ROLE OF SOCIAL CAPITAL IN NATURAL RESOURCE CONSERVATION:
A CASE STUDY OF CAT TIEN NATIONAL PARK IN VIETNAM

By

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A DISSERTATION PRESENTED TO THE GRADUATE SCHOOL
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To my parents

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The Cat Tien National Park (CTNP) is one of the last remaining lowland jungles in

Vietnam, which possesses unique biodiversity including the last surviving population of the

Vietnamese Javan Rhinoceros (*Rhinoceros sondaicus annamiticus*). People inhabiting in and

around the CTNP belong to diverse ethnic groups with different histories, administrative

systems, and land use strategies. One of the World Bank's projects entitled "Forest Protection

and Rural Development Project (FPRDP)" is being implemented in the buffer zone of CTNP

with a dual objective of sustaining the CTNP and improving the livelihoods of local inhabitants.

However, conservation and management of CTNP, a typical public or collective good, is not a

trivial task. Drawing from the literature on public goods and collective action, this study explores

the role of social capital on households' conservation attitude and participation in conservation

programs. More specifically, this study explores the relationships among households' socio-

demographic variables, social capital, conservation attitude, and participation in the FPRDP for

those inhabiting in and around the bufferzone of the CTNP.

Data from 270 households representing nine villages were collected, using a structured

questionnaire and a face-to-face interview method, to achieve the study objective. A three level

stratified random sampling approach was followed to account for spatial and ethnic diversity of

households living around the park. Factor analysis was employed to identify eight social capital components and four conservation attitude components and the identified components were used to construct social capital and conservation attitude indices. Multivariate regression techniques were used to determine the effect of social capital and other socio-demographic variables on household attitudes toward conservation of CTNP. Logistic regression models were used to determine the effect of social capital, demographic variables, and conservation attitude on household's participation in the FPRDP.

Results suggest that education, social cohesion, familiarity, and social integration have positive and significant impacts on households perceived benefit of conservation. Households that scored high on voluntary cooperation and social integration variables tend to perceive less direct use benefits from the park. Households with higher social commitment and community support indices feel more secure about forestland ownership. Results also show that land tenure security can improve participation in conservation activities. Important implications of this study include (1) a policy or program to increase social capital in general with emphasis on efforts to enhance social networks among households in and around CTNP; and (2) government should create a land tenure regime that better encourages households to participate in conservation activities.

CHAPTER 1
INTRODUCTION

Managing human impacts on national parks has been a major challenge for government agencies and other natural resources managers (Rao and Geisler, 1990). This task is more challenging in developing countries such as Vietnam because local human populations—being driven by poverty—often rely primarily on protected areas for their livelihood (Polet, 2003). The issue becomes even more complex if protected areas are created on the same land that has been traditionally used by local communities for generations (Primack, 1993). The decision of natural resources management, therefore, can affect a number of different stakeholders and may affect them differently, especially where resources are scarce or of high value.

In order to address this issue, since 1980s, conservation organization have been implementing approaches that aim to build support among local communities by sharing social and economic benefits from protected areas (Nguyen and Tran, 2002). Scherl et al. (2004) have summarized these approaches in protected areas, which have been implementing in the world. These approaches are namely: (1) integrated conservation and development projects; (2) inclusive management approaches; and (3) community conservation areas. The goals of these initiatives include ensuring that local communities derive benefits from protected areas; compensating local people for depriving their access to protected areas, and providing alternative income sources that would allow them to benefit economically from conservation while refraining from environmentally destructive practices.

Integrated conservation and development projects (ICDPs) approaches aim at building support among local communities by sharing social and economic benefits from protected areas. In practice, evidence suggests that the equitable distribution of financial and social benefits from protected areas can be problematic; for instance, it is often not enough to assume that community

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leaders will assure that benefits will accrue to the neediest people. However, in Africa, ICDPs have shown that accountability is improved if whole communities, including women, are involved in decision-making (Sherl et al., 2004). More specifically, McShane and Wells (2004) have summarized the main shortcomings of ICDPs which lead to lack of success because of failures in identifying, negotiating, and implementing trade-offs between the interests and claims of multiple stakeholders; focus on activities of social programs and income creation through alternative livelihoods rather than impacts on biodiversity; and addressing local symptoms while ignoring underlying policy constraints or conversely dealing with macro-level issues while ignoring local realities.

Sherl et al. (2004) also explain "Inclusive Management Approaches" as a form of collaborative management between local communities and technical advisors to ensure that local communities have a major stake in decision-making and receive a major share of the benefits from protected areas. The increased empowerment, skills and trust between local communities and technical advisors in Kwazula Natal of South Africa are noted as the ingredients to the success of this approach (Sherl et al., 2004).

"Community Conserved Areas" (CCAs) are defined as "natural and modified ecosystems, including significant biodiversity, ecological services and cultural values, voluntarily conserved by indigenous and local communities through customary laws or other effective means" *(Excerpted from Recommendation 5.26. V^{th} IUCN World Parks Congress 2003).* The term as used here connotes a broad and open approach to categorizing such community initiatives, and is not intended to constrain the ability of communities to conserve their areas in the way they feel appropriate. Community conserved areas are managed by indigenous and local communities through customary laws or other effective means. Wishitemi (2002) and Okello et al. (2003)

found that in Kenya and Tanzania, local communities can gain benefits and participate at all levels of management in a range of conservation and ecotourism enterprises. However, McShane and Wells (2004) assert that community conservation initiatives can only work when they are supported by national policy and a legislative environment that enable devolution of meaningful authority and responsibility for natural resources. Sherl et al. (2004), in terms of the above approaches, note critically that they may contribute towards reducing poverty through social empowerment and provision of financial benefits to communities in and around protected areas, but they are rarely enough to achieve significant poverty reduction.

Even though there are several different principles in all of these approaches, they all share a common interest on building trust between local communities, creation of local groups and enhancement of networks among communities, commonly referred to as social capital. It is also thought that this social capital would influence behavior towards collective actions such as participation in protected areas management (PPP, 2000).

The concept of social capital has emerged in the recent years as a theoretical framework that explains successes in conservation and development initiatives in developing countries (Pretty, 2003). To understand social capital as an "applied concept", Scoones (1998), in his analysis of sustainable livelihoods frameworks, distinguishes five forms of capital—natural, physical, financial, human, and social. In simple terms: natural capital is what you find, physical capital is what you make, financial capital is what you save, human capital is what you know and social capital is whom you know. In the context of environmental conservation and rural development, the strategies of intervention prescribed by these applied concepts of social capital also mean promoting the creation of and strengthening of local groups (community associations, cooperatives, farmer groups, etc.) and their empowerment through participatory methods as a

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strategy to transform their practices and social organizations into sustainable and socially just systems (Pretty and Ward, 2001). Through the creation and support of local groups, building social capital is a viable mechanism to generate collective practices of natural resources (Pretty, 2003). Thus, participatory management of protected areas has been proposed by scholars of common property as the most viable option for combining poverty reduction, enhancement of local level economic development and biodiversity conservation (Pretty, 2003).

Statement of Problem

In Vietnam, several environmentally sensitive areas have been declared as natural conservation zones and national parks. Several communities inhabit the bufferzones of the natural conservation zones and national parks and most of them are poor and little educated. Their subsistence depends on forest products and the related ecosystem. They are generally indigenous peoples or resettled people. About 90% of hunting and collection of forest products activities are being carried out by these people in the bufferzone. Furthermore, farming practices of these people tend to employ a low level of technology and thus agricultural productivity of these practices are low (Nguyen, 2002).

According to Sunderlin and Huynh (2005), there is a high incidence of poverty in the remaining stands of natural forest, and forest resources still play an important role in poverty alleviation of local communities. However, they do not discuss how forest resources can contribute to the income of local people. The research on forestry, poverty reduction and rural livelihoods in Vietnam by Dinh (2005) indicates that local communities who depended on forests have high poverty rates. Specifically the study noted that there exists conflict between forest protection and biodiversity conservation and people's living improvement.

Bufferzones are designed to filter out negative external influences upon core zones of protected areas. Bufferzones can help isolate the core zones from surrounding agriculture,

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diseases, and noise, air, and soil pollution (IUCN, 2003). The complexity associated with

bufferzones was a main motivation for hosting the international conference on the bufferzones of

protected areas in Vietnam. The summary record of the conference (published in 2002) is

considered as literature for arguments. On that summary record, Vo (2002) overviewed the

problems of bufferzone management including the human complex, poverty, low education, and

the dependence of people on forest. He also argued local people must participate in the projects

which are implemented in the bufferzones. Pham et al. (1998) found that to achieve the

objectives of national parks and natural reservation zones, managers should not create the

conflicts between conservation and local communities. In addition, Neefies et al. (2002) revealed

that poverty leads to natural resource degradation and believed that projects and programs that

improve people's living condition will reduce human pressure on protected areas.

The study in the bufferzone of Tam Dao National park by Do (2003) found that the

establishment and subsequent extension of the park caused a significant loss of productive land

for local people. Local people living nearby lost access to the parks and to collecting forest

products for household consumption. People also lost their grazing lands, and in some cases they

were forced to illegally exploit timber for construction, firewood and for coffins. The research in

Bach Ma National Park by Le et al. (2002) also found that forest products play an important role

in supporting the livelihoods of marginal and poor households. They note that the majority of

local people appreciate the benefits of biodiversity conservation in terms of water storage and

erosion control. However, they do not explain how to shift from a protective conservation

approach to encouraging local people to sustainably use and conserve resources.

Various studies on sustainable rural development (Pretty 1995, Dasgupta 2000, Pretty and

Ward 2001, Krishna and Uphoff 2002) have used social capital as an indicator for institutional

results of projects aimed at sustainable rural development and conservation at the local level. Social capital was incorporated as an indicator of successful intervention and therefore became the new conceptual framework for the strategy of community development and empowerment. It is thought that social bonds and norms are critical for sustainability—and where social capital is high in formalized groups, people have confidence to invest in collective activities, knowing that the others will do so too (Pretty 2003).

This research project will add to that body of knowledge by assessing how social capital affects the attitude of households toward biodiversity conservation in the Cat Tien National Park (CTNP) in Vietnam. It will also attempt to analyze the relationship between social capital and household's participation in conservation activities associated with the Forest Protection and Rural Development (FPRD) project—a project. This project was started a few years ago and impacted the communities who reside in the bufferzone of the Cat Tien National Park, Vietnam – one of the last remaining lowland jungles which holds the last surviving population of Javan Rhinocerus on mainland Asia.

Study Objectives

Using social capital as an exogenous variable, the researcher seeks to address the general question: How do households' social capital affect households' attitude towards Cat Tien National Park?

Specifically, this study attempts to explore the following questions:

- How does household's social capital affect the household's conservation attitude towards Cat Tien National Park?

- How does household's social capital affect the household's participation in conservation activities of the FPRD project?

- How does household's conservation attitude affect the household's participation in conservation activities of the FPRD project?

In the process of exploring the above research questions, the following objectives will be pursued:

- To provide a theoretical rational for studying social capital in improving conservation attitude of local households in the CTNP in Vietnam.

- To identify dimensions of households' social capital and conservation attitude toward CTNP, Vietnam.

- To quantify the relationships among dimensions of social capital and conservation attitude.

- To predict the effects of social capital and conservation attitude on households participation in conservation activities.

To develop a better picture of the study population, other demographic variables will be included in the analysis of social capital and conservation attitude such as: ethnicity, religion, length of residency, education, income, age, marital status, gender.

Significance of the Study

As the study seeks to examine how social capital affects the attitude of households toward biodiversity conservation in the national park, results of this study helps develop policies to improve conservation and development in the bufferzone of CTNP in Vietnam. Moreover, this study generates additional knowledge of the human population characteristics of the Cat Tien National Park, thus helping managers to better manage the park. Especially, data on ethnicity may help government and donor agencies plan development interventions. Local perspectives on development and conservation, which will be collected in this study, will help develop action plans.

Finally, this study will provide knowledge about social capital literature in Vietnam – a socialist country that is experiencing socioeconomic transformation due to its integration into the

world economy. That would help to compare Vietnam with post-communist countries (Hayoz and Sergeyev, 2003).

Dissertation Organization

This study consists of five chapters. After this introductory chapter, Chapter 2 will 1) review relevant theories of public goods and collective action, 2) discuss how social capital influences collective action, and 3) analyze research related to social capital and conservation. Chapter 3 presents the background of the study, including an overview of national parks of Vietnam, the Cat Tien National Park (the study site) and a discussion of the Forest Protection and Rural Development Project (FPRD). Chapter 4 presents a conceptual framework that guides the research and discusses the methodologies used to collect and analyze data. Chapter 5 presents the results of the analyses. Specifically, results from descriptive statistics, factor analyses, and linear and logistic regression analyses relating to social capital, conservation attitude, and participation in the FPRD are presented and discussed. Finally, Chapter 6 provides a brief summary with conclusions and policy implications.

CHAPTER 2
THEORETICAL FRAMEWORK

This chapter analyzes the role of social capital in the management of collective goods. Specifically, this chapter 1) discusses the theory of public goods, 2) explores how trust—a key component of social capital—relates to collective action, and 3) reviews research related to social capital and resource conservation.

Theory of Public Goods

Paul Samuelson was the first economist to develop a theory of public goods. In his seminal work, Samuelson (1954) notes that one of the characteristics of a public good is non-rivalry—when a good is consumed by a person, the amount of that good will not be reduced for other people to consume. Another characteristic of a public good is non-excludability. This means that once the good is in place, it is very difficult (if not impossible) to prevent others from consuming that good. Fresh air and a light house, for instance, may be considered as public goods because they possess the above two characteristics. Although there may be no such goods as "completely" non-rival or non-excludable goods, these represent one end of the continuum while private goods, which are rival and excludable, represent the other end. Both communal (or collective) goods and toll goods can be shown to exist somewhere between the two ends of continuum (Figure 2-1).

Public goods (fresh air, light house…)	Communal goods (community lakes, grazing areas…)	Toll goods (toll ways, club goods …)	Private goods (cakes, books, clothes…)

Non-excludable
Non-rival
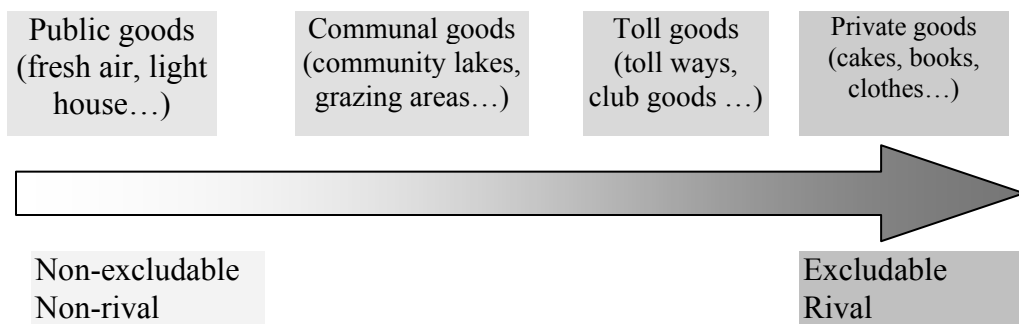
Excludable
Rival

Figure 2-1. Classifying goods based on the degree of excludability and rivalry

This representation allows us to perceive that it is possible to convert typical public goods into communal goods or toll goods or perhaps even private goods or vice-a-versa. Privatization of a national forest is an example of a transformation of a public good into a private good.

From a market perspective, both public and communal goods suffer from under supply and over use. Non-excludability and ill-defined property rights provide little motivation and fewer incentives for individuals to invest their resources in the supply of these goods. As such, markets cannot supply these goods at socially desirable levels. Although one could argue that transformation of public and communal goods into either toll or private goods can address this problem, there are often environmental, social, and ethical factors that preclude such transformations. For examples, privatization of a communal lake (e.g. for fishing), might alleviate the problems of over use but may still generate significant social and ethical problems. This suggests that sustainable management of pubic and communal goods is a challenging task and therefore exploring strategies to address this challenge is important.

