Politics of Mangrove Restoration

Changing Policies and Strategies of Mangrove Restoration in the Central Coast of Vietnam

Hoang Hao Tra My

Consortium of Development Studies in Southeast Asia (CDSSEA)

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About the series

The Consortium of Development Studies in Southeast Asia has drawn on primary postgraduate research undertaken for theses from the master's programs of Chiang Mai University's Master of Arts in Social Science (Development Studies) (MASS); Chulalongkorn University's Master of Arts in International Development Studies (MAIDS); and the Asian Institute of Technology's Master of Science in Gender and Development Studies (MGDS). With a diversity of academic approaches (gender studies, political science, social sciences), the individual works of this collection have in common a focus on the increasing interconnection and regionalization of the five mainland Southeast Asian countries (Myanmar, Thailand, Laos, Cambodia and Vietnam), and examine these exchanges and encounters within the context of the Greater Mekong Sub-region (GMS).

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Series Foreword

The Regional Center for Social Science and Sustainable Development (RCSD) at Chiang Mai University has extended its publication program to include Master's dissertations from The Consortium of Development Studies in Southeast Asia (CDSSEA). The CDSSEA series covers mainland Southeast Asia: Myanmar, Thailand, Cambodia, Laos and Vietnam, and regionalization, development encounters and exchanges within the Greater Mekong Sub-region (GMS).

The CDSSEA program brings together resources and expertise from three of Thailand's leading institutions offering Master's degrees in development studies: Chiang Mai University's Master of Arts in Social Science (Development Studies) (MASS); Chulalongkorn University's Master of Arts in International Development Studies (MAIDS); and the Asian Institute of Technology's Master of Science in Gender and Development Studies (MGDS). Although the Consortium's program focuses on the relationship between development studies and social sciences, each of the programs has a different emphasis. The Chiang Mai degree focuses on social sciences and anthropological perspectives, with research interests in environmental and resource management, food security and local livelihoods, labour migration and trans-border issues, ethnicity and development, health, tourism, and agrarian transitions. Chulalongkorn's program concentrates on the political dimension of development, including democratization, human rights, conflict resolution, international and civil society development organizations, community development and globalization. The Asian Institute of Technology focuses on the relationships between gender and development—including women's rights, civil society, and gender dimensions of urbanization and industrialization.

The CDSSEA program has a practical dimension, building leadership capacity in mainland Southeast Asia's regional development, bringing together postgraduate students, encouraging debate, and promoting the rethinking of development alternatives in such areas as social equality, justice and participation, environmental and economic sustainability, and community development. In this regard, a major objective is to develop the knowledge and skills of development practitioners and to enhance the quality and effectiveness of policy-making and its implementation in the region.

The publications in this series—selected from the CDSSEA Master's program—are designed to express this diverse range of interests in development studies and regionalization, and to emphasize the relationships between empirical and theoretical research, policy-making and practice.

Victor T. King, Senior Editorial Adviser,
Consortium of Development Studies in Southeast Asia series

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Abbreviations

DDARD	District Department of Agricultural and Rural Development
DDFP	District Department of Forest Protection
FIPI	Forest Inventory and Planning Institute
GIS	Geographic Information System
MARD	Ministry of Agriculture and Rural Development
MONRE	Ministry of Natural Resources and Environment
NTFPs	Non-Timber Forest Products
QPPC	Quang Phong People Committee
QPFA	Quang Phong Farmer Association
QTFAE	Quang Trach Forestry-Agriculture Enterprise
PTAC	Phong Tan* Agricultural Cooperative
PTPC	Phong Tan People Committee
PTVA	Phong Tan Veterans Association
PTEA	Phong Tan Elderly Association
PES	Payment for Ecosystem Service
PPC	Province People Committee
REDD	Reducing Emissions from Deforestation and Forest Degradation
RS	Remote Sensing
SFE	State Forest Enterprise

1 "sao" = 500 m^2 in Central Coast of Vietnam

1 USD = 21,000 VND

* *Phong Tan is the old name of Quang Phong*

Acknowledgements

Sitting here writing this acknowledgement, all of my memories during the past two years return to my mind. Earning this master degree from Regional Center for Social Science and Sustainable Development (RCSD) is one of my big successes in life during the last 25 years.

Life is never smooth and success is a goal that feels like a long way away. It needs to be built up step by step and day by day. Also, life is meaningless without experience and part of my life in RCSD is filled with interesting experiences. It helped me to become more mature, open my eyes and reshaped the way I see the world. Being an M.A student in one of the most famous programs of Social Science in Thailand and Southeast Asia (SEA) gave me many opportunities to participate in conferences, workshops, and interesting fieldtrips as well as interact with top scholars in the social sciences. However, I also experienced difficult times, as a forestry engineer who managed one subject in General Social Science during my undergraduate study, I experienced difficulties in understanding social sciences papers during my first two months at RCSD. In addition, studying in English made the challenge even greater. These problems have been overcome thanks to the helpful support from many kind people. It is said that during your lifetime, you will face many challenges but if you can tackle them with a belief in yourself and some people are willing to support you, anything can be achieved. Therefore, I would like to give my deep gratitude to those people as follows,

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Hoang Hao Tra My

Chapter 1

Introduction

Background and Research Problem

As an undergraduate forestry student, I had the opportunitiy to participate in a variety of projects related to natural resource management in upland and coastal areas in the Central Coast region of Vietnam. I realized that forest management in mountainous areas is different from coastal areas because of not only the geography, history or people, but also the local customs. The way highlanders and lowlanders use their local knowledge to manage their resources impressed me. However, they still did not know how to combine their own knowledge with scientific knowledge for a better solution under the era of modernization. Therefore, my undergraduate thesis concentrated on the linkages between forest cover change and shifting cultivation practices to demonstrate that shifting cultivation is not only a reason for deforestation but also a traditional practice of indigenous people, and that decision makers should take this problem into account. Now, as a graduate student in the development field, I want to examine the issue of how political, historical, and social contexts link with local knowledge in the coastal area through a case study of mangrove restoration in the Central Coast region of Vietnam.

Mangrove forests are ecosystems that occur along most tropical and subtropical coastlines and are considered to be one of the most important ecological and socio-economical sources for coastal communities (Alongi, 2014). Mangrove forests not only provide habitats for many marine species and

act as a natural barrier to protect local villages from natural disasters (Dahdouh-Guebas and Koedam, 2008), they are also a source of income for local people, such as firewood, medicine, fish, and crabs (Alongi, 2014). In addition, it is believed that mangrove ecosystems play a crucial role for both climate change adaptation and mitigation. Although mangroves occupy only a small percentage of the global coastal area, they have high capabilities for carbon sinks and carbon sequestration (Hongxiao Liu et al., 2014). Their contribution to carbon sequestration is now interpreted as a tool for conservation and a way to help reduce greenhouse gas emissions (Alongi, 2014).

However, mangrove forests are endangered ecosystems and they are being degraded dramatically (Valiela et al., 2001; Nguyen Tai Tue et al., 2014). Mangrove forests are being destroyed and degraded by unsustainable harvesting and unsustainable coastal development projects (Dahdouh-Guebas and Koedam, 2008) as well as natural disasters and climate change (FAO, 2007). In Africa, Asia and the Americas, the total area of mangrove forests from 1980 to 2000 has been reduced by around 35% (Valiela et al., 2001; Nguyen Tai Tue et al., 2014), and the decreasing rate has been continuing at 1-2% per year (FAO, 2007; Nguyen Tai Tue et al., 2014). Southeast Asia, one of the most diversified and dense regions in the world with more than 33.5 % of global mangrove forest, has been witnessing a dramatic decrease of mangrove areas because of both natural and man-made disturbances (ITTO, 2012).

Therefore, nowadays, mangrove restoration and reforestation programs have seen many new innovations. Although these projects have been conducted in many countries, it could be said that they have not been effectively implemented even though some good results have been noted. According to Biswa et al., (2009) ecological restoration of mangroves is extremely challenging and difficult because of the dynamic nature of mangrove ecosystems and the effects of natural and man-made disturbances. Furthermore, the majority of the population in the southeast asian coastal region are poor and vulnerable people whose livelihood is based mainly on the mangrove forests (Iftekhar and Islam, 2004). The challenge here is to come up with new innovations which can be applied not only on a national scale but can also provide frameworks which can be adapted to the local and customary realities of a specific area.

Vietnam is a Southeast Asian country which has seen a dramatic loss of natural forests and mangrove forests since the 1960s (Hawkins et al., 2010).

Over the past 50 years more than 80% of mangrove areas have been lost which has drawn a lot of concern from both environmental and social scientists. There have been various national and international programs set up to address this issue resulting in a significant increase in forest cover (FAO, 20110). However, more than 70% of the remaining mangrove forests in Vietnam are classified as protected areas which local people cannot access.

In Vietnam, mangrove forests are managed by both the Ministry of Agriculture and Rural Development (MARD) and the Ministry of Natural Resources and Environment (MONRE). While MARD is in charge of forest management in general, MONRE is responsible for land management, including forest land. Before Economic Reform (Doi Moi) in 1986, all the land was public land and the forests were under the control of the government. Under the Doi Moi policy, the government issued the Land Law 1987 and revised it several times in 1993, 2003, 2013. These revisions contributed to the flexibility of land management in general. Forest land can be distributed to Forest Management Boards, Commune People's Committees, private companies, and households as well as to individuals for planting and protection. Although Vietnam has been through land policy reform regimes during the past five decades, land policy has not been implemented smoothly because of conflicts among stakeholders, for example, between the state and the peasantry (Kerkvliet, 2005; Borras, 2008). The most crucial laws have been amended to govern forest use and management. They are the Land Law, which was first amended in 1987 and revised again in 1993, 2003, and 2013, and the Forest Protection and Development Law in 1991 and 2004.

Realizing the important role of forests in general and mangrove forests specifically, the Vietnamese government has formulated various national programs, such as Program 327 (1992-1998) and Program 661 (1998-2010), and adopted some international innovations, such as REDD (Reducing Emissions from Deforestation and Forest Degradation) and PES (Payment for Ecosystem Service), to improve the Vietnam forest situation. Although there are efforts among stakeholders for reforestation and forest conservation, the results have been limited.

In Vietnam, there are some areas where mangrove restoration has been conducted under the auspice of state projects and with cooperation between state and international organizations since the 1980s. The majority of these

mangrove restoration projects are based in the Red River Delta in Northern Vietnam and in the Mekong Delta in Southern Vietnam, while few projects have been conducted in the Central Coast of Vietnam. Because of its own geographical and historical characteristics, mangrove restoration in the Central Coast has been found difficult to implement. However, this area is the most vulnerable under climate change and is one of the poorest areas in Vietnam. Therefore, it is of real importance that mangrove restoration in the Central Coast of Vietnam should be taken into account.

One more problem is that all of these projects are under the control of the Ministry of Agriculture and Rural Development (MARD) as well as the Land Law and the Forest Protection and Development Law. However, while MARD is in charge of mangrove management, the Ministry of Natural Resources and Environment (MONRE) is responsible for land management, including wetlands. It means:

> MARD has jurisdiction over the trees in mangrove forests, while Ministry of Natural resources and Environment (MONRE) has jurisdiction over the land itself. (Hawkins et al., 2010: 14).

In addition, aquaculture and fisheries are under the management of MARD, while MONRE regulates geology, mining and water. The question here is, "do forests include only trees or land, or both of them?"

As mentioned above, MARD is in charge of forest management in Vietnam. Therefore, MARD has the capacity to issue forest protection and development plans as well as forest management in general. MARD has local branch offices at the provincial and district levels known as the Provincial Department of Forestry and the District Department of Forestry. However, there is no branch at the Commune level. At this level, the Commune People's Committee is in charge of forests in general, normally supported by the District-based Department of Forestry. In addition, although the responsibility of MONRE is different than that of MARD, their structures are the same. MONRE is in charge of land management, land use mapping, and land titles. The provincial and District MONRE branches manage this work at their levels and support the Commune People's Committee in exercising state management of land.

All in all, it can be said that in mangrove management, the roles of these two ministries are overlapping, which creates a big space for confusion about law and implementation (Hawkins et al., 2010). This overlapping of responsibilities leads to conflict in tenure security, which affects local participation in mangrove restoration. In addition, local people have no voice in the government: All they can do is hope for the Commune People's Committee to transfer their opinions to the Central government.

Thus, in this thesis, the ambiguity of understanding about environmental governance, and the unclear role of local knowledge and scientific knowledge particularly in mangrove restoration in the Central Coast of Vietnam will be addressed. Firstly, local people are often left out of decision-making processes in forest restoration and are only asked to participate once implementation has begun. Secondly, mangrove restoration policy has not stated clearly about livelihood concerns along with restoration. Thirdly, there is a link between the local people's culture and the social-political practices (Truong and Orlando, 2010). However, under current reforestation projects, this kind of relationship has not been recognized by the government. As a result, local people in general are not interested in participating in mangrove restoration. Lastly, the combination of scientific knowledge and local knowledge is still limited. It is believed that each local specific area has its own knowledge and cultural systems. Scientific knowledge can provide the stake-of-knowledge for local villagers to deal with the change of environment and weather, when local knowledge can give inside perspective about local context. Therefore, in this paper I would like to clarify the controversies arising due to the mangrove restoration policy in Vietnam. Mangrove forests are not only important for their ecological role, but are also highly important to local communities. This study aims to examine why in the case of mangrove restoration, local knowledge and scientific knowledge are not considered equally and what is the potential solution for it?

Research Questions

- To what extent do local villagers participate in mangrove restoration projects, and how does decentralization work in these projects?
- How have different stakeholders adopted mangrove restoration governance, and what kind of knowledge has been used in these projects?

- In what ways do local villagers, local government and the state use local knowledge and scientific knowledge as environmental knowledge and coping strategies? What strategies are in place to promote an output of active participation by local people in mangrove restoration projects?

Research Objectives

The general objective of the study is to identify how local villagers participate in the mangrove restoration projects, how political, historical, ecological and social aspects link together in these kinds of projects, and how local knowledge and scientific knowledge combine and challenge each other in mangrove restoration. In order to make the objectives clearer, my specific objectives are as follows:

- To study the level of participation of local villagers, particularly in decision-making and the implementation process of mangrove restoration projects as well as the way power has been transferred through different levels of administration.
- To examine the level of management, understanding and implementation of mangrove restoration policy between central government, local government, and local villagers as well as what form of knowledge has been used in the project.
- To study the practices of local knowledge and scientific knowledge in reality as a form of environmental knowledge and coping strategies. It also examines the level of interaction and the capacity of combining scientific knowledge and local knowledge in mangrove restoration among local villagers, local government, and the state for an effective outcome for all stakeholders.

Research Methods

Research Site Selection

My research area is located in village 6, Quang Phong Ward, Quang Binh Province. There are 159 households in this village. More than 60% of their income comes from agriculture and aquaculture sectors, which includes farmering and shrimp farming. Some villagers work in both agriculture and

aquaculture fields, while some just work in one field for their livelihood. A hundred percent of households there hold land for their residence and/or cultivation. The minority of villagers there work in other sectors, such as in the service industry or as migrant industrial workers.

Quang Phong Ward is a coastal area belonging to Ba Don Town, Quang Binh Province in the Central Coast of Vietnam. The region has been affected by frequent natural disasters. This Ward is a small area located along the low downstream area of the Gianh watershed, which is 10.2 kilometers away from the coast. The mangrove forest here plays an important role not only in environmental, economic, and social terms but also in cultural terms, and it is one of the last remaining forests in the Central Coast of Vietnam. Quang Phong borders Ba Don Town to the East, Quang Thanh Ward to the West, Quang Long and Quang Phuong Ward to the North, and Quang Loc, Quang Hai and Gianh rivers to the South. The total natural area of this Ward is 470.04 hectares, in which agriculture land makes up 240.00 ha, and non-agriculture land occupies 230.04 ha.

The total population of this Ward is 5483, of which 58% are farmers and fishers, followed by 12 % who are industrial workers, and 30% are in the service industry. People in this area are Kinh people - the ethnic majority of Vietnam. They are mostly indigenous people who have lived in this area for many generations. Their traditional livelihood heavily depends on farming and fishing, and the mangrove forest has been critical for this in the past. Therefore, they have a lot of experience and knowledge in terms of using and managing the mangrove forest. In the past, this area was one of the pilots for mangrove reforestation in the Central Coast of Vietnam. In 1978, the local government and local villagers organized and used their local knowledge for a reforestation project with the target of recultivating 8 ha of mangrove, and this has been kept going year after year. However, due to natural disasters, the mangrove area has been decreasing dramatically. Therefore, the government started another mangrove reforestation project from 2009-2012 but the outcome was limited.

At present, the local villagers' livelihood has been changing due to the impact of development. Some new forms of livelihood have been found, such as industrial shrimp farming, working abroad, small business, and other service industry jobs. Most local villagers do not rely on this mangrove forest for their livelihood. They just look at the mangrove forest as a natural disaster reduction

barrier for their village. In the past, local villagers actively participated in the project as one of their community activities. However, more recently they participated in the project as their responsibility as a Vietnamese citizen. They wanted to get money from the project, and after the project ended and there was no more money, not many people cared about the forest.

In addition, climate change has been causing some serious problems in Vietnam. Realizing the important role of mangrove forests to protect coastal areas from the impact of climate change, the government has adopted and set up mangrove restoration programs. Quang Phong is one of the areas that has been chosen by the government.

This is the reason why this area has been chosen as the study site, as it represents an ideal site to observe the government's reforestation policy and the local community's involvement through a historical timeline before and after the Doi Moi policy in 1986. The first mangrove restoration project was conducted in 1978 before Doi Moi, and the later ones were conducted after Doi Moi. Through this period of time, decentralization seems to have not worked in the same way, and scientific knowledge has played a key role in reforestation. Local environmental knowledge is going to disappear because of not only the policy but also the local peoples' awareness of the mangrove forest. This problem needs to be taken into account. One reason for choosing village 6 as my research site is the limitations of time and budget. Another reason for choosing this village is because I would like to consider villages which are both directly and indirectly linked to the mangroves. Understanding this village in depth will help to clarify the topic of the politics of mangrove restoration, not only here, but also in other areas of the Central Coast of Vietnam.

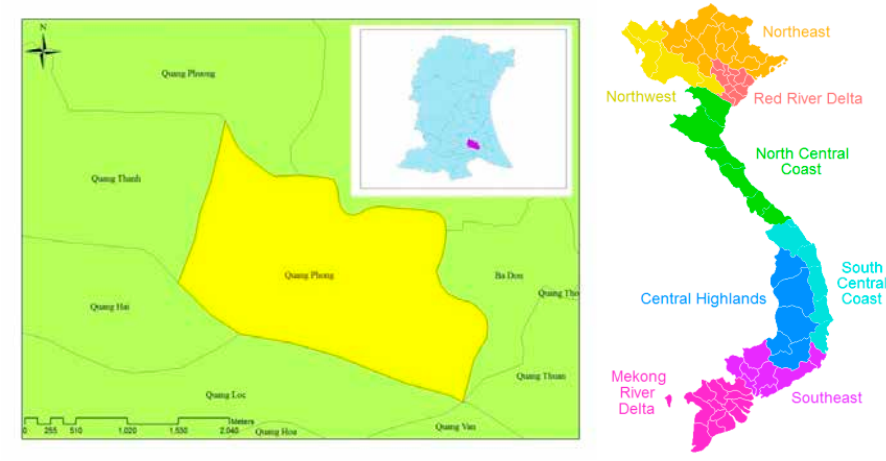


Figure 1.1 Research site in Quang Binh Province, Vietnam

Unit and level of analysis

My study unit of analysis is based on the individual, groups, and social organizations. Each local villager plays an important part in the community contribution to local knowledge as well as participation in community activities. Each of them can participate or contribute their own knowledge as well as raise their voice during the decision-making or implementation processes. In addition, each person has their own job and interests, so that they have different perspectives on mangrove restoration projects specifically. It means each group views the forest in a different way. Moreover, the mangrove restoration projects do not only operate within individual or group relations, but also include the relationship among social organizations. This thesis concentrates on only three actors, the state, local government, and local villagers, and the way they interact with each other in mangrove restoration projects. It helps to take a glance at the way local people use their local knowledge in terms of mangrove usage and how environmental knowledge is used in the study site. Discussions with local villagers and local government representatives give a broad picture about the way they think about mangrove restoration. Lastly, the analysis will concentrate on the actions and interactions among stakeholders in mangrove restoration.

The level of analysis is based on both local and national levels, but this thesis mainly focuses on the local group level and differentiates each group

with different interests to mangrove restoration projects. The case is then shifted to a higher level in order to know how different actors perceive the policy and how it works in different scales In particular, in the context of the Central Coast of Vietnam with comparisons made with the national, regional, and global levels. The purpose of this study is to understand the politics of mangrove restoration in Vietnam, how it works in the central government and how it plays out on the ground, and how that kind of policy is adopted by the government in the regional and global context.

Data collection methods

The data collection method was qualitative in nature with minor support from exploratory survey. Key informant interview, group discussion, participatant observation and field notes were employed for collecting the qualitative data, while the exploratory survey was used before for the purpose of understanding basic information of the field before digging deeper into the topic of research.

At first, secondary data was collected from the previous literature related to the research topic, such as books, chapters in books, journal articles, and reports from NGOs, the local government and the central government, and data from the internet, such as satellite image and some online reports. This data helped to provide a general understanding about the geography, physical aspects, and some basic information of the research site. Next, documentary analysis was carried out at Hue University of Agricultural and Forestry. Some theses and research reports from my former faculty were collected. Besides that, some conversations with experienced researchers on related topics of mangrove restoration in general and in some Provinces in the Central Coast of Vietnam were helpful in getting information and experience about the research topic. The use of these resources allowed the development of a theoretical approach that guided the methods in the field. At the DDFP, restoration planning and final reports of restoration projects were collected. Socio-economic reports, agricultural reports, statistical reports, and annual reports from QPPC and DDARD were also collected. This data in combination with Land Law and Forestry Policy helped develop a deep understanding about what is going in the study site.

