sample households*

<b>Indicators</b>	<b>Income from mangrove's harvest per production cycle (1995 - 2010)</b>	<b>Income from shrimp's harvest per year (2008- 2009)</b>
Areas (ha)	65.15 ha	62.75 ha
Productivity	78 m <sup>3</sup> ha <sup>-1</sup> yr <sup>-15</sup>	218 kg ha <sup>-1</sup> yr <sup>-1</sup>
Total income	38,865 US\$ m <sup>3</sup> ha <sup>-1</sup> yr <sup>-15</sup>	96,600 US\$ ha <sup>-1</sup> yr <sup>-1</sup>
Income (US\$/ha/year)	40 US\$ ha <sup>-1</sup> yr <sup>-1</sup>	1,539 US\$ ha <sup>-1</sup> yr <sup>-1</sup>

*Sources: Household recording from October 2008 to October 2009; and household questionnaires 2011, this study*

According to the contracts with forestry companies and management boards, mangroves can be harvested for commercial purposes from year 11. If the households want to harvest, they must inform and register with the companies or management boards, who come to the farm for harvest planning, which is mainly for calculating the volume of wood and the calculation of their share after cutting. After cutting the forest, the farmers are obliged to sell the products to selected traders, who are concessionaires for wood and are chosen by the forestry companies and management boards. The income from cutting mangroves that farmers get from traders therefore depends on the volume of planned cutting and the price of wood. Information from the fields and questionnaires show that the price of wood that farmers were paid from traders is much lower than the normal market price. For example, by the year 2010, in the free market one cubic meter of commercial wood was priced from US\$50 to US\$60, while farmers got only around US\$15 payment from the forestry companies and management boards. Moreover, household income from mangroves is reduced by various 'management costs' levied by protection forest management boards and forestry companies.

The income from mangroves for households however differs from year to year (*see Table 5.3*). The results show that the income from mangrove's harvest from 2006 to 2008 was very low with less than US\$3 per m<sup>3</sup> and significantly increased in 2009 and especially in 2010. The reason, as explained by farmers, is that before 2008 most of

farmers did not attach much about the value of the wood to sell because they considered the revenues very small or even almost nothing compare to the income from shrimp. Later on however, some farmers recognised that the income they received from timber was far lower compared to the market value. A number of farmers then decided not to harvest after 10 years but wait until the benefit sharing mechanism changed. In 2009 for example, only few households in the study sites harvested mangroves and this is the reason why we have only one household selected to fill the questionnaire. Some others tried to get a higher price for the wood harvested through bargaining with the forest management boards and forestry companies. In 2010, the income from wood significantly increased for households (even though the price was still lower than that in free market), because the farmers took a stronger stance vis-à-vis the forestry company and management boards. In 2010 therefore, many households decided to harvest mangroves and the number of households who filled out the questionnaire was 13. The income from wood for households therefore also depends on the bargaining power of households. The more care farmers took in the maintenance and harvest of mangroves, the more income they received.

**Table 5.3.** *Productivity, income and price of mangroves according to the year of cutting*

Indicators	Total	2006	2007	2008	2009	2010
Number of household interviewed	32	2	4	12	1	13
Forest area harvested (ha)	65.15	5	8.75	22.54	1	27.87
Wood production (m <sup>3</sup> )	5,077	265	615	2,102	90	2,500
Productivity (m <sup>3</sup> /ha)	78	53	70	93	90	88
Total income (US\$)	38,865	720	1,545	6,100	600	29,900
Price per m <sup>3</sup> (US\$/m <sup>3</sup> )	7.65	2.71	2.51	2.90	6.67	14.91

*Source: Household questionnaires in 2011, this study*

Although the income from mangroves was not as high as from shrimp, the harvest yields a certain amount of money at one time, which can be used for larger investments or buying new land. This was an important difference to income from shrimp, which was higher overall, but earned on a monthly basis. The information from the field also shows that although productivity of shrimp in forest areas is not higher than in non-forested areas, farmers in mangrove areas have more diverse sources of income than farmers in non-forested areas, both from mangroves and aquatic products. Shrimp production in an integrated shrimp–mangrove system therefore appears far more stable than in an improved extensive monoculture system. Moreover, the results

show that farmers in an integrated system generate extra income from fish and crab (nearly 28% of total income), but in non-forested areas, farmers generate only an additional 9% from these sources (Ha et al., 2012). Diversification of income is highly valued by farmers (ibid.).

### 5.5.3 *Farmer's decision-making and perspectives on mangroves in two study sites*

Table 5.4 provides the farmer's perception and decision making in mangroves based on the survey results. The first part of the table shows two the most important values of mangroves for farmers are timber and the habitat creation for shrimp. However, as shown in the second section of the table, if farmers gained complete ownership rights half of them would maintain the government's benefit sharing regulations, while about 43% of them want to reduce forest areas to increase the area of their shrimp pond. Only two out of 32 respondents indicated they would clear all mangroves on their land for shrimp farming – as revealed later in interviews, this was in response to what they perceived as an unfair benefit sharing mechanism between farmers and forestry companies. About one third of the respondents mentioned that mangroves are vital for shrimp and nearly 30% of them think that high density of mangroves is not good for shrimp and that they reduce income from shrimp farming.

The last part of the table indicates three of the most important factors that influenced their timing in harvesting the mangroves. The results show that the most important factor for cutting forest is the schedule set by the forest companies. This is followed by the age of forests. Farmers believe that mangroves older than 15 years negatively affect the growth of shrimp, demonstrating their concern over shrimp farming in relation to mangroves. The recent high value of wood in the market is the third factor affects farmer's decision on cutting forests. Despite the apparent negative perception of mangrove production, all of the farmers interviewed said they are willing to plant mangroves if further land was made available to them. Moreover, all farmers interviewed expressed their aspiration to obtain full rights and responsibilities over forest resources through the forestland allocation programme, and that this would not lead to further deforestation. These more positive statements about mangrove management reflect the long-term benefits the farmers receive from planting mangroves, as well as reflecting the concerns from farmers and local government officers alike, that forestry companies are inefficient in their use and management of the forests. The farmers' primary argument is that they get a very low share of the revenue from mangroves after cutting as explained by the data shown in the previous section, and that this undermines the acknowledged value of having mangroves integrated on their land. Some farmers therefore do not care about the quality of mangroves such as

density of trees. They cut mangroves continuously for domestic use and sometimes for selling or giving to others.

**Table 5.4.** *Farmer's perception and decisions making in mangroves*

<b>Farmer's perceptions and decision making</b>	<b>Percentage of respondents (%)</b>
<i>1. Mangrove's value (select more than one option)</i>	
Value of wood to sell in the market	100
Good environment for shrimp	72
Domestic use of wood	19
<i>2. Decision to cut mangroves (if farmers have right to do so)</i>	
Cutting all mangroves for shrimp farming	6
Maintaining the status quo	50
Reducing forest areas to increase shrimp pond area	44
<i>3. The reasons behind cutting mangrove's decision (if they have right)</i>	
No mangrove no shrimp	34
Increasing shrimp pond to gain more money	22
High density of mangroves is not good for shrimp	28
Woods have high value	9
No mangrove higher shrimp production	6
<i>4. Factors influencing the decision in time of cutting mangroves recently (farmers are asked to list the most three important factors)</i>	
The time that forest companies allow to harvest	78
Mangroves of more than 15 years are not good for shrimp	44
High price of wood in the market	22
Family's economic situation	16
Benefit sharing from harvesting with forestry companies	9

*Source: Household questionnaires in 2011, this study*

## **5.6 Discussion and conclusion**

The integrated shrimp mangroves farming system in Ca Mau provides an interesting case of how forests are managed by farmers in relation to a highly competitive land use type like shrimp farming. Farmers recognise the value of wood in the market, because this may bring them a substantial income that they can use for longer-term asset accumulation, while income from shrimp is mainly for daily subsistence. However, given the fact that overall income from mangroves is very low compared to shrimp, decisions are primarily based on maximising aquaculture production. At the same time, the value of mangroves is also judged indirectly through the provision of habitat for shrimp production as well as improving the stability of shrimp production and the lower incidence of disease (Binh et al., 1997; Ha et al., 2012).

The results show that farmers do recognise the positive role mangroves play in terms of ecological function is much more important than directly financial income from wood

The government's prescribed forest cover of 50% is an indicator for the quantity of forest but it is not necessarily the best indicator for the quality of forest such as the density of trees. Farmers and provincial government officials alike blame the continued decline of mangrove quality in the province on the mechanism of benefit sharing between farmers and forest companies and management boards. The low return farmers receive at the end of production cycle is a key reason for many farmers to cut mangroves continuously. It reduces the capacity of forest to maintain ecological functions. The ecological function of mangroves thus is indirectly affected by the benefit sharing policy applied by the forestry companies and management boards to contracted households. Although the regulations of the state on forest-to-pond ratio are followed by the farmers, they do not pay attention to the quality of mangroves due to their low share in the benefits after harvesting. It also shows that farmers' decisions and perceptions are very much determined by the government regulations and the way in which they are implemented by the forest companies and management boards. Moreover, they are willing to have control over forest in terms of time of cutting and turnover after cutting even under the current state regulations.

The productivity calculated as  $78 \text{ m}^3 \text{ ha}^{-1}\text{yr}^{15}$  by the forestry company and management board also raises questions. A simple calculation of the potential income from mangroves after cutting from known data and information shows a very different picture. With a density of 7,000 trees per ha at the time of cutting and the high quality of mangroves in this area, an average productivity can be reached of  $250 \text{ m}^3$  per ha at the age of 15 years, based on the Vietnam Forestry Sector Standard 04 - TCN-66-2003. Similarly, Alongi (2011) calculates a potential production of 260-340  $\text{m}^3$  per ha for the Mekong Delta in a 20-year production cycle. The commercial wood production can therefore be calculated at least at about 200 cubic meters for a 15-year production cycle. With a price of US\$ 50 - 60 per cubic meter in the free market in 2010, farmers could have an income of US\$ 10,000 -12,000 per ha per production cycle, which is much higher than the average of US\$ 596 that the farmers had previously received.

Therefore, it can be concluded that if forests are managed by farmers with full responsibility and rights over products they can be well protected and maintained. This contradicts the government's concern about maintaining forests for shrimp farming if mangroves are allocated to local people. This point also provides the reason why forest allocation process has been poorly implemented in the Mekong Delta and especially in Ca Mau province. Given the ongoing conflict of interest between forest companies and management boards and households, further devolution of rights through household

contracts do not appear to hold much potential in bringing further benefit to farmers. As shown by our results, despite the fact that revenues in 2010 were higher, the income farmers obtained from mangrove cutting is only a small part of the potential revenue they can get from mangrove cultivation. In contrast to wider opinion, it therefore appears that full rights over mangrove forest would result in much higher income from mangroves, and that this income would further strengthen sustainable use of the mangrove forest.

Forest policy and management in integrated shrimp-mangrove farming in Ca Mau province provides an interesting case of changing patterns of legal rights, actual rights and benefit of forest management practices associated with forest devolution. First, despite the fact that shrimp farmers consider mangrove management as part of their aquaculture practices, decision-making over mangroves is very much influenced by shrimp-farming activities in which income from shrimp is much higher than that from forests. Second, the bargaining power of shrimp farmers to get more benefit from the mangroves with protection management boards and forestry companies is very much influenced by their resources, skills and previous experiences with the state, which is represented by forestry companies and forest management boards. Third, the ways in which shrimp farmers benefit from policies in place is problematic because of the unfair benefit-sharing mechanism applied by the forestry companies and management boards as these stakeholders control forests and relations with markets.