The Free Rider Problem

In the process of production and consumption of a private good[1], each rational individual is expected to allocate his/her time and resources in an optimal manner, given the context. Collectively speaking, it is conceivable that private goods are both produced and consumed at socially desirable levels. In the context of a public or communal good (in terms of both production and consumption) individuals make rational decisions in allocating their scarce resources. However, collectively they fail to produce and/or consume these goods at a socially optimum level. Many researchers have investigated this dilemma in various contexts (see Olson (1971), Ostrom (1998) for more details).

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[1] In the face of well defined property rights, perfect competition, perfect information, and no externalities, markets will ensure optimum allocation of resources for the production and consumption processes.

In the context of a public or collective good (whether produced or consumed), research suggests that individuals do not allocate resources at optimum levels because of negative apathy or positive apathy (Figure 2-2). Positive apathy is a situation wherein an individual in a large group will reason that the collective good (goal) will be produced (achieved) without his/her contribution because others will contribute. In other words, an individual thinks that his/her limited or non-existent contribution is insignificant and the contribution of others will lead to optimal production of the collective good. This situation is also commonly known as the "free rider" problem. Negative apathy is a situation wherein an individual in a large group will reason that the collective good (goal) will not be produced (achieved) with his/her contribution because others will not contribute. In other words, production of the collective good will not result because an individual concludes that his/her contribution is insignificant, while the contribution of others is limited or non-existence. Either way, individuals are less likely to contribute to the production of a collective good, with the result that the socially optimal level is unattained. In making consumption decisions about a collective good, similar reasoning suggests that individuals are more likely to over use a collective good thereby resulting in a "tragedy of commons" situation. In economics, both positive and negative apathy are extensively studied through "prisoners' dilemma" or "game theory" models (Nash (1996), Fudenberg (1991) for more details).[2]

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[2] Game theory is a group of mathematical theories first developed by John Von Neumann and Oskar Morgenstern (1953). A game consists of a set of rules governing a competitive situation in which from two to n individuals or groups of individuals choose strategies designed to maximize their own winnings or to minimize their opponent's winnings; the rules specify the possible actions for each player, the amount of information received by each as play progresses, and the amounts won or lost in various situations
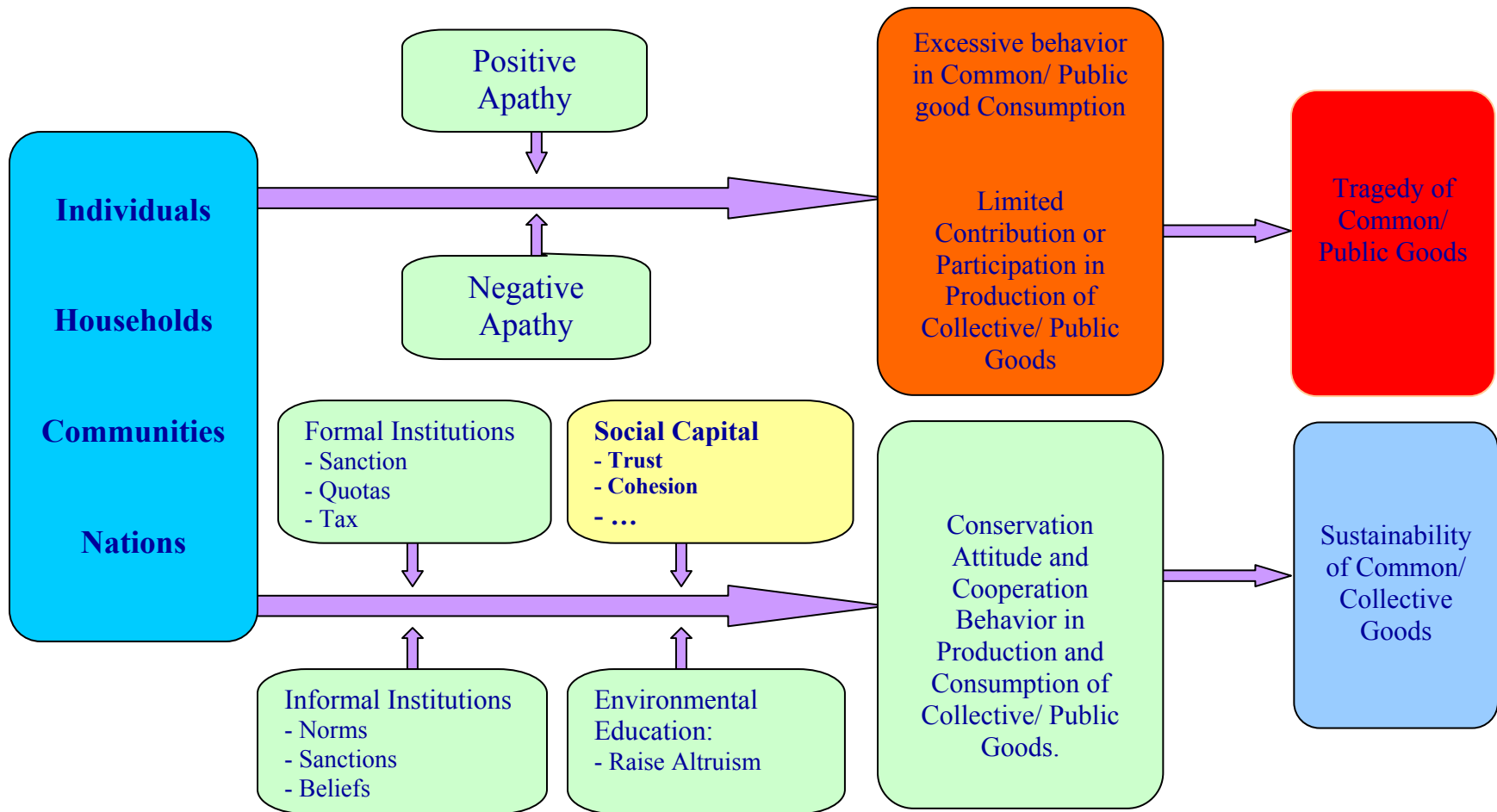
Figure 2-2. Conceptual framework explaining the rationale for social capital in collective action

Solutions to Positive and Negative Apathy

Several solutions have been proposed to address positive and negative apathy. They include decentralization, provision of selective incentives/penalties, and raising altruism of individuals. Olson (1971) listed several factors influencing public participation (can be considered as collective good) in large groups. Firstly, the outcome of group action must be of great value to the individual; secondly, participation must serve both collective and private interests (selective incentive, monetary and non-monetary, to individual would help); and finally costs must decline to individuals for participating in the collective action. These factors are more likely to come together in small groups where individuals know each other very well and tend to collaborate in collective action. This may be one of the arguments for decentralized decision making.

Dominant assurance contracts are contracts in which participants make a binding pledge to contribute to a contract for building a public good, contingent on a quorum of a predetermined size being reached. Otherwise their money is refunded. A dominant assurance contract is a variation in which an entrepreneur creates the contract and refunds the initial pledge plus an additional sum of money if the quorum is not reached. In game theory terms this makes pledging to build the public good a dominant strategy: the best strategy is to pledge to the contract regardless of the actions of others.

The Coasian solution proposes a mechanism by which potential beneficiaries of a public good band together and pool their resources based on their willingness to pay to create the public good. Coase (1960) argued that if the transaction costs between potential beneficiaries of a public good are sufficiently low, and it is therefore easy for beneficiaries to find each other and pool their money based on the value of public good to them, then an adequate level of public goods production can occur even under competitive free market conditions.

If voluntary provision of public goods will not work, then the obvious solution is making their provision involuntary. One general solution to the problem is for governments or states to impose taxation to fund the production of public goods. The difficulty is to determine how much funding should be allocated to different public goods, and how the costs should be split. Sometimes the government provides public goods using "unfunded mandates". An example is the requirement that every car be fit with a catalytic converter. This may be executed in the private sector, but the end result is predetermined by the state: the individually involuntary provision of the public good (e.g., clean air).

A government may subsidize production of a public good in the private sector. Unlike government provision, subsidies may result in some form of competitive market. The potential for cronyism (for example, an alliance between political insiders and the businesses receiving subsidies) can be limited with secret bidding for the subsidies or application of the subsidies following clear general principles. Depending on the nature of a public good and a related subsidy, principal agent problems can arise between the citizens and the government or between the government and the subsidized producers; this effect and counter-measures taken to address it can diminish the benefits of the subsidy. Subsidies can also be used in areas with a potential for non-individualism. For instance, a state may subsidize farmers to maintain certain forest coverage on their farm to protect the watershed.

The study of collective action shows that public goods are still produced when one individual benefits more from the public good than it costs him/her to produce it. A group that contains such individuals is called a privileged group. A strategy to overcome the free rider problem in this case is to simply eliminate the profit incentive for free riding by buying out all the potential free riders, making the marginal social benefit meet the marginal social cost

because in this case, they are equivalent to the private marginal benefits and costs. While the purchase of all potential free riders may solve the problem of underproduction due to free riders in smaller markets, it may simultaneously introduce the problem of underproduction due to monopoly. Additionally, some markets are simply too large to make a buyout of all beneficiaries feasible—this is particularly visible with public goods that affect everyone in a country.

Another solution, which has evolved for information goods, is to create intellectual property laws, such as copyright or patents, covering the public goods. These laws attempt to remove the natural non-excludability by prohibiting reproduction of the good. Although they can solve the free rider problem, the downside of these laws is that they imply private monopoly power and thus are not Pareto-optimal. For example, in the United States, the patent rights given to pharmaceutical companies encourage them to charge high prices (above marginal cost), to advertise to convince patients to nag their doctors to prescribe the drugs, to sue even mild imitators in court, and to lobby for the extension of patent rights in a form of rent seeking.

Finally, an approach that is increasingly recognized by social scientists to overcome collective goods production and consumption problems is to promote social capital among individuals, communities, and corporate actors. If enough people do not think like free-riders, the private and voluntary provision of public goods may be successful. A free rider might litter in a public park, but a more "public-spirited" individual would not do so, getting an inherent pleasure from helping the community. In fact, an altruistic person might voluntarily pick up some of the existing litter. If enough people do so, the role of the state in using taxes to hire professional maintenance crews is reduced. This might imply that even someone typically inclined to free-riding would not litter, since their action would have such an obvious cost. Altruism may be encouraged by non-market solutions such as tradition and social norms. Therefore, raising

altruism also means creating social capital. The following sections will discuss how trustworthiness of social structures, information channels; and norms and effective sanctions (components of social capital) solve collective good problems using natural resource management examples.

Trust and Collective Action for Common Management

This section explains how trust, itself a collective good, can be provided spontaneously in the light of the theory of collective action for commons management. The common-pool resources may be owned by national, regional or local governments as public goods, by communal groups as common property resources, or by private individuals or corporations as private goods.

Commons Management as an Assurance Problem

The problems of collective action in commons management are often described as assurance problems. The contribution of an individual to a collective action will be more likely if there is an assurance that others will also contribute. These assurance problems can be solved through voluntary cooperation to the extent that group members trust one another to reciprocate their cooperation. Trust is a key component of "social capital", defined by Putnam as "features of social organization, such as trust, norms, and networks that can improve the efficiency of society by facilitating coordinated actions". Trust itself is a public good and its provisions constitute a second-order social dilemma. Runge (1981) argued that establishing assurance (or trust) is needed to solve this second-order social dilemma faced by members of a group through strategies of reciprocity. Sugden (1986), however, observed that players follow reciprocity strategies depend on the basis of trust that other will reciprocate. Adoption of reciprocity strategies as a solution to a group's assurance problem thus entails the third-order social dilemma of establishing enough trust to make those strategies attractive.

Ostrom (1998) studied how to create enough social capital in the form of trust for reciprocity to bring about voluntary cooperation in a large group assurance problem. She found that each individual assesses subjectively the trustworthiness of those with whom they share the assurance problem. This subjective assessment is reassessed over time in the light of how others' reputations are affected by unfolding evidence of how they have practiced reciprocity. Therefore, trust and reciprocity mutually reinforce one another through positive feedbacks. When an individual perceives that reciprocity has increased, this strengthens her trust that others will reciprocate cooperation in the future. This provides her own incentive to practice reciprocity. Practicing reciprocity enhances her reputation, thereby increasing others' trust in her and ready to practice reciprocity with her. Conversely, perceptions that adoption of reciprocity has declined will weaken the trust and thus the reciprocity. Trust, reciprocity and voluntary cooperation can thereby strengthen and weaken through spontaneous social dynamics. Betts (1997, p.2) observed " a group can become engaged in a virtuous circle of reciprocal exchanges where trust and collaboration beget more trust and collaboration, or a vicious circle where defection and betrayal lead to more of the same."

Establishing Trust through Verbal and Face-to-Face Communication

The assumption in the prisoners' dilemma game theory is that individuals sharing an assurance problem are unable to communicate verbally prior to making their choices. This assumption is obviously unrealistic for many assurance problems where there is scope for each player to communicate verbally with at least some other players.

This scope can allow a group facing a collective action problem to reduce its costs of organizing significantly in reaching a shared understanding of the problem and in agreeing to a solution that clarifies the particular kind of cooperation expected from each group member. Sometimes, it may not be immediately apparent to all individuals that they are caught in a

collective action problem. Consequently, they could do better for themselves by cooperating than by acting independently. To the extent that individuals have internalized a norm for promise-keeping, promises to cooperate that individuals make in the process of agreeing to a solution to their shared problem can add significantly to their likelihood of actual cooperating. In addition, when there are repeated opportunities for communication, group members are able to revise their original agreement if it proves to be unworkable or ineffective in its existing form (Ostrom, 1998).

Ostrom et al. (1994) found that in collective-action laboratory experiments, cooperation levels have been consistently higher when communication occurs face-to-face compared with other media. Based on these experiments, Ostrom (1998) gave two explanations for why cooperation levels are higher when communications occurs face-to-face. The first was that face-to-face communication enhances individuals' ability to assess other's reputations.

The second explanation was that punishing the defectors and praising the cooperators, which becomes possible in repeated-play experiments with communication allowed after each round, has added emotional force when exercised face-to-face. A further explanation is that face-to-face communication can promote "group identity' and thereby make group members sufficiently more regarding of each other's welfare that they become more likely to cooperate with each other (Dawes et al., 1990).

In reality, each person faces a steady succession of assurance problems. At least in smaller communities, therefore, it is likely that any given individual will share a variety of such problems with a common group of others. Ellickson (1991), who studied the governance of cattle trespass problems in a county of California, noted that farmers typically deal with one another on a variety of issues, including water supply, controlled burns, fence repairs, social events and

staffing the volunteer fire brigade. He referred to such overlapping relationships as "multiplex" in contrast to "simplex" relationships between people who interact on a single front only.

An advantage of groups characterized by multiplex relationships, or "dense social networks", is that individuals are likely to have more "repeat plays of assurance game" with one another than would be the case if most relationships were simplex. This advantage has a number of aspects. First, the greater interconnectedness of the "game" strengthens the shadow of the future for individuals. This is because defection in any single play of one game puts at risk benefits not only from others cooperating with them in the future plays of that particular game but in other games as well. Second, the greater frequency of repeat plays increases opportunities for the feedback that individuals require to establish and maintain their own reputations and assess the trustworthiness of others. Third, since trust is strengthened the more it is used, the greater number of reinforcing encounters in dense networks allows greater flexibility in practicing reciprocity – people can more easily reciprocate cooperation.

Feedback through Everyday Social Interaction

Humans are social creatures and often gain considerable satisfaction from the feedback processes of monitoring one another. They share what they have seen and heard, and provide social rewards and punishments. The greater this satisfaction the lower the net cost to individuals of partaking in such processes.

Jacobs (1992) noted this phenomenon when she observed urban street life in the context of US inner city neighborhoods. She highlighted an insight now usually attributed to Granovetter (1973). She observed that strong interpersonal ties tend to be less important than weak ties in sustaining community cohesion and collective action. Strong ties generally occur among people who share common bonds. Weak ties tend to more instrumental, and enable the building of a "social bridge" between groups that less obviously share common bonds. Hence, weak ties are

indispensable for integrating individuals within large groups. After illustrating how weak ties can generate trust sufficient for a neighborhood of strangers to function effectively as a community, Jacobs proceeded to describe how such ties can also enable collective action to emerge spontaneously at the higher level of districts.