Then, an exploratory survey was made to obtain demographic information about the study site in general as well as some basic information

about local villagers perception about mangrove restoration activities. The purpose of this survey was to triangulate the secondary data from the local government and get a general picture about the village in terms of its culture, social structure, and how mangrove restoration plays out in the study site. This data helped to classify the interviewees clearer and have an initial understanding about the research site in terms of livelihood, land use, customs, local knowledge, and people's opinions about mangrove restoration in general. In the study site, 53 households out of 159 households (33.3 %) were selected using systematic random sampling that selected one in three household randomly. Two research assistants helped collect this data over five days. After each day, there was a meeting in order to discuss any problems the research assistants faced and try to find ways to solve the problems.

After that, key informant interviews, group discussions, participation observation, and field notes were used to dig deeper into the topic of research.

Firstly, key informant interviews were conducted with the purpose of understanding the special knowledge of key people who were willing to share information with the researcher. This method was conducted throughout my field work in order to try to understand the research topic in more depth. Interviews with key person in mangrove restoration projects were used to have a better picture of what was occurring in the village from the past to the present. By using this tool, information was collected from a wide range of people who had different perspectives in terms of the mangrove forest and mangrove restoration. It provided a particular knowledge and understanding as well as insight into the nature of the problem. Interviews included both formal and informal interviews, which played an important role in helping me to obtain information naturally. Cross checking was also used in these interviews in order to get exact information from different perspectives.

Additionally, 12 semi-structured interviews were conducted to give an opportunity to the villagers of different age, gender, and groups of interests to express their views on the topic of mangrove restoration activities and policy in the area. The perception of mangrove restoration in the area varied among generations and social status was also addressed. Interviewees included the older generation who have experienced the changes of the mangrove forest and mangrove reforestation at the study site, and the younger

generations who are knowledgeable about mangrove restoration. They are farmers, fishers, and others workers.

In the middle of the fieldwork, a group discussion was conducted to investigate the village history, mangrove restoration history, seasonal calendar, livelihood systems, and land use map of the village. Five people were selected for the discussion.

Throughout the fieldwork, participant observation and field notes were always collected in order to actually observe the things local people did and get the meaning of why they did them. Participant observation was very important for data collection in order to gather information from local people in terms of forest management, mangrove reforestation, and coastal risk reduction and so on. Participation in everyday activities with key people helped to gain a deeper understanding about this information. Through this participation, I also understood the way local people connect with their history and their nature.

Data analysis

This study is an inductive case study, whereby the role of the researcher is not only a person who conducts the research but who is also a tool for furthering the research and generating new theories. All of the data was analyzed, explained and debated based on the main questions and using the conceptual framework.

Exploratory data was processed and analyzed by using Excel software, Geographic Information System (GIS). Also, Remote Sensing (RS) was used to analyze basic secondary data, and then qualitative data was analyzed by memos, and transcript, and open coding into category following the conceptual framework.

Chapter 2

Theoretical Relevance and Literature Review

Review of Theories and Concepts

Decentralization of Natural Resources Management

Decentralization has been discussed widely since the 1980s and is seen as a tool to transfer power from the central government to local administrative units (Cheema and Rondinelli, 1983; Chusak and Vandergeest, 2010) as a means to achieve political-economic and policy objectives (Agrawal and Ribot, 1999). It can also be seen as a transferring of decision-making authority and financial responsibility to lower levels of government (Meinzen-Dick and Knox, 2001; Chusak and Vandergeest, 2010). This thesis will concentrate on the distribution of power among local government and local community in regards to the decentralization of natural resource management.

The decentralization management model of natural resources has become a dominant theme in the discussion of natural resource policies for governments in terms of development and conservation (Agrawal and Ostrom, 2001; Chusak and Vandergeest, 2010). According to Chusak and Vandergeest (2010) there are two types of natural resource decentralization – administrative decentralization and political decentralization (democratic decentralization). Political decentralization is when decisions over resources and local people's lives are made by local actors.This form of decentralization refers to

representative and downwardly accountable local actors who have autonomous, discretionary decision-making spheres with the power and resources to make significant decisions pertaining to local people's lives (Ribot, 2002; Johnson, 2001; Larson and Fernanda, 2008: 216).

This will increase local autonomy, the involvement of local people in natural resource management, and the privatization of services (Battergury and Fernando, 2006). However, decentralization is not a simple process and it needs a linkage among its components: social actors, power, and accountability. The involvement of all actors with clear understanding of the power in the decision-making process and with accountability upward and downward will help decentralization work effectively. Decentralization in natural resource management links directly to property rights and power relations (Chusak and Vandergeest, 2010). Agrawal and Ostrom (2001) point out that when local people gain the rights to access resources, the issue of power and participation will be solved and decentralization is likely to work well. In order to get that outcome, power relations should be transferred equally among the actors. However, in reality, power relations just work between powerful actors, and the powerless actor is normally excluded. Therefore, NGOs can be the bridge between the government and local people in terms of power distribution because, in general, local people do not clearly understand the policy and do not know what happens in the higher institution. So in this case, NGOs will help the local people have a better understanding about local rights, what they can and cannot do under the government policy.

Decentralization of natural resource management is a trend in both developed countries and developing countries (Agrawal & Ostrom, 2001; Larson, 2002; Benjamin, 2008), and many aspects of this field have decentralized power structures (Agrawal & Ostrom, 2001; Benjamin, 2008). However, the outputs of decentralization are still limited (Benjamin, 2008). For example, in a case study of a Forest Land Allocation Program in Vietnam, when the government tried to decentralize forest management by redistributing forest land to local communities and households, the local elites used their power in order to seize the land. This caused an unequal distribution of the land between the powerful and powerless people (Phuc, 2010 cited in Chusak and Vandegeest, 2010). The idea of natural resource decentralization is to bring the state closer to people and try to benefit from the redistribution of centralized management authority (Larson, 2002). Therefore, it is necessary to build clear linkages

between traditional and modern governance institutions and between the state and the people without causing inequality in ethnicity, social status or gender (Benjamin, 2008). There is also a link between decentralization and environmental governance. In order to decentralize natural resource management, the government needs to establish clear environmental governance models. When new governance has been issued, in which power is transferred downward from the central government to local institutions, at least in principle, local people can raise their voice to the higher institutions (World Bank, 1992; Batterbury and Fernando, 2006). As mentioned, decentralization is also a state distribution of power control and is not enough on its own for a healthy environment. Therefore, it needs a form of environmental governance called environmentality or eco-governmentality (Agrawal, 2005).

Environmentality: a Form of Environmental Governance

As I mentioned above, there is a link between decentralization in natural resources management and environmental governance. Environmental governance is addressed as follows, according to Lemos and Agrawal, 2006:

> Environmental Governance is synonymous with interventions aiming at changes in environment-related incentives, knowledge, institutions, decision making, and behaviors. More specifically, we use 'environmental governance' to refer to the set of regulatory processes, mechanisms and organizations through which political actors influence environmental actions and outcomes. It includes the actions of the state and, in addition, encompasses actors such as communities, businesses, and NGOs (Lemos and Agrawal, 2006: 298).

Environmental governance is a complicated process. It needs inter-relationships among institutions with discussion of knowledge for decision-making processes. These are processes or mechanisms that work with the related organizations in sharing power. It is not the responsibility of the state alone, but all stakeholders must be involved. Although there are many aspects of environmental governance, the concept of environmentality has been chosen for the thesis discussion. Environmentality was mentioned in Luke's article about Geo-Power and Eco-Knowledge in 1995. In his point of view, "in some case, the environment is 'Nature' for commoner, but it is also 'society', or more accurately, 'Nature-as-transformed-by-Society' (Luke, 1995: 6)." And discourse

of knowledge and power is a part of 'transformation of human life'. "The environment, according to Foucault, can be divided into biological and historical (Luke, 1995: 11)." In human history the biological dimension always links with historical development. Luke also mentioned Foucault's govern-mentality and conservation and their links in environmentality, in which bio-powers and geo-powers, ecological and historical, govern the environment.

And then, Agrawal (2005) mentions environmentality again in his book 'Environmentality: Technologies of Government and the Making of Subjects'. According to Agrawal (2005), environmentality is an application of Foucault's governmentality and bio-power.

> Environmentality is a union of environment and Foucauldian governmentality, the terms stands for an approach to studying environmental politics that takes seriously the conceptual building blocks of power/ knowledge, institutions, and subjective. The analysis builds on existing writings by political ecologists, common property theorists (Agrawal, 2005: 8).

According to Malette (2009), eco-governmentality is Foucauldian governmentality's application to the natural world with a core concern in bio-power. In this concept, Foucault examined how government uses power to rationalize the ecological system. Eco-governmentality focuses on how government constructs the environment using the dominant knowledge named "scientific knowledge". In this case, there is an on-going debate about how knowledge can be situated in specific areas with specific interactions.

Environmental governance is under the control of the state, which directly affects local people's life. According to Tania Li's book '*The Will to Improve*': "the field of power in Michael Foucault term is defined as 'conduct of conduct', government is the attempt to shape human conduct by calculated mean" (Li, 2007: 5)." Government uses means to make people believe in their ideas and acceptance of Government practices is affected by national and international institutions. In addition, "when power operates at a distance, people are not necessarily aware of how their conduct is being conducted or why (Li, 2007: 5)," they just follow the government ideas. In the case of mangrove restoration, the government provides knowledge about a healthy environment to serve global and national goals in terms of ecosystem services. However,

when the policy goes to local people, they think more about their livelihood than ecological services.

All in all, in an environmental sense, the government forces people to think about conservation and ecological value more than the other aspects, such as social, economic, and cultural. The governance has been driven by market mechanisms . For example, in mangrove restoration, the government tries to make people aware of the mangrove forest and of the value of the mangrove ecosystem according to scientific knowledge and to a lesser extent, combining local knowledge. However, this effort has not yet worked effectively. It is believed that local knowledge has been used for a long time, not only as environmental knowledge but also for the local livelihood and culture. Therefore, the solution for a good combination of scientific and local knowledge is an urgent task for these projects.

Local Knowledge in Response to Environmental Governance

Spiegler, (2003) states that local knowledge is "the capacity for effective action in a domain of human actions (Spiegler, 2003: 535; Taylor and Loë, 2012)." According to Yos (2003), local knowledge in terms of resource management is a key part of the relationship between human beings and nature, that is, the interaction of human ecology when people and nature support each other.

In addition, according to Nygren (1999), local knowledge is situated knowledge. She argues that knowledge production should be recognized as a process of social negotiation, one that involves multiple actors and complex power relations. Local knowledge is situated knowledge because it is happening all the time and changes in response to the changing situation in a community from era to era. Moreover, it can be viewed as a continuous process of change, adaptation, and contestation and combines the traditional and modern, the situational and the hybrid, and local and global knowledge – all integrated together to create a complex local life (Nygren, 1999). Local knowledge in mangrove forests is not only for ecological conservation but also for community culture and people's livelihood. People's livelihood is not fixed to traditional knowledge alone; it is also situated with knowledge to cope with changing circumstances. They use their traditional knowledge combined with new insights for a better solution under the changing circumstances. For example, in the case of mangrove restoration, they use the mangrove forest for their

livelihood, but under the effect of climate change, they also built a sea wall to protect their forest.

However, with scientific knowledge being dominant in the world, government considers it superior to local knowledge and it is poorly considered by the state (Taylor and Loë, 2012). In the book 'Seeing like a State', James Scott claimed that the state views forests simply as a revenue source, such as timber and fuel for economic purposes (Scott, 1998). Other important factors are missing from the state perspective, such as flora and fauna in forest ecosystems as well as human interaction. It means that in scientific forestry, the economic aspect is the most important focus while environmental, social, or cultural aspects are excluded. However, the fact is that the government demonstrates that scientific knowledge is more important than local knowledge so that they can claim resources, excluding local knowledge. Knowledge can turn someone who was previously a forest user into a forest destroyer because of the economic concepts of scientific forestry, and the law is hidden under this action (Peluso, 1992). In this case, if local people cannot demonstrate their knowledge as a tool of environmental conservation and livelihood strategies, they will be excluded from mangrove forests. Scientific knowledge is a global innovation and however much of ithas been used as a tool of the central government, it is not a good way to manage natural resources (Forsyth and Walker, 2008). Therefore, the integration of local knowledge and scientific knowledge into environmental decision-making is needed because environmental knowledge is very difficult to produce without referring to political and social contexts.

In the case of mangrove forests, they are considered as a common property right, which is accessible to every local villager. Mangrove forests play an important role in the local community. Local use of mangrove forest resources is varied and significant (Armitage, 2002). People rely on the resources of mangrove forests, such as firewood, food, and timber. The coastal ecosystem is an important source for onshore and offshore fish species and directly or indirectly supports local livelihoods through this function (Tuyen et al., 2010). Armitage (2002) found that mangrove forests contribute to household income more than the formal wage economy. However, scientific knowledge does not recognize the important social and cultural aspects of mangrove forests for local people, which causes conflict between the state and local people when conservation projects are initiated. In the modern era where the forest is seen mainly as an economic resource, local people claim their knowledge is a tool

to negotiate with with the government. So, the question here is how can local people negotiate with the government to protect their local knowledge?

One aspect that should be considered in this situation is the practice of politics. People should use politics as a tool to negotiate their rights of life, such as livelihood strategies (work, land, and income). Negotiating livelihood strategies here means local people use their knowledge to negotiate with the state for a better solution for their livelihood.

Turnbull (1997) introduced the concept of knowledge space in which he began by recognizing that knowledge production is a social activity as well as a social history of space (Anan, 2008). Concept space means how the same concept can be applicable to different situations and includes both the places of knowledge and of power production in the sense that they are contested spaces associated with complex social relations (Anan, 2008). It means local people have to generate a new knowledge space to prove that local communities cannot live without the mangrove forest and that they have their own knowledge to take care of the forest.

The Politics of Scale

Scale not only refers to 'regional scale' or 'national scale', but also relates to globalization, localization, regionalization, which is called 'politics of scale' (Clifford et al., 2009: 218). Scale here is interpreted by different actors, and it depends on how they construct scale and how politics shape the scale-making process. Scale, in this thesis, is the bridge among three main concepts: decentralization, environmentality, and local environmental knowledge. There is a linkage among them, although it is hidden under the surface. Decentralization is about the scale in terms of power control and access to resources at different levels. Power will be transferred to different actors in different levels. Power is transferred from global to national to local. Each scale has different actors with different understandings about the policy. There is hope that this kind of power transferring will produce good environmental governance (Lebel, Garden, and Imamura, 2005). Governance is issued by the government and is transferred to the local level. Scale, here, means local and national levels in which governance is interpreted at different levels and different contexts. Moreover, in the context of the national level, scientific knowledge is dominant, and local knowledge is a tool of local people at the local level. However, local knowledge is normally

seen as being inferior in comparison with state knowledge. All scales need to be taken into account under any policy or governance.

Additionally, as Crang (1999) pointed out in 'Local Matters, Global Vision', there is always a difference in terms of global and local thinking. From a global perspective the view is on world issues, while local views are about their local problems. While global thinking is about modernization and the use of scientific knowledge to solve environmental problems, local thinking is about development as sustainability and livelihood improvement. Thus, scale is important here. The relation between global and local thinking needs to be considered. For example, this study looks at the local level and concentrates on one particular place which is not the same as another place in local governance or especially in terms of local knowledge and development interpretation. Global and national levels think about climate change adaptation or carbon sequestration, whereas the local level thinks about how to get livelihood security. These different views cause a problem in terms of how global, national and local levels can cooperate for a good outcome from projects or policy. However, it is always possible to have a discourse between the global and the local levels.

Review of Related Studies

There are many studies about mangrove forests in general and mangrove restoration specifically. While some studies look at the field of natural sciences, such as biological diversity, the potential of mangrove forest in natural disaster reduction, or the application of geographic information systems (GIS) and remote sensing (RS) to mangrove management, others concentrate on the field of social sciences, such as the cultural, social, or economic aspects of mangrove forests. This thesis combines both natural science and social science tools to study how decentralization and environmental governance work on a local scale in comparison with the global, national and regional scales. In addition, GIS and RS is applied for the analysis of mangrove forest areas in the combination with quantitative and qualitative approach in the study site in order to have a big picture in both qualitative and quantitative perspectives.

Overview of Local Participation in Mangrove Restoration

In an era of much debate over "Sustainable Development", there are a variety of studies concentrating on the field of natural resource management, and mangrove restoration is one focus area. Mangrove restoration has been looked at as a tool of "Sustainable Development" and has been studied in a variety of ways. In terms of mangrove forests, in the industrial economic era, a large area has been destroyed because of economic development projects such as shrimp farming. Realizing the importance of mangrove forests, the government claims that mangrove restoration is a must-do in the era of climate change and sustainable development. However, success in mangrove restoration has remained very limited, mainly due to a lack of cooperation among stakeholders and insufficient skills by forest activists as well as inactive community participation in mangrove restoration (Memon, 2011). This problem is likely to happen in many countries when government conducts reforestation projects without acknowledging the missing links with local involvement (Datta, 2012). One of the reasons for this problem is that there is no stakeholders' meeting before mangrove reforestation implementation. Additionally, the state is only concerned with the interests of a small group of land owners without considering the impacts on other sectors (Stone, 2008)

The government and other powerful agencies have their own particular worldview and, through the use of language create an image of mangrove restoration in order to serve their conservation purposes. However, they forget to embed environmental aspect with the economic and social aspects of these restoration projects. As Mills (2003) pointed out in his chapter 'Discourse' about Foucault views, the distinction between true and false is a power relation: the ones who are being regarded as 'experts' have the right to the truth, whereas the rest who possess no power are denied this right. In the case at hand, the government concentrates on conservation aspects, claiming that mangrove restoration is a priority in this era. As Foucault has pointed out, the combination of power and knowledge shapes the truth. The language chosen by the government influences the thinking of citizens in order for them to adopt the government's worldview (Mills, 2003). The government has the power and, therefore, entertains only the knowledge and ideas of its choice.

In addition, it is not only the policy toward mangrove restoration but also the tenure of the policy that influences the security of programs. Forests are considered as a common property in many countries. Common property, according to Hardin's (1968) hypothesis in 'Tragedy of the Commons', is

managed by the state regime and is considered as "bundles of ownership" in which the rights to access among stakeholders is overlapping (Roy et al., 2013). It is a fact that local people use mangrove forests in their everyday livelihood with insufficient rights because of unsustainable property rights regimes. There are no clear rights to the use of the mangrove forest or what they will get from these projects in 5 or 10 years. Therefore, local people just participate in mangrove restoration as an obligation. For example, in Vietnam, forest land is managed by the state and by industrial-agricultural-forestry enterprise associations. State policies regulate forests and their products as national assets, owned by the state. Therefore, local people do not have rights to manage and use either forestland or forest products (Truong and Orlando, 2010).

Moreover, there is no clear connection set up about the relationship between the forest and people and the relationship between sustainable forest management and the property rights regime (Roy et al., 2012). According to Ostrom and Schlager (1996), forests are a common property and both the costs and the benefits should be shared among stakeholders because if the government or local people do it separately, it would be costly or have a zero return (Ostrom and Schlager, 1996).

Another issue is when all the forest belongs to the state, local people can sometimes collect Non-Timber Forest Products (NTFPs), such as catch fish in the mangrove forests, but there is no tenure security, which leads to no livelihood security. They have no rights to access mangrove forests legally, and they cannot control it. 'Access' links to property rights in natural resources management. The definition of 'Access' is addressed in Ribot's and Peluso's paper in 2003 as follows: 'Access' means 'the *ability* to derive benefits from things', and later as: 'the *right* to benefit from things'. Following this definition, access is more akin to 'a bundle of powers or abilities' than to property's notion of a 'bundle of rights'. It includes a wider range of social relationships that constrain or enable benefits from resource use than property relations alone." (Ribot and Peluso, 2003: 153). In the case of mangrove restoration, local people cannot access the forest because they have no power acknowledged by the government policy.

In addition, conflict happens not only between the government and the local people but also within the community. There is conflict between local elites who can access exclusive property rights and who lost their access or could not access such resources. In the past, all local people could go to

mangrove forests and collect NTFPs, crabs, fish, shrimp, and dry branches for firewood. After conducting mangrove restoration, there is new conflict inside the local community as some can have access to the forest and others are denied access because of lack of power. In this way, the poor and the powerless are excluded from the mangrove and marine resources (Hue and Scott, 2008). As a result of this type of dispute, communities differ significantly in their responses to reforestation proposals. Many people respond that mangrove forests need to be restored, while others reply that the forest does not need to be restored anymore, because they receive different benefits from these projects. Thus, local participation in mangrove restoration still varies, such as some participate actively in the first stage of implementation and then abandoned later or some refuse to participate at the beginning. All in all, people more actively participate when the projects have a connection with livelihood security and have obvious benefits from that kind of project. Thus, being clear about a project's aim and raising the awareness of local people is necessary here (Ekindi, 2008).

All in all, the top-down approach taken by the local government in mangrove restoration makes local people confused about their livelihood. People do not take care of mangrove forests because there is no clear sharing benefit system for them (Tuyen et al., 2010) and there is no livelihood security after conducting these projects.

Armitage (2002) pointed out that equitable property rights and access regimes are still limited because of the insufficient legal frameworks from the state and the ambiguous management at different levels of administration. Thus, an alternative solution for sustainable forest management in which the missing link between conservation and livelihood security is filled needs to be found (Roy et al., 2012). Co-management and decentralization can be a solution, in this case, in which cost and benefits are shared among stakeholders, power is transferred equitably, and there is a secure ownership for land owner (Roy et al., 2012).

Local knowledge, mangrove forest and livelihood strategies

Local people can use their knowledge to protect their traditional livelihood from the impact of mangrove restoration policy and its discourse on mangrove forests. Local people have their own livelihood strategies through which they perceive and learn about the environment, ecology and society.

These are improved by the inter-relationships among humans and between humans and nature.

The relationship between local people and the place they have lived for generations not only illustrates economic interests but also deeper cultural and spiritual connections to that place. The question here is that without land security and ownership how can local people live sustainably? As pointed out above, the relationship between people and the place links their economy, society, and culture. In order to maintain that kind of relationship, local people need to have full rights of access to their resources. Without tenure security and land ownership, there is still a limitation of resources control for local people. Local people only have rights to access resources and do income-earning activities when they have a secure ownership. They cannot do it for one year and then their land is converted to a different type of land-use the following year. It is all about tenure security means. A household can have their own secure livelihood when they have their own ownership and they can control their resources.

Moreover livelihoods can be conceptualized as negotiated space used by local people to gain power to manage and control natural resources. They can struggle to get power and the rights to control the forest. In this case, they can use their knowledge in natural resource management. They can maintain both conservation and livelihood with their knowledge space.