Our results indicate that shrimp farmers are willing to plant and to protect mangroves if they are given both economic incentives to do so, as well as greater control over the management of their forestland. Farmers are therefore not fundamentally opposed to mangrove plantation and protection, but their decision-making is very much influenced by the way in which the benefit sharing policy is implemented by the state management boards and forestry companies. Reflecting the landscape integrated shrimp aquaculture model outlined by Bush et al. (2010), shrimp farmers may well hold the potential to plant, protect and manage mangroves if they have full rights and responsibilities over forests. Accepting this would mean reevaluating the perception that shrimp farming fundamentally leads to the deforestation and degradation of mangrove habitats. The integrated shrimp-mangrove model in Vietnam therefore appears to provide an alternative model more sustainable and brings more income sources for farmers in forested areas. Seen as such, shrimp farming is a mangrove-friendly source of revenue, which also promotes the planting and protection of mangroves.

These findings therefore lead to important policy implications. Integrated shrimp mangrove system is a sustainable system that should be considered as the best practice



for coastal areas to conserve mangroves and increase income for local shrimp farmers. The government policy and management over mangroves therefore should pay attention to shrimp farmer's livelihood from both, direct income from mangroves and indirect benefit from ecological function of mangroves, which affect shrimp production. This would change perception and attitude of farmers about the value of mangroves and thus provide reasonable incentives for shrimp farmers to plan and protect mangroves. Inter-sectorial approach for mangroves and shrimp production therefore should be considered in the government's policy and management scheme and implementation.

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# 6

## **General discussions and conclusions**



Integrated shrimp-mangrove farming system in Tan An commune, Ngoc Hien district, Ca Mau province

## GENERAL DISCUSSIONS AND CONCLUSIONS

### 6.1 Introduction

The preceding chapters have demonstrated that the Vietnamese shrimp industry is embedded in a global system of markets and governance. The industry's greater exposure to international markets has brought economic benefits to producers but has also increased producers' vulnerability as trade and emerging trade-related policies have generated economic risks and uncertainties. Moreover, the increasing emphasis on new qualities of shrimp production through trade, including both production and environmental aspects of shrimp aquaculture, also influence Vietnamese producers' capacity to achieve sustainable production. All of these risks and uncertainties are related to the overall social-ecological resilience of coastal areas such as the Mekong Delta, where shrimp aquaculture is one of the most important economic activities. While some researchers have correctly observed that the most dramatic period of shrimp production was during the boom decade of the 1990s (Hall, 2004; Lubchenco, 2003; Kwei-Lin, 2001), this thesis has demonstrated that even in a consolidation phase, such as occurred in Vietnam, the sector continues to face a combination of chronic and acute trade and production risks. This thesis was written from 2007 to 2012 against the backdrop of an increasingly vulnerable economic and environmental landscape, including the global financial crisis and the increase in disease outbreaks in the Mekong Delta.

As an illustration, the Ministry of Agriculture and Rural Development (MARD) reported that in the first 9 months of 2011, 594,421 ha of shrimp ponds were in use in the Mekong Delta, 99% of which were dedicated to black tiger shrimp, accounting for 92% of the total shrimp production of the country (Notification Nr.5330/TB-BNN-VP). However, the report also outlines unprecedented losses suffered by farmers in the Delta due to an unspecified disease that infected approximately 80,000 ha of ponds, leading to losses of 13 billion fry (MARD, 2011b). As of June 2011, 52,000 ha of shrimp farms in the Mekong Delta had been destroyed by a strain of liver necrosis that first emerged in March 2011. These diseases caused a drop in output and a shortage of supply, which left regional processing plants operating at only 50% to 60% of their capacity. This outbreak illustrated the vulnerabilities faced by shrimp farmers in the Delta and the importance of governance arrangements to better address issues of risk and vulnerability.

In October 2011, MARD organised a workshop addressing the prevention of shrimp disease in the Mekong Delta. The conclusions were similar to those of previous

meetings. Disease is caused by a range of interrelated environmental factors (a theme explored in greater detail by Hoa, 2012), including harsh changes in the weather and climate, which lead to unfavourable changes in temperature and tidal (saline) influence. In addition, a range of production practices and wider governance failures contribute to the problem, including the following:

- the build-up of chemical residues in the water and soil environment by shrimp farming activities;
- shrimp farmers' non-compliance with regulations with respect to dredging and disposing of sediment for disease control, which leads to water pollution;
- the low quality of fingerlings; the government's management failings with respect to the feed, chemicals and medicine used for aquaculture, leading to these products' poor quality;
- ineffective state aquaculture extension services; and
- an overlap in the roles and functions of different state organisations that are responsible for shrimp aquaculture, such as the aquaculture, veterinary, quality management, and environmental management departments at the provincial and district levels (MARD, 2011b).

There is therefore an urgent need for solutions in which the governance of shrimp farming takes centre stage.

In the preceding chapters, we addressed some of the challenges of shrimp production in the Mekong Delta by linking environmental factors and production practices to governance arrangements in an attempt to contribute to a discussion about the wider social-ecological resilience of coastal communities that depend on coastal resources. In doing so, we moved beyond the local level by integrating broader economic processes compared to the more locally oriented concerns of other studies focused on the resilience of coastal areas (e.g., Adger, 2000). In doing so, we attempted to traverse different spatial scales, moving beyond the local to incorporate global markets by exploring how decision making through these global (networked) markets interact with other spatially discrete governance arrangements, such as the state (Oosterveer, 2005). We have seen how the promise of high returns on investment in shrimp farming has been gradually tempered by higher risks and increasing levels of social and ecological uncertainty and vulnerability (Bush et al., 2010). As shrimp farmers are increasingly embedded in a global system of markets and governance arrangements, the control and management over their resources has therefore also expanded to include networks of state and non-state actors on multiple spatial and political scales, from local to global (Bush and Oosterveer, 2007).



Through the four empirical studies presenting different governance arrangements in Ca Mau province, we critically investigated the interaction between existing state and non-state actors and institutions to develop a more informed understanding of how state, market and community-based governance arrangements at different levels influence decision making over shrimp farming in the coastal areas of the Mekong Delta of Vietnam. In doing so, the research has focused on the interplay between local, regional, national and international market channels; policy-making at the local and national levels; social practices at the local level in governing shrimp farming; and the collective influence of these channels, levels and practices on coastal shrimp production. Thus, the research contributes to understanding the influence and interdependencies of local and global governance processes in attempting to foster equitable and sustainable shrimp farming in the context of global networks and markets.

This final chapter relates the main findings from the four empirical chapters to the broader context of sustainable shrimp farming and how the interplay between the governance arrangements presented may contribute to the social-ecological resilience of the coastal areas. In doing so, the chapter pays attention to three main issues: (1) the shift from government to governance and the changing role of the Vietnamese state; (2) value-chain governance and upgrading small producers; and (3) shrimp farming governance and the social-ecological resilience of coastal areas. The final section presents the broader theoretical implications of the thesis results with respect to governance and resilience.

## **6.2. The shift from government to governance and the changing roles of the state**

Governance has emerged as a buzzword in political science, public administration, political geography and human ecology during the past decade. It refers to a paradigm shift in the way that postmodern societies steer decision making (Buizer et al., 2011). Viewed in a more dynamic way, the turn to governance is a shift in the role of government and the emergence of alternative actors, sites and modes of decision making (Kooiman and Bavinck, 2005). Government is often depicted as an “old” institution tied to hierarchical arrangements of decision making with power concentrated at the national level. In contrast, governance breaks these hierarchies and views decision making as a function of networked forms of collaboration through public-private partnerships or less hierarchical arrangements within and/or beyond the nation state (van Tatenhove et al., 2000). From an environmental perspective, this shift to governance is seen as positive because the structure of the state, which is traditionally oriented to the (re)distribution of welfare, is not well suited to address new social-ecological challenges, let alone more expansive notions of resilience (Adger et al., 2003). This study engaged this shift in the role of the state by exploring the ways in which the

Vietnamese government and private actors respond to a series of arrangements set within global value chains and aimed at promoting sustainable shrimp production.

As a broad organising concept, global value chains (as outlined in the first chapter of the thesis) have provided a sharp lens to focus on the transformation from state-based to alternative market-based and community-based shrimp production management arrangements in the wider context of mangrove forests. One of the main drivers behind the broader transformation of governance in the global agro-food system is the increased emphasis placed on sustainability and the environment as new qualities of (shrimp) production. As part of a wider set of qualities, from the regulation of safety and nutritional content to a range of ‘credence’ issues with respect to the production process—including sustainability, organic production and fair-trade (Watts and Goodman, 1997; Busch and Bain, 2004)—environmental governance through value chains is leading to a fundamental change in the role of the nation-state. It forces governments to adopt a more decentralised and consensual approach at multiple levels to the governance of shrimp production (Gunningham, 2009). As argued in chapter 2, the Vietnamese government, like many others, has begun to re-negotiate its role from a regulator to a facilitator, ensuring conditions for global regulatory processes and flows (Mol and Spaargaren, 2006). More concretely, this renegotiation includes the shift from public to private regulation with respect to safety and quality standards, branding, and contract, environmental and social certification organised for competition based on quality (Busch and Bain, 2004, Lee and Marsden, 2009).

As illustrated in this thesis, Naturland certification, WWF and processor-led production clusters, and market incentives for mangrove protection are clear examples of these shifts in shrimp aquaculture, especially given that shrimp is a high-value export commodity that depends on natural resources and ecosystem services. The main challenges of the three governance arrangements and the current and potential role of the Vietnamese government to contribute to improved governance are summarised in *Table 6.1* and described below.

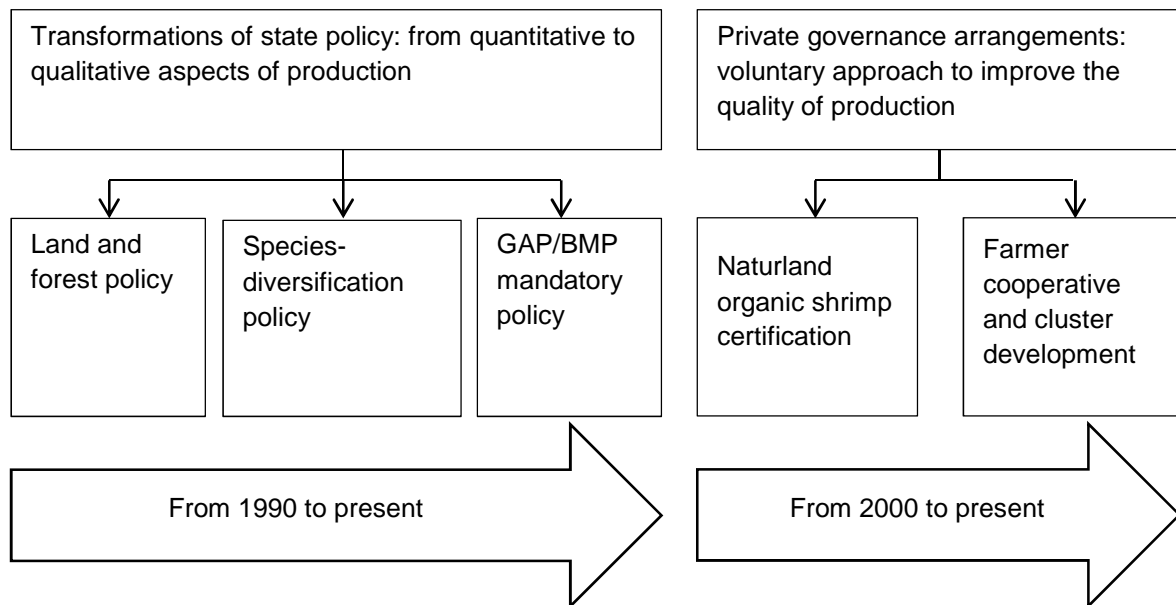
**Table 6.1. Challenges of governance arrangements and (potential) roles of the state**