<div align="center">**Social Capital and Natural Resources Conservation**</div>

This section reviews the concepts of social capital and their relationship to natural resources conservation and management. It also discusses the relationship between household characteristics and social capital.

Social Capital

Although the concept of social capital was first defined by Pierre Bourdieu in the 1970s (Bourdieu, 1980), James Coleman has been widely recognized for introducing the concept of social capital in its current usage within the field of development (Coleman 1988, 1990). Social capital, as envisioned by Coleman, is largely defined by its function and consists of a number of entities that have at least two elements in common: "they consist of some aspect of social structures, and they facilitate certain actions of actors—whether persons or corporate actors— within the structure." Social capital, like physical and human capital, is distinguished from other social interactions by its productive quality, and as such, should be perceived as a resource that helps actors achieve their specified interests. Coleman pointed to various forms of social capital which include: obligations, expectations, trustworthiness of social structures, information channels; and norms and effective sanctions (1988).

While Coleman can lay major claim for introducing social capital as a conceptual tool, there is no doubt that this term gained considerable academic popularity and practical prevalence through the works of Robert Putnam (1993, 1995) in Italy and the United States. Putnam defines social capital in this way: "By analogy with notions of physical capital and human capital – tools

and training that enhances individual productivity – "social capital" refers to features of social organization such as networks, norms, and social trust that facilitate coordination and cooperation for mutual benefit" (1995:67). In his highly influential book, *Making Democracy Work: Civic Traditions in Modern Italy*, Putnam provides a convincing argument that the strongest determinant in Italy for socio-economic development is the vibrancy of what he labels as "civic involvement" or "civic traditions", which he measures by associational life, newspaper readership, and other indicators of political participation. Much of the recent thinking on social capital has developed from the premises and empirical research carried out by Putnam in Italy and the United States, for as Putnam himself argues: "…working together is easier in a community blessed with a substantial stock of social capital… The social capital embodied in norms and networks of civic engagements seems to be a precondition for economic development as well as for effective government" (Putnam 1993, in Harris and Renzio 1997).

Within the field of economics, particularly strong support comes from the school of institutional economists, where one can find striking similarities between economists' description of economic institutions and the way social capital is conceptualized by sociologists and political scientists (Castle 1998). North describes economic institutions as "the rules of the game in a society or, more formally, are in the humanly devised constraints that shape human interactions" (North, 1990 in Castle 1998). North and others in the school of institutional economics recognize the importance of institutions in socioeconomic development and distinguish between "formal rules and those constraints embedded in customs, traditions, and codes of conduct" (Cattle 1998:6). Social capital has also been recognized and embraced by the World Bank, which cites that "increasing evidence shows that cohesion is critical for societies to prosper economically and for development to be sustainable. Social capital is not just the sum of

the institutions which underpin a society – it is the glue that holds them together" (World Bank 2000). Much as Coleman envisioned with the introduction of the term in the late 1980s, social capital has "seemed to promise answers which are attractive both to the neoliberal right – still skeptical about the role of the state – and to those committed to ideas about participation and grassroots empowerment. Thus it is that since 1993 'social capital' has become one of the key terms of the development lexicon, adopted enthusiastically by international organizations, national government and NGOs alike" (Harris and Renzio 1997:920).

Even though the term has gained wider acceptability both by theorists and practitioners, social capital remains theoretically and conceptually elusive. There is still great debate on what exactly constitutes social capital, how it should be assessed and measured, and probably most importantly for practitioners, how social capital can be created or enhanced, sustained, and reproduced. While few would disagree with Woolcock's (1998) broad definition of social capital, which is, "norms and networks facilitating collective action for mutual benefit," there are few consistencies concerning social capital's conceptual application beyond this. One reason is that such terms as norms, trust, and networks that are often used to define social capital are also incredibly elusive to define and measure as well. Another reason is that the level of analysis for studying social capital changes with each theorist area of expertise, often stretching the term beyond its practical use. Where Coleman (1990) explicitly references social capital as endowed in individuals, Putnam (1993, 1995) pushes much further by endowing social capital as the property of groups, and even nations (Harris and Renzio 1997). The conceptual and analytical ambiguity surrounding the term has led some to question its explanatory efficacy (Barron and Hannan 1994), but a far greater number of theorists support the basic premise surrounding the concept of social capital—that social relations are fundamental considerations in economic

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development and sustainability – and as such, are seeking ways to both clarify the terminology and explicate on its uses (and abuses), as well as its analytical and practical applications in the field of development economics.

Social Capital and Natural Resource Conservation

The concept of social capital captures the ideas that social bonds and norms are important for people and communities (Coleman, 1988). As social capital lowers the transaction costs of working together, it facilitates cooperation. People have the confidence to invest in collective activities knowing that the others will also do so. They are also less likely to engage in unfettered private actions with negative outcomes, such as resources degradation (Pretty and Ward, 2001). As adopted by these authors, the concept of social capital has four important features that facilitate the cooperation: relation of trust; reciprocity and exchanges; common rules, norms, and sanctions; and connectedness in networks and groups. In rural areas where use of natural resources has been unsustainable, communities lack social capital, mostly because it was destroyed by unfavorable policies and structures of social relations.

Krishna and Uphoff (2002)'s study on watershed development in Rajasthan, India found that an index of social capital is positively and consistently correlated with superior development outcomes, both in watershed conservation and in cooperative development activities more generally. These authors used some concrete and rigorous measures of development performance against which to test and validate the phenomenon of social capital in the very specific rural context. For them, "Social capital is a matter of more than academic concern". They further argue: "Examination of social capital deserves all of the rigor that academic analysis can bring to them, but this analysis must also contribute to an understanding of social capital that can be applied to real-world setting".

Household Characteristics and Social Capital

Economists, imbued with methodological individualism, prefer to emphasize individual decisions about social capital. For instance, Glaeser et al. (2002) develop an investment model in which the individual's stock of social capital (and the flow of investment in social capital formation) is a function of his or her age, discount rate, expected mobility, opportunity cost of time, and occupational returns to social skills, as well as aggregate stock of social capital in specific community and the rate of social capital depreciation (including that due to relocation). They compare the predictions of the model with available evidence, using data from the General Social Survey, a repeat cross-sectional survey in the United States. To measure individual social capital they use membership of organizations rather than subjective measures of trust, arguing that the latter do not necessarily reflect trusting behavior in practice, while the membership measure is reasonably well correlated with other measures of community mindedness, such as working to solve a local problem, forming a new group to solve a local problem, or contacting local government regarding a local problem. Their results indicate that social capital (1) first rises then falls with age, (2) declines with expected mobility (3) rises in occupations with greater returns to social skills, (4) is higher among homeowners, (5) falls sharply with physical distance, and (6) is correlated with investment in human capital. However, their prediction that social capital investment falls with the value of time is not supported by the available data. Moreover, while their model allows for group level effects on individual investment decisions, they find no robust evidence for such effects. Their overall conclusion is that "individual incentives, not group membership, drive social capital accumulation decisions".

Analysis of household survey data in a Landcare program in Southern Philippines (Cramb 2004) shows that social capital varied with individual incentives, rising then falling with age (peaking of 50-59 years) and increasing with farm size and education, but group level factors

were also important. That is, contrary to Glaeser et al. (2002), an individual social capital depended as much on his or her local community as on individual characteristics. The research found out that the relationship between social capital and soil conservation is not a straightforward matter of investing in the rapid formation of self-sufficient community landcare groups in order to accelerate adoption of soil conservation practices on farm.

CHAPTER 3
BACKGROUND INFORMATION OF THE STUDY SITE

This chapter presents the background information of the study area which includes three sections. The first section reviews the concept of national parks around the world in general, and Vietnam in particular. The second section describes the Cat Tien National Park, including a discussion of the Forest Protection and Rural Development Project (FPRD) that is being implemented in the bufferzone of the CTNP. The third section describes the profiles of the three study communes.

National Parks in the World

There are many national parks across the world that have been established primarily to protect biodiversity. These national parks usually provide a haven for a variety of flora and fauna. Because the intense sunlight makes ecosystems in equatorial regions more productive, tropical forests make up more than a half of the species in the world even though the area of tropical forests is only seven percent of earth surface area. For instance, tropical and semi-arid areas of Africa have about 30,000 species of flora while the tropical regions of Asia including New Guinea and Australia have about 45,000 species. (World Resources Institute, 2006).

The world's first national park, Yellowstone, is located in the western United States. It was created by an act of Congress in 1872 and signed into law by President Ulysses Grant. Yellowstone National Park has about 2.2 million acres of wilderness and is "set apart as a public park or are the area reserved for the benefit and enjoyment of people". This national park is now very famous for ecotourism activities. Other countries have created national parks for various purposes. In Tanzania, numerous national parks form the core of a much larger protected ecosystem, and have been set aside to preserve the country's rich natural heritage, to provide secure breeding grounds where its fauna and flora can thrive, and to save them from the

conflicting interests of a growing human population. The existing park system protects a number of internationally recognized bastions of biodiversity and world heritage sites, thereby redressing the balance for those areas of the country affected by deforestation, agriculture and urbanization.

In South Africa, most national parks are maintained by the government while the parks in KwaZulu-Natal are managed by Ezemvelo KZN Wildlife (an amalgamation of the former National Parks Board and KwaZulu Directorate of Nature Conservation). A number of these national parks have become Peace parks (or Transfrontier Conservation Areas - TFCAs) that span across boundaries of multiple countries, where the political border sections that are enclosed within its area are abolished. Private Parks are also starting to have a huge impact on the conservation scene. (South African National Parks, SANParks—Official website: http://www.sanparks.org)

In Southeast Asia, Cambodia, Lao PDR, Thailand and Vietnam have established among the largest protected area systems in the world as measured by proportions of national territory. Many of these are national parks (or national protected areas as they are called in Lao PDR), and nature and wildlife reserves in which no exploitative uses are permitted. These restrictive national policies are coming under increasing scrutiny because of growing population pressure, especially the needs of poor communities living in and around protected areas (ICEM, 2003).

Bufferzones

According to Gilmour and Nguyen (2000), a bufferzone is an area identified by a clear boundary and it is located outside the boundaries of the protected area. Martino (2001) has used a wide range of literature to understand the concept of bufferzones. He found that there is no agreement among conservationists regarding the definitions of bufferzones. Although the objective of bufferzones is to protect the biodiversity of the park, this protection has to be harmonized with the creation of benefits to local people. Martino (2001) concluded that there has

to be a difference between the management and goals of the bufferzone and the management of the protected area, if not, there would be no logical reason for bufferzones to exist.

The reasoning behind the establishment of bufferzones is generally a need to protect the park from encroachment from local population and from the destructive activities that take place outside the park but that affect conservation inside. However, there is recognition of the legitimate needs of the local population. Martino (2001) revealed that many studies show that by providing benefits in the bufferzone will create an incentive for local people and provide for their needs, and the result will be that local people will be less likely to extract resources from the park. In addition, Rustagi and Garcia (2005) assert that creation of the bufferzone around protected areas assists in the optimization of the ecological, economic and socio-cultural values of protected area, through extension and social buffering of the protected area. Martino (2001) argued the inclusion of local people in development projects that take place either in the bufferzones or near the protected areas is aimed to protect those areas from local peoples' discontent rather than to integrate local peoples' need to access the protected area for resources. This is a crucial point that comes from the very definitions of bufferzones and may explain in part why bufferzones are not proving to be an effective complement to the conservation of protected areas.

National Parks in Vietnam: An Overview

Political Context

In Vietnam, forestland is divided into three categories, namely production, protection and special-use forests. Production forests are earmarked for exploitation in compliance with approved management plans, while protection forests are designated to protect land and water sources in critical areas (Nguyen et al., 2000) and their exploitation is restricted to mainly non-timber forest products in natural forests. Special-use forests are designated based on their

importance for the conservation of Vietnam's biodiversity, science, tourism or cultural and historical heritage. In January 2001, Decision No. 08/QD-TTg classified special-use forests into the following categories: (1) National parks; (2) Nature reserves, which were further divided into two sub-categories: nature reserves and habitat/species management areas; and (3) Cultural, Historical and Environmental sites (Landscape conservation areas).

The history of national parks in Vietnam can be summarized as follows (Table 3-1): In 1960, President Ho Chi Minh announced Ordinance No. 18/LCT: 'Law on Organization of the Government Council of the Democratic Republic of Vietnam'. This ordinance included a proposal to establish the General Department of Forestry. In doing so, the Government of Vietnam had carried out the first actions to preserve natural resources through promulgating degrees on forest protection. In 1962, Cuc Phuong Protected Forest was established as the first protected area; and in 1966 it became the first national park in Vietnam. In 1986, decision No. 194/CT decreed the establishment of a further 73 Special-use Forests nationwide. These Special-use Forests comprised two national parks, 46 nature reserves, and 25 cultural and historical sites. In 1992, the Prime Minister announced Decision No. 08/CT, the establishment Cat Tien National Park. In 1994, the biodiversity action plan for Vietnam recommended the strengthening of the national parks and the protected areas system. Currently, there are 26 national parks in Vietnam.

Table 3-1. Timeline of the development of national park in Vietnam

Year	Events
1960	Ordinance No 18/LCT authorizes the General Department of Forestry.
1962	Cuc Phuong Protected Forest (the first protected area) was established.
1966	Cuc Phuong became the first national park in Vietnam.
1986	Decision No. 194/CT establishes 73 Special-use Forests nationwide including national parks, nature reserves, and cultural and historical sites.
1992	Decision No. 08/CT authorizes Cat Tien National Park
1994	PM Decision No. 845/TTg approves The Biodiversity Action Plan for Vietnam.

The Profiles of National Parks

In Vietnam, the natural conservation zones and national parks were established comprising

areas where natural resources were not acutely devastated (Vo, 2002). The average size of a

national park in Vietnam is about 34,832 ha; Yok Don national park is the largest area with

115,545 ha and Xuan Thuy is the smallest park with 7,100 ha. The average size of national parks

in the south is higher than that of the north by approximately 9,200 ha; and the standard

deviation in term of size of 26 national parks in Vietnam is about 29,467 ha. Similar to other

national parks around the world, the purpose of the national parks in Viet Nam is the same—to

conserve valuable and rare flora and fauna; to protect and maintain the representative tropical

forest ecosystem; to provide a platform for environmental education and scientific research; to

develop ecotourism activities; and to create jobs for people living in proximity to the parks.

Further, the national parks are integrated into a master plan which includes ecotourism (and

historical tourism) in order to attract domestic and foreign tourists. In Vietnam, in order to

manage and conserve resources in a sustainable manner, national parks enjoy extensive support

from a variety of donors and non government organizations such as IUCN (The World

Conservation Union), WWF (World Wildlife Fund), GEF (Global Environment Agency) and

JICA (Japan International Cooperation Agency).

National Park and Bufferzone

In Vietnam, the term "national park" was defined through Decision No.62 -2005/QD-BNN

(Ministry of Agriculture and Rural Development), and also promulgated the regulation on

criteria for classification of special-use forests. National parks can be "natural areas on the

mainland or on the mainland with some submerged-lands, or sea areas. They are large enough

for the conservation of one or more typical or representative ecosystems. It shall not be affected,

or be affected, to the conservation of endemic or endangered species of present and future

generations. National parks serve as a basis for spiritual, scientific, educational, recreation and eco-tourist activities which are controlled and have less negative impacts". Decision No. 09/2001/QD-BNN-TCCB (Ministry of Agriculture and Rural Development of Vietnam) notes that a bufferzone is a forest area, land area, or wetland area located close/nearby to national parks or natural protected zone.

According to Vo (2002), the people that live in the bufferzones of Vietnam are mostly poor and with limited education. Their subsistence depends mostly on forest products or the related ecosystem. They are generally indigenous peoples or resettled people. These people account for about 90 % of the hunting and the collecting (of forest products) activities in the bufferzone. The farming practices of these people reflect low levels of technology and low agricultural productivity (Nguyen, 2002).