Although multiple negotiation forms have already been used, they have not been beneficial in some contexts due to the domination by development policy which expresses the relationship between the economic, political, cultural and social dimensions. Therefore, to construct better livelihoods, people could have a choice of the assets and resources they have access to, so after that they have a choice of strategies (DFID, 1999). For instance, the emphasis on this spatial dimension of knowledge opens up the possibility of seeing knowledge more clearly as practices by knowledge producers. "The practices, especially through social strategies of negotiation, allow knowledge producers to create spaces that can generate new knowledge from heterogeneous and isolated knowledge (Turnbull, 1997: 553 cited in Anan, 2008: 5)." They can regenerate their knowledge and negotiate for their livelihood strategies. They have to negotiate for better livelihood strategies under a new situation, and the concept of knowledge space can help them better understand how they may negotiate.

The concept of knowledge space is also useful for understanding the multiplicity of knowledge (Anan, 2008).

Local knowledge should be seen as a strategic package of contestation and negotiation. It can be mixed with the other kinds of knowledge, and it is also situated under the change. Through their engagement in social forestry, people can generate different kinds of knowledge space in the community forestry movement in order to negotiate with the government. Under the concept of negotiation is the concept of practice. It means that local people do not only use their knowledge in only one way but in different ways. Although they have local knowledge, they still can adapt new knowledge to survive under different circumstances. They can adapt and practice many kinds of livelihoods by mixing different kinds of knowledge.

Additionally, in order to negotiate for their livelihood strategies, they have to extend their networks and their social capital. According to DFID (2001), the livelihood of each household depends on five types of capital: natural capital, human capital, financial capital, physical capital and social capital. They have to strengthen their capital if they want to negotiate with the government. What capital do they have, and is this capital sustainable? Because the state and other powerful agencies, with their own interests, approaches, language and styles, generate discourse and meaning in development which is intended to serve their purposes of power, the government cannot see the potential in the local community strategies. This means that local people have to combine indigenous knowledge with scientific knowledge to show their benefit in front of the government (Hirsute and Wyatt, 2004). Therefore, the diverse methods of livelihood have to be shaped by the natural and socio-economic conditions of a given region in order to generate new knowledge and adapt to a new situation.

Put in another way, local people have to demonstrate their sustainable livelihood from an economic, social, and environmental perspective. From an economic perspective, mangrove usage provides food and livelihood for local people. In terms of the social perspective, mangrove usage can be seen as a traditional livelihood, associated with the people from generation to generation. Additionally, besides it's ecologically, societally, and economically crucial roles; mangroves also play an important role in historical and cultural aspects (Datta, 2010). Local people usually associate development and conservation with

making money. Thus, conservation is also linked to the negotiation for livelihood resources in the forest.

To sum up, local people can negotiate for their livelihood strategies and struggle to get access to resources by applying local knowledge flexibly or asking for alternative sources of livelihood. Thus, livelihood-based mangrove restoration may be a solution for reducing the pressure on the mangrove ecosystem. Because it is believed that there is a direct link between local livelihoods and mangrove ecosystems, it is possible to pursue a positive attitude of local people toward sustainable mangrove management (Badola et al., 2012).

Conceptualization of Research

This examines the politics of mangrove restoration in which decentralization is one tool of the government to transfer the policy objectives and their power from the central government level to the grassroots level. However, in the local context, villagers have their own knowledge, customs, and culture. Therefore, the policy normally goes in different directions with what the local government imagines in the beginning. This is called practices of politics. In this study, we can see how forestry land policy and environmental governance is transferred to the projects themselves and how decentralization works in central government and how it plays out in the local context. The government uses environmental governance to manage their policy. In this way, scientific knowledge always contributes as a government tool for their governance, whereas local knowledge is ranked at a low status, which causes ineffective decentralization. When scientific knowledge is integrated with local knowledge, a new solution will emerge. This study also looks at the relationship between humans and nature from the historical background of the area. It is believed that environmental issues cannot be separated from politics and history.

The state forms the forestry land policy which causes conflict among stakeholders in terms of forestry land, which leads to tenure insecurity. Besides that, environmental governance uses scientific knowledge to form mangrove restoration projects, which also causes conflicts in terms of access to the forest and using forest resources. These reasons lead to the loss of the villagers' control of their natural resources and livelihood. The fact is that their livelihood has been based on local knowledge for a long time. At present, they have started to use scientific knowledge to adapt with the development of new knowledge.

Their local knowledge is used not only for their daily livelihood; it is also used for cultural, social, and environmental aspects. In addition, local knowledge and scientific knowledge is contested in some ways at different levels in daily life and in mangrove restoration in the past. Therefore, this study will try to find out the solution for combining both kinds of knowledge for a better solution in human-nature interaction. When the knowledge is combined, mangrove restoration projects will gain a better outcome.

Another point is the politics of scale. When the mangrove restoration is viewed on a different scale, it will have a different meaning. In the case of mangrove restoration, governance or knowledge will be different on the global, national, and local scales. Each level has its own context, and the policy will go different ways from its original course.

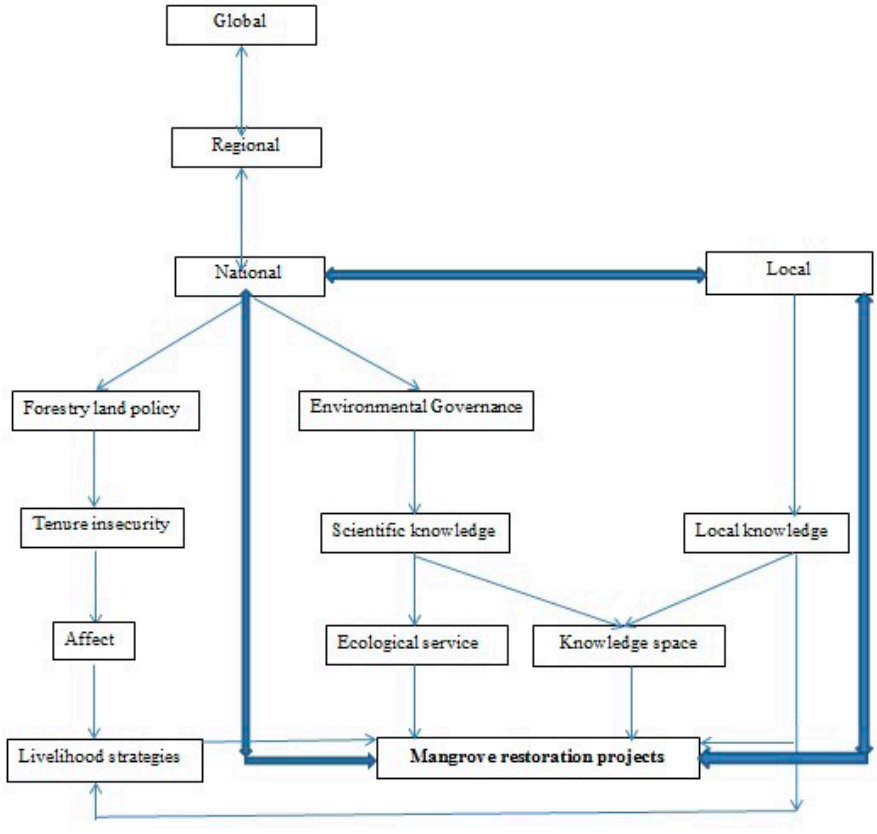


Figure 2.1 Conceptual Framework

Summary

In summary, this chapter first reviewed four relevant concepts including (1) Decentralization of Natural Resources Management; (2) Environmentality: a Form of Environmental Governance; (3) Local Knowledge in Response to Environmental Governance; and (4) The Politics of Scale as well as related studies in mangrove restoration in order to make a conceptual framework and give readers a picture of how the concept is going to be embedded in the study. Related studies were addressed to get the strong and weak points of previous studies in order to address a new aspect of mangrove restoration that this thesis intends to explore.

Chapter 3

The Research Setting: People, Environment, and its Relations

The Central Coast of Vietnam is located in the middle of Vietnam with twelve Provinces, and is among the six main regions in Vietnam, occupying one of the largest forest areas, which plays an important ecological and economic role (Table 3.1). The weather varies between the North Central Coast and South Central Coast because of territory and geographical characteristics. However, the geography of this area is generally the same, with narrow fields and high mountains as well as high sand dunes and lagoons. There are several mountain ranges that go directly from the highland areas to the ocean, from the northwest to the southwest, which create a unique geographical feature resulting in one of the most vulnerable areas for storms, floods, and soil erosion. The average temperature is about 25 ^{o}C, and the humidity around 82%. In the winter, the northeast wind brings warm air from the sea to this area, so that the weather here has more humidity and rain in comparison with the North, South, and Central Highlands of Vietnam. In addition, the rainy season in this area is concentrated from September to December and causes tremendous floods. These floods affect not only the local people's livelihood but also the mangrove forest in the area. This causes difficulties for mangrove restoration in the Central Coast of Vietnam.

	Forest area in total (000 ha)	Natural forest area (000 ha)	Plantation area (000 ha)	Total forest area compared with 2000 (%)
In total	13258.7	10338.9	2919.8	121.5
Red River Delta	428.9	207.6	221.3	129.1
North	4633.5	3565.8	1067.7	150.3
Central Coast	4592.0	3520.0	1072.0	120.9
Central Highlands	2925.2	2715.7	209.5	97.8
Southeast	402.8	269.3	133.5	92.0
Mekong Delta	276.4	60.5	215.9	102.2

Figure 3.1 Forest area in six regions in Vietnam 31/12/2009
(Source: Vietnam general statistic department, 2011)

Quang Binh Province is a coastal Province located in Central Vietnam, bordering Ha Tinh to the north, Quang Tri to the south, the South China Sea to the east, and Laos to the west. This Province is located in the narrowest area of Vietnam horizontally with the main topography being the Truong Son Mountains in the west and the sea in the east. Quang Binh Province was one of the frontier areas during the Vietnam-America War, and was affected by serious bombing with most of the forest areas being destroyed. However, this Province still ranks among the ten Provinces that have large forest areas in Vietnam; the forest cover makes up 66.9 % of the land (Table 3.2). Quang Binh has a dry season that lasts from April to August and a rainy season lasting from September to March, especially concentrated from September to November with frequent floods and storms. During the rainy season, water is over-supplied for aquaculture and agriculture as well as household demand, whereas there is a lack of water during the dry season. The special topography and weather patterns along with fast flowing rivers cause extreme flooding in the area to be a common occurrence. Therefore, the mangrove forest plays a really important role in ecological, social, and historical aspects and there are several mangrove restoration projects that have been conducted in the coastal area of the Province.

Province	Area (000 ha)	Forest Cover (%)
Northeast		
1. Son La	583.5	41.2
2. Ha Giang	422.5	52.6
Central Coast		
3. Nghe An	807.2	47.8
4. Thanh Hoa	527.1	46.1
5. Quang Binh	545.7	66.9
6. Quang Nam	457.1	43.1
Central Highlands		
7. Gia Lai	717.1	46.0
8. Kon Tum	655.9	67.3
9. Dak Lak	629.0	47.2
10. Lam dong	602.8	61.2
Total	5948.2	

Figure 3.2 Ten most forested provinces in Vietnam
Source: Thuy et.al, 2012; Department of Forest Protection, 2010

The Local Setting in village 6, Quang Phong: People, Place and Culture

Quang Phong is a small ward located in Quang Binh Province. It is organized with a residential area in the middle, surrounded by immense paddy fields in the north, east and west. The south is covered by shrimp farms, followed by mangrove forests that border the Gianh River (Figure 3.1 and 3.2). It is a small coastal Ward belonging to Ba Don Town, which is located along the low downstream area of the Gianh watershed, about 10.2 km from the river mouth and 45km from Dong Hoi city. The total natural area of the Ward is 470.04 hectares with 240.00 ha agricultural land and 36.24 ha non-agricultural land. Generally in rural home gardens in Vietnam, people plant a variety of perennial and short-term fruit trees and vegetables; however, in this area, only vegetables and banana trees are planted because of the level of salt in the soil. Every family has their own small vegetable garden for self-sufficient use. They plant vegetables

even along the road edge. It seems local people know how to use their land or, because of over population, people try to use land effectively.

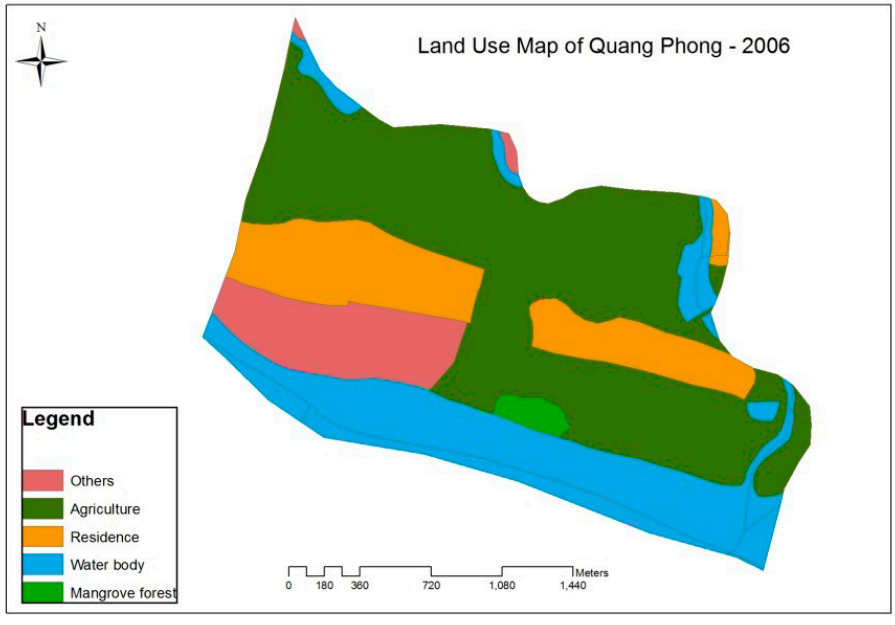


Figure 3.3 Land use map of Quang Phong -2006

Before 1956 the Quang Phong farmers association existed consisting of eight small hamlets. After agrarian changes by the Vietnam government, a combination of these hamlets formed an association named the Phong Tan Farmer Association. In 2007, Phong Tan was changed to become the Quang Phong Farmer Association and included ten villages named from village 1 to village 8, Tan Phong village, and Cau village (Group discussion, December 2014). Quang Phong is inhabited by 5493 people, consisting of 1196 households, of which farmers and fishers make up 58%, followed by 12% industrial workers and 30% other services. 100% of the people are Kinh – the ethnic majority of Vietnamese of which 60% are Christian and the rest are Buddhist or non-religious. They have lived peacefully for generations here. Every year, they celebrate Buddhist festivals in the middle of April and July according to the Vietnamese lunar calendar and, the Christians celebrate their Christmas as well as the other activities according to Western calendar. (Quang Phong Ward, 2014).

Village 6, the research site for this study, is situated in the east side of Quang Phong Ward with a population of 690 people, consisting of 159 households. The residential area is 19.4718 ha, the rice field area is 16.5261 ha, the aquaculture area is 7.9491 ha, and the garden area is 3.8614 ha (village headman, December 2014). All of the people are Christian, and one of their annual biggest activities is Christmas, which is celebrated on December 24 according to the Western calendar. They also celebrate the village ceremony to show their respect to the village founder every August 11, according to the Vietnamese Lunar calendar, when all of the villages participate. Women are responsible for cooking and cleaning, men are in charge of decorating and preparing, and elders play a spiritual role in the main ceremony. On Lunar New Year, they visit relatives and neighbors, play cards and traditional games, gather together, and especially organize one of the main activities called '*Tết Trồng Cây*', or the 'Tree Planting Festival' on the second day of the Lunar New Year to plant a tree following Uncle Ho's statement in the past, "One tree makes nothing, but three trees can make a mountain". This activity is a spiritual activity, not a mangrove restoration project. The participants are not only people in village 6 but also from the other villagers in the whole Ward made up of mostly government officers with representatives of social organizations and some villagers. Although it is not a real mangrove restoration project, this activity plays an important role in raising awareness of the mangrove forest in the area among villagers.

Socio-Economic Conditions of the Village

During interviews, although local people said their life is better in the present than in the past, conditions seem quite harsh. It is hot and dry in the dry season and cold in the rainy season, and it is windy all the time. During the pre-field trip in June, the temperature increased to 40^0 C on some days; whereas, it could decrease to 9-11 ^{0} C in the winter. During outdoor interviews and observations on a shrimp farm or paddy rice field, the wind was really strong. In addition, the rainfall has been decreasing and the weather has been more extreme over the last several years. The summer has become extended, causing drought and sometimes, unpredictable enormous floods destroying everything from mangrove forest to rice and vegetable crops in a day, such as the flood in 2010. Under these conditions, local people's life has become unstable. Therefore, they have found themselves alternative options of livelihood, such

as additional jobs as petty traders, migrant workers, construction workers, wage labors, broom making, and so on.

Generally, the income per capita of the area is approximately $605 which is very low compared with the national per capita income of $1,910 (Quang Phong Ward, 2014). This village is one of the medium-sized villages with a large number of middle income households in Quang Phong. It consists of 7 rich households, representing 4.4%; 137 medium households, making up 86.2%; 8 poor households, representing 5%; and 7 very poor households, comprise the remaining 5%. According to observations and household surveys, the rich families have diverse livelihood strategies from agriculture to services, while the poor normally have only one source of income with limited capital. The rich are educated people who work in the government and who also cultivate their land as well as doing other service jobs. They mostly have a large area of rice fields, a home garden, and a shrimp farm, and they know how to use their land effectively. They raise many kinds of livestock, such as chickens, ducks, and buffalo. Some of them work in the Town, while family members work on the farm. They normally have big and fully furnished houses and modern motorbikes. The medium households have less livelihood strategies and capital than the rich. The poor households normally do not have a motorbike and have very limited capital. They are either a family with many children and little land, a family with a sick member, or a family with only elderly. Either rich or poor, all households here have from 200 to 250 square meters for their residential area, and all of them have land for cultivation. One more interesting thing is although the gap between the rich and the poor is very wide, their awareness about mangrove forests is the same. One hundred percent of my interviewees have a general awareness about the mangrove forest and its history with different levels of understanding.

In addition, the traditional village landscape still remains (Figure 3.3). It is common to see a buffalo used in the field to prepare a paddy or a pile of rice straw in the home garden as fuel for cooking. The rural landscape appears unchanged and peaceful with local people's traditional livelihood still based on agriculture. They raise livestock all the year round and do fishing activities when it is not planting or harvesting season. However, due to the impact of development and modernization, the local villagers' livelihood has been changing to include new livelihood activities, such as aquaculture, service jobs or migrating to the city.

Figure 3.4 Traditional landscape in rural area of Vietnam: Buffalo in a rice field; rice straw stacked in a home garden

Livelihood strategies are mainly based on natural resource-based activities (on-farm and off-farm activities), such as traditional paddy rice cultivation, home gardens, crop plants and livestock raising as well as onshore fishery activities. However, their livelihood strategies have changed in accordance with changes in the environment over time and place. Nowadays, besides traditional livelihood activities, villagers also work in other services for additional income, such as construction work, working abroad, and industrial services. There are 309 working people out of 365 people in the village, consisting of 11 carpenters, 9 businessman, 68 overseas workers, 41 construction workers, 103 farmers, and 31 mixed farming and aquaculture work. The on-farm activities of the villagers here concentrate on rice field cultivation, shrimp farming, home gardening, and animal husbandry. This farming system has been determined by the human-ecology interaction of the villagers over a long time. All year round, local people plant vegetables for their daily use, raise livestock, and sell produce from their home garden. Every family has a plot for vegetables, and some families have bigger plots for business. There was land concession in 2002 in Quang Phong and 7.9491 hectares of rice field was converted to aquaculture. At the time of the concession preparation, shrimp farming was a new economic tool with high benefits, so every villager wanted to convert their land into a shrimp farm. Thus, at the village meeting, they organized a lottery to select who would have the right to own the concession land. If a villager already had land in the concession area, this had nothing to do with them. However, if another villager did not have land in the concession

area but got the right lottery number at the meeting, they could take the land of the one who did not get the number. In this case, they had to pay an annual tax to the owner. Although all of the villagers agreed to participate in this, there were some who were not willing to give their land to another villager. After two years of operating the shrimp farm, this conflict has disappeared because of the reducing shrimp yield.

Fishing in the river or collecting non-timber forest products is also a source of local villagers' income. However, these kinds of livelihood activities are just additional income. Some villagers use a small boat to catch shrimp and fish in the Gianh River. They can earn 150,000 VND (USD 7.5) each time on average, and they normally catch ten times in one month. Additionally, local villagers also collect crabs, fish, oysters and hunt birds in the mangrove forest. Villagers can enter into the forest to collect such natural resources, however it is illegal to cut down the forest. One more thing is that local villagers cannot currently collect fire wood from the forest as they did before in the primary forest because of the protection of the live trees. When people come in and collect a dead tree, it will also affect the young trees.

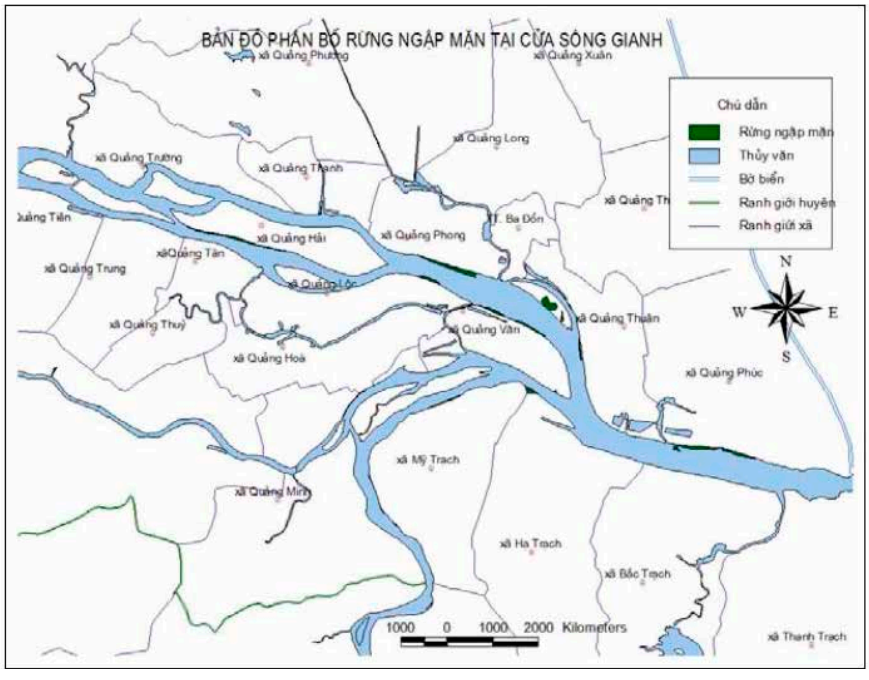
Because of the difficulties associated with the degradation of environmental conditions and the limit of available land, some households cannot devote all of their labor force and productive time for farming. Therefore, in addition to on-farm and off-farm activities, local villagers' livelihood is also based on non-farm activities such as small businesses, industrial work, construction work, overseas work, carpentry, sewerage, and as government officers. Outside employment is becoming a popular option among villagers because of its sustainable income without having to worry about weather conditions and it is also because a good source of income for local villagers all year round.