<b>Main challenges of governance arrangements</b>	<b>(Potential) roles of the state</b>
<b>1. Organic shrimp certification</b>	
<b>1.1.</b> Involvement of shrimp farmers as partners rather than targets of regulations.	<b>1.1.</b> Establishing national standards in accordance with international (organic) standards.
<b>1.2.</b> Unfair premium-sharing mechanism for certified farmers.	<b>1.2.</b> Facilitating negotiations between farmers and processing companies/other actors.
<b>1.3.</b> The legitimacy and credibility of private auditing systems.	<b>1.3.</b> Monitoring and steering private auditing systems.
<b>2. Shrimp-farmer clusters</b>	
<b>2.1.</b> Externally induced formation of shrimp-farmer clusters without regard for farmers' needs and abilities.	<b>2.1.</b> Providing clusters with support and infrastructure for development.
<b>2.2.</b> Ability to establish vertical contractualisation between clusters and actors along the value chain.	<b>2.2.</b> Creating a legal framework to help private actors to play their roles in extension and credit services.
<b>2.3.</b> Ability to generate economic benefits from cluster formation.	<b>2.3.</b> Better enforcement of legislation with respect to contract arrangements along the value chain.
<b>2.4.</b> Ability to ensure the long-term operation of farmer clusters.	<b>2.4.</b> Supporting the incorporation of BMP/GAqP in contract farming.
	<b>2.5.</b> Providing management knowledge and skills to clusters
<b>3. State mangrove forest policy and management</b>	
<b>3.1.</b> Perception that forest allocation to households will lead to mangrove clearance for shrimp farming.	<b>3.1.</b> Considering integrated shrimp-mangrove systems as the best practice for the management of mangroves in coastal areas.
<b>3.2.</b> Unfair implementation of the forest benefit sharing policy by state forestry companies and forest management boards	<b>3.2.</b> Hastening the devolution of forest management in coastal areas.
	<b>3.3.</b> Applying an inter-sectoral approach to the management of shrimp farms at the local level.

The implication of these governance shifts for the Vietnamese government is that decision making at the farm or local level is no longer subject to state policy alone but is also contingent upon a range of external influences. As a single-party state, this fact presents a particular challenge for Vietnam: if sustainable and equitable shrimp production is to be fostered, what challenges need to be overcome to balance internal and external governance objectives? This question evokes a central governance dilemma faced by most economies in transition that are engaged in high-value production such as shrimp aquaculture. On the one hand, the domestic shrimp industry is embedded in a global system of production, thereby creating local employment and income (Nhuong et al., 2006; Thong et al., 2004). On the other hand, this arrangement exposes producers to high risks in international markets, thereby driving the degradation of coastal ecosystems (see, for example, Manson et al., 2005; Vaiphasa et al., 2007; Primavera, 1997). However, if governments such as Vietnam's are able to effectively shift their role from that of governor to that of facilitator, market pressures can be put to effective use. Based on international concerns over product quality and strategies to secure future market access, market-based or value-chain approaches can lead to a shift from 'internal' state economic policy to the constructive use of 'external' forces to incorporate social and environmental qualitative aspects of production (see Humphrey and Schmitz, 2002). In Vietnam, the concerted effort to combine both quantitative and qualitative production goals under the new export-led economy offers a positive means of complementing the regulatory role of the state with the power of the market. This shift has led to new questions beyond the state-community dialectic that focuses on how new governance arrangements can balance quantitative and qualitative production goals defined and enacted through actors located in private and market-based institutions.

The transformations of Vietnamese shrimp aquaculture policy evident through the case of Ca Mau province also present a complex balancing act between externally imposed global market demands and consumer concerns with respect to the environmental and social performance of tropical shrimp production and the Vietnamese government's interest in maintaining sovereign control over the shrimp industry and fostering export-led economic growth (chapter 2). As external interests through markets and networks become more prevalent in Vietnam, the government finds itself as a key but also more equal partner with private companies and NGOs. As indicated in *Figure 6.1*, the government has repositioned itself in two parallel processes of government-to-governance shifts. The first transformation, beginning in the 1990s, has been a process internal to Vietnam by means of responding to external interests by reorienting land-use and biodiversity policies as well establishing state-led BMPs. The second transformation, beginning in 2000, has been the emergence of voluntary

standards and, even more recently, externally led attempts to revive cooperative production as a means to enable producers to better comply with these standards. The nature of both transformations, as evident from the various cases presented in this thesis, further supports the claim that the Vietnamese government should continue to position itself as a *facilitator* of global private governance arrangements, especially as farmers and global market actors are engaged in transnational regulatory networks operating at local scales. Moreover, the state needs to increase the market incentives to foster farmers' participation in and compliance with these transnational regulatory networks.



**Figure 6.1.** Transformations of the Vietnamese shrimp aquaculture policy—the case of shrimp farming in Ca Mau province, the Mekong Delta

The case of the Naturland organic shrimp certification demonstrates that the participation of small-scale primary producers in the global shrimp supply chain remains, despite considerable support and good intentions, limited (Kambewa et al., 2007). Moreover, this case demonstrates that domestic market and policy failures contribute to the limitations of externally led certification (Nissanke and Thorbecke, 2006). The reasons for the perceived failure of organic certification are the unfair distribution of value in local value chains (from the farmer to the processor), information asymmetries and imperfect competition between the actors. Policy failures in this case refer to the inadequate response by the state in addressing these structural inequalities between value-chain actors. The results of chapter 3 show that state involvement in market-based governance arrangements would provide a stabilising effect on the value chain. However, this involvement should also be facilitative rather than regulatory by steering private regulation to be more effective and as a third-party

arbiter, in which local governments at the communal and village levels bridge a widely perceived lack of trust among actors by providing an independent assessment (auditing) of the shrimp chain. Moreover, the state needs to give far more attention to market incentives for fostering the participation and compliance of farmers in these transnational regulatory networks.

The Vietnamese government has already demonstrated its engagement with actors further down the value chain by promoting cooperative forms of production in an attempt to facilitate better inclusion of these actors in global markets (chapter 4). Although the policy promoting cooperatives and clusters for aquaculture has been developed and implemented in partnership with international NGOs such as NACA and WWF, the results indicate there is a need for further internal reform. Cooperatives can only remain in business when their performance improves in terms of production volumes and marketing activities as well as product quality and safety (Francesconi, 2007). For aquaculture cooperatives to be a sustainable venture for producers, they must move beyond facilitating horizontal relations between producers to address vertical (contract) relations with processors and compliance with private 'voluntary' environmental and quality standards. A key lesson learnt from this research is that vertical relations are imperative for enabling farmers to organise into clusters or cooperatives and that both horizontal and vertical relations are needed to ensure that changes in production—towards sustainability—are in the common interest of producers and processors alike.

Given wider observations that improved quality, with or without certification schemes, leads to increased control and more integrated governance arrangements, such as long-term contracts (Ruben et al., 2007), the Vietnamese government policy should better incorporate state-led BMPs/GAqPs or other international standards. In doing so, the most effective role of the state would be to build the capacity of cooperatives and clusters to manage the implementation of standards, including training programmes for farmers to employ sustainable practices. However, this admonishment includes a proviso around the BMP/GAqP standards. For these state-led standards to be effective, they must provide a market incentive, which they do not currently given their lack of recognition in export markets. Clustering as a means of upgrading will therefore only be effective if these national standards gain recognition in the global value chain and/or are built into the contract terms of processing companies. Moreover, more effective cooperation between state and non-state extension services may be an important means of spreading technologies, thereby assisting farmers to comply with BMP and GAqP.

The devolution of forest management, as explained in the case of integrated shrimp farming (chapter 5), is also a key transformation of government policy. The study's results demonstrate that when the government allocates and subcontracts mangroves to households using long-term contracts, farmers respond with greater stewardship over the mangroves even when shrimp is their primary source of income. The case also shows that governance over shrimp production should be placed in the wider context of governance of coastal areas, especially with regard to mangrove policy and management. The results of this thesis demonstrate that the role of shrimp farmers in the planting and protection of mangroves should be reassessed. In practice, an integrated management scheme from the government should place more emphasis on the potential of the integrated shrimp-mangrove farming system given that the production model appears to provide a more sustainable shrimp farming system in terms of both its ecological function and income generation for farmers in forest areas. The devolution of forest management must therefore be hastened in the coastal areas in the Mekong Delta with a better implementation of a benefit-sharing policy to provide reasonable incentives for shrimp farmers to plant and protect mangroves.

### **6.3 Value-chain governance and upgrading small producers**

The shrimp supply chain in the Mekong Delta, as with other vulnerable tropical food products, is heterogeneous in terms of its production practices and access to international markets. As outlined by Lambert and Cooper (2000), tropical agrifood supply chains have some common features, including (1) large irregularities in supply due to the nature of the farming systems; (2) scattered production by a large number of smallholder producers; (3) high transaction costs due to the long distance between producers and consumers; (4) thin local markets with a limited number of traders; and (5) deficient public regulation and limited capacity for collective action. All of these factors are evident in the shrimp-farming sector in the Mekong Delta. The results also support the broader observation that shrimp farmers, despite being an important actor in a 'supply-driven' global value chain (see Gereffi, 1994), remain vulnerable to the relations and practices in the domestic segments of the chain. For market-based governance arrangements, such as certification, to be effective in promoting more resilient forms of shrimp production, they must encourage producers to develop the capacity to respond in a timely and appropriate way to external drivers of change, whether in the environment or global markets. The evidence demonstrates the current inadequacy of the system.

The rapid changes in the agricultural sector over the last two decades, such as technological innovation, environmental concerns, the changing roles of governments and multi-national corporations, strongly influence global agricultural development



(Pattison, 2000). In transitional countries such as Vietnam that are moving from a centrally planned economy to an open market system, these changes have been particularly rapid, and farmers who face more competition in the global market and less government support are increasingly left to their own devices to improve their position (Chirwa et al., 2005; Pattison, 2000). Recently, a number of international development organisations have placed greater emphasis on the role of value-chain approaches to reducing poverty through strategies designed to assist producers to improve their position in the value chain (see, for example, Mitchell and Coles, 2011). However, the success of these strategies depends on the extent to which these interventions are able to stimulate changes in products and/or production processes that enhance producers' rewards and/or reduce their exposure to risk.

The case of Naturland organic shrimp certification represents this type of innovative governance arrangement (see chapter 3). However, the results presented in this thesis show that three regulatory challenges must be overcome before organic certification will be effective in improving producers' position. First, shrimp farmers need to be better integrated as partners rather than targets of regulation under certification. Currently, certified shrimp farmers are objects of regulation both by Naturland standards and the state regulations. Their experiences and values are not recognised because they only have the right to sell or not to sell their certified products to the processing companies. They are not actively involved in value-chain activities or decisions around management. Second, the ways in which economic benefits are shared between actors in the value chain is unfair; certified farmers do not receive a reasonable (and contracted) premium for their certified products. Shrimp farmers only receive half of the added value that the processing company receives. Third, the level of legitimacy given to private-sector-led auditing systems is questioned by a range of actors. The main issue here is that traceability in the organic shrimp chains is undermined when the ICS cannot effectively monitor the collectors as reported by farmers. These regulatory challenges indicate two central points: (1) shrimp farmers, the primary producers, are the most powerless actor along the chain; and (2) collectors, as "middlemen" who link small producers with processors, are the "weakest" actor in the chain because they are the most difficult to monitor.