The Study Site: The Cat Tien National Park

As shown in Figure 3-1, the Cat Tien National Park (CTNP) is located in southern Vietnam, approximately 150 km North of Ho Chi Minh City (Saigon) and nearly 150 km south of Da Lat. The protected area is comprised of 73,878 ha; a bufferzone of 183,479 ha surrounds the park. The CTNP can be subdivided into three sectors: Nam Cat Tien (38,100 ha) in Dong Nai Province, Tay Cat Tien (5,143 ha) in Binh Phuoc Province, and Cat Loc (30,635 ha) in Lam Dong Province. Cat Loc in the north part of the park is geographically disconnected from the southern part by a 10 km band of heavy populated rural land.

Nam Cat Tien received protected status in 1978 (Decision 360/TTg of July 7, 1978). It attained a national park status in 1992 (Decision 08-CT of January 13, 1992). Cat Loc received protected status from Lam Dong Province in 1992. The area remained managed by Cat Tien District, and a formal Management Board was established only in 1996. The decision of January 13, 1992 (08-CT) included the suggestion to extend Nam Cat Tien National Park with both Tay

Cat Tien and Cat Loc. Decision 38 1998 QD of February 16, 1998 approved the integration of

Nam Cat Tien, Tay Cat Tien, and Cat Loc in what is currently known as the Cat Tien National

Park. The transfer of responsibility from the Provinces to the Ministry of Agriculture and Rural

Development took place on December 22, 1998.
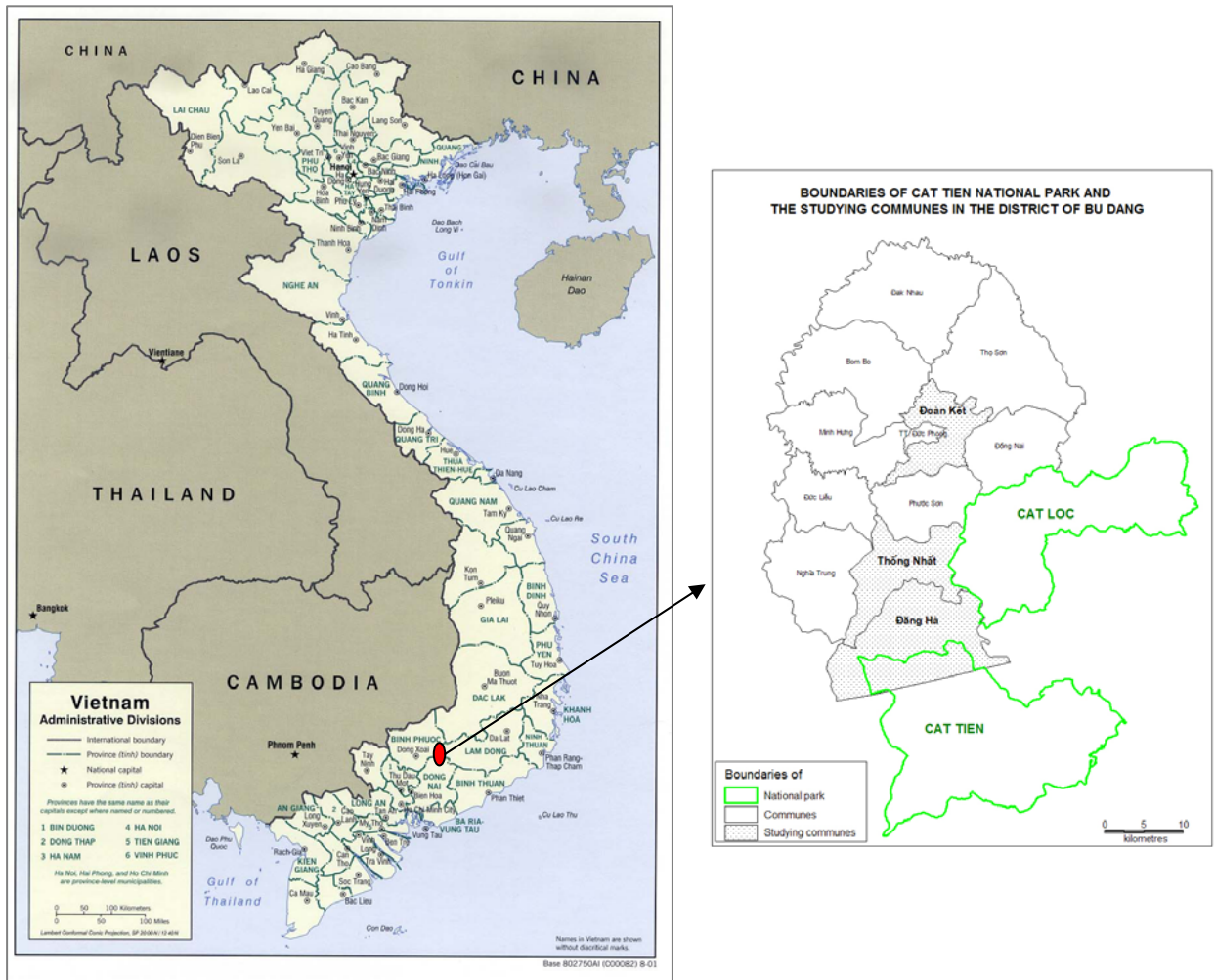
Figure 3-1. Location of the study sites[1]

As mentioned earlier, the area of Cat Tien National Park is currently 73,878 ha. With the

re-demarcation of the park boundary the area will be 70,549 ha in two separate forest blocks: the

Cat Loc sector (26,970ha) in the north, and the Nam Cat Tien and Tay Cat Tien sectors

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[1] Courtesy of the University of Texas Libraries, The University of Texas at Austin

(43,579ha) in the south. The topography of the area varies greatly between the three sectors. Cat Loc is situated in the beginning of the southern foothills of the Central Highlands and, although elevations only reach 659m, the topography is steep. Nam Cat Tien and Tay Cat Tien are situated in the lowlands that are typical of southern Vietnam: the topography of this area is characterized by low, gentle hills.

Numerous springs and streams originate in the area and drain into the Dong Nai River, which is the second largest river system in southern Vietnam. The Dong Nai River flows through the Park, forming the western boundary of Cat Loc and the eastern boundary of Nam Cat Tien. The lowlands in the north of Nam Cat Tien are poorly drained, resulting in a network of swamps and lakes, which expands and contracts seasonally. Mean annual rainfall ranges from 2,300 mm in the lowlands to 2,850 mm at higher elevations.

The flora of Cat Tien region is typical for the Dong Nam Bo bio-geographic region (the eastern part of the southern Mekong Delta) with *Dipterocarpaceae* and *Lythraceae* the most commonly represented families in areas where human modification is minimal. In forests disturbed by humans, the major families represented are *Euphorbiaceae* and *Moraceae*. Only of the species found in the Cat Tien region are endemic to Vietnam (FIPI, MOF&WWF, 1995). These habitats support a rich diversity of biological life. Currently 76 mammal, 320 bird, 74 reptile, 35 amphibian, and 99 fish species have been confirmed in the Park.

As valuable as the number of species, the area is also known to be important for ungulate, primate, and bird communities. Amongst the ungulates Sambar *(Cervus unicolor)*, Wild Boar *(Susscrofa)*, and Gaur *(Bos gaurus)* reportedly occur at relatively high densities compared to other areas in Vietnam (Ling 2000).

Of the fauna occurring in the area, 40 species are IUCN red-listed. The key species amongst them are: the Vietnamese sub-species of the Javan Rhinoceros *(Rhinoceros sondaicus annamiticus)*, which is the rarest large mammal on earth with a population of less than 7, these are only found in Cat Loc; the Orange-necked Partridge (*Arborophila davidi)*, which is another species endemic to this region of Vietnam; the Siamese crocodile (*Crocodylus siamensis),*which were locally extinct but have been re-established in the Park; the Asian elephant *(Elephas maximus)*; the Black-shanked Douc Langur *(Pygathrix nigripes)*; the Yellow-cheeked Crested Gibbon *(Hylobates gabriellae)*; the white-shoulder ibis *(Pseudibis davisoni)*; and the white-winged wood duck *(Cairna scutulata)*

A total of 9,442 people live inside the CTNP. Approximately 81% of these people live at the edge of the park, but five villages are isolated deep inside the park and contain nearly 1,794 people (CTNP, 2003). They have no land titles in their current location but are treated as *de facto* legal inhabitants. A small proportion of these people originate from lowland areas, from which they departed after people of the Kinh majority settled in their ancestral lands. Most of them, however, settled inside the park as immigrants from other parts of Vietnam following the American War in the 1960s.

There are 11 ethnic groups living within the CTNP. They can be divided into three main groups and each has a different history, different connection to administrative structures, and different land use strategy. These groups are: mainstream Vietnamese (Kinh); indigenous ethnic minorities (Stieng and Chau Ma); and recently migrated minorities from the Northern provinces of Lang Son, Cao Bang, and Bac Kan (Tay, Nung, Dao, Hoa, H'Mong etc.)

The Stieng , Chau Ma, and Chau Ro tribes have lived in the region of the park for several centuries. Village 5, Village 6 and K'Lut (Tien Hoan), K'Lo-K'it (Phuoc Cat 2) are mainly Chau

Ma. Stieng people are concentrated in Village 3 and Phuoc Son (Phuoc Cat 2) and Village 4 (Ta Lai). These indigenous minorities have a long history of shifting cultivation. For these people, it takes time to change their traditional cultivation practices and style of living to more sedentary livelihoods.

The recently migrated minorities from the Northern provinces started arriving around 1987-1988, but most settled after 1990. Their traditional livelihood strategies consist of fishing, hunting, and shifting cultivation, but now they are mainly engaged in farming. They predominately occupy the Da Bong Cua area (Dang Ha Commune, Bu Dang District, Binh Phuoc Province).

The human population of the bufferzone, which comprises 31 communes and 2 towns in 8 districts, is far higher than the population inside the CTNP. Nearly 200,000 people live in the direct vicinity of the Park, and the bufferzone is heavily farmed with little conservation value. Part of the Park's boundary is shared with the government-operated State Forest Enterprises (SFEs), which have previously been logged, or are currently being logged to varying extents. However, most SFEs are currently under a logging ban. Although illegal settlers have converted large parts of these SFEs into agricultural lands, these areas also contain large tracts of important forest habitat with a variety of wildlife.

Forest Protection and Rural Development (FPRD) project

Since 1997, the World Bank has been supporting a project entitled "Forest Protection and Rural Development" (FPRD). The goal of the project is to improve environmental protection in Vietnam by protecting and managing remaining natural forests with high biodiversity. The project objectives are (a) the effective protection of high priority protected areas; (b) the effective management of remaining natural forests in the bufferzone; (c) the reduction in dependency on protected areas for subsistence and cash income by improving the livelihood status of residents

in the bufferzone; and (d) the strengthening of government capacity to effectively design, implement, and monitor integrated conservation and development programs.

The project area includes the Chu Mom Ray Nature Reserve (CMRNR) located in Kontum Province, the previously mentioned Cat Tien National Park (CTNP) located in Dong Nai, Lam Dong, and Binh Phuoc provinces, and surrounding areas of agricultural and forestry land (i.e., the bufferzone). The FPRD project supports only bufferzone community development activities because of existing Dutch-funded conservation projects that apply to Cat Tien National Park. The bufferzone has been defined as a continuous band of those communes adjacent to the protected areas; however, it also includes additional contiguous communes within three kilometers of the national park in which human populations may present an actual or potential threat to biodiversity conservation. This definition was adopted because the commune is the smallest administrative unit within the Vietnamese administrative system through which project activities can be effectively managed.

For the development of the bufferzone, the project aim is to reduce the incursion pressure on the national park by providing alternative income-generating opportunities, securing land–tenure, and enhancing the management and use of existing natural forests in the bufferzone. Development of rural communities, and the better management and use of forests located in the buffer communes of the national park, are the key to reducing the incursion pressure on the protected area. A participatory process-oriented approach is used to derive commune action plans (CAPs) based on priority needs identified by the participating communes. The FPRD project funded the following activities: (i) community development planning process to formulate CAPs and negotiate a conservation agreement based on CAPs in exchange for community cooperation in PA protection; (ii) land allocation to improve access to institutional

credit, promote sustainable land use, control in-migration, and increase social stability; (iii)

social support programs to improve basic social infrastructure and increase incomes and

employment opportunities for communities, particularly those that are very poor; (iv) agricultural

support activities to improve yields and diversify farm incomes; (v) issuance of long term forest

protection contracts to households, in order to jointly protect the remaining natural forests in the

bufferzone, and a feasibility study to restructure State Forest Enterprises (SFEs) adjacent to the

protected areas as a means to improve management of estates under their control; (vi) small-scale

irrigation expansion and constructions in order to increase food production and security, and road

upgrades to improve service to rural communities and expand market opportunities.

The Commune Profiles

The Thong Nhat Commune

The Thong Nhat Commune was established during the American war. It was also the base

of the revolution (the communists under Ho Chi Minh and resistance to the French back to

1940s). At that time, the area was inhibited mainly by the Stieng indigenous ethnic group who

lived on shifting cultivation[1]. After 1975, the new government created some autonomous

hamlets that later became communes, with leadership from military officials and other

government cadres who helped build the local government.

In 1985, the People's Committee of Song Be Province had planned the Thong Nhat State

Forest Enterprise, and Thong Nhat Commune was put under the jurisdiction of the SFE.

However, until October 1987 the Thong Nhat SFE was divided into two enterprises: Thong Nhat

and Nghia Trung SFEs. Since that time, people who lived in Thong Nhat Commune were under

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[1] Shifting cultivation, according to Conklin (1957), is any agricultural system in which fields are cleared by fire and cropped discontinuously.

the management of the two state forest enterprises and people cultivating land there were considered squatters in the state forest lands.

People who were relocated by the government from the construction of the Tri An hydraulic dam, together with many war veterans, also came to settle along the Dong Nai River. Historically, they cultivated wetland rice and other short-term industrial crops. These people were organized into *hamlet 4* of the Thong Nhat commune.

In response to the national immigration plan, in 1991 the government resettled the population such that the Song Be province established the New Economic Zone (NEZ) of Duc Lieu. Part of Thong Nhat commune territory belonged to the newly established commune of Duc Lieu. In 1993, ethnic minorities migrated from different parts of the country, especially from Cao Bang, Bac Kan, Lang Son provinces (mountainous provinces bordering with China). These ethnic groups rushed to this area after realizing the potential of this fertile land. This led to serious deforestation as a result of shifting cultivation. Taking advantage of the master plan for the hydraulic dam at nearby Thac Mo, many people came and had commercial logging ventures even in the protected forest that was managed by the state forest enterprises. By 1994, due to rapidly increased physical population growth the government again decided to separate Thong Nhat Commune into two communes—Thong Nhat and Dang Ha. The total area of Thong Nhat Commune now is about 14,085 hectares.

Located in the upper part of the Dong Nai River watersheds, the commune has a network of creeks which are usually barren in the dry season. As the Dong Nai River runs through the area, water for irrigation is available throughout the year. This geographical condition has made the commune suitable for developing industrial crop plantations and home gardens.

In recent years there have been waves of immigration to the area, which has resulted in the formation of many population clusters. With a total population of 10,860 persons, there are now about 12 hamlets in the commune that are made up of people who have immigrated from 52 provinces and belong to 15 different ethnic groups. This reflects the diversified population of Thong Nhat commune.

The Dang Ha Commune

The Dang Ha Commune was established in 1994, from the *hamlet 4* (mentioned previously) that was separated from Thong Nhat Commune. Before 1987, the commune had vast forestland as part of Nghia Trung Forest Enterprise where several veteran families had migrated from Lam Dong province. At that time, the people living in the area were mostly self-sufficient. Moreover, there was no government body and all commercial activities were conducted in the nearby town of Cat Tien (Lam Dong Province).