In the past community groups were established to manage specific activities, and they have been adapted to the current era. In Vietnam, the village is the grassroots administrative unit and it has a board who are elected from among the villagers. The board includes the village headman, and a village representative for the Communist Party, elderly people, the Vietnam Youth Union, the Farmer's Association, and for the Women's Association. All of them belong to the respective higher level group at the Ward level. In addition, in this area there is one more group called the Veterans Association. In these

groups, both men and women can become the representatives if they have enough ability. The exception is the Women's Union where only women can participate. The village headman is someone who has experience, village knowledge, and the respect of the villagers. The village headman is in charge of implementing the policy from the government and is the individual who solves basic village problems before forwarding to the Commune level. The Farmer's Association and Women's Union play an active and important role in the village's economic development. They help the local farmers in gaining access to systems and extension activities as well as managing funds for poor and vulnerable members. All of their activities are reported to the respective group in QPPC. Actually, the role of the representative in the village is not really active because most of the activities are implemented directly by QPPC.

Condition of mangrove forest and its restoration

At first glance, this village may seem just like other rural areas in Vietnam with immense paddy rice fields and several buffalos eating grass on the field's bank. However, there is one additional characteristic which makes this Ward famous in Quang Binh Province. It is the mangrove forest along the side of the Gianh River. The mangrove forest here is one of the remaining mangrove forest areas in the Central Coast of Vietnam and extends along the adjoining land between Quang Phong and the Gianh River. It has a long history to go along with the historical situation of Vietnam in general and the village specifically. In 2009, the mangrove forest grew at its best before being destroyed by a storm in 2010. Nowadays, the mangrove forest maintains a 6 ha stretch along the Gianh river side located on the south of the village, which plays a really important role in environmental protection, disaster risk reduction, and cultural beliefs.



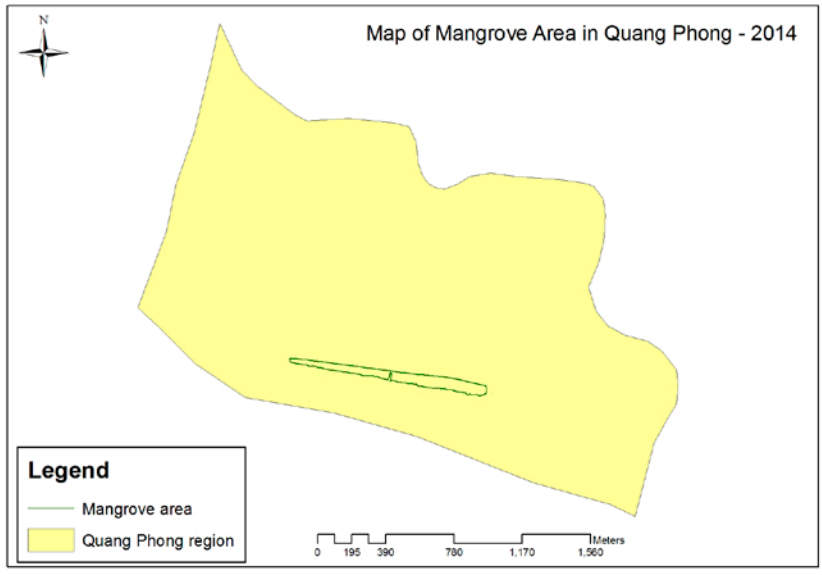


Figure 3.5 Map of mangrove area in Quang Phong 2009 and 2014
Source: Thanh, 2010 and data collection, 2014

It is believed that the land and other natural resources are tightly linked to local livelihood strategies. Living and making a living based on land use makes a tightly held relationship between villagers and natural resources. In addition, land not only has material value but also spiritual value for local villagers. They inherited land from their ancestors from generation to generation, and they have deeply-held beliefs to protect and nurture their land. Besides land, the forest is the common property within the village. In the past, they used it equally and regenerated the forest using their local knowledge; however, nowadays there are limitations for mangrove usages because all of the forests are under the control of the government, so no one can access the mangrove forests legally.

According to the information gained from interviews and group discussions, the primary mangrove forest existed before 1968, and it has been a source of livelihood of local people for a long time. People came to the forest to catch fish and crabs as well as collect non-timber forest products in order to make a living. They could also hunt animals and birds in the forest. The forest area is calculated to be 20 ha, which goes from the river side to the village through the mouth of the canal. During the Vietnam-America war, the mangrove forest was the shelter for Vietnamese military and local people's cargo boats. These boats carried goods for the Vietnamese military and, thanks to the density of the forest, it became a good shelter for both soldiers and boats. However, this forest was destroyed by American bombs during the beginning of the 1970s. After that war, the first mangrove restoration project was conducted under a government-funded project for planting protection forests from 1978 to 1982. In this project, local people participated actively. They recieved points for this similarily to their participation in agricultural cultivation as a part of their earning food vouchers according to the Vietnam government's regulations at that time. In Quang Phong, this was organized by the Veterans Association of Quang Phong and Quang Phong Asociation of the Elderly under the management of QTFAE. Under this activity, 8 ha of mangrove were planted along the side of the Gianh River, and this mangrove area was expanded in 1982. The majority of participants were veterans and elderly people. Restoration and scientific knowledge were combined with local knowledge in the project. Even so, under the impact of unsustainable development and natural disasters (storms and floods), the mangrove area here had been decreasing significantly. Therefore, a new project was conducted in 1992 by local veterans and the elderly

again to recover some spare area in the forest. After that, several government restoration projects were carried out in Quang Phong from 2009-2012, with a small area of this project (14.89%) to generate new forest (Forest Protection Department Report, 2014). These new projects are under government policy, such as Program 661 (1998-2010) and the Program of Forest Protection Restoration projects, and have been influenced by innovations at a regional and global level like REDD and PES. According to Vietnamese law, all of the forest belongs to the government, so this forest is under the management of two ministries, namely the Ministry of Natural Resources and Environment and the Ministry of Agriculture and Rural Development.

Period of time	**Activities**
Before 1968	Primary mangrove forest
1968-1972	Shelter for Vietnamese soldiers and cargo boats. Being destroyed by American bombing.
1974	99% of mangrove forest was destroyed
1978-1982	First mangrove restoration organized by Elderly's Association, Veterans' Association and QTFAE
1992	Mangrove restoration 2nd time
2007	Flood and cold weather caused mangrove tree's death
2008	Almost all of the mangrove trees died
2009	DDFP in cooperation with Farmers' Association for mangrove restoration project 1st under 661 program with 4,2 ha
2010	Flood causes mangrove tree's death, remain 0,7 ha
2011	2nd mangrove restoration by DDFP with 4,7 ha
2012	3rd mangrove restoration by DDFP with 4,2 ha
2013	Tending process and stop mangrove restoration

Figure 3.6 Historical conditions of Quang Phong mangrove forest
Source: Data collection, 2014

This forest not only plays an important role in the history of local culture but also, from an environmental aspect, it acts as a natural barrier and provides a diverse ecosystem. There are five main species belonging to two families in this forest, which include *Đước* (*Rhizophora stylosa*), *Vẹt dù* (*Bruguiera gymmorhiza*), *Bần ổi* (*Sonaratia ovate*), *Mắm ổi* (*Avicenia marina*), and *Sú* (*Aegiceras corniculatum*). Besides these, there are varieties of participation species such as *Cỏ gà* (*Cynodon dactylon L.*), *Sậy* (*Phragmites vallatoria* (*L.*) Veldk), *Cóc kèn* (*Derris trifoliate Lour.*). This mangrove forest occurred both outside and inside the river bank in the past; however, nowadays, it only occurs outside the bank with a total 6 ha.

Problems the village has faced in the past and at the present

From a social science perspective, the village has some internal problems that need to be solved. Firstly, in this modern era more and more of the younger generation are migrating to the city, or going overseas to work to gain a better quality of life. This may naturally lead to some forgetting their ancestral customs and traditional livelihood. Secondly, the structure of the village remains the same, but the customs and activities that kept the community cohesive have declined. For example the sharing activity has almost disappeared, causing a loss of villager integration and local knowledge, especially in the area of mangrove restoration. Thirdly, the problem of water needs to be considered by the local people's committee. Although it is a Ward belonging to Ba Don Town, there is no tapped water supply for daily life. Water supply for daily usage comes from local people's self-constructed water tanks. One hundred percent of the local people's water usage relies on rain fall and they have to buy water from outside in the dry season. There are three main sources of water in the village: river water is used for livelihood activities, such as irrigation for agriculture and aquaculture as well as drinking water for livestock. Water from wells and rain are used for daily life, but because of the bad quality of the water in the wells, people can only use it for washing. Therefore, the main supply of drinking water is dependent on rainfall in the area, which causes serious problems in the village. Water is a basic necessity and a lack of access to fresh water is neglecting a basic human right. According to the villagers, there was a water supply project that operated in 2012, however they still have no fresh water to use. These problems need to be taken into account by the policy makers.

Figure 3.7 Water tank for rain accumulation

Summary

As a typical rural coastal area in the Central Coast of Vietnam, village 6 has its own characteristics with rainy and dry seasons, frequent floods and storms, and traditional landscape of rice fields, buffalo, and rice straw stacks. A peaceful picture of rural life appears throughout this village. The village's traditional culture is seen in its festivals and ceremonies when local people show their respect to their beliefs and religion. In this community, everyone has their own responsibility in the family, interest groups, and in the whole community. The community is not homogenous, and there are gaps between the rich and poor, genders, ages and social statuses. In order to survive well in a society, recognizing the differences and putting the best efforts based on capital and strategies for a better outcome is required. Local people's livelihood strategies have changed and adapted to the current era of development under changing political, social, and environmental aspects.

With a long history of nature-based livelihood strategies, the mangrove forest plays an important role in the cultural and economic sides of local life.

A long history involving the Vietnam-America war caused the degradation of the mangrove forests, followed by a variety of restoration projects by the local government, NGOs, and national government. With the new era of sustainable development and the problems of social structure, economic changes, political transformation, and water quality, mangrove restoration has changed since its first inception. All the stakeholders perceive this restoration through their own understanding and participation. Local knowledge and scientific knowledge have their own position in these projects. Therefore, in order to make it clearer, the next chapter will address the issues of how stakeholders understand mangrove restoration, how decentralization really works among people, and what kind of knowledge is used in these projects.

Chapter 4

Decentralization and Environmental Governance in Mangrove Restoration: A Political Ecology Analysis

In Vietnam, forests play an important role in biodiversity conservation, natural disaster risk reduction, as sources of forest products, and in climate change adaptation and mitigation. However, during the last fifty years, due to both man-made and natural disturbances the forests have decreased dramatically in size. Forests cover has declined from 43 % in 1943 to 23 % in 1995 (MARD, 2001; Tuan, 2003). According to the Ministry of Agriculture and Rural Development, by the end of 1999 the total forest area in Vietnam was 10.9 million hectare, or about 33.2 % of the total natural area, consisting of 9.4 million hectares of natural forest and 1.5 million hectares of production forest (Sam and Trung, 2003).

Along with forests in upland areas, mangrove forests have also witnessed significant change during the past fifty years. Over that time, more than 80% of mangrove areas have been lost, from 408,500 ha in 1943 to 156,608 ha in 1999. This has drawn a lot of concern from scientists in terms of environmental and social impacts (MARD, 2001). Before the Doi Moi policy in 1986, there were no specific laws or regulations referring to mangrove forests and mangrove restoration; however, after that time, several crucial laws have been enacted that relate to the management of mangrove forests and mangrove restoration, such as the Land Law, enacted in 1987 and then amended in 1993, 2003, and 2013, and the Forest Protection and Development Law in 1991 and 2004.

Over time, as a colony, through wartime and even until now, Vietnam has evolved in terms of its historical, political and socio-economic aspects; the forestry sector is no exception. The decreasing or increasing of forest areas in the country is the result of complicated processes involving many different factors. Therefore, in this section, an over-view of forest and land policy as it relates to mangrove forests and mangrove restoration in Vietnam will be examined. The main periods of 1953 to 1985 and of 1986 onwards will be addressed based on their own respective historical, political, and socio-economic transformations that affect the policy of mangrove restoration.

From 1953 to 1985: Centralization in Natural Resources Management

In Vietnam, forest and land policy has changed over time. During the colonial era, forests were controlled by the French. Then during the Vietnam-America War, Vietnam was divided to two parts, the North and the South. The South belonged to a new government under the influence of the United States of America, and the North was under the control of the Vietnamese government. There was not much concern about forestry policy at that time because the majority of people's concern was on agricultural production and the war.

As pointed out previously, forest cover has changed dramatically since 1943. It is said that "between 1950 and 1983, mangrove forests were depleted, nationally, by around 37 per cent as a result of war damage and conversion to rice production and timber extraction" (Perrings, 1998: 121). This change was not only caused by the war but also by economic development in the country after Doi Moi. In 1953, Vietnam witnessed a tremendous agrarian change, the so-called 'land devolution' in which all of the land was collected by the government and distributed to the peasants. This is one of the most controversial policies in Vietnam's history because of its consequences. The redistribution affected not only the agricultural sector but also the forestry sector, as the use of trees and land have always had a tight connection.

In 1953, the Vietnamese government implemented agrarian reform, transforming the agricultural economic landscape across the whole country. The main purpose of this reform was to collectivize all means of production, and it is also the original reason for the establishment of agricultural cooperatives (*hợp tác xã nông nghiệp*-HTX). During this period, all farmers worked in HTX and received points for monthly food vouchers (*tem phiếu*) and essential

supplies. Additionally, there were no land use rights for local people. According to this reform, land should be distributed to people who are landless. The reason for this was that "the landlord class accounted for only four percent of the whole population, but occupied more than half of the total land area, while 62 percent of farm households were landless tenants of the landlord class" (Cuc and Tiem, 1996; Le, 2009: 64). This reform was aimed to bring equality and security to the country. It was considered as a first step in establishing socialism in Vietnam. Therefore, these kinds of collective farms produced everything together and shared the points they received which the people attained in harvest seasons. Each person received points based on the type of work they were assigned. In a HTX, people were divided into several small groups which specialized in different fields, such as agriculture, forestry, fisheries and so on. Each group had a leader who was responsible for production and distribution, and each member was assigned a task relevant to their age, skill, gender and educational background (Le, 2009). This collectivist structure lasted for almost three decades until it was changed by Doi Moi in 1986. Also during this period,in 1978, there was the first mangrove restoration project in Quang Phong. In this project, local people received points based on mangrove restoration activities. It is clear to see that by implementing this reform, the Vietnamese government had the rights to control all kinds of resources in rural areas that played a really important role in Vietnam during that period.

During the collective period, in 1981, Vietnam's agricultural system witnessed one of its first evolutions called '*Khoán 100*'. Under this policy, land was owned by the government and managed by agricultural cooperatives. Agricultural land was assigned to farming groups and individuals for planting, caring, harvesting, and selling products. This reform led to an increase in agricultural production in Northern Vietnam until 1986.

Previous to 1975 and before the independence of the country, forestry was a source of national economic growth concentrated solely on the production of timber. After the reunification of Vietnam, forests were still considered a source of wood, and the ecological importance was considered as less important than the economic aspects. Until Doi Moi in 1986 and the agrarian reform in Vietnam, the role of forests had remained the same, however after 1986, forests were viewed differently, with aspects of environmental conservation included. However, most forestry production was under state control and as a result, the forest was over-exploited, due to production quotas that were based on state

demand rather than the productive capacity of the forest (MOF, 1991). Under the central management system, the state paid no attention to local people's participation in forest management and tended to neglect the role of the forest in local people's livelihoods.

From 1986 onwards: Decentralization in Natural Resources Management

In 1986, after years of socialist policy, Doi Moi was introduced promoting varying forms and degrees of market-oriented land policies. As previously mentioned, after the "*Khoan 100*" in 1981, agricultural production had increased until levelling out in 1988, which caused a serious food crisis in Northern Vietnam (Cuc, 1995; Le, 2009). Additionally, in the early 1980s, under the central planning economic system, Vietnam faced its most severe economic crisis. Thus, in December of 1986, the Vietnamese Communist Party decided to adopt an economic reform policy which gradually shifted away from a centrally-planned economy towards a market-oriented economic system. Such a policy also applied to land and forest tenure (Tuan, 2003). One of the most important policies at the beginning of this period in order to deal with the food crisis was '*Khoan 10*' in April 1988 in which agricultural land was distributed to people for a period of ten to fifteen years (Dung, 2013). This is the first time that private ownership of a type and production from the land was recognized; however, there was still no land use rights for households. During this time, households received land according to the number of members in their family, in which 550 m^2 was assigned for each person. Therefore, some would have a large amount of land while others would not.

During the period after Doi Moi, there were a variety of laws related to forest management and land; these included the Land Law of 1987 and Forest Protection and Development Law of 1991. The Land Law was amended later three times, in 1993, 2003, and 2013, and the Forest Protection and Development Law was been amended once in 2004. The Land Law 1993 and Land Law amendments in 2003 contributed to the change of land ownership in Vietnam by which people had the right to transfer, exchange, inherit, lease, and mortgage their land. These changes contributed to a big impact in economic development in Vietnam (Dung, 2013). According to the Land Law of 1993, land belonged to the people and was managed by the state. With this law, land could be allocated and leased to organizations, households, and individuals for long-term use. The duration of land allocation differed from each kind of land use,

such as crops or forest land. In addition, the Land Law of 2003 added more land-use rights: the right to use, lease, inherit, transfer use rights, and collect. Under this policy, farmers were more autonomous and they had more rights with their land. The land-use rights, however, did not include formal ownership of the land at all. Additionally, when the policy was operated at a local administrative level, there were issues because of differences in understanding and implementation.

After the Doi Moi policy, with the change in law and policy for economic development, policy makers also considered the degradation of forests with efforts to protect the forest cover in Vietnam. Thus, the government issued several policies to develop the forestry sector, such as the Forest Land Allocation Program, Program 327 (1993-1998), and Program 661 (1998-2010). These programs aimed to restore the forest cover of the country back to 43% of the total land. Additionally, they addressed forestland allocation and leases to organizations, households and individuals for long-use for forestry purposes and also concentrated on how to regenerate forest areas to improve the forest cover of the entire country. It is this type of policy in which forests were beginning to be allocated to local households for management under the consultation of local government. This was a new step in decentralization in Vietnam in which power was transferred to different stakeholders.

The Prime Minister's Decision (661/QD-TTg, dated July 29, 1998), on 'objectives, tasks, policy and implementation mechanisms on the new five million ha of afforestation project' brought a new flow of reforestation in general and mangrove restoration specifically. In addition, under the era of climate change, the role of mangroves was considered more central to the state with a Prime Minister's Decision (158/2008/ QĐ-TTg) about the National Program on Climate Change Adaptation and Mitigation. Also, there was a MARD Decree (85/2007/CT-BNN) about 'Promotion of Reforestation in the Protected Forest' in which both of these regulation areas concentrated on mangrove restoration.

Decentralization in Mangrove Restoration: A Critical Analysis

Decentralization in natural resources management has been discussed widely since the mid-1980s and it has become a dominant theme in the discussion of natural resources policies in terms of the relationship between

development and conservation (Larson and Fernanda, 2008). Decentralization itself is not a simple process because in one context it can work well, whereas, in another, responsibility can overlap among stakeholders. Decentralization is not simply the transferring of power in decision-making processes, but it is also how actors use that power and how it affects access to the resource (Chusak and Vandergeest, 2010). Thus, it links to the way some actors behave with their power to control the resources in a specific context. Here, in mangrove restoration, it can be the control over who has access to mangrove forests.

In recent years, the term 'land grabbing' has been widely used in both academic and civil society. 'Land grabbing' refers to the "transfer of ownership, user rights and control over resources that were once publicly or privately owned – or not even the subject of ownership – from the poor into the hand of the powerful" (Fairhead, Leach, and Scoones, 2012: 238; Holmes, 2014: 549). In Holmes's point of view, "land grab is defined as the transfers of control over property and resources over large areas of territory from local control to more powerful outsiders" (Holmes, 2014: 550). The outsiders here can be a big company with plantation projects or it can be the government with reforestation or land allocation projects. It links to power exclusion and power relationships when the powerful can exclude the powerless from their rights to use their own land and resources. 'Green grabbing' is one type of 'land grabbing'. 'Green grabbing' here means property rights and rights of access has been seized under the name of environmentalism. In this case, mangrove restoration has been conducted under conservation policy and concentrates on ecological services while socio-economic and cultural aspects are almost entirely left out. Local people's livelihood and communal areas are affected by this policy and the policy makers do not realize, or choose to ignore, the effects of policy.