In the case of shrimp farmer cooperatives and clusters, the results show that the model is a potentially effective strategy to improve farmers' position in the value chain, but that its success depends on the type and strength of the vertical coordination of farmers with other actors along the value chain (see chapter 4). Vertical contractualisation between farmer clusters and downstream value-chain actors can economically benefit the producers, but this situation is more likely to occur for farmers

engaged in intensive rather than (improved) extensive production. Contract farming does not seem to be appropriate in the case of improved extensive shrimp farmers largely because of the poorer economies of scale derived from geographically fragmented production. However, there are possibilities for improved extensive farmers to establish the vertical coordination if they are able to coordinate cooperative forms of production, as evident to different degrees in the cases of Naturland in Ngoc Hien and WWF-led clusters in Dam Doi. However, this conclusion comes with an important proviso. To be successful, shrimp farmer clusters should not solely focus on increasing production efficiency but also on actively integrating farmers in the value chain by producing high-quality and safe products and by engaging in sustainable on-farm management practices.

Upgrading shrimp farmers in the value chain, especially the structure of incentives and rewards for doing so, is also determined by forest policy and management in Vietnam. The case of integrated shrimp-mangrove farming in Ca Mau (chapter 5) provides an interesting case of how changing patterns of the legal rights, actual rights and benefits of forest management practices associated with forest devolution influence the stewardship of forested coastal habitat. This shift is demonstrated in three ways. First, although shrimp farmers consider mangrove management to be a part of their aquaculture practices, decision making over mangroves is influenced by shrimp-farming activities in which income from shrimp is higher than that from mangrove production. Second, benefits to shrimp farmers from forest policies and management already in place is problematic because of the unfair benefit-sharing mechanism applied by the forestry companies and management boards. Third, the bargaining power of shrimp farmers to obtain more benefit from the mangroves with management boards and forestry companies is influenced by their resources, skills and previous experiences with the state. Therefore, the results support the claim that farmers are also weak actors in the mangrove value chain, despite attempts to raise their profile and bargaining power in the shrimp chain. Redressing this imbalance between mangrove and shrimp farming therefore requires ensuring that the incentives for farmers to plant and protect mangroves are given equal importance to the concerns regarding improved shrimp production practices.

In the shrimp industry, as in other agrifood sectors, quality is a competitive advantage to join global food chains, and ecological sustainability is emerging as a key factor in determining long-term supply (Kambewa et al., 2007). Production is mainly in the hands of small-scale primary producers, and thus they play an important role in ensuring the sector's sustainability. The results of this thesis therefore show that governance arrangements must better address the need for appropriate incentive

structures that enable shrimp farmers to invest resources and concerted efforts to promote quality improvement (Hueth et al., 1999). The results of this thesis show that all cases in some way strive to empower farmers and move them to self-regulation. However, as argued above, better enforcement of regulation from the side of the state is equally important to adequately meet the demands for the production of safe and quality products. What is perhaps particular to shrimp is that any mix of incentives and regulation cannot by-pass or subjugate producers. In both strategies (implemented jointly or separately with the state), the participation of the producers in decision making and (self)regulation is imperative. With this assertion in mind, we now turn to three specific considerations for improving our understanding of the role of shrimp farmers in sustainable shrimp production: (1) the roles of shrimp farmers in ensuring production sustainability and product quality; (2) the importance of bargaining power in affecting the distribution of added value in favour of shrimp farmers; and (3) identifying the factors that affect farmers' choice and compliance to both state and market-based governance arrangements.

Although shrimp farmers, as other small-scale primary producers, are often excluded from global networks and are unable to exploit the opportunities from integration in world markets (Kambewa et al., 2007), they are important in ensuring the quality and environmental sustainability of the sector for which their on-farm activities remain vital. The results of this thesis clearly show that shrimp farmers in the sites of Naturland organic shrimp certification largely complied with organic shrimp standards, which is assessed as a means of linking farm-level management to the sustainability of landscapes (in chapter 3). Shrimp farmers in other places in Ca Mau also follow state regulations on sediment disposal during pond preparation and pond-forest ratio, which is important for the water quality and environment. Moreover, shrimp farmers strictly follow state disease control regulations as shown in the case of farmer clusters (in chapter 4). This finding is important because shrimp farming, unlike land-based agriculture, has a higher degree of interaction with the environment and other producers, e.g., through the use of a common water resource and common discharge channel (e.g., Anh et al. 2010). Environmental sustainability and product quality can therefore only be achieved when farmers strictly comply with regulations and environmentally friendly farming practices.

The ability of small producers to benefit from the added value created in the production chain is strongly related to their power and bargaining capacity. Small-scale shrimp farmers depend in most cases on downstream actors in the chain, such as intermediaries, retailer or exporters for their input suppliers, credits and market access while value is mainly added at the end of the supply chain (Ruben et al., 2007). Thus, the

distribution of the added value received by farmers does not reflect the investment required for the improvements that are made. For example, it is clear that certified shrimp farmers in Naturland organic certification sites receive almost the same price for their products as non-certified farmers. Moreover, farmers are not seen as a *partner* along the value chain but as an *object* of monitoring and management schemes applied by downstream chain actors. Similarly, shrimp farmers who plant and protect mangroves for fifteen years obtain low revenues through the benefit-sharing mechanism applied by forestry companies and management boards. As demonstrated in the cases of the Tam Giang and Tan An communes, one hectare of mangroves harvested yields less than 3% of its income from shrimp. However, those who have skills and previous experiences with the state, which affect their bargaining power, are able to increase their benefit from the mangroves harvested (chapter 5). Improved horizontal coordination also indicates an improved bargaining power but only for intensive shrimp farmers who have an adequate level of capital, production and therefore adequate economies of scale (chapter 4). Improving the bargaining power of farmers is therefore a strategy to ensure that benefit-sharing by farmers becomes more equitable.

Third, the shrimp farmers' decisions about compliance with governance arrangements depend on the incentives that they perceive. In the case of Naturland organic shrimp certification, shrimp farmers participated in the scheme primarily because of the promised price premium but were discouraged from continuing with the scheme when this premium did not materialise or was paid with a considerable delay. If such (predominantly) upstream issues around the distribution of value in value chains are not adequately addressed by certification schemes, the motivation of farmers to enter or continue their involvement will likely diminish (chapter 3). State regulations of forest management also demonstrate this point. If farmers receive a reasonable income from the mangroves after harvesting, both the quantity and quality of forests are more likely to be ensured (in chapter 5). Examining incentives is therefore a valuable way to determine which standards are able to effectively sustain an on-going presence rather than focusing on the moment when the standards were introduced, as is done in most policy-related studies.

Governance arrangements oriented towards the realisation of sustainable shrimp farming must therefore recognise farmers' great importance and their position and relationships with other actors along the value chain. Benefits from any activity adopted by producers or downstream actors are therefore imperative to understanding the impetus behind the willingness to voluntarily co-operate in market-based governance (Plummer and Fennell, 2007). The farmers participate in the organic certification programmes, cluster because of economic benefit they derive from these programmes,

and leave when their economic incentive is not satisfactory. Economic incentives therefore provide the starting point for co-operation and the drive for long-term collaboration towards sustainability.

#### **6.4 Shrimp farming governance and social-ecological resilience of coastal areas**

This thesis has been set against the backdrop of *resilience* as an organising concept for a broader research programme *Rebuilding Resilience in Coastal Populations and Aquatic Resources* (RESCOPAR). Resilience is used as an organising concept because it draws together a range of disciplinary approaches that address the interrelationship of mangrove-shrimp production as a linked social-ecological system (Holling, 1973; Folke et al., 2002). In this thesis, resilience has not been applied directly but has provided a conceptual means to link decision making and societal steering (i.e., governance) to practices in both value chains at the farm level with a broadly defined notion of 'sustainable' ecological function (cf. Kassam, 2010). Reflecting on the 'governance results' from the thesis in reference to the wider concerns of (coastal) resilience provides a means of engaging with the aims of the RESCOPAR programme and opens four further lines of argumentation exploring the material outcomes of shrimp aquaculture governance: (1) farming systems and their effect on the resilience of coastal areas; (2) linking scaling to shrimp farming governance and the resilience of coastal areas; (3) global-local links, economic risks and their effects on the resilience of coastal areas; and (4) governance in the context of social relations and its implications for resilience.

##### *6.4.1 Farming systems and their effects on the resilience of coastal areas.*

As outlined in the introduction to this thesis, the question of *which* shrimp farming systems are best able to facilitate both the social and ecological resilience in coastal areas is an on-going concern for policy makers. Bush et al. (2010) point out that the rise of the sustainable seafood debate and the global proliferation of quality standards have led to two opposing scenarios situated along a spectrum of potential production systems. The first scenario is landscape-integrated systems: low-input aquaculture integrated with mangrove systems akin to the integrated shrimp-mangrove systems in Ca Mau province. Although the production system has low production per unit, its main advantage is the ability of balancing conservation issues while optimising economic profitability. At the other end of the spectrum are closed intensive systems, which are characterised by closed recirculation ponds located outside of the intertidal zone. The systems have a high level of production per unit compared to the extensive systems (Otoshi et al., 2009). However, because of the high investment costs, small-scale producers are less likely to utilise the intensive farming systems (Bush et al., 2010). Both systems are resilient in their own way: integrated systems are more vulnerable to

external influences but are better able to recover from any perturbation such as disease, while closed systems are less exposed to external influences but are more vulnerable to catastrophic changes should they be compromised.

This research identified several social-ecological indicators of shrimp farming systems that are indicative of the resilience of coastal areas that can also be taken into consideration by decision-makers (*see Table 6.2*). Four social-economic indicators can be considered relevant for an assessment of the resilience of shrimp farming in the Mekong Delta. The *first* indicator is the investment cost, which is indicative of the ability of shrimp farmers to adopt a specific farming system and to reinvest when dealing with a shock or changes. The indicator is linear: the lower the investment cost, the greater the ability of shrimp farmers to (re)invest. The *second* indicator is the Benefit Cost Ratio (BCR), which expresses the economic benefits of a project or business relative to its costs: the higher the BCR, the better the investment. This indicator is useful for comparing different farming systems in terms of their financial yield. For small-scale farmers, identifying the type of farming system that results in the greatest benefit relative to its cost is important and directly affects the farmers' social-economic resilience. The *third* indicator is the diversification of farmers' income sources. This indicator is important for shrimp farmers to reduce the risk and uncertainty associated with monoculture aquaculture, such as price fluctuations in international markets or the loss of production due to natural hazards or disease. The *fourth* indicator is the stability of (revenues from) shrimp production. This indicator is important because it is directly linked to the ability of shrimp farmers to maintain their income over time.

From an ecological perspective, we focus on two main indicators. The *first* is the level of a disease's virulence: the increased incidence of the White Spot Syndrome Virus (WSSV) is an environmental issue, but it creates great economic risks for shrimp farmers. This indicator emerged from Dieu's (2010) study on the epidemiology and evolution of WSSV in the Mekong Delta. The *second* indicator is bio-diversity maintenance, for which the area of the existing mangroves relative to the shrimp ponds is most important. As noted by Beveridge et al. (1997) and Rönnbäck (1999), the productivity and sustainability of shrimp aquaculture depends directly on the support of environmental goods and services from mangroves. Mangroves in their natural state are robust to disturbances and capable of rapid regeneration in which a minimum amount of mangroves will be necessary to maintain coastal fish productivity and diversity (Manson et al., 2005). Changes in mangrove area and structure may affect the ability of the coastal ecosystem to recover from shocks and long-term changes and may thus affect ecological resilience (Bush et al. 2010). Moreover, the value of these social and



ecological indicators is not absolute because these factors interdependently affect resilience and may occur in different combinations.