In 1988, the Bu Dang District was established as separate district from the District of Phuoc Long (of the former Song Be Province). Together with the establishment of the new district, *hamlet 4* of Thong Nhat was named with approximately 60 households. At that time there were no roads and transportation was difficult, being accessible only by boat along the Dong Nai River. The only source of transportation to meet the need of local people was a two engine boat running two trips every Wednesday and Saturday. From 1989, the migrants from the mountainous provinces of Tuyen Quang, Cao Bang, and Lang Son (near the border with China) rushed to the area and began clearing forests and cultivating wetland rice. In 1990, a major event changed the life of people living in *hamlet 4*. In order to supply sand for building of the Thac Mo Hydraulic Electricity Plant, the project management board built a new road from Sao Bong to Dako Bridge. This road became the life blood of subsequent cultural and economic

development of the area. By 1993, *hamlet 4* of the Thong Nhat Commune had reached 500 households in size.

To cope with the dramatic change of increased population due to migration to the area, and in order to better manage the area, the Central Government decided to split *hamlet 4* of Thong Nhat Commune and establish the Dang Ha Commune. In 1996, the People's Committee of Song Be Province decreed the allocation of 2,598 ha land of the Nghia Trung Forest Enterprise to Dang Ha Commune to be put under their management.

Currently the total population of Dang Ha Commune is about 6,062 people (1,020 households) distributed in 6 hamlets. *Hamlets 1,6,8* are mainly comprised of the Tay-Nung ethnic group that migrated from the Northern provinces and there are no indigenous minorities in these hamlets. The commune shares the borders with the national park in the southwest. Land has been allocated to 480 households according to the recent directive (173 CT); among these households there are 170 households that actually live inside the national park. Since year 2000, the resettlement of these households has been proposed, but it remains on paper only. *Hamlets 1 and 2* are under the re-demarcation. Some parts of this land will belong to the park and the affected households will need to be resettled. After 1990 there has been no additional spontaneous immigration to this area.

Being a remote commune, Dang Ha is still a very poor commune of the district of Bu Dang, Binh Phuoc Province. Generally, the living standards of the local people here are still very low compared to other communes throughout the nation.

The Doan Ket Commune

The territory of the Doan Ket Commune was once the ancestral domain of the Stieng. These people have been living in this area since the 1930s, practicing shifting cultivation as their main mode of agricultural production. In 1958, the Diem government (American-supported at

the time) relocated the migrants from the central provinces of Vietnam to this area. These

migrants then began living together with the Stieng people to make full use of the land resources

in the region. After the victory in the Bu Dang District of the revolutionaries in 1974, the new

government established the new commune of Thien Hoa, the original name of the then Doan Ket

Commune. Households were organized into cooperatives.

Beginning in 1989, the Tay and Nung ethnics from the northern border provinces

immigrated to this area, began clearing the forests for agricultural cultivation, and formed the

then *hamlet 7* of Doan Ket commune. Migrants from the Mekong delta regions also settled

around the area called Dakbon, forming *hamlet 5B*. In 1994, the Duc Phong town was split from

Doan Ket Commune. Today, the total area of Doan Ket is about 13,065 hectares with 1,250

households numbering 5,731 persons from the following ethnic groups: Kinh, Tay, Nung, Stieng,

Hoa (Statistical Yearbook, Bu Dang District, 2005).

Living standards of the Doan Ket Commune people are considered higher than other

communes. However, there is a big gap between people who are living in some hamlets nearby

the town of Duc Phong and those who live in the remote hamlets where transportation is limited.

Agricultural production is relatively developed with some perennial crops such as coffee,

cashew, black pepper, rubber, and some fruit trees. Animal production includes swine and cattle,

but is not extensively developed. Generally speaking, the weak infrastructure, limited

transportation, lack of technical knowledge/skills, and lack of capital have limited economic

development in Doan Ket commune.

Table 3-2. Demographic data for the three selected communes

	Total areas (square kilometers)	Total Population (persons)	Agriculture Households	Persons living on agriculture	Number of person at working age
Doan Ket	75.50	5,107	1,067	4,908	2,160
Thong Nhat	93.00	10,860	2,410	10,524	4,354
Dang Ha	201.97	6,062	1,225	6,032	2,328

Ethnographical Sketch of Population Living in the Three Study Communes

Stieng ethnic

The Stieng is the indigenous ethnic group that resides mostly in *hamlets 6, 2* and *12* of Thong Nhat Commune and *hamlets 6, 1B, 5A, 5B* and *2* of Doan Ket Commune. The southeast part of South Vietnam is the traditional niche of Stieng, and they are also found in neighboring Cambodia.

The Stieng divides itself into two major groups: *Bulo*, or " the people above" (upstream); and *Budeh*, or "the people below" (downstream). Key informants among the Stieng that were interviewed also identified local groups called *Bulach* and *Budip*.

The Stieng trace their descent through the male line. Kin are recognized to the third ascending generation and the third descending generation. Marriage patterns reflect patrilineage exogamy, rules against marrying the father's sister's daughter, and preference for marriage with consanguine kinswomen of the mother's patrilineage.

Traditionally, an individual of the Stieng has only one name, and it generally does not have a particular meaning. During the 1950's the government required surnames for identification cards, so all Stieng were given *Dieu* as their family name. At present time, the full name of male Stieng includes a surname and a last name (last name is given in Vietnamese) such as *Dieu BDai, Dieu Tiet, Dieu Giaray*, etc.

The Stieng have traditionally lived together in the same area in separate small houses (no longhouse remained), thus forming the traditional tribe. But some Stieng families live separately from their tribe, adjacent to the main road, and they have home gardens and farming practices like the Kinh or Tay Nung ethnic groups. Some of them intermarry with Kinh people, but intermarriage with Tay Nung people has not yet been observed.

Although others live far away from the road system, they have been affected by Kinh culture through their dress, consumption patterns, and housing structures (style of Kinh). However, they still maintain their traditional activities including: shifting cultivation, food gathering, wild animal hunting, taking a bath in streams, using traditional tools and equipment such as crossbow, back-basket, footing, etc.

A few of the Stieng have been resettled in remote areas far away from the road system. Swidden agriculture practice is the main way to produce their food. Houses are built near each other (not longhouse), thus forming a true tribe. Their livelihood opportunities are limited and they have been known to face a six-month shortage of food in a year.

The Stieng language is classified in the South Bahnatic subgrouping of the Mon-Khmer family within the Austro-Asiatic stock. This language does not exhibit the interesting vowel register phonemes of many Mon-Khmer languages, but its extensive use of semantic pairing, onomatopoeia forms and internal rhyming make Stieng a colorful and fascinating language.

Tay, Nung, Hoa, Muong, Man, Dao, Cao Lan, San Diu ethnic minorities

The Tay, Nung, Hoa, Muong, Man, Dao, Cao Lan, San Diu groups are migrants from various northern provinces of Vietnam. These groups are very similar to each other in terms of culture, traditions, and farming practices (the so-called VAC system, which stands for *Vuon*=Garden, *Ao*=Fish pond, *Chuong*=Pig Barn in Vietnamese). They often build big houses made of several timber species; each family owns a separate house (along with a home garden) that has a clear spatial boundary. A water source for paddy rice cultivation is important for their farming and for establishing the VAC system; therefore they often select low-lying sites for building their hamlets.

They usually assist each others in terms of technical and financial assistance; in some cases they are willing to receive newly migrated persons into their area, allowing them to stay on their

own farms for at least one year. During this period, the new migrants have to work hard and save money in order to be able to establish their own (separate) farms. They are patient and dedicated farmers, known for saving money and building up their wealth from the land.

Kinh people

The Kinh people are the major ethnic group in Viet Nam (and in the study communes, as well), and linguistically belong to the "Viet-Muong". The Kinh migrated from the Mekong Delta, the Central Coastal area, and the neighboring province of Dong Nai. The Kinh prefer to live along the sides of main roads, or deep in the basal soil forest area. Their religious affiliations include ancestor worship, Buddhism, and Roman Catholicism.

Farming systems in Kinh households in the commune include plantations with more diversity than those of other ethnic groups and are generally based on commercial and perennial tree crops like cashew nut, coffee, and rubber trees. Like some of the other ethnic groups, a portion of the Kinh have migrated into the area around CTNP. These migrated Kinh that have come from the North were former government officials, soldiers, or displaced migrants (due to the land shortage pressure in the North) familiar with the VAC system in the North, who prefer to apply this farming system in the new areas area. The Kinh that migrated from the Central Coastal areas are skilled in wetland rice cultivation, and they always seek to find lowland areas in order to apply their paddy rice cultivating technique in other parts of the country.

The Kinh that came from the Mekong Delta are skilled in fruit tree species, and have established fruit orchards with longan, or sapodilla. The Kinh that came from the southern parts of the Central Highland or from the Dong Nai or Lam Dong provinces have both the funds and technical knowledge to invest in coffee and rubber plantations.

Indigenous Ethnic Groups in Transition

Changes in community structure

The traditional system of administration in the ethnic tribal areas is the council of elders led by certain individuals who know the traditional regulations of the tribe and are respected by the local community. When the commune was established, the Stieng had representation in the local assembly (called *Hoi Dong Nhan Dan Xa*), and the role of elders was now limited to giving suggestions to local government. It may be that traditional regulations and the indigenous knowledge will be eroded in the future. Kinship still has strong influence on the household economics of the Stieng people.

Indigenous knowledge system

As with the other ethnic groups in Vietnam, the Stieng owned precious indigenous knowledge—not only in agriculture, traditional medicine, traditional regulations, and community administrative, but especially in natural resource management. At the present time, the indigenous knowledge of the Stieng is changing: from knowledge and skills related to traditional shifting cultivation into cashew nut based agro-forestry practices.

Changing characteristics of family, household and community

Before 1975, the Stieng tribe was distributed from the center of Dong Xoai Town to deep within the forest. Under the wave of migration pressure, however, the Stieng is now concentrated in small tribes living together in small settlement areas called "bon", and are led by an elder.

The "Bon" tends to be topographically isolated from the Tay-Nung. Because the livelihood activities of the Tay-Nung are based on the VAC system, a water source is most important for fishpond digging and paddy rice cultivation. Thus, the Tay-Nung select low-elevation sites for establishing their settlement while the Stieng prefer to select high-elevation sites in order to establish their "bon", which is more appropriate for their swidden activities.

On the other hand, however, during the cropping season almost all members of the Stieng households have left their houses to stay in the *Miir* (swidden field), and return back to the "bon" only on the weekend, as they do not like to live near other ethnic groups with which they are unfamiliar. However, Kinh houses can be alternated with Stieng in the "bon" for business activities; Kinh also supply the needs and food for Stieng during food shortage period, and offer credit to Stieng by pre-buying agriculture product (rice, tuber, root, cashew nut…).

In general, there are 3 main types of Stieng settlement areas found in the study communes. The original type of "bon" structure, where houses were built next each others; there are no plants in settlement area. Their swidden areas are usually located in the surrounding area or far away in the natural forest. Their main crop is upland rice grown with sesame.

The second type of "bon" is composed of separate houses with home gardens and clear boundaries that separate individual dwellings. The Stieng 's home garden usually includes fruit trees like bananas, ananas; and spices such as chili, lime grass, zingers, feed for pig like wild taro (*Alocasia macrorrhiza*), livestock-shed, etc. However, they still strongly depend on swidden agriculture as well, especially for growing upland rice and other food crops in the natural forest. They also grow cassava; rice and other food crops are typically alternated with cashew trees.

The third type of "bon" is the most advanced where the bon elder leader allocates land alongside of the road, and each household includes house, kitchen garden, cashew-field, swidden combined with clear boundary. Animal raising and cashew nut production are part of the income generating activities.

There is no longhouse even in the original type of "bon". The houses of the Stieng are constructed on the ground: the key informant (elder) related that in the 1950s they had been forced to adopt this style by the government.

A typical Stieng house is small and low with small poles, thatch roof, exterior and interior walls that are formed by split bamboo. Internal arrangement varies, but a common pattern is to have a bamboo platform about a half meter high, which is used as the bed, and an open hearth with three stones set in a hole in the ground. At the present time there is no flat gong and rice alcohol jar in the Stieng household. The back-baskets, the fish-catching baskets, and the rice-winnowing baskets are all hung on the bamboo wall or on the beam. On the floor is the mortar that is used for husking rice.

Some Stieng houses are presently constructed with bridge and cement (these are influenced by Kinh culture), but the kitchen still remains in the Stieng style. Some advanced Stieng households may own a radio, a TV set, a cassette player, and/or a motorcycle. For example, this study observed 2 TV sets, 3 radio-cassettes, and 9 bikes that were owned by households of a "bon" of 11 Stieng families that live in a remote area. Other outside influences on the Stieng are evidenced by the women that now know how to make-up themselves, paint their fingernails, dye their hair, and use luxurious soaps and dress slippers at home.

The family is the basic social unit and the household is the basic unit of production. Similar to the Kinh which is strongly influenced by Confucianism, the social structure of the Stieng is also traced descent through the male line. Everyone knows the name and the village of the second or third ascending generations. Weddings and funerals bring matrilineal kin together to strengthen their ties not only by contact but also through recitation of ancestor's names as ritual offerings are made.

Marriage is often intro-ethnic and an important event in the life of an ethnic group. Almost all Stieng now belong to the Baptist religion, and are influenced by Kinh culture. The Stieng's wedding ceremony is very simple; there is no bride price for marriage. At the present time, the

Stieng and Kinh have been practicing intermarriage. This study found no intermarriage between the Stieng and Tay-Nung groups because the Tay-Nung people are new migrants who have not yet adapted to the new social environment.

After marriage, a new split house is established which then receives assistance from the community. The families in the village usually have many children. The average numbers of children in the family in the study site is 4 to 5.

Commune's people committee

A commune is an official political entity at the local level, and is administered by an institution called *"Hoi Dong Nhan Dan Xa"* (People's Council of the Commune). This institution is considered by law to be the decision-making body when it comes to commune issues. It elects the executive committee, which is called *"Uy Ban Nhan Dan Xa"* (People Committee of the Commune). At present, the Chairs of both the Doan Ket and Thong Nhat Communes belong to the predominant Kinh group, but the Chair of Dang Ha is a male from the Tay ethnic community.

Local mass organizations, such as Women's Union, Farmer's Union, Youth Union, Veteran's Association, Red Cross Society, Gardening Association, Association of Elderly People, exist in each commune. They are considered as implementing tools for accomplishing objectives and targets set by the local government. These organizations, however, are very active and are regarded as effective local partners in many development projects; the Women's Union, Farmer's Union, and Veteran's Association in particular. Every one or two months, the commune people's committee will organize meetings with the leaders of these organizations to inform them of government decisions and plans. The leaders, in turn, are expected to disseminate the information to the villagers.

Beside the above mentioned local association which are sponsored by the government, other groups such as religious groups, credit groups (rotating credit associations), and kinship groups are also found in the villages. However, almost all respondent tended not to mention about those informal groups, especially those who belonged to protestant religion.

Summary

This chapter presented a general overview of the location-related background information that is central to the study. In particularly, distinct characteristics of the CTNP and its bufferzone were described, which also highlights the challenges for biodiversity conservation in the park. Similar to other national parks in Vietnam, the people who live in the bufferzone of the CTNP are mostly indigenous minorities or resettled households and are very poor with limited education. Their subsistence depends mostly on forest products or related ecosystems. In term of sociodemographic conditions, each ethnic group has a different history, a different connection to administrative structures, and a different livelihood strategy. The ethnographic sketch of the population living in the three study communes was presented with a particular focus given to the transition of the Stieng—an indigenous ethnic group—from a subsistence mode of living to a commercial farming system. This implies a socioeconomic transformation of the Stieng (as well as of other ethnic groups making this transition). Besides the traditional institutions that govern natural resources, many other new modern institutions are now in place such as local organizations that are either sponsored by the government or are civil society organizations. The nature and importance of these organizations, as well as households' participation in them, will be further discussed in the analysis chapter.

CHAPTER 4
METHODOLOGY

This chapter presents the methods and scientific reasoning behind the study. The steps

documented in this chapter were used to access household social capital and conservation

attitude toward the Cat Tien National Park in Vietnam. Included is a discussion of the conceptual

framework used to establish relationship among variables, the units and levels of analyses, study

sites selection criteria, data collection efforts, and the overall research design used in this study.

Conceptual Framework

This study focuses on households' social capital and its effect on conservation attitude and

behavior toward the CTNP—specifically where the World Bank supported project—Forest

Protection and Rural Development project—is in place. Drawing on the literature, a conceptual

framework (Figure 4-1) was developed to assess the relationships among various variables[1]. This

framework shows that a set of demographic variables would impact households' social capital.