Mangrove restoration had been conducted in Vietnam before and after political transformation, so it witnessed the changes in the way policy makers perceive the mangroves and the way power is transferred through different scales. Through this kind of transfer, power normally goes in a different direction than its original course because of the new context, differences in understanding, or simply uncertainty within the local government. Good governance can change into bad, or vice versa. In the case of Quang Phong, before and during the Vietnam-America War, primary mangrove forest was used as a source of local villagers' livelihood and shelter and a part of their culture and spirit. It

acted as a natural barrier for not only natural disasters but also the bombing by the American military. "Mangrove forests, with their dense root systems, made it difficult for big patrol ships or boats to pass by, and so were very useful as shelters for anti-American troops. During the Vietnam War, mangroves in the south were used to receive and store weapons brought from the north, and were, therefore heavily targeted for destruction by the American army" (Hong, 2004: 178). In the past, the forest also provided aquatic species, plants, and birds for people's daily food during difficult times when food was insufficient. With destruction during the war and later with agricultural transformation much of the mangrove forest was lost,

Then, the first mangrove restoration project was conducted from 1978 to 1982 for the purpose of increasing the area of protection forest and for protecting the dike. After the war, the Vietnamese government tried to improve living conditions and facilities including this mangrove restoration project. In Quang Phong, the river dike played a crucial role in reducing soil erosion and protecting the area. Until the Vietnam-American War, this dike had been well-protected by the mangrove forest until the mangroves were destroyed in 1968. After that, realizing the importance of the mangroves in terms of dike protection, the government issued a mangrove restoration order but with a very limited budget. At the time, the project was under the management of the District agricultural department. Under the management of the forestry officer of that department, during the collective period, a group of villagers conducted a mangrove restoration project. After that, no one could have access to the mangrove as they had previously used it because the mangrove forest was now state property. Many years later, in the era of industrial economic development, a large area of mangrove was destroyed due to economic development projects, such as shrimp farms. As a result, local villagers were facing more and more serious natural disasters than ever before. Realizing again the importance of the mangrove forest, the government determined that mangrove restoration was a must-do in the era of climate change and sustainable development, with new projects being conducted under the name of climate change adaptation and mitigation. This time, people from diverse groups participated in the projects; however, local people still have no rights to access the mangrove. It is obvious that in both periods of centralization and decentralization powerful actors excluded the powerless from their natural resources and what they used

for their livelihood in the past. All in all, it can be said that there was a lack of policy integration and coordination among the different actors.

In Vietnam, as in other SEA countries like Thailand, Laos, or Cambodia, forests are common property which belongs to the state, and whatever mangrove restoration is conducted by the state or other agencies is still under the management of the state. This kind of policy affects tenure security and access rights of local villagers. In Quang Phong, local villagers were not sure about their right to access the forest, and all of the forest was under the control of local level administration. Mangrove forests, here, were classified as protected forests, which were under the management of DDFP. No individual household was assigned to manage the forest, which was the same as in the Land Law of 2003 and the Forest Protection and Development Law of 2004, as previously pointed out. Mangrove forests were classified as essential forests that cannot be allocated to local people. However, the criteria for that classification and how the forest protection board managed that forest are unclear. It is clear that local villagers who lived in the area could have been a good manager of the forest for both protection and development. However, with such current policy and ambiguous understanding about the law, local villagers are being excluded from their land and resources.

2. Protected forest is allocated to the Forest Protection Board, State Enterprise, Military Unit, individuals and households who lived in the area without any tax in order to protect and develop protected forest according to suitable documents following the Land Law.

Figure 4.1 Article 24: Forest Allocation, Forest Protection and Development Law 2004

1. Protected forest with the total area above 5,000 ha or below 5,000 ha with the important role in protection will be under the management of the Forest Protection Board which is set up by the government.

2. The other protected forest that does not belong to any kind in no.1 will be allocated to state enterprise, military unit, households, and individuals who live in the area for management, protection and usage.

Figure 4.2 Article 46: Protected Forest Management, Forest Protection and Development Law 2004

1. Protected forest land are:

a) Watershed protected forest land

b) Soil erosion protected forest land

c) Wave prevention protected forest land

d) Environmental preservation protected forest land

2. Upstream watershed protected forest is allocated to forest protection board for management.

3. Forest Protection Board is in charge of forest allocation to households and individuals who live in the area for protection and development. …

5. The Provincial People Committee can decide to give the rights of enterprise for eco-tourism in the forest.

Figure 4.3 Article 76: Protected Forest Land, Land Law 2003

The law is enacted by the powerful actor (State), and the powerless actor (local people) seems to be vulnerable here. The government and other powerful agencies have their own particular worldview, and through the use of language they create an image of mangrove restoration in order to serve their own conservation purposes. The fact is that although there are mechanisms for creating mangrove restoration plans, there are no forums set up for stakeholder negotiation. It is clear that in the law, there is no specific point that addresses the livelihood of local people. In addition, in Quang Phong, there is no meeting or training about mangrove restoration projects before they are implemented.

As a result, local villagers are the last actors to know about the policy after it has been amended.

Forest is a common property, and the costs and benefits should be shared. If the government and local people carry out the projects separately, they could be costly or have zero impact. Therefore, all actors need to share the costs and benefits among themselves (Ostrom and Schlager, 1996). A clear connection between sustainable forest management and benefit sharing among stakeholders should be established because in reality property is not a legal issue, it is also associated with society and culture. Mangrove forests are one kind of common property, and, in the past, this kind of common property had shared costs and benefits among the stakeholders. However, after the Doi Moi policy in 1986, new laws and regulations began governing the traditional customs and livelihood of local people. The mangrove forest went from being a resource that every villager could access, to officially becoming government property with little access for local people.

All in all, it seems that mangrove restoration is still following the top-down approach with no tenure security or benefit sharing and policy related to it is ambiguous and not clearly understood.

Environmental Governance and Decentralization: Its Operation on Different Scales

There are a variety of environmental policies in which the government conducts knowledge awareness programs about healthy environments to serve their goal in terms of conservation and ecosystem services. Although benefit sharing systems are referred to in the Forest Protection and Development Law of 2004, there are many problems in reality. The focus of this study is on environmental politics and to examine the relationship between humans and local nature under the impact of politics. Over the past decade there have been several laws and decrees declared by the government relating to mangrove reforestation. These have focused on sea dike protection, climate change adaption and mitigation, and mangrove restoration being directly referred to in the development plan of the country. Following these laws and decrees, a variety of documents were also issued at the local government level for implementation in the local context.

It can be said that these policy documents concentrate only on the development of forests in quantitative and protective functions without a focus on long-term conservation. Additionally, a policy has to come through many levels of administration which causes the implementation to often take a different direction than originally intended. Cooperation among different organizations at the same level is also a problem. For example, the mangrove restoration policy concentrates only on how to develop and protect the forest, whereas the land concession project is interested in how to convert land to shrimp farming for economic development. This kind of conflict is one of the causes of the ineffective management of mangrove restoration projects.

The understanding about mangrove restoration differs between levels. Regarding the same question about government policy, a District officer could instruct which laws refer to the policy and when it has been conducted, while local officers have only a basic knowledge of it, and local villagers have almost no knowledge of the policy or to which project it refers. The level of understanding here varies with each level. Therefore, it causes a problem in transferring power from higher levels to lower levels. Because the stakeholders have a different understanding about the project, the project's direction sometimes goes a different way than what was intended to occur from the central government's vision.

> We conducted two projects in 2009 following Decision 661 of the government under the five million hectare, and the second one was following Decision 57 of the government and 516 of Quang Binh Province about reforestation of protected forest areas. When the forest is regenerated, it can protect the river dike and the village from natural disasters as well as contribute to the increase of our country forest cover. We have done the projects although it is not as successful as we proposed it to be. (Forestry Protection Board officer, December 2014).

According to Hawkins et.al, (2010), the level of management in mangrove and wetlands in Vietnam is divided into four levels, namely national, provincial, district, and commune or village. Although the process of mangrove restoration projects has been increasingly decentralized to the lower levels, the influence of institutions at the state level is still ambiguous. This is because they are

responsible for issueing or helping the central government to issue legal documents concerning reforestation policy. At the state level, social actors have been involved in the promulgation of the reforestation legal framework. In mangrove and wetlands management, MARD and MONRE both have a role of management because MARD is responsible for forest management in general and MONRE is in charge of land management throughout the nation. In mangrove restoration, MONRE is in charge of land management and making maps, while MARD is responsible for designing and operating the projects. In general, MONRE takes care of land, and MARD is responsible for the trees in the forest.

After the policy has passed at the national level, it will come directly to the provincial level with the joint management of the Provincial People's Committee, the Forestry Inventory and Planning Sub-Institute, the Provincial Department of Natural Resources and Management, and the Provincial Department of Agriculture and Rural Development. At this level, the Provincial People's Committee plays a role coordinating the policy with other departments. The other two provincial divisions belong to MARD and MONRE, who will facilitate the projects to the lower level in terms of land and forest management. The Forestry Inventory and Planning Sub-Institute plays a role in planning and design. Depending on the situation of the area, some related documents are issued based on the original document at the national level. In that case, the policy will come to the District level administration, which includes the District People's Committee, the District Department of Natural Resources and Management, the District Department of Agriculture and Rural Development, and the Forest Protection Board. At this level, the Forest Protection Board will work directly with the Commune People's Committee and Farmer Association for the implementation of the project. It means that all of the decision-making processes are done at the highest level – the central government. Several staff members are in charge of the project, such as forestry department officers, agriculture and rural development officers in charge of a forestry sector, and Farmer Association representatives. During the process, the staff will have a meeting with the representative of each stakeholder involved in the project, and then the representative will share the information later with their constituents. However, the fact is that these representatives get only very basic information about the project, and, of course the villagers rarely get exactly the same information regarding what is going on in the project. Information

regarding the project is delivered through a top-down process. Therefore, in this kind of policy, it seems that the roles of institutions in the District and Commune levels are really important because they are the entities who understand the context and work closely with the local people. The outcome of the project will depend on how these institutions perceive the policy and how they work within the context.

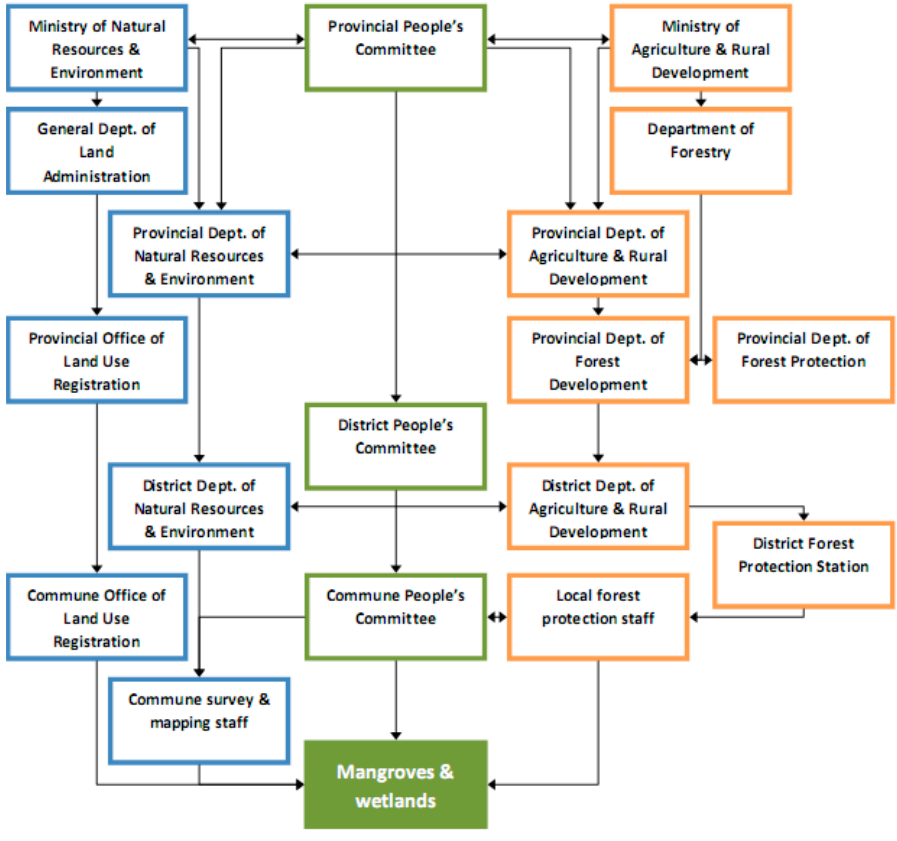


Figure 4.4 Level of mangrove and wetlands management in Vietnam

Source: Hawkins et.al, 2010: 5

In Vietnam, decentralization in forest management has been occurring since the 1990s (Tuan, 2003); however, the outcome of this policy is still limited. The majority of mangrove restoration has operated since the 1990s after the decentralization period; however, in the case of mangrove restoration in Quang

Phong, the old project was conducted from 1978-1982 in the centralization and collective period. Thus, in this project, the government framework had some different points that are shown in the figure 4.2. According to interviews, this project belonged to a National Dike Protection Policy in which it concentrated on the planting of protected forests. This kind of policy followed a top-down approach with the transferring of power from the central government to the grassroots level. During this period of time, the government mechanism was still simple, so that the power was transferred more directly to the grassroots level. They normally had meetings with the participants, so that the understanding of the policy was quite good.

For the first project in 1978, the Ministry of Forestry was in charge of mangrove restoration, in cooperation with the Ministry of Agriculture. The interesting thing is that all of the planning and implementation processes were carried out by forestry staff, in which local officers had the right to manage the project in their own way. In Quang Phong, the project was conducted successfully because the officer was one of the villagers who clearly understood the local context and respected the elder generation in the area. The important point is that although there was no specific reason for the meetings they had for gathering information among the villagers, she did it because she believed the project would be better planned if they gathered information before implementation.

All in all, in this case, the understanding of a policy went directly to the local area with its own original aim and adaptation to the local context by a useful initiative of a local forestry staff officer. The reason for that is, during the collective period, there were several interested groups which did specific work that they specialized in and understood the purpose as a member of the cooperative farm. There were some productive teams in the cooperative farm; each team was divided into small groups, such as a cultivation group, an aquaculture group, and so on. Each team member was responsible for their own work and received the same points for a whole day of working. In this project, mangrove restoration was also counted as a cooperative farm's activity, and the participants got the same number of points as one who worked on a farm. Furthermore, in this case, the local officer knew the cultural meaning of the forest during the Vietnam-American War as well as the social meaning in terms of local livelihood, so that the Veterans Association and Elderly Association were also involved. This led to the combination of local knowledge

and scientific knowledge. The period before 1986 can be called a time that power devolved from the central government to the regions directly. In the case of Vietnam, local government somehow could implement the policy closer to the context than the central government and this case showed that.

Level 1	Central government Ministry of Forestry Ministry of Agriculture
Level 2	Provincial People's Committee Department of Forestry Department of Agriculture
Level 3	District People's Committee Quang Trach Forestry-Agriculture Enterprise Forestry State Enterprise
Level 4	Phong Tan People Committee Phong Tan Agricultural Cooperative Phong Tan Veterans Association Phong Tan Elderly Association

Figure 4.5 Level of Mangrove Restoration Management in Quang Phong in 1978

After that program, there were some tending and caring activities conducted by local villagers until the second big mangrove restoration in 1992, in which local villagers tried to replenish the areas of dead trees by planting new ones. The mangrove was nearly fully developed until it was almost destroyed by unexpected cold weather and floods in 2007. A new restoration project of DDFP followed, covering an area of 4.2 ha which was reduced to just 0.7 ha after the long and tremendous flood in 2010. After that, DDFP conducted a long-term project of 4.1 ha in 2011 and 4.2 ha in 2012 and a tending process in 2013. From the lesson learnt from the previous policy, the new policy tried

to come up with benefit-sharing among the stakeholders. However, due to unclear understanding of the policy at different levels of administration and the complicated institutions in the new government mechanism, the system was still ambiguous.

Additionally, in this new policy, the relationship between humans and nature seemed to be ignored by the local MARD officer. Some of the reasons they pointed out were too much pressure by higher level institutions regarding planning, overly complicated meeting agendas, a limited budget of only 15,527,621 VND/ha (around 739USD), and harsh weather with a lack of rain and a long cold winter. Something to point out is that the officers were not people from the local area and seemed to care only about the quantitative report of the project for the higher administration, so they did not organize any meetings or training for the projects. From my survey, it is showed that more than 100 local people participated in the restoration activities and more than 8 ha were planted in comparison with 12 participants and 4 ha in the 1978 project. It appears that they did not sufficiently consider the qualitative aspects of the mangrove rehabilitation or ensure the understanding of other factors, such as the local villagers' cultural or socio-economic aspects. The level of their understanding here was that more mangroves were restored, the cost of the dike maintenance would be reduced, and it would create a natural disaster barrier for the area. It was believed that dike maintenance and natural disaster protection was very important, however, local knowledge and understanding about this case should have been taken into account. Local people were often left out of decision-making processes in forest restoration and were only asked to participate once implementation had begun, even though their livelihood has depended on the mangrove forest for a long time.

In addition, there was a close relationship between local people and their resources as well as their social structure, traditional customs, culture, and political practices (Truong and Orlando, 2010). However, while conducting these projects, their voice was not heard by the local government and as a result, local people in general were not interested in participating in forest restoration. Also, there were differences in the level of understanding of the project among stakeholders. For example, while the MARD and Forestry Department officer could give the exact decision and how it should be implemented, the local people's committee and Farmer Association's representative knew only the name of the project. Government officers looked at mangrove restoration as

ecological services following the government's policy; the local villagers just viewed it as a source of livelihood and a part of their culture.

> "The mangrove forests provided food and firewood for us in the past, and it provide the source of shrimp and fish for our shrimp farms currently. When I grow some mangrove trees along the bank of my shrimp pond, it helps reduce the loss of fish and shrimp during floods" (Shrimp farmer, December 2014)

Level 1	**Central government** Ministry of Environment and Natural Resources Management Ministry of Agriculture and Rural Development
Level 2	**Provincial People's Committee** Forest Inventory and Planning Institute Department of Forestry Department of Agriculture and Rural Development
Level 3	**District People's Committee** District Department of Agricultural and Rural Development District Department of Forest Protection
Level 4	**Quang Phong People Committee** Quang Phong Farmer Association

Figure 4.6 Level of Mangrove Restoration Management in Quang Phong in 2009

In this case, according to household surveys, 79.1 % of local villagers want to participate in the decision-making process and meetings about mangrove restoration, whereas 20.8% of them do not want to participate. Their reason for a desire to participate is that they want to share their experience about the mangroves, learn new knowledge about mangroves and how to expand livelihood-based opportunities, know about government policy, and

share lessons learnt from previous projects. Some villagers do not want to participate because of a lack of time, they don't have any knowledge about mangroves, or they have health problems. All of the information they have about mangrove restoration comes from the village headman. One interesting question some of them raised was why they could participate in meetings at the time of land concessions for shrimp farms but there have been no meetings for mangrove restoration because shrimp farms are a source of their livelihood and the forest used to be as well.

The concession that transformed rice fields into shrimp farms affected 7.9491 hectares in 2002, as mentioned in chapter 3. It was one of the government economic development policies during the period after 1986. From 1991 to 2001, the number of shrimp farms almost doubled because of encouragement through policy from the government. Thus expansion of shrimp farms affected the mangrove degradation in Vietnam (Hawkins, 2010). Under this policy, the government promoted economic development by means of converting agricultural land into shrimp farms. This process had to be a collaboration between MARD and MONRE because MONRE designed the concessions while MARD was responsible for agricultural management; aquaculture land was a type of agricultural land according to the Land Law of 2003. The policy provided for a conversion of paddy rice fields next to the dike into shrimp farms, which had higher profits. This land had already been allocated to the villagers without a land title, causing an interesting situation in the area – a lottery meeting as described in chapter 3. After this meeting, all of the villagers had land titles for both cultivation and paddy land. The way people reacted was interesting. Normally when a policy came to the lowest level, it was just implemented. The ones who had land in the area to be converted just converted it. But in this case, local people realized the benefits from shrimp farming, so they held a lottery requiring a lot of local involvement.

It can be seen that in the 1978 project, during the centralization period, the involvement of the local community seemed to be clearer than their engagement in the 2009 project onwards. This can be credited to the fact that in the 1978 project, the government policy was embedded in the local context by a local officer who understood the local situation. Additionally, the level of involvement in cooperative farms seems to be a stronger point of the 1978 project when livelihood security was coincidently provided. Participants received the same points as with their agricultural activity. Their livelihood

was secured, so they concentrated on mangrove restoration activities. Lastly, the mangrove restoration's cultural meaning drew the interests of the Veterans Association. Mangroves played an important role for these veterans in the past and now they were recovering it as part of a spiritual significance. This project seemed to work well when power was transferred directly to the grassroots level. Whereas, in the projects in 2009 onward, the involvement of the different levels is more complicated. The lowest level involvement seems to be not strong enough for a sustainable project.

In the politics of mangrove restoration, the actors and their interactions always need to be taken clearly into account. Mangrove restoration should be put into a triangular framework of how state operates the policy, how local government interprets and implements the policy, and how local villagers use their environmental knowledge to participate in this kind of project. Additionally, scientific knowledge and local knowledge are either opposing or intertwining depending on which scale the project is operated at.

Local Participation in Mangrove Restoration Activities

When it comes to local context, environmental policy is often introduced into a region without taking into account local conditions. However, in reality, participation at the local level is essential. Thus, the points needing to be discussed here are how policy is perceived locally and what levels of participation in policy implementation and awareness of duties are required. Local in this context means not only local villagers but also local government. There are varying degrees of understanding and participation among the different levels of administration, which can produce unintended outcomes.

In the new mangrove restoration in Quang Phong different institutions are in charge of the project compared to in the past. The DDFP is directly managing the project in cooperation with QPPC and Farmer Association, while DDARD just has the role of consultant. Compared to the old project, the DDARD played the main management role and the Veterans Association and the Elderly Association played important roles in both consultation and implementation. During the collective period, a group of interested local players had an important role throughout the process. In the old project, 12 people from the Veterans Association and the Elderly Association actively participated in the. However, in the new project, local villagers are only asked to participate

in the implementation activities after the planning is done. They are the same people who participated in the old project and clearly understand about the role of mangrove forests. They are also the village leaders, former leader, or Farmer Association representatives who have knowledge and experience with mangrove restoration. There are also some from the younger generation who have adopted the ideas from the older generation. Thus, in Quang Phong, people do not seem to be passive in reality. According to the household survey, 54.7% of the people participated in the mangrove restoration, of which 7.5% had also participated in the old project. Thirteen percent of the people can name the main types of species existing in the mangrove, 79.2 % can name some kinds of trees, whereas only 11.3% do not know any of the type of trees in the mangrove forest. All of my interviewees know about mangrove restoration in the area; however, the level of understanding is different. Additionally although the majority of villagers can distinguish between the old and new projects, they do not know which higher institution managed the projects. According to them, the old project was conducted by the Veterans Association and the Elderly Association, and the new one was conducted by the Farmer Association.