**Table 6.2.** *Level of social-ecological resilience indicators observed among systems*

Shrimp farming systems	Investment cost	Benefit Cost Ratio	Diversity of sources of income	Stability of shrimp production	Level of virulence of disease	Bio-diversity maintenance
Intensive farming	xxx	x	x	/	xxx	x
Monoculture-improved extensive	x	xxx	xx	x	x	xx
Integrated shrimp-mangrove	xx	xx	xxx	xxx	x	xxx

(Note: xxx: high level; xx: medium level; x: low level; /: not observed)

The results of the economic analysis of different shrimp farming systems in Ca Mau show that the integrated shrimp-mangrove system scores higher than the intensive system in terms of investment costs, economic efficiency, diversity of sources of income for farmers and bio-diversity maintenance. The integrated shrimp-mangrove system is also found to be better than the monoculture-improved extensive system in terms of the diversity of sources of income for the farmers, the stability in productivity and bio-diversity maintenance (see chapter 3). This finding is supported by Martínez-Porchas et al. (2010), who argue that shrimp poly-culture is an important alternative to resolving and/or minimising numerous problems that shrimp aquaculture has faced over the past two decades, such as environmental pollution, diseases and fluctuating prices. Moreover, as mentioned by Gunderson (2010), the role of diversity in contributing to resilience is recognised for both social and ecological systems. Hence, integrated shrimp-mangrove systems can be seen as a lower risk form of farming for the majority of shrimp farmers in Ca Mau. The intensive system, although it has a (potentially) high productivity also appears to be a higher-risk form of farming and may thus negatively affect the social-ecological resilience of the coastal areas. Moreover, intensive production is only appropriate for a small number of shrimp farmers in the region because of the high investment costs. The provincial government's plan of increasing the area under the intensive cultivation system to 10,000 ha in 2010 did not materialise, and the intensive farming area remained at 1,300 ha from 2008 to 2011.



In addition, it is useful to examine farming systems for the long-term resilience of coastal areas in the context of climate change. In the Mekong Delta, the effects of climate change are visible most obviously through the occurrence of drought that leads to sanitisation. According to the scientists from the Southern Institute of Water Resources Research, in 2011, the water levels of most inland rivers in the region were their lowest in 30 years, thereby leading to salinization in most of the provinces in the Mekong Delta. This change is especially evident in the Ca Mau peninsula, with its three sides bordering the sea. Therefore, mangroves as a coastal forest belt are an important means to mitigate the effects of climate change (MARD, 2011a). In this situation, integrated shrimp-mangrove farming is the most appropriate cultivation system applied in brackish water areas. This model can thus be viewed as a sustainable farming system that contributes to both the ecological and the social resilience of the coastal areas of the Mekong Delta.

#### *6.4.2 Linking scaling to shrimp farming governance and resilience of coastal areas.*

In ecological science, scale and scaling have been viewed as determining factors underlying numerous environmental problems (Verburg and Veldkamp, 2005). Scale has often been defined as the spatial, temporal, quantitative, or analytical dimensions used to measure and study any phenomenon (Gibson et al., 2000), while scaling can be regarded as the translation of information across scales (Wu and Li, 2006). Environmental problems manifest themselves at various scale levels. To address them, action should be reconciled between these scale levels to avoid discordance between the problem at hand and the governance arrangements addressing them (Buizer et al., 2011). Linking scaling to governance is therefore an important issue for the improvement of environmental management and policies to achieve effective governance. However, the governance arrangements can only be regarded as effective if they positively influence the resilience of social-ecological systems beyond the scale they target.

As shown in *Table 6.3*, all three governance arrangements investigated in this thesis have the potential to promote the social-ecological resilience of the coastal area, although they predominantly focus on the farm level. For instance, the shrimp-farmer cluster model can be viewed as a means to link the farm-level management of water and disease control to higher ecosystem levels, while state forest policy provides a means of linking the farm-level management of mangroves to the coastal landscape level. Organic certification can provide a means of linking farm-level management to the sustainability of landscapes through both shrimp farming and mangrove management at the farm level. Indeed, the notion of “organic coasts” presented in chapter 3 is an attempt to address the question of how best to manage shrimp farming to ensure both social and ecological resilience in coastal areas in the Mekong Delta.

**Table 6.3.** (Potential) impacts of governance arrangements on coastal resilience

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*I. Organic shrimp certification*

- 1.1. Improving shrimp farmers' livelihoods through the diversification of sources of income.
- 1.2. Improving legitimacy of the auditing process for certifying organic shrimp to meet international market requirements.
- 1.3. Linking farm-level management of shrimp and mangroves with the level of the coastal landscape.

*II. Shrimp farmer clusters*

- 2.1. Improving farmers' livelihoods through income created by vertical contractualisation.
- 2.2. Upgrading small producers' position along the value chain.
- 2.3. Creating economies of scale for small producers.
- 2.4. Linking the farm-level management of water and disease control to the sustainable management of the coastal landscape.

*III. State mangrove forest policy and management*

- 3.1. Improving shrimp farmers' livelihoods through the diversification of sources of income.
  - 3.2. Linking farm-level management of mangroves to the sustainability of the coastal landscape.
- 

The governance arrangements not only affect ecological functions at different scales. The results of the study also show that two private governance arrangements may have an impact on the social resilience of coastal areas at different scales by operating through the value chain. In the case of organic shrimp certification, one of the (potential) impacts is that the implementation of value-chain governance arrangements may affect the legitimacy of the existing systems. Although shrimp farming in mangrove areas in Ca Mau province already shows "organic" characteristics (see chapter 3), the system requires a third-party auditor to legitimise its environmental soundness and to demonstrate to customers in foreign markets that the products are environmentally and sustainably produced. The premium for organic products can therefore only be generated when the farming systems are certified. In the case of farmer clusters, the main effect on the value chain is the creation of economies of scale in production, which is important for a fragmented chain as in Ca Mau. This governance arrangement also improves the relationships among actors along the value chain through vertical

contractualisation. The results of the research therefore show that such governance arrangements, although primarily focused on farm-level management, also affect the coastal landscape level through wider networks of control.

#### *6.4.3 Global-local links, economic risks and their effects on the resilience of coastal areas*

Water pollution and disease outbreaks are commonly cited as two of the main environmental problems associated with shrimp production in the Mekong Delta, but they also have severe consequences for the economic vulnerability of farmers. Economic vulnerability and uncertainty also result from global and local economic processes that have received much less attention in the literature addressing shrimp aquaculture and coastal resilience. The global economic downturn in 2008 led to a reduction of shrimp exports. At the same time, both the EU and US markets have become increasingly stringent because of Sanitary and Phytosanitary measures (SPS). Moreover, shrimp-farming governance in the Mekong Delta is influenced by external factors, such as the consumer requirements with respect to safety and environmentally sound products through certification systems and international conventions (cf. Ponte and Gibbon, 2005). These global economic risks directly affect the practices of shrimp farmers in the Mekong Delta, thereby indicating the importance of a global value-chain approach to understanding the relationship between local social-ecological resilience and globalisation.

Certified shrimp farmers in Tam Giang and Tan An clearly faced the risk of receiving a lower income than the non-certified farmers for the same amount of product for two reasons: first, the strategy of lowering the farm gate price to avoid mixing non-certified with certified products applied by processing companies and second, the long period of time required for premium payments after export combined with the low percentages that they receive from the premium price. If a discounting factor were applied, this risk would be even more obvious. Another issue for certified farmers is the risk of rising costs if they have to pay for auditing costs, which are now paid by SIPPO. One of the main institutional barriers that may exclude small producers from participating in certification schemes is the cost of auditing, which is often costly. If SIPPO ceases to subsidise the auditing costs, the shrimp farmers will no longer participate in the scheme. Moreover, certified shrimp farmers may have to face the global economic crisis, which may lead to difficulties in locating markets for organic products. All of these effects may potentially harm the income and livelihoods of shrimp farmers and thus jeopardise the social-ecological resilience of the coastal areas.

These economic risks resulting from the global-local links raise numerous issues. First, there is the question about the roles of the external auditors and international traders/importers in establishing lasting governance arrangements aimed at resilience

in the delta. What are the reasons and motivations for the auditors and traders/importers to invest in the new governance arrangements, such as certification for the purpose of coastal area sustainability? A related question is what challenges changing consumer preferences pose to the governance arrangements in relation to the concern over the delta's resilience? A second issue is the role of the government in maintaining its control over the sector within the context of globalisation. What challenge does the Vietnamese government faces in maintaining its sovereignty? Answering these questions requires additional research to understand the global-local link and its effects on the social-ecological resilience of coastal areas such as the Mekong Delta.

#### *6.4.4 Governance in the context of social relations and its implications for resilience*

The literature on governance and resilience focuses on the adaptive capacity of people and institutions in social-ecological systems to develop resilience through collective actions (Walker et al., 2004). An adaptive governance framework proposes collaboration between a diverse set of stakeholders operating at different scales in multi-level institutions and organisations (Olsson et al., 2004). Social relations among these stakeholders play an important role in supporting flexible institutions and social networks in multi-level governance systems, as one of four essential aspects of adaptive governance (Folke et al., 2005). A final governance challenge, or paradox, emerges. Social relations that have developed over time around an activity such as shrimp farming might not foster resilience but can be sustainable in their own right. Numerous examples of this arrangement emerge from this thesis, from trade relations between farmers and middlemen to political ties behind the success of cluster formation. External intervention by the government or market actors, as prescribed in this thesis, then faces the challenge of intervening in these social relations and raises questions about what these interventions might mean for the social dynamics of resilience.

In the case of the Nhi Nguyet intensive shrimp-farmer cluster, it is clear that its success is strongly influenced by the existing social relations of a group of farmers with political and commercial interests. One of the founding cluster members was a member of the national parliament. Given his past political affiliations, he continues to have a good relationship with processing companies, input providers and government staff. His involvement affects the ability of the cluster in obtaining favourable input and output contracts with other actors along the value chain by increasing the cluster's bargaining power. His position also influences the decisions by the government staff to invest in infrastructure for the intensive shrimp-farmer cluster. The case is similar to that of pangasius production in the Mekong Delta, where Belton et al. (2011) concluded that "private economic activity is deeply embedded in informal relations with the state

bureaucracy in Vietnam” (p.567). The case also shows that power is an intrinsic aspect of the social relations within social networks.

The case of Naturland organic certification, in contrast, shows the strength of the patron-client relationship within the social networks of shrimp production. The results from the interviews with shrimp farmers in the sites of organic shrimp certification show that there are numerous certified shrimp farmers who are not satisfied with the premium payment for their certified products, but they still sell to organic collectors. However, the non-certified shrimp farmers also sell their products to organic collectors. In the study sites, it is common for shrimp farmers to borrow money from collectors without interest but with an unwritten contract that they must sell shrimp harvested to these collectors. Moreover, there is no difference between the price from collectors and the market price. Their relationship developed over a long period of time and is maintained through the social capital and trust between them. This arrangement demonstrates that the social relations established between shrimp farmers and collectors are flexible and present a win-win situation that benefits both parties. The functioning of these long-standing relationships may also affect the traceability of organic shrimp products when collectors source shrimp from both certified and non-certified farmers and mix them together. Similarly, in intensive shrimp farming, the shrimp farmers have closer relations with the input providers in term of information and technical transfer than with the state aquaculture services.