Social capital index is shown to have various components including trust, social cohesion, social

commitment, community support, voluntary cooperation, familiarity, social integration, ethnic

interaction. It is conceivable that both demographic variables and components of social capital

are expected to influence households' attitude towards the conservation of CTNP. Since

household attitude is expected to influence the behavior, it is shown that all three sets of

variables (demographic, social capital, and attitude) would influence household behavior towards

the CTNP.

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[1] Note that the components or dimensions of social capital and conservation attitude listed in this figure are derived
from factor analysis described latter in this chapter.
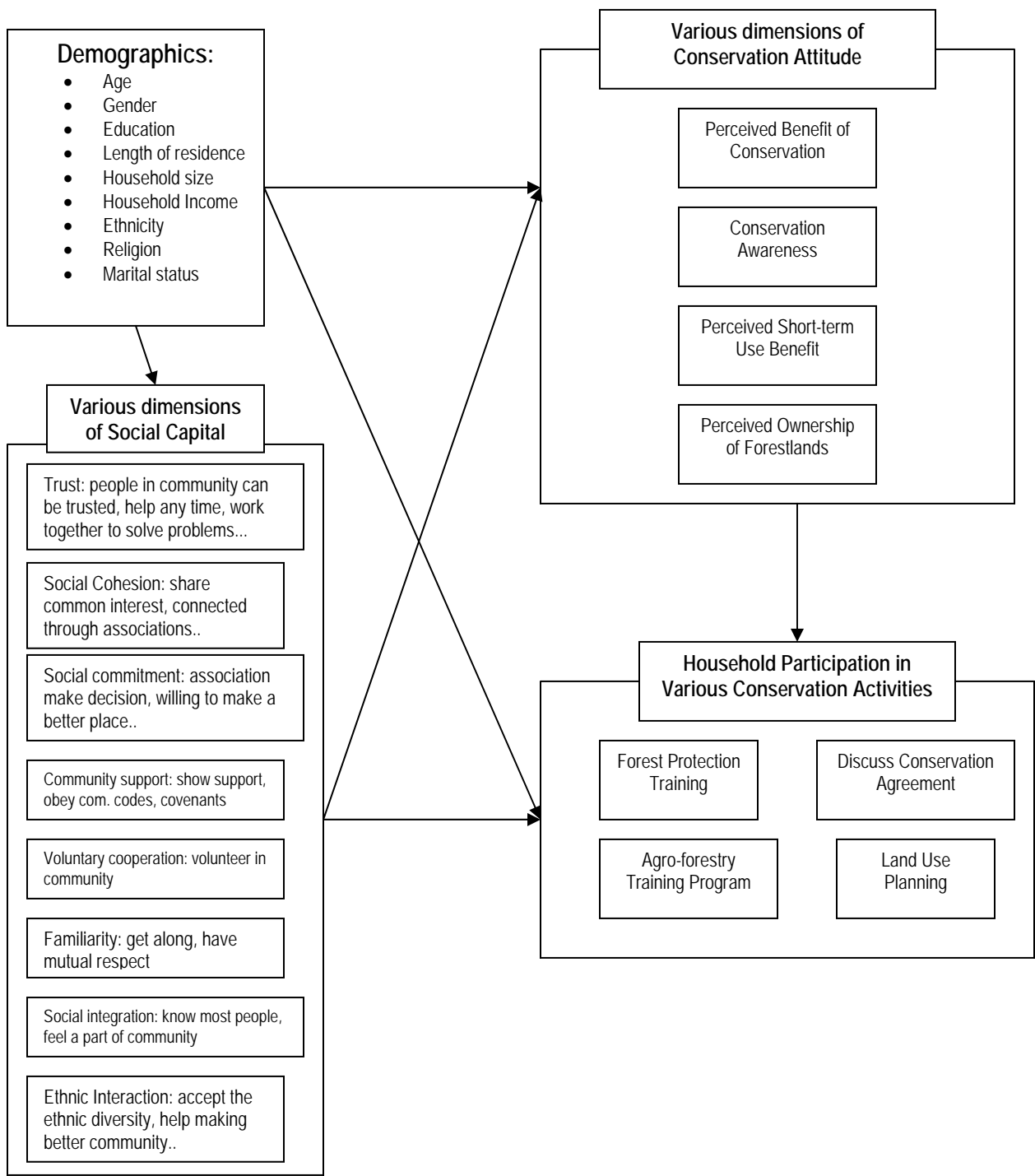
Figure 4-1. Conceptual framework to examine the relationship among selected variables

Unit of Analysis

Individual households are the unit of analysis in this study. The attitudes, interactions with other households, and experiences and opinions of respondent households were used to measure social capital as well as the factors that contribute to it (Narayan and Cassidy, 2001). Households were chosen as the unit of analysis because, in the rural context of Vietnam, the household is the basic unit of production that governs the daily activities of all people, including their attitudes and behaviors toward natural resource conservation.

Sampling Methods

A total of 270 households from the three communes of Thong Nhat, Dang Ha, Doan Ket were identified for participation in this study using a stratified sampling design. Several steps determined this sample size. First, based on the total number of households in the three communes (4,702 households), the minimum number of completed questionnaires needed was determined to be 253 (based on the number of available households). This sample size is considered appropriate since the population presents a homogenous structure; moreover, it is also sufficient to limit sampling error and still be statistically representative of the population at a level of .05 (Kraemer and Thiemann, 1987; Isaac and Michael, 1997). The selection of samples is generally outlined in Figure 4-2.

Stratified sampling allows the researcher to select respondent households from three main groups mentioned in the previous chapter. These groups are the mainstream Kinh (Vietnamese), the indigenous ethnic minorities (Stieng), and recently migrated minorities from the Northern provinces (mainly Tay, Nung, and Hoa). At the commune level (i.e., the first strata), three out of five communes were purposefully selected. These communes represent the characteristics of the population of Binh Phuoc province which belong to the bufferzone of CTNP because the various distances from these communes to the national park, as well as the diversity of the ethnic groups

in these communes. At the hamlet level (second strata), three hamlets were chosen from each

commune, with each hamlet representing the characteristics of each of three groups above.

Because the population in each hamlet is relatively homogenous, 30 households out of more than

100 households were randomly selected. Thus, a total sample size of 270 households (3

communes x 3 hamlets x 30 households = 270) was determined.

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┌──────────────────┐         ┌──────────────────────────┐
│                  │────────▶│  Three out of five        │
│    Communes      │         │  bufferzone               │
│                  │         │  communes of Bu           │
│                  │         │  Dang District were       │
│                  │         │  selected                 │
└──────────────────┘         └──────────────────────────┘
         │                              │
         ▼                              ▼
┌──────────────────┐         ┌──────────────────────────┐
│                  │────────▶│  From each commune        │
│     Hamlets      │         │  three hamlets are        │
│                  │         │  selected randomly        │
└──────────────────┘         └──────────────────────────┘
         │                              │
         ▼                              ▼
┌──────────────────┐         ┌──────────────────────────┐
│                  │────────▶│  From each hamlet 30      │
│    Households    │         │  households are selected  │
│                  │         │  (270 households in total)│
└──────────────────┘         └──────────────────────────┘
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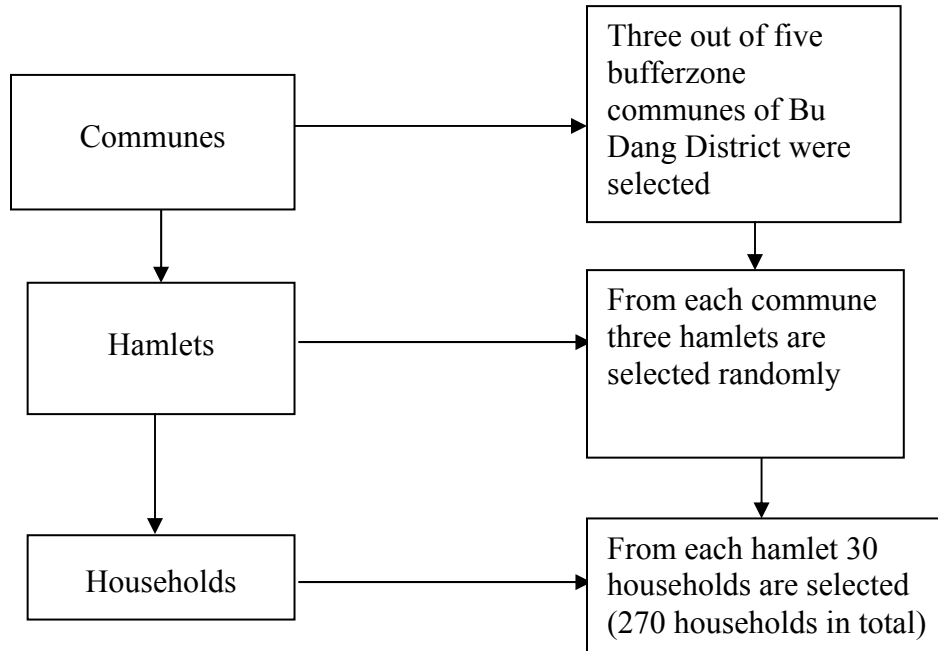
Figure 4-2. Sampling approach followed to select communes, hamlets, and households

Survey Instrument/Questionnaire Development and Research

A survey instrument was developed to obtain household data on social capital,

participation in the FPRD, attitudes towards biodiversity conservation, and demographic

characteristics of respondents. These are the main areas of the instrument and can be observed in

the sample questionnaire presented in Appendix A. The design of the questionnaire followed the

suggested formatting of the Tailored Design Method (Dillman, 2000). The development of the

questionnaire was based on information from semi-structured interviews with key informants in

the study sites. These interviews were conducted by the principal investigator with different key

informants in summer 2003 in the three study communes. Participatory Rural Appraisal (PRA)

reports (FPRD, 2000; FPRD, 2001) for three communes Thong Nhat, Dang Ha, Doan Ket produced by the World Bank project in these areas were also helpful, especially in terms of identifying community groups, social organizations, and development activities in the study sites.

Survey Pre-test

A pre-test of the questionnaire was conducted in order to identify any incorrect or misleading survey items, problems with data collection methodology, and/or additional areas for research that were not present in the literature. As such, a random sample of 20 households was drawn from the residents list in the Thong Nhat Commune to be interviewed for this purpose. This commune was chosen for two reasons: (1) it is more accessible than the other two communes, and thus minimized the cost of the pre-test; and (2) it has more diversified ethnic groups with different languages and social structures, which provided a desired amount of variability for the pre-test. The selection of 20 residents would be considered an adequate sample size for this pilot test (Isaac and Michael, 1997: Babbie, 1998). Testing was conducted in the first week of April 2005.

The pilot test was conducted following the planned methodology used in the overall study. In addition, respondents were asked to comment on the questionnaire content, design, clarity, wording, and format. Where possible, all respondents were gathered together to discuss the survey in a group setting or focus group. Additional issues that were discussed include: the wording of certain items, how to approach respondents who live deep inside the Park, etc. Based on this pretest, revisions were made to the questionnaire and, where necessary, the data collection methods.

Administration of the Survey

The survey proper was conducted from 20 April to 10 August 2005. The questionnaire was translated into Vietnamese and administered orally by a team of two trained research assistants assigned to each commune. These interviewers are extension workers who worked in the areas and have a good rapport with the local people. As respondents might be reluctant to answer sensitive questions, extension workers were chosen to conduct the interviews in order to avoid the potential bias that may be caused by hiring foresters. The response rate was 100% (270/270) due largely to the fact that the survey was conducted through face-to-face interviews that were pre-arranged.

Concepts and Variables

This study is focused on three primary concepts: social capital, participation in the FPRD project activities, and general attitudes toward biodiversity conservation. The first two factors are hypothesized as being key components that influence the conservation attitude of given respondent households. Thus the conservation attitude is also utilized as a dependent variable.

There are two main types (or categories) of social capital: *structural* forms and *cognitive* forms (Krishna and Uphoff, 2002). Both pertain to and affect social relationships and interactions among people, and both affect and are affected by expectations. Structural social capital *facilitates* mutually beneficial collective actions through established roles and social networks that are supplemented by rules, procedures, and precedents. Cognitive social capital, which includes shared norms, values, attitudes, and beliefs, *predisposes* people toward mutually beneficial collective action (Krishna and Uphoff, 2002).

Participants in the survey were asked to express their opinions on a series of questions about their involvement with, and perceptions about, their neighbors. A Likert scale was used to record the responses. General topics covered by the questionnaire include: organizations that the

67

respondent belongs to; collective activities participated in the last 12 months, feelings towards neighbors, friends.

Community Group/Social Organization Membership

Respondents were asked if they are aware of, or belong to, various groups, associations, and/or organizations that exist in their community, such as farmer unions, women's unions, youth unions, veteran's association, Red Cross Society, Gardening Association, Association of Elderly People, Religious groups, Credit groups. These groups/associations were listed according to the pre-existing information available in the study site. The following questions were asked:

Are you aware of this group existence in your community? 1) No   2) Yes

Do you belong to this group? 1) No   2) Yes

Involvement in Community Activities

Involvement in community activities was measured by asking respondents how often they performed various activities in the past year (Kasarda and Janowitz, 1974; Riger and Lavrakas, 1981; Luloff et al. 1995, Brennan, 2006, Brennan, 2007). These activities include community events, sporting events, meetings, training, and work projects. Information about these activities was also derived from the semi-structured interviews with key informants before the survey was conducted. The following question was asked:

In the past year have you participated in the following activities with your neighbors or other people in the village? For each activity indicate how often you performed the activity: 1) Never; 2) Once/year; 3) Few times/year; 4) Once/month; 5) Few times/month.

Perception of the Community

Perceptions about one's community are important for social action and interaction (Wilkinson, 1991). Thus, the respondent's perception about their community was measured by asking each respondent household to agree or disagree with 30 related statements. These

statements were derived from the integrated questionnaire for measuring social capital used by the World Bank (Grootaert *et al.,* 2004), and were modified to suit the specific context of this study. The questionnaire explores the respondent's subjective *perceptions* of the trustworthiness of other people, and of the key institutions that shape their lives; as well as the norms of cooperation and reciprocity that encompass attempts to work together to solve problems (i.e., cognitive social capital). These perception variables can then be measured through 32 items (see Appendix A) which are related to trust and social commitment, participation, social cohesion and inclusion, etc (Grootaert et al., 2004). Below is an example of the Likert scale used for responding to the example statements which follows:

> *Please tell us how do you feel about the following statements using the scale from 1 to 5, 1 being strongly disagree (SD), 2 being disagree, 3 being neutral, 4 being agree, 5 being strongly agree.*

> *c. Most people in this village are willing to help each other whenever they can.*

> (1) strongly disagree; (2) disagree; (3) neutral; (4) agree; (5) strongly agree.

Participation in Conservation-Related Activities of the Forest Protection and Rural Development Project

The main goals of the Forest Protection and Rural Development Project (FPRD) are to protect and manage the forests with high biodiversity. Households' participation in FPRD can take many forms. In the case of the bufferzone of the CTNP, a variety of FPRD project activities have been identified through the Commune Action Plan (CAP) that was available to the principal investigator prior to the implementation of the survey.

The conservation related activities include attendance at meetings to discuss a conservation agreement, attending training on forest protection, agroforestry training, land use planning

training, etc. Each respondent were asked to report if they participated in specific project activities in the past 12 months. For example:

In the past 12 months have you:

Participated in training on forest protection? 1) No   2) Yes

Attended meeting to discuss conservation agreement? 1) No   2) Yes

Participate in land use planning?   1) No 2)   Yes

Participated in Training on Agroforestry?   1) No 2)   Yes

Conservation Attitudes

An attitude is defined as the organization of beliefs about an object or situation that influences one's response to that object (Rokeach, 1968). Conservation attitudes of the respondents are measured on the basis of their reactions to 18 statements (see Appendix A) that were adapted from the survey in the Royal Chitwan National Park, Nepal (Nepal, 1993), and subsequently modified to suit the particular context of this study. The following sections provide sample questions in order to illustrate how conservation attitudes were elicited.