As previously mentioned in this chapter, the government started a restoration project for dike protection from 1978-1982. This project was one of the most successful projects not only in Quang Binh Province but also in the Central Coast of Vietnam. The mangrove restoration had a really effective plan and implementation. All of the members of these two organizations participated in the project under the guidance of the MARD District officer. According to Vietnamese government regulations before the Doi Moi policy, the agricultural system was still under the control of the government following the collective farm model, so all of the members who participated in the restoration project could get points just as if they participated into the other agricultural activities, such as rice cultivation or growing crops. There were 12 people who participated in the activities at that time. they could receive 10 points per day (equal to 0.4 kg rice per day) for planting or tending activities in the mangroves. The roles were divided among the members of the group by the group leader. According to the MARD District officer, because of budget limitations and out of respect for the older generation who had knowledge about the forest, she organized the consultation meeting to gather information and plan for the project. She also emphasized that the Farmer Association

representative actively participated in the project. Although there is no official rule about punishment, he set a strict rule for punishment in the case of livestock or man-made disturbances to the forest. If any villagers broke the law, their labor points were eliminated according to the level of law violation. It can be concluded that the older generation were veterans who understood the importance of the forest during the war, therefore they were more active in participating. When they participated in the project, they still received points to redeem for food in the cooperative farm, so they didn't need to be too concerned about their livelihood. Thus, although the project did not realize the important role of livelihood in the local context, one way or another it played a balanced role in conservation and livelihood.

The participants constructed a cottage every twenty five meters along side the mangroves in order to protect the forest from man-made disturbances or natural disasters. Mangrove restoration was seen as a very complicated process and caring for the mangroves played an important role in the outcome of the restoration project. According to the interviews, the participants built the cottages in order to take care of the mangrove trees, especially the seedlings. Firstly, they protected the mangrove forest from fishers from other villages who always caught fish and river shrimps or cut down the forest trees along the outside edge of the forest. Secondly, they could remove waste, snails, and mangrove oysters (*Crassostrea* sp.) from the mangrove seedlings because in this area during the high tide, water brought waste and oysters which attack the mangroves roots, barks, and leaves, causing serious consequences for the development of the mangrove seedlings.

> We built the cottage every twenty-five meters along the mangrove side in order to protect our mangrove trees because the fishers outside the village wanted to cut down the forest, not only for wood but also for their livelihood strategies. They used to catch fish and shrimp in the forest areas, so they still want to fish in this area as they used to do in the past. In addition, the oysters are very dangerous for mangrove trees and they come with the tide every day, so we have to remove them from mangrove seedlings in order to protect the tree. And it worked well. (Former Mangrove Planter, December 2014).

During the time of restoration, the MARD district officer and local people cooperated tightly from the beginning of the project to the end. Although the physical conditions, such as the budget and techniques were very limited, the stakeholders cooperated well for a successful project. Firstly, the meeting among stakeholders was conducted before the operation of the project in order to gather the knowledge of local people about time, location, and suitable techniques to use in the project. Secondly, local knowledge was applied in combination with the knowledge from the MARD officer for a mangrove restoration solution. Thirdly, the caring process was conducted for a long time after the restoration time, which is one of the most important points for the success of the project. According to the former MARD officer who implemented the project in 1978:

> We had to go to another place to buy seeds and then use our knowledge to raise seedlings. We also organized meetings with local villagers in order to gather their knowledge and opinions about which months were good for planting the trees, what was the most suitable time during the day for planting, what kind of species was suitable in the area, what methods should be used with different types of species, and so on. They were the ones who understood about the place because they have lived there for generations. In addition, the budget was very limited; the District provided enough budget only for seedlings, so that we had to cooperate tightly with the local villagers to reduce the cost of the mangrove restoration. (Former MARD officer, December 2014)

The species that was used in the project was chosen after careful consideration of both scientific and local knowledge. Some species can regenerate directly by viviparous seed (*Rhizophora stylosa, Bruguiera gymnorrhiza*, *Avicenia marina*, and *Avicenia alba)* whereas others have to be grown in a nursery to become seedlings before planting (*Aegiaras corniculatum* and *Sonneratia ovate).* They normally planted the mangrove in the beginning of February, when the tide and soil is stable, and normally they prepared the seedlings at the beginning of December. They also used their network and experience to reduce the cost of planting.

> In the 1978 project, we went to another Commune to buy seeds and seedlings as well as ask them about their knowledge of regeneration and protection of the mangrove forest. We applied our own experiences in combination with their experiences in order to generate the new forest, and it worked effectively. (Former mangrove planter, December 2014).

> Based on which types of mangrove tree, we decided the best way to regenerate them depended on their biological characteristics. For example, between Rhizophora stylosa and Avicenia marina, we collected their seeds from the tree. For Rhizophora stylosa, we put the seeds into a bag for two weeks and then planted them directly in the forest area. However, the Avicenia marina seeds need to be cared for in the nursery, which was established in the mangrove area, for around two months before we plant it. The reason we did it like this is because of the size of Avicenia marina seed. When the seedlings have grown enough, it will have the ability to adapt to its new environment under the strong tide. (Former mangrove planter, December 2014)

There was a second project launched by local people in 1992 to replace the dead trees. However, after the storm and flood in 2007, the mangrove forests decreased dramatically. New projects were operated directly by DDFP in collaboration with QPPC and the Farmer Association, from 2010 until 2013.

In these new projects, DDFP officers were allocated using a top-down approach, in which no meeting was held and there was no consultation with local villagers. At the time of implementation, there were 100 people who participated in the project and were paid 100,000 VND/day (USD 5) for their participation. In addition, the participants were mostly middle-aged and young people with little experience with mangrove restoration in comparison with the older people in the village. For example, a forestry department officer came to the area and gave instructions to all of the participants. While some followed the advice, others ignored it and just did as they thought it should be done. Moreover, there was no tending or caring processes for mangrove trees after their planting. There was one person in charge of the protection of the mangroves

who was paid 2,200,000 VND per year (around USD 110 per year). Many local villagers received information only from their village leader and Farmer Association representative who were involved in the old projects and played a good role in spreading information about mangrove reforestation. They tried to create awareness among the villagers through meetings. However, with bad press for the benefits of local knowledge, and poor application of old methods some local villages lost their faith in the project.

> Many people come to ask me about what we did in the past and how their project can be successful like ours. They also asked me how to collect seeds and seedlings as well as the way to take care of the mangrove trees. However, I think they have not applied what I told them because the new projects have not done well recently. I hope our knowledge can continue to be of use in the future. (Former mangrove planter, December, 2014).

The final point here concerns the limited study of the mangrove forest in the Central Coast of Vietnam. It has been studied since 1991 by Prof. Phan Nguyen Hong; however, there are only a few study areas such as Thua Thien Hue or Quang Nam Province, where the study conditions are more convenient than in other Provinces. Therefore, the mangrove forest or local knowledge in the other Provinces has been ignored for generations. Also, under economic development, local people are more interested with earning money, migrating to the city or doing non-farm work. The awareness of mangroves in terms of cultural and social aspects is in danger of disappearing because of the age of the people who have the knowledge about mangrove restoration with many in their eighties, or passed away already. Local knowledge is still vital and needs to be protected in this rapidly changing era. Another point that needs to be addressed is the tenure security of local villagers to the mangrove forest. Before the 'Doi Moi' policy and before the Land Law and Forest Protection and Development Law were amended, local villagers could access the forest, whereas, now they cannot access it because of the law. Although the project seems to be successful, the decision making process is still a big problem and needs to be addressed by the policy makers. In Vietnam, projects always follow a top-down approach, where the lower level of administration is considered as a tool to implement the policy from the central government.

Summary

To sum up, the mangrove forest is still not clearly classified in the law, and there is no law that refers to mangrove restoration, specifically. However, in the era of climate change, nowadays there are some documents that refer to climate change adaptation and realize the important role of mangrove forests. When the law is transferred to different levels of administration, the understanding can become different; this depends on how each institution perceives it. Additionally, the decision-making process still lacks engagement with the lower level institutions.

Furthermore, this case showed the relationship between historical, political and social contexts in environmental projects. Historical contexts changed over time, while the political context changed and led to significant changes in the socio-economic context as well as traditional culture. The political and ecological cannot be separated. These factors affect the outcome of environmental projects, whether it is embedded or not embedded in the social context.

Next, the participation of local villagers in the project has been affected by many factors. These factors are the understanding about local customs, respect of local knowledge, involvement in local livelihood strategies, and the role of project leader. Additionally, the role of village leader is really important in the local context. For example, in the case of a shrimp farm or raising awareness about the mangrove, no one can do it better than the village leader, who is respected by local villagers and understands the local context well.

Lastly, mangrove restoration is a very complex process. It is not only an ecological restoration but also a cultural recovery. Therefore, projects need to promote local autonomy in decision-making processes. Also training and ongoing care processes of newly-planted trees need to be considered.

Chapter 5

Local Environmental Knowledge and Livelihood Strategies

Environmental knowledge here means not only knowledge of mangrove conservation but also the way local people use their knowledge for their culture, society, and livelihood strategies. It is believed that society, culture, and livelihood strategies are linked to historical, political, and social contexts. Thus, environmental knowledge is very difficult to produce without looking into these contexts. Environmental knowledge can come from both scientific knowledge and local traditional knowledge. This section concentrates on how local knowledge acts as environmental knowledge and how local people negotiate with it in the face of scientific knowledge.

Local knowledge is a kind of knowledge that is produced by local people in a specific area. It includes knowledge about soil, crop yields, pest management, water usage, farm management, natural resources use, and so on (Taylor and Loë, 2012). Local knowledge can advise the best time to plant, and harvest, how to care for plants, and what kind of soil is suitable for specific crops. It can also provide any information about how their river operates, how to predict whether or not it will rain, growth of plants, changes in the seasons, and others. This kind of knowledge cannot be learned or accumulated in a matter of days or months. It takes years to actually accumulate the knowledge of a specific area through ongoing experiences.

In Quang Phong, local knowledge acts as a tool for mangrove forest usage, social and cultural practices, and livelihood strategies, which will be discussed specifically in the next section. This kind of knowledge management can be seen in village customs regarding the environment, labor, social relations, sharing of economic interests, resolving differences, and the power of the different actors who are involved in mangrove restoration, labor management, village customs, and knowledge adaptation.

Knowledge in a Mangrove Ecosystem

Before the mangroves were destroyed by the bombing in 1968-1972, the local people used mangroves as a source of their livelihood strategies and shelter during the war. They collected fire wood for their everyday life. Leaves of *Rhizophora stylosa* were collected for food, while fruit of *Sonneratia ovata* was collected for cooking. Villagers said that *Sonneratia ovata* fruit was really good for its sour to slightly bitter taste, which went well with river fish that they caught locally. Local people also sometimes collected firewood from the forest for their personal use, as they mentioned *Bruguiera gymnorrhiza* and *Rhizophora stylosa* as good sources of high energy firewood. Additionally, mangroves were used as sources of construction materials, especially for building a house at that time. Wood of *Rhizophora stylosa* was normally used for the columns of the house.

The mangrove also provided an aquatic source of income for local villagers at that time. They caught fish, shrimp, crabs, and molluscs (oysters and snails) in the mangroves and near-by areas daily. Mangrove oysters were also cultivated on the mudflats in the mangrove from 2008-2010. Crabs were collected by women and children along the river banks and creeks in mangroves. The crabs were collected by using a bamboo trap or hooks. Local villagers normally utilized traps during high tide and stopped when the tide receded. Hooks were used during low tide and normally at night. Experienced local villagers can identify the crab hole, insert a hook, and pull the crab out. Fish and shrimp were collected by traps, lines, and nets. Traps normally were used on the bank of a rice field, river bank, and in the mangrove mud, while lines and nets were used in the river. They also hunted birds during the day.

Although people had open access to the mangrove forest at the time, the village had their own regulations regarding access and use of the forest. Local

villagers could access and collect aquatic resources. However, if they wanted to cut down a tree for their personal use, they needed to have permission from the local committee, determined by a roundtable discussion about access to the forest in order to keep the natural resources sustained. Additionally, firewood collection was only allowed for the dead branches or trees in the forest. Mostly, the village board advised local villagers to use rice straw after harvest for energy, which still plays a traditional role in providing energy now. It can be seen that there was no official law regarding forest management during the wartime. Local villagers knew how to utilize their resources quite suitably.

Based on the experiences of using the mangrove forest, local villagers knew the time and the way to collect the seeds and seedlings as well as the way to take care of the forest effectively in the first mangrove restoration project. Planning, implementation, and caring processes were conducted by the local villagers in the 1978 project. According to a QTFAE officer, during a meeting with a group of local villagers interested in mangrove restoration, she learned the suitable time for planting, which included the tide, level of salt in the water, and the weather. They also discussed how to collect the seeds and how to manage the nursery. Additionally, caring processes were emphasized by the participants as a necessary process in mangrove restoration.

> Before the implementation process, we conducted a meeting with the local elderly in order to ask their opinions about the most suitable time and location for mangrove planting. Because of their knowledge in this area, I knew that these people had valuable knowledge about the way to use and regenerate as well as protect the forest. (QTFAE officer, December 2014)

Mangrove restoration is usually conducted in late January or soon into February, and seeds were collected in late December because, according to the villagers, that is the best time for collecting the seeds, when they are mature enough to regenerate new growth. After collecting, they put all of the seeds into a big bag and kept it in the dark for around one month before planting. Depending on the species, they will plant by seedling or seed directly.

When it came to implementing the planting, local villagers used their knowledge about tide duration and the weather in order to decide the most

effective time to plant. This knowledge of tide duration was also applied to caring for the new growth later. According to them, the best time for planting was February because the trees were no longer small and vulnerable to external factors, such as extreme tidal movement. In February, the tide is stable, not as powerful as from September to December, and not as low as in from April to June. Additionally, the rainfall and temperature also affect the development of the mangrove trees. When the rain is too strong, the trees cannot stand because they are not mature enough, whereas, a lack of rain can cause a lower water level, which has a negative impact on the trees. Additionally, because in Quang Phong, the tide duration is half daily tide duration, which means the duration between high tide and low tide was from 3 to 4 hours. The high tide was at 8 am and 1 pm every day and the highest tide reached at 2 pm. According to a former planter, the duration of the tide movement can affect tree development and the impact oysters have on the seedlings. If the tide movement is too long, the oysters have more time to latch onto a tree, which will cause serious problems in the tree development. Therefore, the villagers have to implement the caring process frequently, including removing the shellfish from the small trees.

> We built a cottage every twenty-five meters along the mangrove side in order to protect our mangrove trees because the fishers outside the village want to cut down the forest, not only because of wood but also for their own livelihood strategies. They used to catch fish and shrimp in the forest areas, so they still want to fish in this area as they used to in the past. In addition, the oyster is very dangerous for the mangrove tree, and they come with the tide every day, so we have to remove them from mangrove seedlings in order to protect the tree. And it worked well. (Former Mangrove Planter, December, 2014)

One more thing local villagers mentioned, mangrove forests help reduce the loss of their shrimp farms during the flood season. After the mangrove forest was generated, they realized that the flood level was lower and that the mangroves made a barrier to protect the shrimp farm. Therefore, the shrimp farm owners tried to regenerate the forest on their shrimp farm banks for protection. They also open the canal twice a year for natural movement of

aquatic species to their farms. Shrimp farms receive a lot of benefits from the mangrove forests.

All in all, local knowledge has also played an important role in environmental knowledge from the past until now. However, the question here is whether mangrove restoration needs only local knowledge or a combination between scientific knowledge and local knowledge in order to have an effective outcome of the project.

Custom and Livelihood Strategies in the Local Context

As mentioned above, local customs towards environment, village social structure and cultural practices as well as their labor distribution and livelihood management are all a part of local knowledge. Their customs and cultural belief were addressed in chapter 3, so in this section, the labor distribution, their livelihood practices, and their link to environmental awareness will be discussed.

Average number of labor	2.9
Average number of people	4.1
Average number of female labor	1.45
Average years of schooling (household owner)	6.8
Average number of children	1.59

Figure 5.1 Basic demographic information of household in Village 6

In rural villages in Vietnam, the role of men is still dominant to that of women throughout economic, social, and cultural activities. Firstly, a household's land title is held by the household's patriarch. Secondly, the participants in the meeting activities were predominantly men. Additionally, the first mangrove restoration project was conducted by twelve members of the Veterans and Elderly Associations, who were also men, and the majority of members on the village board were also men. Lastly, the village headman has always been a man since the village was founded. However, in the era of development when people were educated about gender equality, the role of women improved and women could participate more in the village activities. Interestingly, during the period of the first mangrove restoration project in 1978, when the role of women was a controversial debate, the officer who was in charge of the mangrove restoration project and who managed all of the

activities with the participants was a young women who had just graduated from National Forestry University.

Local people's livelihood was based on the seasonal calendar, and their experience had accumulated over generations. Thus, they learned to cope with the changes of weather and development. During the collective period, there were some interest groups who were divided based on ability, gender, and age, such as the agricultural group, fishery group, sewing group, and so on. Villagers did their work and received points for food vouchers. The more points they accumulated, the more rice they got from the cooperative farm. During that time, mangrove restoration was also an activity of the cooperative farm, and that is why participants received points for their work.

The traditional livelihood of local villagers here is based on the agriculture and fishery sectors. The main crops are rice, corn, and vegetables, and the seasonal calendar is still being used until now (Table 3.3). The main season for rice is from May to September in summer and autumn, and the low season is from December to April in the winter and spring. Because October and November have the highest rainfall in the area with more than 70% of the annual rainfall, vegetables are cultivated during this time and spread out to all year round. The rice seed for both high and low season is accumulated from the low season and stored in a warehouse. Local villagers claim that May and June are the best time for drying the seed, so it normally occurs after the low season harvesting. In contrast, corn seed is stored after the high season harvest in April. It can be said that April (March in lunar calendar) is the highest season of agricultural activities in the rural area. May and June (April and May in lunar calendar) are the time for preparing the seed and the beginning of rice cultivation. Vegetables are in supply all year round for local people, especially *rau khoai lang* (Ipomoea batatas) and *rau muong* (Ipomoea aquatic). Pumpkin is only cultivated from October to April because this species thrives better in rainy season than dry and hot season. Additionally, local villagers have their traditional knowledge about weather and flood forecast based on natural signs from plants, insects, and the surrounding environment. According to an interviewee, villagers use this kind of traditional knowledge in combination with weather forecasting on television for their livelihood activities (Table 5.3)

Vietnamese	English	Interpretation
Chuồn chuồn bay thấp thì mưa Bay cao thì nắng Bay vừa thì râm	If a dragonfly flies low, it will rain, if it flies high, it will be sunny, and if it flies average, it will be cloudy.	About weather forecasting for cultivation activities
Mau sao thì nắng, vắng sao thì mưa	If the night's sky is full of stars, tomorrow will be sunny. But if there are no stars, tomorrow will be cloudy	For livelihood activities. Depending on rain or a sunny day, they will do different activities
Tháng bảy kiến bò, chỉ lo lại lụt	If ants move a lot during the 7th month of the lunar calendar, there will be a flood.	About predicting a flood: Because ants are really sensitive to weather, when they move their nest higher, it means there is going to be a flood.

Nhất nước, nhì phân, tam cần, tứ giống	First: Water Second: Fertilizer Third: Hardworking Fourth: Seed	In agriculture, the priority of factors is water, and then fertilizer, and then the hardworking of labor, and finally seed
Tháng bảy heo may, chuồn chuồn bay thì bão	If a dragonfly flies on a cloudy day in July, a storm is coming.	About weather forecasting. In the past, they used this way to predict storms to prepare before the storm comes.
Lúa chiêm lấp ló đầu bờ Hễ nghe tiếng sấm phất cờ mà lên	If there is thunder in the rice field, rice will grow well.	There will be a chemical process happened during the time of thunder in which KNO3 will be created in the rice field, which is a fertilizer for rice, so that rice will grow better after that phenomena.

Figure 5.2 Quang Phong traditional ecological knowledge

Local villagers also use their agricultural products to feed their livestock, chickens, ducks, and pigs. Food comes from rice, vegetables, and grass on the bank of the rice field. Pigs are raised in a fixed area, whereas chickens and ducks are raised freely in the garden where they can run everywhere to find additional sources of food. Buffalo are fed by grass on the river bank and sometimes are left on the bank of the rice field for half of the day. The main function of buffalo is working in rice fields during the land preparation process, while pigs are raised for meat. Chickens and ducks are raised for both meat and eggs.

Additionally, as pointed out in chapter 4, the Vietnamese agricultural system witnessed one of the first evolutions in the 1980s, firstly, '*Khoan 100*'

in 1981 and then '*Khoan 10*'in April, 1988, which redistributed agricultural land among the people. The local people could use the agricultural land for 10 to 15 years (Dung, 2013). According to field interviews, under '*Khoan 10*' agricultural land policy had been distributed to the local villagers based on the number of people in the household. Each person received 500 square meters and, because at that time each household normally had a large number of people, each household had more than 5000 square meters of agricultural land on average. After the new Land Law was issued in 1987, and then amended in 1993, 1998, 2000, 2003, and 2013, the land certificate was issued, and local people had more rights with their land. However, after their children grew up and got married, parents normally gave their children a fair share of it. Thus, the average land holding in the area is 1240 square meters with the average income range 8,000,000 VND per household per year (USD 381). After the costs of fertilizer, land preparation, and harvesting, each household earned about 5,000,000 VND per year (USD 238).

> During Khoan 10, we received land based on the number of people in our household. Each person received one sao, so at that time, we had around twelve sao. But after that, when our children grew up, we distributed our land among them equally. So, now we just have five sao. (shrimp farmer, December, 2014)

> We got the land title of our residential land in 1993, and we got the agricultural land title in 2002 after the conversion from rice paddy land into a shrimp farm. (Farmer, December, 2014)

Besides agricultural activities, local villagers also have the tradition of in-shore fishing, in which they go fishing in the river at night time, this is called '*di te*'. They also collect marine food sources from the river bank and mangrove forest. The high season for '*di te*' is from September to November. During this period, they can go fishing around 20 times each month on average, with around 1.5-2 kg of river shrimp per night and 3kg of fish per night. With that activity, they can earn 200,000 VND (around USD 19) on average. However, during the low season, they can go approximately 10 times and with very low productivity. The reason for this seasonal shift is that during the rainy season in September and October, thanks to the strong current, the river fish follow the river current and migrate from upstream to downstream areas.