As Tran (2012) outlines, these social relations help to shield the livelihood of shrimp farmers and thus contribute to the social resilience of coastal communities. However, it is difficult to characterise these effects for the social-ecological resilience of the coastal Mekong Delta. The results of the research show that neither state nor market regulations can intervene in the (informal) social relations that exist in the networks. The governance arrangements and their effect on the social-resilience of coastal areas must therefore be analysed within the context of existing the social relations wherein state and non-state actors play their roles. Understanding these social relations within shrimp production and trade will contribute to a better implementation of the governance arrangements.

## **6.5 Final comment**

This thesis has demonstrated that both the material conditions and social relations of shrimp farming affect the effectiveness and responsiveness of governance arrangements aimed at maintaining rural livelihoods and environmental sustainability. The results also show that governing shrimp aquaculture in the Mekong Delta is increasingly a balancing act between externally led global market demands and consumer concerns for the improved environmental and social performance of tropical

shrimp production and the government's interests in maintaining sovereign control over the shrimp industry. This study has shown that all of the cases of shrimp-farming governance appear to have overcome the public-private divide by fostering complex regulatory networks. In this context, the Vietnamese government is embarking on a new era of *Đổi mới*, or renovation, where the state is positioned as a *facilitator* rather than a regulator of a global private governance arrangement. For this process to benefit Vietnam, the effect of these governance arrangements and the social-resilience of coastal areas must be understood in the context of the existing social relations between shrimp production and trade. Only then will the risks and vulnerabilities for shrimp farmers and coastal habitats be adequately addressed.

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# Annexes



Intensive shrimp farming system in Tan Duyet commune, Dam Doi district, Ca Mau province

## Annex 1

### Monthly recording of shrimp farming household

Month.....year.....(Lunar month)

#### 1. GENERAL INFORMATION

HH' leader name:.....

Hamlet:.....Commune:.....District:.....

Type of farming systems:

Intensive

Improved extensive

Integrated shrimp-mangrove

Total area: .....ha

Forest:..... ha

Pond:.....ha

Member of shrimp farmer cluster: Yes  No

#### 2. POND PREPARATION

- Cost :.....VND

- Time for pond preparation: From date..... to date.....

#### 3. STOCKING

- Where to buy shrimp seed (Name & address)?.....

- Did you test the shrimp seed? Yes  No

If yes, - where?.....

- who pay the cost of testing?.....

- Number of shrimp seed:..... - Price:.....VND/unit

#### 4. FEEDING

- Did you feed shrimp? Yes  No

- If yes:

+ Amount of feeding?.....kg/day

+ Cost for feeding: .....VND/kg

+ Type of feed:.....

+ Where did you buy (get) feed?.....

## 5. OTHER COSTS

- Lime: .....VND/month

- Saponin (for killing trash fish in shrimp pond).....VND/month

- Bio-product or enzyme (for sustaining water quality).....VND/month

- Gasoline and oil .....VND/month

- Others (if applicable).....VND/month

## 6. HARVESTING

Time of harvesting	Size of shrimp	Production		Price (VND/kg)
		Number of shrimp pieces	Weigh (Kg)	
First harvest	20 pieces/kg			
	30 pieces/kg			
	Trash shrimp			
	Others			
Second harvest	20 pieces/kg			
	30 pieces/kg			
	Trash shrimp			
	Others			
Other time of harvest (Using <i>Lu</i> )	20 pieces/kg			
	30 pieces/kg			
	Trash shrimp			
	Others			

## 7. SELLING SHRIMP

- To whom did you sell the shrimp?

- Small collector

- Big collector

- Trading company

- Processing company

- Other (mention if applicable).....

- Why did you sell to him (her)?

- Having loan from them
- Getting higher price compare to others
- Getting payment immediately
- Keeping good relationship
- Relative/friend
- Other (mention if applicable).....

- Payment time:            Immediately                       Later on

If later, when? .....

**7. OTHER INFORMATION:**

- Did you borrow money for shrimp culture?    Yes                       No

If yes, from who?.....Interest rate:.....

Purposes of the loan:.....

Amount of money to pay for interest every month or every quarter?.....

- Have your shrimp got disease in this month?    Yes                       No

If yes, how did you deal with the problem? .....

Estimating loss (%):.....

- Did you join any training in this month?            Yes                       No

If yes, who is organizer?.....

Content of the training?

- Introducing new techniques of shrimp farming
- Improved techniques of current shrimp farming
- Water exchange and management
- Drug/chemical use
- Feeding
- Water testing techniques
- Market/price information
- Other training (mention clearly if applicable).....

- Do you think that this training is useful?    Yes                       No

Explain your reason:.....

- Did you share shrimp farming experience with other farmers this month?

Yes

No

If yes, what are the information did you exchange?

- Introducing new techniques of shrimp farming
- Improved techniques of current shrimp farming
- Water exchange and management
- Drug/chemical use
- Feeding
- Water testing techniques
- Market/price information
- Other training (mention clearly if applicable).....

- Do you think that this experience sharing is useful? Yes

No

Explain your reason:.....

### **8. OTHER REMARKS**

Please mention other remarks/comments that you think affect/important to shrimp production in this month



## Annex 2

### Household questionnaire for mangrove management

#### 1. GENERAL INFORMATION

HH' leader name:.....

Hamlet:.....Commune:.....District:.....

Total area: .....ha: Forest:.....ha Pond:.....ha

- Legal status of forest:

- Allocated forest (red book)
- Sub-contracted forest (green book)
- Leased forest (specified if applicable).....
- Other (specified if applicable).....

- Forest under management and control of:

- Local government
- Forest Management Board (FMB)
- Forestry Companies (FC)
- Other (specified if applicable).....

#### 2. FOREST PRODUCTION SYSTEM

- The year of plantation of the nearest harvesting.....

- Plantation methods:

- Planted by yourself
- Planted by the FMB/FC
- Planted by others (specified if applicable).....
- Integration of these two methods
- Other (specified if applicable):.....

- Density at plantation (trees/ha):.....

- Do you get any supports from the government for plantation?

- Capital

- Seedlings
- Techniques
- Others (specified if applicable).....

- Estimated the cost over forest production, from plantation to harvesting:.....VND
- The nearest year of harvesting mangroves:.....
- Density at harvesting (trees/ha):.....
- Harvesting methods:
  - Clear cutting
  - Selective cutting
  - Group cutting
  - Other (specified if applicable).....
- Harvesting production (m<sup>3</sup>):.....
- Who calculated this production?:.....
- Income from selling mangroves from harvesting?.....VND
- Benefit sharing policy:.....
- Estimated income from shrimp farming (VND/year):.....

**3. FOREST MANAGEMENT STRATEGY AND DECISION MAKING**

- Your perception on mangrove value (you can select more than one option):
  - Value of wood to sell in the market
  - Good environment for shrimp
  - Domestic use of wood
  - Others (specified if applicable):.....
- Did you decide to harvest forest and to make management cycle depending on (in priority from 1-3):
  - Forest age
  - Timber price in the market
  - Family's economic status

- Related to shrimp farming
- Benefit sharing policy with FMB/FC
- Banking interest rate
- Government's policy
- Decisions of adjacent households
- Others (specified if applicable).....

- If you have full right on cutting mangroves, you will:

- Cutting all mangroves for shrimp farming
- Maintaining the status quo
- Reducing forest areas for increasing shrimp pond areas
- Others (specified if applicable).....

- The reasons behind this cutting decision (if you have right):

- No mangrove no shrimp
- Increasing shrimp pond to gain more money
- High density of mangrove is not good for shrimp
- Woods have high value
- No mangrove higher shrimp production
- Others (specified if applicable):.....

- Are you satisfied with benefit sharing policy applied by FMB/FC?

- Yes, please give your reason:.....
- No, please give your reason:.....

- Please give suggestions for better mangrove management in your location?:.....

.....



## ***Summary***

The Mekong Delta is one of seven ecological regions in Vietnam as well as an essential habitat for many plant and animal species within the Mekong River Basin. The Delta region consists of 13 provinces and accounts for about 80 percent of shrimp production of the Vietnam. Aquaculture and shrimp products are internationally traded and the shrimp farmers are firmly embedded in a global system of production and trade. The growth of shrimp aquaculture, in addition to population growth and higher levels of investment, has left coastal resources in the Mekong Delta increasingly vulnerable to rapid changes in land and resource use. With government support focused on export-led trade, the vulnerability of producers to global market perturbation and policies has also increased. Shrimp farming is also deemed as a high-risk activity because of the spread of disease, the vulnerability of shrimp farmers to price fluctuations and, consequently, the vulnerability of shrimp-based livelihoods. The shrimp industry, made up of multiple stakeholders and fragmented market chains, is also now subject to a range of attempts to move towards more sustainable and/or responsible shrimp aquaculture. While striving for improved environmental performance to reduce bio-physical variability in production these governance systems have also brought stringent requirements for producers that determine their ability to access international markets.

The general objective of this research was to investigate the interactions between existing state and non-state actors and institutions governing the shrimp industry to develop a more informed understanding of how state, market and community-based governance arrangements at different levels influence decision-making in shrimp aquaculture in coastal areas of the Mekong Delta of Vietnam. The general research question focuses on how different material conditions and social relations affect the effectiveness and responsiveness of governance arrangements aimed at achieving the multiple goals of maintaining rural livelihoods, environmental sustainability and improved food quality.

The research was conducted in Ca Mau province in Vietnam, where a large part of the shrimp industry is concentrated. Data were collected from shrimp farmers, traders, government officials, and representatives of non-governmental organisations and farmer cooperatives.

The second chapter highlights two key transformations of Vietnamese shrimp aquaculture policy in Ca Mau province. The first transformation is an internal policy shift from quantitative to qualitative state-defined production goals. The second transformation is in response to market demands, but is directed to the emergent

'quality' concerns with respect to the environmental and social impacts of tropical shrimp aquaculture. Our results indicate that this second governance shift has created a new set of challenges for the government as it is positioned within the context of global market and (environmental) advocacy networks. Together these two transformations present a complex balancing act between externally-led global market demands and consumer concerns with respect to the improved environmental and social performance of tropical shrimp production, and the government's interests in maintaining sovereign control over the shrimp industry. The results also show that the Vietnamese government should not only position itself as a controlling force but also as a *facilitator* of global private governance arrangements, especially as farmers and global market actors are engaged in transnational regulatory networks, which become operational at local scales. Moreover, the state needs to give far more attention to market incentives for fostering the participation and compliance of farmers in these transnational regulatory networks.

The third chapter analyses the case of Naturland organic certification and its implementation in meeting the government's plan to create an organic coast scaling up the organic farming along southern part of Ca Mau by 2015. The results shows that Naturland certification appears to overcome the state-private divide by ensuring that both landscape-scale forest management and farm level aquaculture practices are reciprocal; with state legislation and mandatory production standards aligned with the incentives offered by an organic export market. Our results support the claim that organic certification can provide a means of linking farm-level management to the sustainability of landscapes dominated by the shrimp-forest integrated farming system in Ca Mau. However, this is only achievable if certain challenges are overcome. The first challenge is the tension between farmer practices and externally defined and regulated quality standards. The second challenge is to ensure that economic benefit are shared between actors in the organic certified value chain; the low price premium for organic shrimp in Ca Mau has emerged as a key source of tension stemming from the imbalance of power between the retailers and small producers, and the imbalance between environmental concerns and the consumer's economic welfare. Finally, the level of legitimacy given to private sector led auditing systems needs to be addressed. The results demonstrate that participation, auditing and supply chain management are all important functions of the Internal Control System (ICS), which in their current make-up appear to be hindering the sustainability of the certification scheme.