Perceptions about biodiversity conservation

Respondent's perception toward biodiversity conservation is thought to be an important factor influencing their behavior toward a protected area (Nepal, 1993; Mehta and Kellert, 1998). Perceptions were measured by asking respondents to express their feelings about statements such as:

"*It is important to keep the park for the survival of various plants and animal species*"

"*The Park is our country's pride and is essential for a healthy environment*". Responses were measured via the Likert scale as above.

Issues/ problems associated with biodiversity conservation

Respondents were also asked to rank issues or problems currently facing their community. These responses are believed to provide an overall measurement of household attitude toward biodiversity conservation, and include statements such as:

"*Conservation has taken land thus farmers do not have enough land to cultivate*.

Again, responses are measured via a five response Likert scale.

(1) strongly disagree; (2) disagree; (3) neutral; (4) agree; (5) strongly agree.

Impacts of conservation activities

The Likert scale was also used to measure the impacts of conservation activities upon respondent households by asking them to agree or disagree with the following statements:

"*Farmers have benefited from the conservation program*";

"*Forest land allocation ensures farmers' ownership of the forestland*";

"*Farmers can get more income because of forest protection and management activities*".

Responses are measured via a five response Likert scale.

(1) strongly disagree; (2) disagree; (3) neutral; (4) agree; (5) strongly agree.

Control Variables/Demographics

A substantial amount of recent literature has shown that household-level socio-demographic variables influence the level of social capital and community participation of households, as well as their attitudes toward natural resource conservation (Israel et al., 2001; Glaeser et al., 2002; Cramb, 2004; Israel and Beaulieu, 2004; Masozera and Alavalapati, 2004; Brennan and Luloff, 2007). Thus, several socio-demographic variables were included in this study and used as control variables in the analysis. This allows for differences in opinion to be compared among various household characteristics. These variables also serve as a mechanism for understanding relationships between other variables and help to confirm and elaborate on

generalizations that are drawn from the findings (Babbie, 1998). Finally, socio-demographic variables were also used in the sample validation process to determine how well the sample of respondents matches the overall population.

The following control variables and the corresponding item values were used:

ETHNICITY: (1) Kinh; (2) Tay; (3) Hoa; (4) Stieng; (5) Others

RELIGION: (1) Buddhism; (2) Catholic; (3) Protestant; (4) Others

LENGTH OF RESIDENCY: (1) Less than 10 years; (2) 10-20 years; (3) 20-30 years ;(4) more than 30 years

EDUCATION: (1) elementary school (grade 1-5); (2) Some high school (grade 6-9); (3) High school (Grade 10-12); (4) College

HOUSEHOLD COMPOSITION: (1) 1-4 persons; (2) 5-8 persons; (3) more than 8 persons

HOUSEHOLD INCOME: (1) less than VND 5,000,000; (2) VND 5,000,000 – 10,000,000; (3) VND 10,000,000 – 20,000,000; (4) more than VND 20,000,000.

AGE: (1) 18-29 yrs old; (2) 30-39 yrs old; (3) 40 –49 yrs old; (4) 50 – 59 yrs old; (5) 60 yrs olds or above

MARITAL STATUS: (1) single; (2) married; (3) divorced; (4) widowed

GENDER: (1) Male; (2) Female

Data Compilation

Upon the completion of the survey, all data from each survey were put in a template file using Microsoft Excel. This template essentially reflects the household survey questionnaire. Data from each household were transcribed into this format for later analysis. Research assistants in three different communes were asked to enter data onto data sheets in the Vietnamese language in order to avoid any ambiguity. This task was done under the supervision of the principal investigator (PI), especially with regard to the handling of specific ambiguities in

questionnaire responses. Finally, the Statistical Package for the Social Sciences (SPSS) was used to handle all necessary data analyses. Reversed coding was used when necessary.

Factor Analysis

Factor analysis is a crucially important component of this research study. Factor analysis is designed to study the pattern of relationships between a number of dependent or independent variables and how the nature of (as of yet unknown) factors may affect them (Darlington, 2006). There are two approaches to factor analysis: exploratory and confirmatory. Because social capital and conservation attitude are designed as exploratory measures, exploratory factor analysis was used. There are three purposes of exploratory factor analysis in scale development (De Vellis, 2003). The first purpose is to determine how many dimensions account for most of the variance in the scale. Second is to allow researchers to condense a scale, using a few items to represent the construct. Finally, exploratory factor analysis helps researchers to define the meaning of factors that characterize a group of items.

Exploratory factor analysis assumes that the number of underlying factors is less than the number of overall items. In addition, because exploratory factor analysis is applied to a correlation matrix (as opposed to raw data), assumptions relevant to Pearson's correlation coefficient are relevant to exploratory factor analysis. Correlation assumptions include a large number sample size (in this study, n=270), and variables measured on an interval scale (Pett, Lackey, and Sullivan, 2003). Exploratory principle components factor analysis was used in this study to identify the factor structures for the 32 items designed to measure social capital and 18 items to measure conservation attitude.

In this study, the factor structures were rotated using Varimax (orthogonal) rotation. The goal of rotation is a simple structure. That is, high loadings on one factor and low factor loading on all others. Orthogonal rotation ensures that the factors remain unrelated, by not allowing the

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axis that are rotated to move beyond perpendicular to each other (George and Mallery, 2001).

Rotation allows for a clearer interpretation of the results. Jeffreys, Massoni and O'Donell (1997)

identified Varimax rotation as the best way to determine the appropriate number of common

factors by analyzing the eigenvalues and adjusted correlation matrix.

As suggested by Hair, Anderson, Tatham and Black (2004) factors with eigenvalues

greater than 1.0 were considered for further analysis. Kaiser (1960) was the first to recommend

this procedure for factor inclusion. In addition, as first proposed by Cattell (1966), a scree plot of

eigeinvalues was analyzed in order to arrive at a final number of factors. Following the

recommendation of Hair, Anderson, Tatham and Black (2004), items with a factor loading of

0.40 or greater were kept. Items that double loaded (loaded on 2 or more factors at 0.40 or

greater) were dropped from the factor in which it loaded least, and kept on the factor in which it

loaded highest. Reliability testing was conducted for each factor. Factors with a Cronbach alpha

of 0.50 or greater were considered acceptable (Baumgartner and Jackson, 1999).

Jeffrey, Massoni, and O'Donnell (1997) recommend the use of the Kaiser-Myer-Olking

(KMO) statistic as a check for the appropriateness of exploratory analysis as a method of

analysis for the items in questions. KMO compares the magnitude of the observed correlation

matrix to the magnitude of the partial correlation coefficients. A small KMO (<0.5) suggests that

exploratory factor analysis may not be a suitable approach. In this study, the KMO was equal to

.874 for the factor analysis of social capital and 0.789 for conservation attitude. This is indicating

that exploratory factor analysis was an appropriate method of inquiry.

The exploratory factor analysis identified eight factors for social capital, which account for

61.85% of the total variance. It also identified four factors for conservation attitude, which

account for 57.8% of the total variance.

The social capital and conservation attitude variables were calculated by summing scores for all items. The use of a scale allowed for more manageable data, and reduced random errors that could impact reliability and validity (Carmine and Zeller, 1979). The scale was tested by means of Cronbach's alpha to provide a measurement of their reliability (Carmine and Zeller, 1979). Cronbach's alpha is a measure of reliability in which a score ranges from zero to one. The higher the score, the higher reliability of the variables involved.

Linear Regression Models

Multiple regression modeling serves to describe a phenomenon, explain relationships, and to a general extent predict events or phenomenon (Barbie, 1998). By inclusion of a wide range of variables and relationships, multiple regression models can increase the power of statistical models. Such models allow us to separate the effects of interrelated independent variables.

In this study, a series of multiple regression models using ordinary least squares (OLS) was estimated to assess the effects of each predictor on various conservation attitude variables (measured as continuous variables). These dependent variables represent different dimensions of conservation attitude such as perceived benefit from conservation, conservation awareness, perceived benefit from using the park, and perceived ownership of forestland. These conservation attitude variables were derived from the factor analysis described previously and were calculated as indices. The socio-demographic variables (age, gender, length of residence, level of education, household size, income, ethnicity, religion) and social capital variables (social trust, social cohesion, social commitment, community support, voluntary cooperation, familiarity, social integration, and ethnic interaction) are used as independent variables in the multiple linear regression models.

The linear regression model is specified as follows:

$$Y = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + ... + \beta_k X_{ki} + \varepsilon$$

Where Y is the conservation attitude, β_0 is the intercept term, β_1, β_2,..., β_k are the coefficients associated with each explanatory variable X_1, X_2, ..., X_k and ε is the error term. The explanatory variables include socio-demographic variables such as age, gender, length of residence, education, household size, household income, ethnicity; and social capital.

Five multiple linear regression models were developed for conservation attitude variables. The first model was developed for the perceived benefit from conservation. The second model focused on the conservation awareness. The third model was used to predict the perceived benefit from using the park. The fourth model focused on the perceived ownership. Finally, a general model was developed for the overall (aggregated) conservation attitude toward the CTNP.

Logistic Regression Models

Participation in conservation activities is the dependent variable. It is a binary variable which takes a value of 1 for household participating in conservation activities and a value of 0 for not participating in any conservation activities.

The logistic regression model characterizing the participation of the sample households is specified as follows:

$$\ln[P_1 /(1 - P_1)] = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + ... + \beta_k X_{ki}$$

Where *Pi* is the probability of a household to participate in conservation activities and (1-*Pi)* is the probability of a household not to participate, β_0 is the intercept term and β_1, β_2,..., β_k are the coefficients associated with each explanatory variable X_1, X_2, ..., X_k. The explanatory variables used to explain household participation of each household include socio-demographic variables such as age, gender, length of residence, education, household size,

household income, ethnicity; and social capital and conservation indices which are derived from factor analysis.

Summary

This chapter presented the methods and scientific reasoning behind the study including a conceptual framework, units and levels of analyses, study sites selection criteria, data collection efforts, and overall research design that were used in this study. A detailed discussion of the major concepts and variables measuring social capital, conservation attitude and participation in conservation activities was provided. In addition, research approach and data analysis methods that are used to achieve the objectives of the study were also discussed.

The next chapter begins by presenting descriptive statistics of socioeconomic variables. Factor analysis results will then be presented to identify social capital and conservation attitude components. Based on these results, indices for social capital and conservation attitude are calculated and used as dependent variables and/or explanatory variables in linear regression and logistic regression models. The relationships among sociodemographic variables, social capital, conservation attitude, and conservation behavior are assessed.

In order to scientifically explore the research questions of this study, an analysis of

household survey data was first conducted. Specific conditions were identified, controlled,

explored, and interpreted. Several statistical analysis methods were used. Univariate and

bivariate analyses were first conducted to determine the impacts of a variety of characteristics on

social capital indices and their relationship to conservation attitudes. To calculate these indices,

a series of factor analyses were first used to identify components of social capital and

conservation attitude.

Frequency of Response Data

Socio-demographic Characteristics

Analysis of data began with a review of overall responses for each major conceptual area.

Table 5-1 presents the frequency of responses for the main socio-demographic variables.[1]

The data in Table 5-1 are categorical in nature and are therefore presented as frequencies,

relative frequencies, and cumulative frequencies. The data for respondents are distributed across

five age categories, with the majority of respondents being between 30 and 50 years old (68%).

This was expected because these individuals are the household heads. Males accounted for 89%

of the respondents which indicates that there are very few female-headed households. The

majority of the respondents had low levels of education: 7% of respondents are illiterate, while

40% have completed primary school and 40% have completed secondary school[2]. Only 12%

have completed high school and 1% has completed college. Respondents were distributed across

ethnicity, in the following manner: 28% belong to the Kinh group, 22% were Tay, 13% Nung,

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[1] A full presentation of all responses to all survey items included in this analysis can be found in the Appendix C.

[2] Secondary school in Vietnam is roughly equivalent to Junior High School in the U.S.

Table 5-1. Frequencies of socioeconomic characteristics for all respondents

Demographic Characteristics (n=270)	Frequency	Relative Frequency	Cumulative Frequency
AGE			
18-29	39	14.4%	14.4%
30-39	93	34.5%	48.9%
40-49	90	33.3%	82.2%
50-59	34	12.6%	94.8%
60 or more	14	5.5.2%	100.0%
GENDER			
Male	240	88.9%	89.9%
Female	30	11.1%	100.0%
ETHNICITY			
Kinh	74	27.4%	27.4%
Tay	60	22.2%	49.6%
Nung	35	13.0%	62.6%
Hoa	4	1.5%	64.1%
Stieng	94	34.8%	98.9%
Others	3	1.1%	100.0%
EDUCATION			
None	19	7.0%	7.0%
Grade 1-5	108	40.0%	47.0%
Grade 6-9	109	40.4%	87.4%
Grade 10-12	32	11.9%	99.3%
College	2	0.7%	100.0%
MARITAL STATUS			
Single	5	1.9%	1.9%
Married	253	93.7%	95.6%
Divorced	2	0.7%	96.3%
Widowed	10	3.7%	100.0%
HOUSEHOLD INCOME (VND)			
Less than 5 M VND	25	9.3%	9.3%
5-10 M VND	57	21.1%	30.4%
10-20 M VND	68	25.2%	55.6%
More than 20 M VND	120	44.4%	100.0%

1% Hoa, 35% Stieng, and 1% others. Ninety four percent of the respondents were married, 2% were single, only two cases (account for 1%) were divorced or separated, and 3% were widowed. In general, divorce is still very rare in the study site, and in other rural areas of Vietnam.

Finally, respondents were asked about their annual household income. Income is presented in Vietnamese Dong (VND), which has the following exchange rate: US$1=16,000VND. Nine percent of households reported income of less than five million VND, 21% reported income between 5 to 10 million VND, and 25% had income between 10 to 20 million VND. Forty five percent reported incomes of 20 million VND or more.

Respondent Awareness of Group's Existence in Community

Respondents were initially asked if they were aware of any community groups, organizations, or associations (Figure 5-1). Most reported that they were aware of the Farmer's Union (95%), Women's Union (89%), Veteran Association (88%), Youth Union (78%), and the Red Cross Society (76%). These numbers closely match data collected from the semi-structured interviews with key informants during preliminary data analysis. The Farmer's Union is considered to be the most active in conducting extension activities, which is likely the reason for the extremely high level of awareness exhibited by this organization. Both the Women's Union and the Veteran Association were also mentioned as active in helping their members; again the high level of awareness of the organization reflects this observation.