After 1986, Vietnam changed from a socialist country to a market-oriented country under a socialist direction. Although there were new coping strategies, agriculture still played an important role in the village. Some new livelihood strategies were developed, such as shrimp farming, small businesses, construction work, migrant work, and so on. The shrimp farm was incorporated in 2002 under a provincial policy of land concession. The price of shrimp was increasing dramatically at that time due to major exporting to Europe and Asia since the late 1980s, and, as a result, the central government encouraged expanding the number of shrimp farms (Hue and Scoot, 2008). The shrimp farm concession in this area was a result of this policy. An area of 7.9491 hectares of rice fields was converted to shrimp farms in 2002 in Village 6, and 43.57 ha were converted in the whole commune. To implement this change, the rice field owners and the non-rice field owners of the converted area had a meeting to undertake a lottery to choose who would convert their rice paddy field into a shrimp farm. In the case that the land owner could not convert their land, they would receive money from those who used their land, the same amount as they would have received from their rice field in the past. This situation clearly shows the socialist construction in Vietnamese society that "all land belongs to the government," but it also shows the autonomous role of the local government and village board in the implementation process.

According to interviews, the shrimp farms made a profit in only the first two years. With 5 sao of shrimp farms, local villagers could get 500 kilograms of shrimp at the end of the season, which helped them earn around 100,000,000 VND (around USD 5,000) per season in the first two years. After that, due to an unidentified disease, the local villagers let the shrimp farm develop naturally and collected the shrimp at the end of the season, amounting to around 8,000,000 VND (USD 400) per year. As observed firsthand, the shrimp farm embankment was very simple, and there was no regular water exchange in the pond. In addition, there was no equipment to add oxygen to the pond, which caused the slow growth of shrimp. According to Hong and San (1993), this situation made the water PH decrease to around 4 or 5, which causes the death of shrimp and other organisms. Also, poorly constructed shrimp ponds caused soil erosion to occur faster, affecting the growth of shrimp and fish. Shrimp are raised from January to May or June in the high season, and they rarely farm in the rainy season because of the annual floods from September to November. According to the shrimp farmers, although the shrimp farm has not worked

very effectively , they would still like to continue shrimp farming. Local villagers use their knowledge about tide and weather to open the mouth of the canal in order to get natural shrimp and fish from the river. Since 2009, some local villagers have also planted mangrove trees along their shrimp farm in order to protect it during natural disasters. During the fieldwork, people claimed that there was only one training session for the shrimp business and when the disease occurred, there was no solution for it. It seems that the local villagers' lack of knowledge of the shrimp business management, especially in water quality and disease management had been ignored by the policy makers. The deterioration of shrimp farms not only caused the death of shrimp but also had a negative impact on the mangrove forest next to the shrimp farms.

> During the first two years, our shrimp farm provided a large amount of shrimp to the local market and brought in a lot of money for us. However, after that, the shrimp got a strange disease, and many officers came to do research about this problem. But there was no solution for this until now. Nowadays, we just open the farm naturally to get the natural shrimp and fish in order to maintain our small income from the farm. (Shrimp farmer, December 2014)

Another livelihood strategy is construction work which more and more local villagers have been doing in villages or towns and also overseas. There were 41 domestic construction workers and 68 villagers working overseas as construction workers out of the 365 people in the village. They mainly worked in Angola illegally with a tourist visa, while others worked in Malaysia and Indonesia legally. All of the construction workers were men aged from 25 to 50. This is currently one of the main income sources of the villagers besides the agricultural sector.

Local villagers have also developed new livelihood strategies based on their main sources of livelihood, such as as merchants and running small businesses. While some buy shrimp and fish to sell in the market, others buy rice and vegetables and sell to the big businesses. Thus in this era of economic change, local villagers have adapted to that change effectively. For example, because of the lack of fresh water in the area, local people have their own water tank for storing rain water. They know that there are around two months, July and August, that the southwest wind brings hot and dry conditions with a lack

of rain. So, they normally keep the water from the high rainy season to use during the time of little rain.

It is believed that there have been a lot of changes in the village from the past until now, changes in the economy, livelihood, and environment. Under these changing conditions, local knowledge is in danger of disappearing. However, the fact is that local knowledge is actually situated in the change. It is just one more piece of knowledge used to adapt to the new changes and is transformed into new kinds of knowledge.

Mangrove Forest Usage as a Situated Knowledge

Local knowledge is in the process of continuously changing, adapting, contesting, and coexisting, in which the traditional and modern, situational and hybrid, local and global are mixed together to create a complicated local life (Nygren, 1999: 269; Yos, 2003: 43). Knowledge is a production of social activities and is socially constructed. It means that in different contexts and social changes, a concept can join or clash with that change.

Mangrove forests are an ecosystem that interacts both internally with its species, river, mudflat and so on, but also externally with other ecosystems such as agriculture or aquaculture or humans. In the study area, local knowledge keeps changing, contesting, coexisting with modern knowledge. For example, the sharing of experiences about the best time for planting, suitable species for mangrove restoration, or the phenological calendar of mangrove species have been maintained in the village.

People do not use the forest products only for their livelihood; it also is a part of their traditional culture and history. Traditional knowledge is used to manipulate mangrove forests as part of their social and cultural roles. Villagers cut timber for houses or boats, catch fish and shrimp, take care of the forest trees, and show respect for the forest. They use their knowledge variably, applying it to new situations to maintain their livelihood while still protecting the forest.

Most of the households here have extended families, when the old generation lives with their children and their grandchildren in the same house. This is a really good opportunity to exchange knowledge and stories from the past as well as new knowledge from the young generation. It is believed that

local knowledge has been transferred orally for many generations. The young generation has gained knowledge from school, while the older generation has built their local knowledge over time. In a household that I interviewed, an old man shared his story and experiences of mangrove restoration in 1978 as well as the time he was a soldier. He shared about how he and the other participants found the source of seeds, how they grew them into seedlings, and how hard they tried to protect and care for the trees under the changing weather. His son and current Farmer Association representative has also adopted this bit of knowledge about mangrove restoration. As there are studies in mangrove reforestation conducted there, and the researchers and students come to the Farmer Association representative to get information, from time to time, in helping the researchers as a research assistant he has also accumulated new kinds of knowledge from the researchers. His network with the scientists has also expanded. For example, he received thirty Nypa trees to plant in the mangrove area along with a guide book from Hue University of Agriculture and Forestry. In combination with knowledge he had received from the old generation, he planted all of the trees. Those trees developed well in the first two years; however, due to the impact of the flood in 2010, the majority of the trees were destroyed. This kind of application by a villager should be encouraged more.

It is believed that local villagers' experiences and new technology in mangrove restoration somehow challenge each other, but they can also work together to produce better results in some cases. As in the case of planting mangrove trees next to the shrimp farms and along the river dike. Scientific knowledge demonstrates that the mangrove forest can act as a natural barrier to protect the river dike and the village. Local knowledge claims that the shrimp next to the mangroves can develop better than the shrimp located farther away. In this case, some shrimp farmers used their traditional knowledge to plant mangrove trees in the shrimp farm area. They collected the seeds of mangrove trees and planted them along the bank of their shrimp farms to prevent erosion and create a habitat for their shrimp during times of flooding. They have also opened a small hole for natural development and have earned an income from the shrimp, fish, and crab naturally present. Some of them can also catch fish along the forest edge and new river side. This shows that their knowledge has adapted to new changes. They applied the experiences from the mangrove

restoration projects that they participated in and applied their traditional knowledge when they carried out this plan.

> During the flood and storm season, our shrimp farm had been affected seriously. After talking with some elderly people in the village, I found the way to prevent the consequence of natural disaster. I collected the seedlings of the mangrove tree and planted them along the canal and my shrimp farm. After two years, it became a good habitat for our shrimp. The number of lost shrimp has been decreasing during the flood seasons, and I am happy with it. (Shrimp farmer, December 2014)

Figure 5.3 Mangrove tree planted by local villagers in the shrimp farm bank

According to scientific knowledge, mangrove forest regeneration depends on specific factors, such as temperature, tide movement, rainfall, soil, the level of salt in the water, and sunshine. The mangrove trees can develop well from 20-30^{0}C, with an annual rainfall from 1800-3000mm/year (Thanh, 2010; Alksornkoae, 1993), and with flexible tide movements, because if there is no

water, the water in the soil will turn to vapor and the level of salt in the water will increase. Salt levels should be between 10-25% with specific 2-11% for Sonneratia and Aegiceras, and 7.5-17% for Rhizophora, Avicenia, and Bruguiera (Thanh, 2010; Blasco, 1984). The level of salt in Quang Phong is 5-10%. Local knowledge claims that mangroves can develop well in the spring time when the temperature and rainfall is medium and the tide movement is not too fast. Additionally, in this area Rhizophora, Avicenia, and Bruguiera are dominant. Although both kinds of knowledge interpret things in a different way, they still demonstrate that they are sometimes alike.

In summary, scientific knowledge or local knowledge alone cannot be a solution to complex problems; local knowledge is suitable within a local context in a specific time and place. However, with changes in weather, socio-economics, the environment or even politics, there needs to be a strategy to not only conserve local knowledge but also integrate it with scientific knowledge to cope with the change. This combination showed that in the case of the shrimp farm embankment, the local villagers adopted mangrove restoration to protect their shrimp farm from storms. It was also highlighted in the case of mangrove restoration projects that the suitable of time for planting was decided by the project manager with the consultation from Farmer Association representative and village board who are villagers. Another example was when the source of rice species was 49.8 percent based on local source, and the rest was based on the hybrid productivity source from DDARD. Some local rice species cannot stand the change of extreme weather in the area, while others can. Thus, the DDARD officer conducted research into developing a new hybrid species which has high productivity and can stand the extreme weather. Thus, when the knowledge is situated, there is a potential solution for coping with the change.

Participation of Mangrove Restoration as Negotiating Livelihood Strategies

Local people have used the forests as shelters, as a food source, and as a means for their livelihood strategy in the past. However, under historical and economic impact, villagers have had to adapt their traditional usages in the new era. Under this new stage of development, the local knowledge of villagers still acts as both environmental knowledge and livelihood strategies for them,

while scientific knowledge just concentrates on ecological services. The point here is that the villagers must negotiate their rights in order to effectively participate in the mangrove restoration programs. In this case, people can negotiate by generating a new knowledge space to prove that local communities cannot live without mangrove forests and that they have their own knowledge to take care of the forest.

Local history has clearly shown that when the power was transferred to a different level of administration, it can turn good governance into bad, and vice versa. An example of a positive outcome is through the local government project in 1978 and the officer who managed the project. In the project in 1978, during the centralization period, a local officer was a good bridge between the government policy and the local context; whereas, in the new projects, too much concern on quantitative outcome causes the project to be not that effective. In the new projects, the local officer realizes there is a lack of livelihood promotion in the project but does nothing because "the policies do not mention about it and the problem of a lack of budget". Both cases show the crucial role of local government in Vietnam - the power of local government to transfer power to and throughout the local context.

There are some successful cases about livelihood promotion in mangrove restoration in the North and South of Vietnam and SEA. Mostly, these projects were conducted by NGOs who involve local people from the starting point of the project. They also monitor and ensure that there is a tightly held link between NGOs, local government, and local people. Thus, in Quang Phong, local people should use their traditional knowledge to negotiate with local government first. The first point they need to concentrate on is to improve their knowledge about the law and updated government decisions and decrees. Local people have cultural and spiritual connections with their land and resources, but without land security, how can they negotiate? Sustainable livelihood should come with security of ownership in which people can access resources. In this case, forests should be allocated to local people for livelihood promotion and mangrove conservation, the government's law showing emphasis on local livelihood.

Therefore, local people have to demonstrate that they can preserve the forest better than outsiders and that they also want to improve their livelihood security by accessing and managing the forest. They can raise honeybees or oysters, they can plant mangroves and cut down trees for sale, or they can

collect fruit for selling. Environmental knowledge has to be used here as a tool to justify the management of the mangrove forest.

Furthermore, they need to maintain and extend their social network with other villages who have knowledge of mangrove restoration, so that they can strengthen their capital to better negotiate with the government. They can have a source of seeds, they can share their knowledge, and they also can have the support from the academic and NGOs sectors.

Summary

Environmental knowledge is a part of local knowledge, and it has been constructed by the specific context they live in. Local knowledge can be applied to mangrove restoration; it also can be a part of traditional livelihood. In everyday practices, local knowledge is maintained. It adapts to the changes, but it is also situated in the local context. Local people are the ones who can use and adapt this kind of knowledge in the context of their environment, but scientific knowledge is always dominant in government policy. Both kinds of knowledge seem to be opposing, but they contest and intertwine in some ways. Thus, a combination of both is a solution for new policy under changing circumstances.

Local villagers seem to be vulnerable because they are lacking a knowledge of law and policy. Additionally, the outcome of projects has been affected by local government policy more than the central government. Thus, local government should play a bridging role to introduce the policy into the local context, and local villagers should negotiate their rights by using their local knowledge.

Chapter 6

Conclusion

The Major Findings of the Study

A village with its historically, socially, and ecologically unique aspects was illustrated. It has a rainy season and a dry season, frequent floods and storms, and a traditional landscape of rice fields, buffalo, and stacks of rice straw. It has its own traditional ceremonies and beliefs. Within the community, people have their own responsibilities according to their age, ability, and gender. Livelihood is mainly based on agriculture with a long history of change and adaptation. In the village, the mangrove forest not only plays a physical role as a natural barrier and provider of natural resources, but it is also a crucial part of their culture. The mangrove restoration project in Quang Phong Commune, from the Vietnam-America War until now clearly shows the relationship between politics and environmental knowledge, and the relationship between nature and humans. The policy works differently in different contexts, and it has been affected by not only specific laws or governance, but also by the way the policy is transferred to the grassroots level and the way those local people interact with their natural surroundings.

Firstly, in Vietnam, decentralization in natural resources management operated in 1990 after the Doi Moi policy. In theory, the project before the Doi Moi policy was under the impact of a centralized approach; however, in reality, in both periods of time, these projects brought out different ideas of what centralized and decentralized really mean and what kind of policy actually

plays out on the ground. In the mangrove restoration project in 1978, the main participants were from the Phong Tan Veterans Association (old Quang Phong) and the Commune's Elderly Association, while there was practically no participation from other villagers on the project. Conversely, in the new projects, participation seemed to be broader, but the participants were still chosen by the Farmer Association representative. Thus, the level of decentralization here in these projects seems to be different just in theory, but in practice, it depends on how local government embedded the policy into the context. If the local officer understood the policy in the right way and he/she also knew how to adjust it to the local context, decentralization seemed to work more effectively in the area.

Before and after the Doi Moi policy, the projects seemed to have different results. Firstly, Vietnam, as a country, has a long history of rice paddy cultivation, in which people live in a community and cultivate in groups as a collective action. In Vietnam before the Doi Moi policy, local villagers still cultivated in the same way. All of the paddy land belonged to the Phong Tan Agricultural Cooperative (PTAC), and each person would get points according to their work. In the mangrove restoration project in 1978 they used this agricultural cooperative system in an effective way and it led to the active participation of those involved. In the project, all of the participants received the same amount of points as their work in the rice paddy fields. This meant that mangrove restoration was also a part of their daily livelihood.

In the later project after the Doi Moi policy, during political and economic change, mangrove restoration in Quang Phong concentrated more on conservation than on other aspects. However, on new projects, during the period of decentralization of natural resources, some villagers didn't clearly understand the purpose of the project and participation was poor, while others actively participated by applying their traditional way of mangrove planting in combination with new technology from the project. Additionally, there is still the problem of limited access to resources in the mangrove granted by property rights resulting from the forestry policy in Vietnam.

Secondly, mangrove forests are still not clearly classified in the law, and there is no law that refers to mangrove restoration specifically. However, nowadays, in the era of climate change, there are some new policies that refer to climate change adaptation and realize the role of the mangrove forests. When

the power is transferred to different levels of administration, the understanding can sometimes become different, depending on how different institutions perceive it. Additionally, the decision-making process still lacks the engagement of lower level institutions on the national scale. It is believed that decision-making processes should be balanced between individual and group interests because institutions are organized by a group of individuals who have an interest in a specific topic. The case study also showed that historical and political context changed, leading to a change in the socio-economic context as well as the traditional culture. Political and ecological priorities cannot be separated. These factors affect the outcome of environmental projects, whether they are embedded into the social context or not.

Thirdly, participation of local villagers in projects has been influenced by many factors. These include the understanding of local desires and respecting local knowledge, local livelihood and the role of the project leader. Additionally, the role of the village leader is really important in the local context. For example, in the case of the shrimp farm or in the case of raising awareness about mangroves, no one could do better than the village leader who was respected by local villagers and understood the context well. Mangrove restoration is a very complex process. It is not only about ecological restoration but also culture recovery, so it needs to promote local autonomy in decision-making processes. Training and caring (tree tending) processes need to be considered more, also.

Lastly, scientific knowledge seems to be dominant in these projects, as environmental governance always considers this kind of knowledge more in mangrove restoration, whereas local knowledge is almost ignored in the policy. Local people use their traditional knowledge towards environmental knowledge and livelihood strategies. They use mangrove forests as a source of their daily income, and they also used their knowledge to regenerate the forest during the mangrove restoration in 1978. They used their knowledge to calculate the time of tides and how to collect the seeds and seedlings. However, in the newer projects this knowledge is not considered as it was previously. There is no meeting for stakeholders to participate, and there is no discussion in the decision-making process or implementation process. In this case, local knowledge can be a tool for negotiation with the government. Local villagers use their knowledge to identify the soil type, manage their crops, and predict the weather to decide a suitable time for harvesting. They use plant and animal behavior to predict the changing of weather or the coming of a storm. However,

nowadays, because of the impact of overpopulation, the change of weather, this kind of knowledge needs to adapt to these changes. In the new era, it is believed that local people can integrate their knowledge with scientific knowledge to negotiate a better outcome. Both kinds of knowledge seem to be in opposition with each other, but they are competing and intertwined simultaneously. Thus, a combination of both is the solution for new policy under changing environmental conditions. In this case, the role of local government is very important in connecting and interpreting policy into the local context.

One last point to mention here is the new findings found during the research. Firstly, the village headman and village board have more power than first presumed. They can construct the change and raise awareness of the local villagers by adopting the policy and introducing it into the local context. The case of shrimp farm concessions and mangrove restoration awareness highlighted this creative combination when the local villagers knew how to adopt new knowledge to deal with the change in environment and the law. When they cannot change the policy, they can adapt to it in their own ways. Secondly, some of the local villagers know how to negotiate by extending their network and adapting to changes, as in the case of the Farmer Association representative. They can also adapt using scientific knowledge and local knowledge, as in the case of the shrimp farmer planting mangrove trees. Lastly, the role of women in the area was not as expected; the fact that the project leader in 1978 was a woman who managed a whole team of elderly and veterans was a surprise. Her role showed that the role of women is not always as a subordinate in comparison with men.

Theoretical Discussions of the Findings

The main argument of the research can be divided into three major points: decentralization, environmentality, and environmental knowledge. Firstly, this research takes a look at the level of decentralization and how local villagers are involved in the decision-making process and implementation process. Then, environmental governance is considered in terms of access control and how different levels of understanding about the policy work in specific contexts. Finally, the study examines the type of knowledge that has been used in the projects and the capacity of a combination of these types as a better solution in mangrove restoration. All in all, the study aims to discover

how political context, socio-economic context and environmental context link together and how human-nature interaction works in the project.

At first, this research using the concept of decentralization of natural resources takes a look at both administrative decentralization and democratic decentralization. Decentralization, here, looked at transferring decision making authority (Meinzen-Dick and Knox, 2001; Chusak and Vandergeest, 2010) and how it also plays a part in which power is transferred from the state to lower institutions in their political administration processes (Johnson, 2001; Larson, 2008). However, decentralization is not a simple process, as many scholars have pointed out previously; it needs a connection among its components: social actors, power, and accountability. The involvement of all actors with a clear understanding of the power in the decision-making process and with accountability upward and downward will help decentralization work effectively. In the study, the fact is that decentralization in mangrove restoration is conducted in only administrative decentralization and democratic decentralization is just a theory. In addition, the central government transfers the power (rights) of forest use to the lower levels of administration, not directly to the villagers. The power of decision-making processes and implementation processes are limited and depend on the local authority. Although the previous project in the past was successful in terms of autonomous participation thanks to the work of a former local government officer, in general, local people have no chance to participate in the decision-making process. It is believed that democratic decentralization aims to increase local people's participation in local decision-making processes (Ribot, 2002), however, in this case, this kind of decentralization seems to have failed in reality. Thus, it would be better if the policy maker can consider a pre-meeting with all stakeholders before the implementation of the policy or projects.

Additionally, in terms of the aspects of power relations and property rights access in decentralization, this study showed that the central government recently has transferred more power to the local government but not the local people. The Land Law and Forestry Law have been amended many times in order to open more freely transferring of power. The local government has more power to control the forest; however, the power seems to stop at the Commune administrative level, and the power just transfers to the powerful people in the community, such as village headmen or Farmer Association representatives. However, the local government officer comes from both

government election and villagers' election, so that there is still a potential solution for solving the problem of decentralization. In the case of Vietnam, a bottom-up policy is still a goal that feels a long way away. It is really difficult to change the policy making mechanism. However, as has been pointed out above, the power of local government is quite strong in the local context. Therefore, in relation to mangrove restoration and other related policies, if the local government can apply their power suitably into the local context, decentralization can really work at the lower level. At this level, some of the local officers are villagers and some of them are outsiders. When these officers work in harmony together, the result is the combination of local and scientific knowledge for greater efficacy of mangrove restoration.

Moreover, the understanding of environmental governance, such as the Forestry Law, Land Law or mangrove restoration specifically, by people at different administrative levels is very different. There is an ambiguous understanding about the law and rights to access the forest. Villagers' rights to access the forest have been limited by the local administrative level, and they do not know exactly which law applies to the current project. On the contrary, local administrators understand the general idea of the policy, and the officer who is in charge of the project at District level understands quite clearly what the policy aims to achieve in the project. In addition, the understanding of mangrove restoration and government policy is different between the older generation and younger generation of villagers. The way each interpret a problem is different. Their experiences are different. In relation to environmental governance, their inclusion in dialogue with other stakeholders such as policy makers and policy implementers, will enhance understanding of on-going policies and projects. Additionally, the villagers should conduct their internal meetings as a means of the continuance of learning and sharing among generations. The utilizing of their internal power with the support of an external source can be considered as a suitable way for any problem solving solution.