The thesis then explores (Chapter 4) the development of shrimp farmer cooperatives and clusters by the government based on a policy to explicitly increase the competitiveness of the sector in the international market and to improve economic conditions for small producers. The results shows that vertical contractualisation under

the form of contract farming between farmer cluster with up and downstream chain actors results in economic benefits for small-holder producers engaged in intensive production. The improved extensive system, however, gives further impetus to determining how cooperative forms of production might assist smallholders to complying with production-oriented quality standards, which in turn may also improving market performance. Although possibilities exist for small-holder improved extensive farmers to establish vertical contractualisation with other actors along the value chain they are less able to do so than intensive farmers. The cases therefore support the claim that the development of shrimp farmer clusters should not solely focus on increasing production efficiency but also on successful integration into the value chain; producing high-quality and safe products, and engaging in sustainable on-farm management practices.

The final case study (Chapter 5) looks at shrimp farming in the broader context of promoting ecological function in integrated shrimp-mangrove farming systems. Attention is given to how incentives are generated for shrimp farmers to plant and protect mangroves by analysing farmer's decision-making and their perspective on mangroves in relation with state-based governance arrangements, the forest allocation and benefit sharing policies. The results show that farmer's perception on the role and value of mangroves are positive and they are willing to plant and protect mangroves both for economic and environmental reasons. Moreover, they want to have control over mangroves although forests are still under the state regulation. However, farmer's decision-making is very much influenced by the way in which the forest benefit sharing policy is implemented by the state-led forest management boards and forest companies. The results show that the perception of shrimp farming as the main cause of deforestation and degradation should be reevaluated in the context of the integrated shrimp mangrove production system because farmers income is improved if mangroves are an integral part of the production system. Instead, the evidence shows that shrimp farmers are potentially the best stakeholders to plant, protect and manage mangroves if they have full rights and responsibilities over forests. Seen as such, shrimp farming is potentially a mangrove-friendly source of revenue, which also promotes the planting and protection of mangroves.

Governance is a political process that deals with how power is distributed between stakeholders, allowing different groups to participate, control and use resources in a way transparent to all others involved. The four case studies clearly demonstrate that market-based and state-based governance processes over natural resources in Vietnam are increasingly interdependent, linked by locally and globally scaled forces that create and regulate flows of information, commodities, and finance.



State and non-state governance arrangements, with their associated political, social, cultural and environmental histories, resulting from these global-local dynamics influence decision-making over aquatic resource use, regulation and management. The research therefore provides a scientific basis for recommendations concerning improved governance arrangements both across coastal environments and socio-political national and international scales.

As governance is a response to the complexity and multi-layered nature of environmental problems, action should take account of the interactions between these scales. Consequently, linking scaling to governance therefore is an important issue for the improvement of environmental management and policy. In this context, resilience defined as the capacity of social and ecological systems to absorb disturbance and still retain their basic function and structure is an important concept as it is closely linked to the sustainability of society and their respective environments. The results show that all three governance arrangements have a (potential) impact on the ecological resilience of coastal areas in which they present a means of linking farm level management to the sustainability of the coastal landscape. The shrimp farmer cluster model can be seen as a means to link farm-level management of water and disease control, and the state forest policy of linking farm-level management of mangroves to the coastal landscape level. Finally, organic certification can provide a mean of linking farm-level management to the sustainability of landscapes by both shrimp farming and mangrove management at farm-level.

The results of the research also show that two private governance arrangements hold (potential) consequences for the social resilience of coastal areas both in terms of linking to environmental processes in coastal areas and in global value chains. Certification holds the potential to affect the legitimacy of existing systems. In the case of farmer clusters, the main effect to the value chain is the creation of economies of scale for smallholders. This has particular importance for improved extensive shrimp farmers who operate in a more fragmented chain than intensive farmers do. Clusters also improve the (horizontal) relationship among farmers as well as provide a basis for better (vertical) value chain coordination. The results show that although all governance arrangements consider farm-level management as the object of regulation they hold the potential to impact the management of the coastal landscape. In doing so they hold the capacity to positively affect the social-economic resilience of the industry and coastal areas, but in many cases they have not yet reached their full potential.

To reach their potential in steering Vietnamese aquaculture to maintaining rural livelihoods, environmental sustainability and improved food quality, and therefore a form of social-ecological resilience, a number of challenges need to be overcome. These

can be classified into three groups. First, (negative) perceptions about the needs and abilities of shrimp farmers have to be changed. Second, the imbalance in power relations between farmers and other actors that leads to unfair benefit share for farmers needs to be transformed. Third, the challenge of monitoring and steering the value chains needs to be addressed by the changing roles of the government. The governance arrangements and its effect to social-resilience of coastal areas have to be analysed within the context of existing social relations where state and non-state actors each have to play their own roles.



## ***Samenvatting***

De Mekong Delta is een van de zeven ecologische regio's in Vietnam en een belangrijke habitat voor vele planten en dieren in het Mekong stroomgebied. De regio bestaat uit dertien provincies en is verantwoordelijk voor ongeveer 80 procent van de garnalenproductie van Vietnam. Aquacultuur- en garnalenproducten worden internationaal verhandeld en garnalenkelters zijn een integraal onderdeel geworden van een mondiaal systeem van productie en handel. De groei van aquacultuur van garnalen, naast bevolkingsgroei en hogere investeringen, heeft tot gevolg dat de hulpbronnen in de kustzones van de Mekong Delta in toenemende mate onder druk staan door de snelle veranderingen in het gebruik van land. Met overheidssteun zijn de producenten zich gaan richten op exporthandel en daardoor is ook de kwetsbaarheid van producenten voor verstoringen op de globale markt en internationaal beleid ten aanzien van aquacultuur en garnalen toegenomen. Garnalenkweek wordt ook gezien als risicovol, vanwege de spreiding van ziekten, de kwetsbaarheid van producenten voor prijsschommelingen, en, als consequentie, de bestaansonzekerheden voor de kleinschalige garnalenteilers. De garnalenindustrie, bestaande uit een veelheid aan belanghebbenden en gefragmenteerde marktketens, is nu onderwerp van een reeks aan (beleids)initiatieven om te komen tot een meer duurzame en/of verantwoordelijke garnalenkweek. Hoewel er gestreefd om te komen tot verbeterde milieuprestaties om de bio-fysische variabiliteit te verminderen, brengen deze nieuwe sturingssystemen, ofwel *governance arrangementen*, ook stringentere eisen voor kleine garnalenproducenten met zich mee, wat invloed heeft op hun toegang tot internationale markten.

De doelstelling van dit proefschrift is de interacties tussen bestaande overheids- en non-gouvernementele actoren en instituties te onderzoeken, om te komen tot een beter begrip van de manieren waarop de besluitvorming in de garnalenkweek in de kustzones van de Mekong Delta in Vietnam wordt beïnvloed door verschillende *governance* arrangementen die voortkomen uit de interacties tussen staat, markt en leefgemeenschappen op verschillende niveaus. De centrale vraagstelling is: hoe hebben verschillende materiële condities en sociale relaties een invloed op de effectiviteit en responsiviteit van *governance* arrangementen die meerdere doelen hebben, zoals het komen tot duurzaamheid op het gebied van rurale leefomstandigheden en milieu, en een verbeterde voedselkwaliteit.

De studie richtte zich met name op de provinci Ca Mau, waar een groot deel van de Vietnamese garnalenproductie is geconcentreerd. Hier werden data verzameld bij een groot aantal garnalekwekers, tussenhandelaren, overheidsambtenaren, vertegenwoordigers van niet-gouvernementele organisaties en boerencoöperaties.

In het tweede hoofdstuk worden twee belangrijke transformaties in het beleid van de Vietnamese garnalenkweek in Ca Mau provincie belicht. De eerste transformatie is een interne beleidsverandering van kwantitatieve naar kwalitatieve productiedoelen die door de staat worden gesteld. De tweede transformatie is in reactie op de marktvraag, maar gericht op de toenemende zorgen over 'kwaliteit' ten aanzien van de milieu- en sociale effecten van tropische garnalenkweek. Onze bevindingen laten zien dat door deze tweede verandering in het *governance* systeem de overheid voor een reeks nieuwe uitdagingen wordt gesteld, omdat zij hier een tussenpositie krijgt met aan de ene kant mondiale markten en netwerken van (milieu-) belangenbehartiging met aan de andere kant de nationale garnalenindustrie. Tesaamen leiden deze twee transformaties tot een complex samenspel tussen, enerzijds, de externe vraag-op mondiale markten en de behoefte van consumenten aan betere milieu- en sociale prestaties van de tropische garnalenindustrie, en, anderzijds, het overheidsbelang gelegen in het handhaven van de soevereine controle over de garnalenindustrie. De resultaten geven aan dat de Vietnamese overheid zich niet alleen zou moeten positioneren als controleur maar ook als facilitator van mondiale, private *governance* arrangementen, met name als garnalenproducenten en mondiale marktactoren betrokken zijn in transnationale netwerken van wet- en regelgeving welke geoperationaliseerd worden op lokaal niveau. Daarnaast zal de staat meer aandacht moeten hebben voor marktprikkels om participatie boeren in deze transnationale netwerken te bewerkstelligen en naleving van wetgeving te bevorderen.

Het derde hoofdstuk geeft een analyse van de casus van de organische certificering van Naturland en de uitvoering hiervan. Organische certificering wordt bevorderd om tegemoet te komen aan de internationale vraag naar organisch geproduceerde garnalen en het overheidsplan om de organische teelt van garnalen in het zuidelijke deel van Ca Mau tussen nu en 2015 op te schalen. De resultaten laten zien dat de certificering van Naturland de kloof tussen staat en het private domein lijkt te overbruggen door ervoor te zorgen dat er wederkerigheid is tussen het beheer van mangrove op landschapsniveau en aquacultuurpraktijken op bedrijfsniveau, en door regelgeving en verplichte productiestandaarden gelijk te trekken met de prikkels die worden geboden door de organische exportmarkt. Onze bevindingen bevestigen de stelling dat organische certificering een middel kan zijn om management op kwekerijniveau te verbinden met het duurzaam beheer van het landschap in Ca Mau dat gekarakteriseerd wordt door de integratie van mangrovebos en garnalenteelt in één agrarisch systeem.

Dit kan echter alleen worden bereikt als er bepaalde problemen worden overwonnen. De eerste uitdaging is het spanningsveld te overbruggen tussen lokale

teeltpraktijken en extern gedefiniëerde en gesanctioneerde kwaliteitsstandaarden. De tweede uitdaging betreft de redelijke verdeling van het economische voordeel over de verschillende actoren in de marktketen van organische certificering; de geringe meerwaarde die telers van organische garnalen in Ca Mau krijgen, heeft zich ontwikkeld tot een belangrijke bron van spanningen. Deze ongelijke verdeling komt voort uit de machtsongelijkheid tussen tussenhandelaren en kleine producenten en de scheve balans van de belangen van kleine garnalenproducenten met milieubelangen en de economische welvaart van de consument. Ten slotte moet er meer aandacht worden gegeven aan de legitimiteit die wordt verleend aan door de private sector geleide auditingsystemen. De uitkomsten tonen verder aan dat participatie, auditing en ketenmanagement belangrijke elementen zijn van het *Internal Control System* (ICS) dat, in de huidige vorm, de verduurzaming van de certificering in de weg lijkt te staan.

In het proefschrift (hoofdstuk 4) wordt vervolgens de ontwikkeling van coöperaties van garnalen-producenten verkend, alsmede door de overheid georganiseerde clusters van producenten die zijn gebaseerd op een beleid dat expliciet de toename van de competitiviteit van de sector op de internationale markt en de verbetering van de economische condities voor kleine producenten nastreeft. De resultaten geven aan dat verticale contractualisering in de vorm van contractteelt tussen clusters van garnalenteelers met actoren uit beide kanten van de marktketen leidt tot economisch voordeel voor kleine producenten met een intensief productiesysteem. Het verbeterde extensieve systeem geeft verder een stimulans aan de ontwikkeling van coöperatieve productievormen die kleine producenten kunnen ondersteunen om zich te kunnen houden aan productie-georiënteerde kwaliteitsstandaarden, welke op hun beurt de toegang tot de internationale markt van deze producenten kan vergroten. Hoewel er mogelijkheden zijn voor kleine extensieve producenten om verticale contractualisering met andere actoren in de marktketen te realiseren, zijn zij minder in staat om dit te bewerkstelligen dan intensieve telers. Deze casus bevestigt zodoende de stelling dat de ontwikkeling van clusters van garnalenkwekers niet alleen gericht moet zijn op het verbeteren van de efficiëntie van de productie, maar ook op een succesvolle integratie in de marktketen, het produceren van veilige producten van hoge kwaliteit en betrokkenheid bij het bevorderen van duurzame beheerspraktijken op de werkvloer van de bedrijven.

De laatste casus bekijkt garnalenteelt in de bredere context van de bevordering van de ecologische functie in het agrarisch systeem dat het beheer van mangrovebos met garnalenteelt combineert. De nadruk in dit hoofdstuk ligt op het zoeken naar de manieren waarop marktprikkels voor garnalenproducenten kunnen worden gegeven waardoor zij mangroves planten en beschermen. Dit wordt gedaan via een analyse van

de besluitvorming van garnalenproducenten en hun percepties van mangroves in relatie tot overheidgestuurde *governance* arrangementen, met betrekking tot de verkaveling op bedrijven en de verdeling van de winst uit de opbrengsten van de exploitatie van mangroves. De uitkomsten tonen aan dat de perceptie van de producenten op de rol en waarde van de mangroves positief is, en dat zij bereid zijn om mangroves te planten en te beschermen om zowel economische als milieuredenen. Daarnaast is het hun wens om de mangroves beheren, hoewel de bossen nog steeds vallen onder de wet- en regelgeving van de staat. De besluitvorming van garnalenteelers is echter sterk afhankelijk van de manier waarop het beleid met betrekking tot de winstdeling uit de inkomsten van de exploitatie van de mangrovebossen, wordt geïmplementeerd door staatgestuurde bosbeheerbesturen en bosbouwbedrijven. De studie laat zien dat, in de context van het integrale model van garnaalteelt en mangrovebeheer, het idee dat garnalenproductie de belangrijkste oorzaak is voor ontbossing en verval moet worden herzien, omdat het inkomen van de kwekers toeneemt als mangroves onderdeel zijn van het productiesysteem. Hiermee wordt bewezen dat garnalenkwekers in potentie de meest belanghebbenden zijn om de mangroves te planten, beschermen en beheren als zij de volle rechten en verantwoordelijkheden over de bossen zouden hebben. Vanuit dit perspectief is extensieve garnalenproductie potentiëel een mangrove-vriendelijke bron van inkomsten die ook kan bijdragen aan de ontwikkeling en bescherming van de mangroves.

*Governance* is een politiek proces dat gaat over hoe macht is verdeeld tussen belanghebbenden, waarbij verschillende groepen kunnen participeren en controleren, en gebruik kunnen maken van hulpbronnen, op een manier die transparant is voor alle betrokkenen. De vier casussen geven duidelijk weer dat in Vietnam marktgeleide en staatgestuurde *governance* processen over natuurlijke hulpbronnen in toenemende mate van elkaar afhankelijk zijn, verbonden door krachten werkzaam op lokaal en mondiaal niveau die informatie-, goederen-, en financiële stromen creëren en reguleren. Institutionele arrangementen vanuit de overheid en niet-gouvernementele organisaties geïnitieerd, met de daarbij horende politieke, sociale, culturele en milieuachtergronden, voortkomend uit deze dynamiek tussen lokale en mondiale processen, beïnvloeden de besluitvorming over het gebruik, regelgeving en management van aquatische hulpbronnen. Het onderzoek geeft daarom een wetenschappelijke basis voor aanbevelingen betreffende de verbetering van *governance* arrangementen voor kustgebieden en sociaal-politiek terrein op nationaal en internationaal schaalniveau.

Aangezien deze *governance* arrangementen een reactie zijn op de complexiteit en veelzijdige aard van milieuproblemen, zal in bij de implementatie van deze aanbevelingen rekening met deze niveaus moeten worden houden. Het maken van verbanden tussen

schaalniveaus door middel van *governance* arrangementen is een belangrijk punt voor de verbetering van milieubeheer en -beleid. In deze context wordt het begrip ecologische veerkracht (*resilience*) gedefiniëerd als de capaciteit van sociale en ecologische systemen om verstoringen op te vangen en de basisfunctie en structuur te behouden, vaak gebruikt dat in relatie tot een debat over de duurzaamheid van de samenleving en de respectievelijke leefomgeving. De resultaten laten zien dat de drie bestudeerde *governance* arrangementen een (potentiele) impact hebben op ecologische veerkracht van kustgebieden waarin zij middelen bieden om management en beheer op bedrijfsniveau te koppelen aan de duurzaamheid van het kustlandschap. Het 'garnalenteelerscluster' model kan worden gezien als een middel om op bedrijfsniveau waterbeheer en ziektecontrole te verbinden, en door de overheid gestuurd bosbeleid geeft middelen om het management van mangroves op bedrijfsniveau te koppelen aan het niveau van het kustkustlandschap. Tot slot, organische certificering voorziet in het verbinden van management op bedrijfsniveau met de duurzaamheid van het landschap, door middel van zowel garnalenteelt als het beheer mangrovebos op het niveau van het bedrijf.

De resultaten van dit onderzoek laten ook zien dat twee private *governance* arrangementen (potentiële) gevolgen hebben voor de sociale veerkracht van kustgebieden, door de koppeling van milieuprocessen in kustgebieden met processen in mondiale marktketens. Certificering heeft de potentie om de legitimiteit van bestaande systemen te beïnvloeden. Uit de casus van de garnalenproducentenclusters blijkt dat het creëren van '*economies of scale*' voor telers het belangrijkste effect op de marktketen heeft. Dit is met name relevant in de verbeterde extensieve garnalenteelt, waarbij de producenten in een meer gefragmenteerde keten opereren dan in intensieve garnalenproductie. Clusters dragen ook bij aan de verbetering van (horizontale) relaties tussen producenten en leggen een basis voor een betere (verticale) coördinatie in de marktketen. De bevindingen wijzen uit dat, hoewel alle *governance* arrangementen het management op bedrijfsniveau als object voor regulering beschouwen, zij in potentie het duurzaam beheer van het kustlandschap kunnen beïnvloeden. Op die manier hebben zij de mogelijkheid om positieve invloed uit te oefenen op de sociaal-economische veerkracht van de garnalenindustrie en kustgebieden, maar in veel gevallen is dit potentieel nog niet ten volle benut.

Om de mogelijkheden in het sturen van de Vietnamese aquacultuur voor het behoud van ruraal levensonderhoud, duurzaamheid in milieutermen, en een verbeterde voedselkwaliteit, en daarmee een vorm van sociaal-ecologische veerkracht, te kunnen waarmaken, moet er een aantal problemen worden overwonnen. Deze kunnen worden geclassificeerd in drie groepen. Ten eerste, (negatieve) percepties ten aanzien van de



behoefden en vermogens van de garnalenkwekers moeten worden veranderd. Ten tweede, de ongelijke machtsverhoudingen tussen producenten en andere actoren, die leiden tot een oneerlijke winstverdeling voor de producenten, moeten worden verbeterd. Ten derde, de toekomst van de monitoring en sturing van marktketens moet worden geduid in het licht van de veranderende rollen van de overheid. De *governance* arrangementen en de effecten op de sociale veerkracht van kustgebieden moeten worden geanalyseerd in de context van bestaande sociale relaties waar overheid en non-gouvernementele actoren ieder hun verschillende rol hebben.

## ***About the author***

Tran Thi Thu Ha was born on May 25<sup>th</sup> 1972 in Quang Ninh province, Vietnam. She obtained her bachelor degree in Forestry in 1994 at Vietnam Forestry University with a specialisation in Forestry Economics and Management. From September 1994 to March 1997 she worked at the Central Highland Forestry Technical School, Pleiku city, Gia Lai province teaching Social Forestry. Since April 1997 she has worked at the Department of Economics, Faculty of Economics and Business Management, Vietnam Forestry University, Ha Noi, Vietnam. Her teaching subjects are Environmental Economics for BSc and MSc students in the Economics major; and Social Aspects of Natural Resource Management for BSc students in Natural Resource Management major.

In June 2000 she received a Post-graduate diploma in Rural Extension and Teaching from Larenstein International Agricultural College, Deventer, the Netherlands. In January 2003 she received a Master of Science degree in Tropical Forestry with a specialisation in Social Forestry at Wageningen University, the Netherlands. In February 2007 she received a fellowship to do PhD from *Interdisciplinary Research and Education Fund* (INREF) of Wageningen University, the Netherlands through the *Rebuilding Resilience of Coastal Populations and Aquatic Resources (RESCOPAR)* project. Her PhD thesis titled *Global and local governance of shrimp farming in the Mekong Delta, Vietnam* belongs to the theme *Governance arrangements facilitating change in aquatic natural resource use* under the RESCOPAR programme supervised by Prof. Arthur P.J. Mol, Prof. Han van Dijk and Dr. Simon R. Bush. The most important results of her PhD research are presented in this thesis.



The author in Ca Mau province for her PhD fieldwork, 2010

## Completed Training and Supervision Plan

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Wageningen School  
of Social Sciences

Name of the activity	Department/ Institute	Year	ECTS*
<b>A) Project related competences</b>			
Proposal writing	WASS	2007	6
RESCOPAR* Social Science: Livelihood and Governance	RESCOPAR	2007 & 2009	6
<b>B) General research related competences</b>			
MGS introduction course	MGS	2007	1.5
CERES orientation course	CERES	2007	5
Presentation tutorials	CERES	2007	5.5
Complexity course in and between social and ecosystem	CERES	2007	3
Competences in for integrated agricultural research	CERES & RESCOPAR	2007	1
Governance cross borders	WASS	2007	3
Techniques for writing and presentation a scientific paper	WGS	2007	1.2
<b>C) Career related competences</b>			
WASS Multidisciplinary Seminar	WASS	2010	1
PhD Competence Assessment	WGS	2010	0.3
“Searching more incentives for shrimp farmers to plant and protect mangroves- Forest allocation and PFES from farmer’s perspectives”	CERES Summer School	2011	3
<b>D) Presentation at Conferences</b>			
“Global and local governance over shrimp farming in the Mekong Delta, Vietnam” (presentation research proposal)	DELTA 2007, Thailand	2007	1
“Transformations of Vietnamese shrimp aquaculture policy”	MARE Conference, the Netherlands	2009	1
“Can certification properly work and promote sustainable shrimp farming? Case of Naturland organic shrimp in Vietnam”	Can Tho University, Vietnam	2010	1
“Towards sustainable shrimp farming: Questioning the role of farmer cooperative and cluster models in the Mekong Delta, Vietnam”	Shanghai Ocean University, China	2011	1
“Global and local governance over shrimp farming in the Mekong Delta, Vietnam” (presentation main results thesis)	University of Bonn, Germany	2011	1
<b>Total ECTS</b>			<b>41.5</b>

\*One ECTS on average is equivalent to 28 hours of course work

\*RESCOPAR: Rebuilding Resilience in Coastal Populations and Aquatic Resources