In the theoretical review in chapter 2, a link between ecological and historical contexts of the problem is mentioned. The study showed that both these aspects govern the environment. Mangrove restoration is under the control of government policy, and this policy is under the impact of history. One more thing is that the mangrove is an ecosystem, and the environment here is governed by both history and ecology. People and nature are interacting with each other, and nature is socially constructed. The policy is under the

control of the state, but when it comes to the specific context, it has been affected by the culture and the local people there. In this case of mangrove restoration, the interaction obviously exists. Additionally, local knowledge is situated (Nygren, 1999) in the study site. At first glance, local knowledge seems to have disappeared, but in reality, it has merely changed and adapted to the new era of development. That is simply a process of nature under the effect of economic change after the Doi Moi policy. Local knowledge here in mangrove restoration is used as a tool of environmental conservation in the past and as a tool for livelihood strategy. Under the development era, scientific knowledge will contribute to state-of-the-art knowledge for the villagers and local officers. Development comes with cost and benefits, and each kind of knowledge cannot stand alone in the current era. Thus, both kinds of knowledge can be contested and intertwined for a better solution for not only environmental purposes, but also for developing livelihood strategies.

Finally, this study showed that the concept of the politics of scale is shaped by the understanding of different actors and how they shaped the scale of decision making processes. The different views about mangrove restoration among different stakeholder's changes the direction of mangrove restoration from what the central government had first imagined. At the ground level, mangrove restoration still looks at the conservation aspect and almost forgets the need of local people. As a result, mangrove restoration does not meet the desired outcome of the project. Therefore, it can be seen that a policy problem needs to be considered not only in the root of problem, but also all the way through its process from decision-making to the implementation and evaluation stages.

Policy Implications

Based on this research in mangrove restoration in Village 6, the problem between policy and reality has been maintained in the way stakeholders understand the policy and how it works in reality. The difference in understanding causes a difficulty in obtaining results. The role of local government should be taken into account in the way that it allows the state to understand the local context and for local people to understand what the purpose of the policy is and the right direction for implementation.

Additionally, the role of NGOs here seems to still be limited in this area. There has been only one small project conducted by the Danish Red Cross through the invitation of the local government in 1992, whereas, the biggest mangrove restoration project in the Central Coast of Vietnam was conducted in Ha Tinh Province of more than 7000 ha in a joint partnership among Denmark, Belgium, and the United Kingdom Red Cross for a period of five years and with more than 80% of trees having developed well until now. In Thua Thien Hue Province, there are varieties of mangrove restoration in Tam Giang Lagoon with the joint efforts among local government, NGOs, and local people, such as the ADAPT projects in Con Te, Huong Phong, Thua Thien Hue since 2008, the WWF and Nokia project with more than 23,000 trees being planted since 2011, or the JICA projects in Tam Giang Lagoon. In these projects, NGOs seem to play the role of mediator who can understand the policy and can also work closely with local people, reducing the gap between policy and reality. It is believed that each area has its own characteristics and knowledge, so what is needed is understanding from policy makers about the decision-making and implication of processes.

Mangrove restoration projects should find a way to reduce the cost of planting by using a combination of local knowledge and scientific knowledge and concentrate more on the caring process because mangrove ecosystems take time to be restored. Therefore, caring processes play a crucial role in the rehabilitation.

One more thing, it would be better if policy makers put their position to local people in the decision-making process in order to think more clearly about the costs and benefits for all stakeholders. Put another way, local people's livelihood strategies need to be considered more in those projects for a better long-term outcome.

Research Challenges and Further Recommendations

Firstly, the study was conducted in Village 6, Quang Phong Commune, Quang Binh Province, Vietnam. In the study site, the mangrove restoration projects have been conducted officially since 1978 under the government afforestation policy. This Commune was one of the pilot mangrove restoration projects during the 1980s. However, because the first project was conducted by the Elderly Association almost 40 years ago, the variation of meetings with

the villagers who directly participated to the projects was very difficult to conduct. However, thanks to my network set up during the fieldwork, I did meet with some people who were involved in the first project, such as the planter, the Former Chair of the People Committee, and also Former QTFAE officer who was in charge of the project at that time. Although the number of key informants was limited, the information was really useful for my research because they are the key people in the previous project who are deeply entwined in the project itself.

Secondly, a statistical record was not kept well according to the timeline of the projects. In addition, the organization who is in charge of the project had changed due to political restructuring, therefore it took me a very long time to collect all of the data through different levels of administration as well as academic institutions in order to get the essential data for my research.

Thirdly, as an outsider conducting research in a very religious area, at the very beginning I had some difficulties in getting people to share their stories and the village's history in regards to the mangrove forest and things related to it. Fortunately, thanks to a letter of recommendation from the DPFD, the support from my gate keeper, and my efforts during my two visits, we got closer, and it was easier for me to talk with them naturally about their daily life through their life. In addition, although my study is related to mangrove restoration, there was no mangrove restoration project at the time of my fieldwork in 2014 because the last one had concluded (2011 to 2013). However, based on my previous experiences in ADAPT mangrove restoration project in Thua Thien Hue Province and my interaction with local people in the study site, the limitations were reduced in some aspects.

Last but not least, due to time and budget limitations, my study was limited to one commune. However, in practice, the mangrove restoration project is carried out in different places in Vietnam, with various stake holders as well as different contexts. Therefore, the findings of the research are limited, especially in terms of scale. However, thanks to the similarities in political and socio-economic contexts, as well as geography characteristics, the study can be considered as an example for further study about mangrove restoration in the Central Coast of Vietnam.

Bibliography

Aksornkoae, Sanit. (1993). *Ecology and Management of Mangroves.* Bangkok: IUCN.

Alongi, M. Daniel. (2014). Carbon Cycling and Storage in Mangrove Forests. *The Annual Review of Marine Science,* 6:195–219.

Anan, Ganjanapan. (2008). Multiplicity of Community Forestry as Knowledge Space in the Northern Thai Highlands. Working Paper Series No. 35, *Afrasian Center for Peace and Development Studies*, Ryukoku University, Kyoto, Japan.

Agrawal, Arun. (2005). *Environmentality: Technologies of Government and the making of subjects.* Durham: Duke University Press.

Agrawal, Arun and Elinor Ostrom. (2001). Collective Action, Property Rights, and Devolution of Forest and Protected Area Management. *Politics and Society,* 29 (4): 485-514.

Agrawal, Arun and Jesse Ribot. (1999). Analyzing Decentralization: A Framework with South Asian and West African Environmental Cases. *The Journal of Developing Areas,* 33: 473-502.

Armitage, Derek. (2002). Socio-institutional dynamics and the political ecology of mangrove forest conservation in Central Sulawesi, Indonesia. *Global Environmental Change,* 12: 203–217.

Badola, Ruchi. (et al.) (2012). Attitudes of local communities towards conservation of mangrove forests: A case study from the east coast of India. *Estuarine, Coastal and Shelf Science*, 96: 188-196.

Battergury, P.J.Simon and Jude L.Fernando. (2006). Rescaling Governance and the Impacts of Political and Environmental Decentralization: An Introduction. *World Development,* 34 (11): 1851–1863.

Benjamin, E. Charles. (2008). Legal Pluralism and Decentralization: Natural Resource Management in Mali. *World Development,* 36 (11): 2255-2276.

Blasco, F. (1984). Mangrove evolution and palynology, in S.C. Snedaker and J.G.Snedaker (eds.) *The Mangrove Ecosystem: Research Methods* (pp.37-49). Unesco, America: Bernan Associates.

Biswas, Shekhar. R (et al.) (2009). A unified framework for the restoration of Southeast Asian mangrove bridging ecology, society and economics. *Wetlands Ecol Manage*, 17:365–383.

Borras, Saturnino M. (2008). Towards a Pro-Poor Forest Land (Re) Allocation Process in Vietnam. *An Evaluation Report of the Forest Land Allocation Project*, CIRUM.

Cheema, Shabbir and Dennis Rondinelli. (1983). *Decentralization and Development: Policy Implementation in Developing Countries*. Bevery Hills. CA: Sage Publications.

Chusak Wittayapak and Peter Vandergeest. (2010). *The Politics of Decentralization: Natural Resources Management in Asia.* Thailand: Mekong Press.

Clifford, Nicholas. (et al.) (2009). *Key Concept in Geography, 2nd edition*. BE: Sage Publications Ltd.

Crang, Philip. (1999). "Local-Global", in Cloke, Paul, Philip Crang and Mark Goodwin (eds.) *Introducing Human Geography* (pp. 24-34). Breat Britain: Arnold and Newyork: Oxford University Press. Inc.

Cuc, Nguyen Sinh. (1995). *Agriculture of Vietnam 1945 - 1995.* Hanoi: Statistical Publishing House.

Cuc, Nguyen Sinh and Nguyen Van Tiem. (1996). *A Half Century of Agricultural and Rural Development in Vietnam: 1945 – 1995.* Hanoi: Publish House of Agriculture.

Dahdouh-Guebas, F and Nico Koedam. (2008). Long-term retrospection on mangrove development using trans-disciplinary approaches: A review. *Aquatic Botany*, 89: 80–92.

Datta, Debajit. (et al.) (2010). Application of criteria and indicators in community based sustainable mangrove management in the Sunderbans, India. *Ocean & Coastal Management,* 53: 468-477.

Datta, Debajit. (et al.) (2012). Community based mangrove management: A review on status and sustainability. *Journal of Environmental Management*, 107: 84-95

Department for International Development (DFID) (1999). Sustainable livelihoods guidance sheets. British Government.

Department of Forest Protection (DoFP) (2010). *Data of changes in the forest of Vietnam from 2002 to 2009.* Vietnam Government.

Duke, N.C. (et al,) (2007). A world without mangroves? *Science*, 317, 41–42.

Dung, Bui Quang. (2013). *Peasants and Contemporary Problems (Nông dân những vấn đề cơ bản và đương đại)*. Ha Noi, Vietnam: Social Sciences Publishing.

Ekindi, Jean Hude Moudingo. (2008). Community participation in mangrove ecosystem restoration can be improved in Cameroon's Douala-Edea Wildlife Reserve. *ITTO Tropical Forests Update*, 21/1.

FAO (Food and Agriculture Organization of the United Nations) (2007). The world's mangroves 1980–2005. *FAO Forestry Paper*, 53. FAO, Rome.

FAO (Food and Agriculture Organization of the United Nations) (2010). *Global Forest Resources Assessment 2010*: Country Report of Vietnam.

Fairhead, James, Melisa Leach and Ian Scoones. (2012). Green grabbing: a new appropriation of nature. *Journal of Peasant Studies,* 39 (2): 237-261.

Forsyth, Tim and Andrew Walker. (2008). *Forest Guardians, Forest Destroyers: The Politics of Environmental Knowledge in Northern Thailand*. University of Washington Press. Seattle and London.

Government of Vietnam. (2003). The Land Law 2003. Retrieved from http://www.vbqppl.gov.vn

Government of Vietnam. (2004). The Forest Development and Protection Law 2004. Retrieved from http://www.vbqppl.gov.vn

Hann, C.M. (1998). Introduction: the embeddedness of property, in Hann, C.M (eds.) *Property Relations: Renewing the Anthropological Tradition*. (pp.1-47). Cambridge: Cambridge University Press.

Hardin, Garrett. (1968). The Tragedy of the commons. *Journal of Science*, 162: 1243-1248.

Hawkins, Slayde. (et al.) (2010). Roots in the Water: Legal Frameworks for Mangrove PES in Vietnam. *Katoomba Group's Legal Initiative Country Study Series*. Forest Trends: Washington, DC.

Hirsch, Philip and Wyatt Andrew. (2004). Negotiating Local Livelihood: Scale of Conflict in the Se San River Basin. *Asia Pacific Viewpoint*, 45 (1): 51-68.

Holmes, George. (2014). What is land grab? Exploring green grabs, conservation, and private protected areas in southern Chile. *Journal of Peasant Studies*, 41 (4): 547-567.

Hong, Phan Nguyen. (2004). The Serve Impact of Herbicides on Mangroves in the Vietnam War and the Ecological Effects of Reforestation, in Hisao, Furukawa, Nishibuchi Mitsuaki, Kono Yasuyuki, and Kaida Yoshihiro (eds.). *Ecological Destruction, Health, and Development: Advancing Asian Paradigms* (pp.177-198). Kyoto: Kyoto University Press and Trans Pacific Press.

Hong, Phan Nguyen and San, Hoang Thi. (1993). *Mangroves of Vietnam.* IUCN Wetlands Program. Thailand: IUCN Bangkok.

Hongxiao Liu (et al.) (2014). Carbon stocks and potential carbon storage in the mangrove forests of China. *Journal of Environmental Management,* 133: 86-93.

Hue, Le Thi Van and Steffanie Scoott. (2008). Coastal Livelihood Transitions: Socio-Economic Consequences of Changing Mangrove Forest Management and Land Allocation in a Commune of Central Vietnam. *Geographical Research*, 46 (1): 62–73.

Iftekhar, M. S and M.R. Islam. (2004). Degeneration of Bangladesh Sundarban: a management issue. *International Forestry Review*, 6(4):123–135.

ITTO (2012). ITTO. *Tropical Forest Update*, 21 (2): ISSN 1022-5439.

Johnson, Craig. (2001). Local Democracy, Democratic Decentralization and Rural Development: Theories Challenges and Options for Policy. *Development Policy Review*, 19: 521-532.

Kerkvliet, Benedict. (2005). *The Power of Everyday Politics: How Vietnamese Peasants Transformed National Policy.* Ithaca. N.Y. Cornell University Press.

Larson, M. Anne. (2002). Natural Resources and Decentralization in Nicaragua: Are local Governments up to the job? *World Development,* 30 (1): 17-31.

Larson, M. Anne and Soto Fernanda. (2008). Decentralization of Natural resource Governance Regimes. *Annual Review of Environmental Resource,* 33: 213-39.

Le, Nguyen Phuong. (2009) Negotiating Agrarian Change: livelihood Articulations of the Commercial Craft Peasantry in Northern Vietnam. *Unpublised PhD Thesis.* Chiang Mai University.

Lebel, Louis, Po Garden and Masao Imamura. (2005). The Politics of Scale, Position, and Place in the Governance of Water resources in the Mekong Region. *Ecology and Society*, 10 (2): 18.

Lemos, Maria Carmen and Arun Agrawal. (2006). Environmental Governance. *Annual Review of Environmental Resource*, 31:297–325.

Li, Tania Murray. (2007). *The Will to Improve*. Duke University Press. Durham and London.

Luke, Timothy.W. (1995). On Environmentality: Geo-Power and Eco-Knowledge in the Discourse of Contemporary Environmentalism. *Cultural Critique*, 31: 57-81.

Meinzen-Dick, R and A. Knox (2001). Collective action, property rights, and devolution of natural resources management: A conceptual framework, in R. Meinzen Dick, A. Knox and M. Di Gregorio Feldafing (eds) *Collective Action, Property Rights and Devolution of Natural Resource Management – Exchange of Knowledge and Implications for Policy,* edited Deutsche Stiftung fur Internationale Entwicklung Germany.

Malette, Sebastien. (2009). Foucault for the next century: eco–Governmentality in Binkley, Sam. and Capetillo Jorge (eds.) *A Foucault for the 21st Century: Governmentality, Biopolitics and Discipline in the New Millennium* (pp. 221-239). Cambridge: Cambridge Scholars Publishing.

MARD (2001) *Five Million Hectare Reforestation Programme Partnership.* Synthesis Report.

MOF (1991). *Vietnam Forest Sector Review.* Hanoi: Agricultural Publishing House.

Memon, Junaid Alam. (2011). Critical Appreciation of Restoration and Conservation of Degraded mangroves in Thailand. *International Journal of Environmental and Rural Development*, 2 (2).

Mills, S. (2003). *Discourse*. London and New York: Routledge.

Nygren, Anja. (1999). Local knowledge in the environment - development discourse: From dichotomies to situated knowledge. *Critique of Anthropology*, 19 (3):267-288.

Ostrom, Elinor and Edella Schlager. (1996). The formation of property rights in Susan Hanna, Carl Folke and Karl-Goran Maler (eds.) *Rights to Nature: Ecological,*

Economic, Cultural and Political Principles of Institutions for the Environment (pp.127-156). Washington D.C: Island Press.

Peluso, Nancy Lee. (1992). The Emergence of scientific forestry in colonial Java, in Peluso, N.Lee (eds.) *Rich Forest, Poor People* (pp.44-78). University of California Press.

Perrings, Charles. (1998). The Environmental Effects of Policy Reform in Vietnam in Griffin, Keith (eds.). *Economic Reform in Vietnam* (pp 109-156). London: Macmillan Press Ltd.

Phuc, To Xuan. (2010). Elite Capture and Local Inequality, in Chusak Wittayapak and Peter Vandergeest (eds.) *The Politics of Decentralization: Natural Resources Management in Asia* (pp. 57-74). Thailand: Mekong Press.

Quynh, Truong Huu. (1983). *Vietnam Agricultural Land Mechanism (Chế độ ruộng đất ở Việt Nam).* Ha Noi, Vietnam: Social Science Publishing.

Ribot, Jessy, C. (2002) *Democratic Decentralization of Natural Resources: Institutionalizing Popular Participation*. World Resource Institute, Washington, DC. Retrieved from http://pdf.wri.org/ddnr_full_revised.pdf (Accessed 2014, Oct).

Ribot, Jesse. C and Nancy Lee Peluso. (2003). A Theory of Access. *Rural Sociology*, 68 (2).

Roy, Anjan Kumer Dev (et al.) (2012). A review of the role of property rights and forest policies in the management of the Sundarbans Mangrove Forest in Bangladesh. *Forest Policy and Economics*, 15: 46–53.

Roy, Anjan Kumer Dev (et al.) (2013). Community perceptions of state forest ownership and management: A case study of the Sundarbans Mangrove Forest in Bangladesh. *Journal of Environmental Management,* 117: 141-149.

Sam, Do Dinh and Trung, Le Quang. (2003). Forest Policy Trends in Vietnam, in M.Inoue and H.Isozaki (eds.) *People and Forest-Policy and Local reality in Southeast Asia, the Russian Far East, and Japan.* Kyoto: Kyoto University Press.

Scott, James, C. (1998). *Seeing Like a State: How Certain Scheme to Improve the Human Condition Have Failed.* Yale University Press. New Haven and London.

Spiegler, Israel. (2003). Technology and knowledge: bridging a "generating" gap. *Information and Management*, 40: 533–539.

Stone, Kathy (et all.) (2008). Factors influencing community participation in mangroves restoration: A contingent valuation analysis. *Ocean & Coastal Management*, 51: 476–484.

Taylor, Brent and Loë, Rob C. De (2012). Conceptualizations of local knowledge in collaborative environmental governance. *Geo Forum*, 43 : 1207–1217.

Thanh, Tran Trung. (2010). Sustainable Mangrove Forest Management in Gianh River Mouth Qunag Binh province (Nghiên cứu định hướng quản lý bền vững hệ sinh thái rừng ngập mặn tại cửa sông Gianh Quảng Bình). *Unpublished master's thesis*. Hue University of Agriculture and Forestry.

Thuy, Pham Thu (et.al.) (2012). The Context of REDD + in Vietnam: Drivers, agents and institutions. Occasional paper 75. CIFOR, Bogor, Indonesia.

Tuan, Hoang Huy. (2003). Decentralization and local politics of forest management in Vietnam: A case study of Cotu Ethnic Community. *Unpublised master thesis.* RCSD. Chiang Mai University

Tue, Nguyen Tai (et al.) (2014). Carbon storage of a tropical mangrove forest in Mui Ca Mau National Park, Vietnam. *Catena,* 121: 119–126.

Turnbull, David. (1997). Reframing Science and Other Local Knowledge Traditions. *Futures,* 29 (6): 551-562.

Truong, Luong Thi and Orlando M. Genotiva (2010). Recognizing Ethnic Minority Customary Land Rights in Vietnam and the Philippines. *Property Reforms and Forest Rights in Vietnam project*, RECOFTC.

Tuyen, Truong Van (et al.) (2010). Livelihoods and co-management in the Tam Giang lagoon, Vietnam. *Ocean & Coastal Management,* 53: 327-335.

Valiela, Ivan., Jennifer L. Bowen and Joanna K. York. (2001). Mangrove forests: one of the world's threatened major tropical environments. *Biogeosciences*, 51: 807–815.

Vietnam General Statistic Department. (2011). *Socio-economic statistic report from 2001-2010*. Ha Noi: Statistic Publishing House.

Ward, Lucas. (2013). Eco-Governmentality revisited: Mapping divergent subjectivities among. Integrated Water Resource Management experts in Paraguay. *Geo Forum*, 46: 91–102.

World Bank (1992). Governance and development, paper presented at Development Economics Seminar. Washington, DC: The World Bank.

Yos Santasombat. (2003). *Biodiversity, Local knowledge and Sustainable Development.* Chiang Mai: Regional Center for Social Science and Sustainable Development, Chiang Mai University.

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V

Politics of Mangrove Restoration

Changing Policies and Strategies of Mangrove Restoration in the Central Coast of Vietnam

Hoang Hao Tra My

This report concerns the controversy surrounding mangrove restoration policy in Vietnam, examining how decentralization works in a central state and how it plays out on the ground. It is also a look into the level of understanding of mangrove restoration policy among stakeholders, and how local and scientific knowledge contest and intertwine in mangrove restoration.

The study found that local people are often left out of the decision-making process, and whether or not their participation in implementation is effective depends on the way the local government interprets policy and embeds it into the local setting.

There is a diveristy of understandings of what is "mangrove restoration policy" among actors concerned. The state's policy concerns ecology, while locals interpret mangrove restoration in a more complicated way with cultural, ecological, and economic meaning. Although scientific knowledge is still dominant in state policy, local knowledge of sustainable mangrove restoration and usage has been in the area for many generations. This local knowledge stills plays an important role in mangrove restoration, which, due to policy uncertainty and market-driven economic forces, is under threat of disappearing.

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