Community Groups/Social Organization Membership

The next few questions continued this line of inquiry by asking respondents if they belong to any community groups/organizations, or clubs. Figure 5-2 shows that a wide majority of respondents (83%) reported belonging to at least one group/organization. This indicates that a very large proportion of the households living near the CTNP are at least somewhat engaged in their local community.
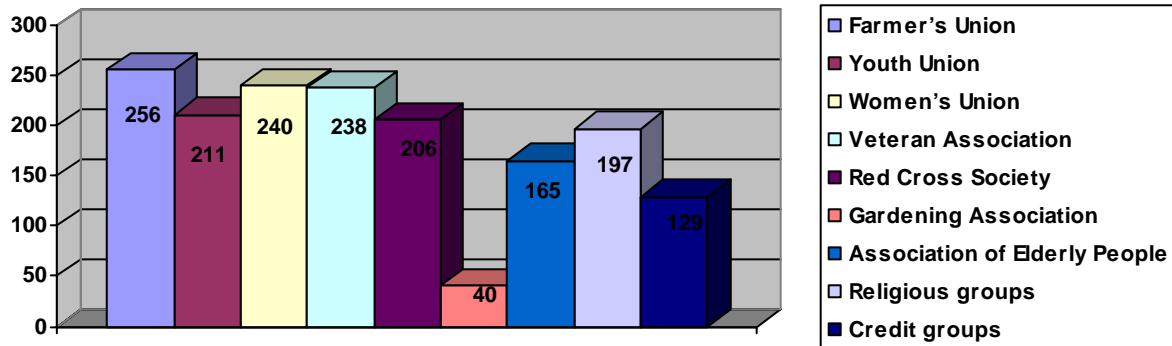
Figure 5-1. Respondents' awareness of local groups and organizations
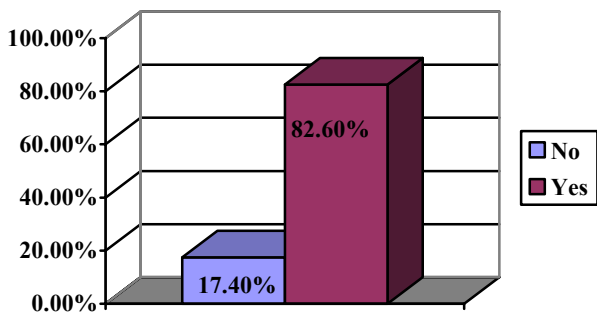
Figure 5-2. Relative frequency of respondents' affiliation to local groups and organizations

To the extent that membership in local groups/organizations reflects engagement in the local community, the association made above is confirmed by Figure 5-3. More than 65% of respondents stated that they belong to 2 or more groups. The breakdown is as follows: 14% reported belonging to only one group, 32% belonged to two groups, 17% reported belonging to three groups, 14% reported belonging to four groups, and 6% reported that they belong to more than five groups. Seventeen percent (17%) of the respondents reported not belonging to any group at all.
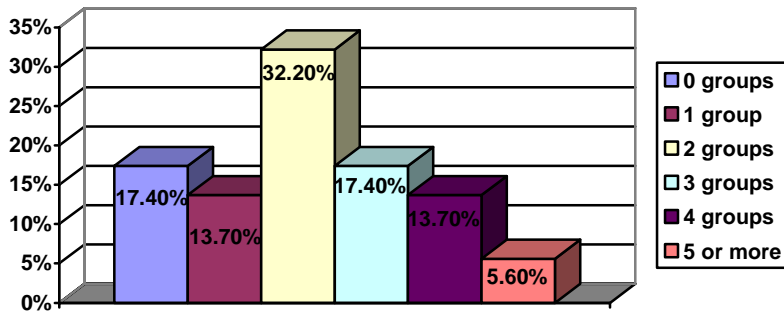
Figure 5-3. Percentage of respondents belonged to number of groups/associations (n=273).

Respondents were then asked to specifically identify the groups to which they belong. The same list of organizations listed in Table 5-1 was provided to each respondent. Not surprisingly, the Farmer's Union had the highest number of members; this was followed by the Red Cross Association, Religious groups, and the Veteran Association. The Women's Union is very active: 25 of the 30 female respondents were found to be associated with this organization.
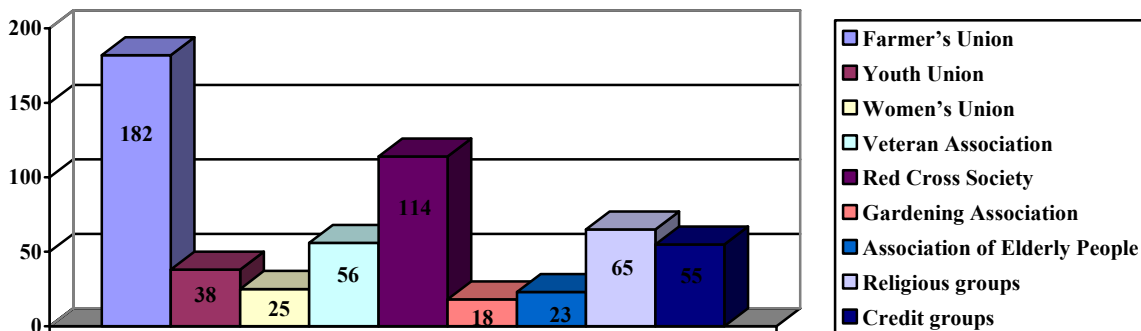
Figure 5-4. Number of members of each group/organization

Involvement in Community Activities

To assess the level of involvement in community and local level activities, a series of questions were asked that inquired about the regularity with which respondents participated in activities in the past year. These data are presented in Table 5-2. Included were participation in community events like village festivities (e.g., harvesting, officiating sacrifices) (54% respondents reported never participating), clubs/groups activities (e.g., picnic, outing) (83%

never participated), sports (e.g. soccer, volleyball) (68% never participated), village meetings to solve problems inside and outside the village (only 4% never participated), training (e.g., extension, conservation) (36% never participated), and work project (e.g., tree planting on Lunar New Year, clean up village) (17% never participated).

Table 5-2. Frequency of participation in community events and other groups or activities (n=270)

Types of Activities	Never	Once/ year	Few times/ Year	Once/ Month	Few times/ Month
Community events	145	39	63	12	11
Clubs/groups activities	225	28	5	11	1
Sports	185	30	42	12	1
Meetings	10	14	166	63	17
Trainings	96	75	70	25	4
Work projects	45	93	99	30	3

In the previous section, the data suggests that many households are engaged in the local community based on their membership in various groups. However, the data on *actual participation* in these groups indicates that this is not the case. In rural Vietnam, people are encouraged to join mass organizations such as Farmer's Union, Youth Union, Women's Union, Veteran Associations, etc. To some extent, these organizations can help their members to access to information and financial resources. However, to what extent that the membership of these organizations can help each individual household can be an issue that needs further investigation. Given the fact that there is no other "real" civil society organization, the existence of these associations still plays a crucial role in mediating between local people and government.

Overall, the above descriptive statistics have shown that households are very diverse in terms of age, gender, ethnicity, education, and income. Their participation in community activities and organizations are not homogeneous either. These observations would be useful to understand the variations in conservation attitude and behavior among households. Furthermore,

these results help decision makers and project managers develop target specific programs or policies in the Cat Tien National Park.

In Vietnam, people are encouraged to join mass organizations which are under the leadership of the Communist Party such as Farmer's Union, Youth Union, Women's Union, Veteran Associations, etc. Even though these organizations are considered as the "extended hands" of the local government to implement their policies, it is found in the study sites that at the grass-root level, these organizations were working very effectively in organizing and facilitating development activities. For instance, with the funding from the Forest Protection and Rural Development (FPRD) Project, the Farmers' Union in the three study communes has successfully organized many extension trainings for its members while the Women's Union helped its members in organizing micro-credit projects.

Given the Vietnamese socio-political context, it is suggested that conservation programs should use these organizations as local partners to implement the activities. Moreover, through the participation in these projects, these organizations can be strengthened themselves, thereby attracting more people to join. Such institutional strengthening, in turn, will bring about voluntary cooperation for collective action.

Identifying Dimensions of Social Capital and Conservation Attitude

Following the descriptive analysis of the socio-demographic data, a series of factor analyses were employed in the evaluation of the data collected and construction of several variable indices. Specifically, factor analysis was used to determine the various dimensions[3] of social capital and conservation attitude. These dimensions were then analyzed in order to augment the analysis of the socio-economic data described in the previous section.

Data gathered through this survey were factor analyzed using principal axis factoring and rotation models. The criteria established in advance of the selection of factor items were factor loading of 0.40 or higher; at least 0.10 difference between the item's loading with its factors and each of the other factors, and interpretability (Kim and Mueller, 1978). Review of factors with eigenvalues of greater than 1.0, and subsequent analysis of scree test plots, indicated that either a one (or at best a two) factor solution would be most appropriate since the scree test had distinct and obvious breaks at these points (Kim and Mueller, 1978).

Social Capital Dimensions

The exploratory factor analysis identified eight factors, which accounted for 61.85% of the total variance. Thirty one of the thirty two items used to measure social capital loaded on one of the eight factors[4] (Table 5-3). Items loading highest on the first factor were related to social trust. These eight items yielded a reliability coefficient (i.e. Cronbach alpha) of 0.86. Trust is an important dimension of social capital and this factor accounted for the most variance in the social capital items. For the study respondents, the mean value of Trust Index[5] was 3.88 (Table 5-4).

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[3] Factor names were scrutinized and developed through a focus group discussion among graduate students from different academic disciplines.

[4] Following the recommendation of Hair, Anderson, Tatham, & Black (2004), items with a factor loading of .40 or greater were kept.

[5] Trust and other social capital indices were measured on a scale of 1 to 5.

The second factor was dominated by items related to social cohesion. These four items show strong factor loadings, and including all four items also produced a strong scale reliability (alpha = 0.73). Social cohesion is one of the most important components of social capital. The mean of social cohesion score was 3.92.

Items loading on the third factor were related to social commitment. Although the item "people are willing to make the community a better place to live" loaded moderately on this factor (0.455), the inclusion of all four of these items in this factor produced the strongest scale reliability (0.77) and seemed to make the most sense conceptually.

The strongest loading for the fourth factor were for the following items, "People in this community show support for a cause that may not directly benefit them but benefits the community as a whole", "Some of my neighbors attend several community functions", "For the most part, people in the community obey community codes and covenants", "People in this community offer enough chances for a person to do volunteer work". These four items yielded a reliability coefficient of 0.71 and are clearly focused on the construct of community support.

The fifth factor was dominated by items related to voluntary cooperation. Three items clearly show strong factor loadings and produced a reliability coefficient of 0.64. The mean of voluntary cooperation index was highest as shown by a mean value of 4.02.

The sixth factor was related to familiarity. These three items loaded only moderately on this factor and produced the lowest scale reliability of 0.58 (as compared to other factors), but this factor shown the highest score with a mean value of 4.02.

Three items loading highest on the seventh factor were related to social integration. These three items produced a reliability coefficient of 0.65 with a mean of 3.41.

Table 5-3. Factor loadings of social capital dimensions

Items*	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8
Most people in this community can be trusted	.757							
I think people in this community can be trusted	.711							
I can count on my neighbor for help any time	.659							
Most people in my community do voluntary work for community	.606							
Most people in this community are involved in activities that benefit the community	.531							
People in this community are easy to contact	.527							
People in this community work together to solve problems	.500							
Usually people in this community greet one another	.407							
People in the community share common interests		.674						
For the most part, people in this community are friendly		.654						
Most people in the neighborhood are connected through the association		.558						
People in this community do get involved in community activities		.484						
I trust my association to make decision on my behalf			.744					
Most people in this village are willing to help each other whenever they can			.734					
Most people in this village are concerned about their own welfare			.708					
For the most part, people are willing to make the community a better place to live			.455					
People in this community show support for a cause that may not directly benefit them but benefits the community as a whole				.738				
Some of my neighbors attend several community functions				.695				
For the most part, people in the community obey community codes and covenants				.569				
People in this community offers enough chance for a person to do volunteer work				.456				
I always greet my neighbors when I first see them					.706			
I volunteer in my community					.657			
This community is a safe place for children					.620			
I know most people in my village						.639		
People in this village have mutual respect for one another						.532		
People in this community get along with each other						.434		
I know some people in this community, most are strangers							.762	
Most people in this do not feel they are a part of this community							.759	
Very few people socialize in the community							.748	
My actions have impacts making this community a better place to live in								.849
The community is a mix of different cultural ethnic groups								.762
Number of items	8	4	4	4	3	3	3	2
Eigenvalue	9.60	1.99	1.74	1.57	1.45	1.25	1.16	1.05
Percentage of variance explained	29.99	6.21	5.42	4.90	4.53	3.91	3.61	3.28
Cumulative variance explained	29.99	36.20	41.62	46.52	51.05	54.96	58.58	61.85
Cronbach Alpha	.86	.73	.77	.71	.64	.58	.65	.71

* Variables coded on 5-point scale with 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree

Table 5-4. Reliability Analysis for social capital dimensions

Dimensions	Questionnaire Items	Mean	SD	Corrected Item Total Correlation	Alpha If Item Deleted
Trust	Most people in this community can be trusted	3.86	.67	.60	.85
	I think people in this community can be trusted	3.85	.66	.64	.85
	I can count on my neighbor for help any time	3.92	.69	.57	.85
	Most people in my community do voluntary work for community	3.84	.65	.62	.85
	Most people in this community are involved in activities that benefit the community	3.84	.68	.68	.84
	People in this community are easy to contact	3.90	.59	.58	.85
	People in this community work together to solve problems	3.83	.62	.63	.85
	Usually people in this community greet one another	3.97	.61	.59	.85
	Overall Index Standardized Item Alpha = 0.86	*3.88*	*0.65*		
Cohesion	People in the community share common interests	3.91	.60	.60	.62
	For the most part, people in this community are friendly	3.97	.57	.48	.69
	Most people in the neighborhood are connected through the association	3.83	.65	.54	.66
	People in this community do get involved in community activities	3.95	.51	.47	.70
	Overall Index Standardized Item Alpha = 0.73	*3.92*	*0.58*		
Social commitment	I trust my association to make decision on my behalf	3.81	.71	.64	.68
	Most people in this village are willing to help each other whenever they can	3.90	.70	.70	.64
	Most people in this village are concerned about their own welfare	3.90	.65	.56	.72
	For the most part, people are willing to make the community a better place to live	4.02	.56	.40	.79
	Overall Index Standardized Item Alpha = 0.77	*3.91*	*0.66*		
Community support	People in this community offers enough chance for a person to do volunteer work	3.88	.66	.52	.63
	People in this community show support for a cause that may not directly benefit them but benefits the community as a whole	3.78	.61	.49	.65
	Some of my neighbors attend several community functions	3.90	.50	.49	.66
	For the most part, people in the community obey community codes and covenants	3.98	.54	.50	.64
	Overall Index Standardized Item Alpha = 0.71	*3.89*	*0.58*		
Voluntary cooperation	Usually people in this community greet one another	4.11	.56	.51	.45
	I volunteer in my community	3.97	.56	.46	.52
	This community is a safe place for children	3.98	.61	.37	.64
	Overall Index Standardized Item Alpha = 0.64	*4.02*	*0.58*		
Familiarity	People in this community get along with each other	4.02	.53	.40	.40
	I know most people in my village	4.04	.81	.32	.57
	People in this village have mutual respect for one another	4.00	.57	.40	.39
	Overall Index Standardized Item Alpha = 0.58	*4.02*	*0.64*		
Social integratione	I know some people in this community, most are strangers	3.49	1.09	.49	.52
	Most people in this do not feel they are a part of this community	3.22	1.10	.47	.55
	Very few people socialize in the community	3.52	1.03	.44	.59
	Overall Index Standardized Item Alpha = 0.65	*3.41*	*1.07*		
Interaction	My actions have impacts making this community a better place to live in	3.87	.62	.55	-
	The community is a mix of different cultural ethnic groups	4.00	.48	.55	-
	Overall Index Standardized Item Alpha = 0.71	*3.94*	*0.55*		

* Variables coded on 5-point scale with 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree

The final factor was dominated by two items expressing ethnic interaction. These two items loaded very high on this factor (0.85 and 0.76). These two items also showed high reliability (0.71) with a mean of 3.94.

In sum, items loaded cleanly into the eight factors representing important constructs underlying social capital. In addition, the mean scores are rather high with 7 of 8 social capital dimensions having a value greater than 3.50.

Conservation Attitude Dimensions

The factor analysis of the conservation attitude items generated four factors explaining 57.8% of the total variance (Table 5-5). Items loading highest on the first factor were related to perceived benefit from conservation. These five items generated a reliability coefficient of 0.88. This factor accounted for the most variance in the attitude items with a mean value of 3.68.

The second factor was dominated by the items related to conservation awareness. All five items showed strong loadings and produced a strong scale reliability (alpha=0.84) (Table 5-6). Conservation awareness has the highest mean value of 4.20.

Items loadings for the third factor were related to perceived benefit of using the park. These items yielded a reliability coefficient of 0.71. The mean value was 2.32.

The final factor was dominated by two items related to perceived ownership of forest land. These two items loaded nicely on this factor and yielded a reliability coefficient of 0.65. The mean value was only 3.68.

In sum, most of the attitude items loaded cleanly into four factors. The factors that were identified seemed to make most sense conceptually. Particularly, the third factor – perceived benefit of using the park—shows a lowest mean value of 2.32.

Table 5-5. Factor loadings of conservation attitude dimensions

Items*	Factor 1	Factor 2	Factor 3	Factor 4
Farmers can benefit from forest replanting in the bufferzone	.855			
I can get more income from the forest protection and management activities	.843			
I have benefited from the conservation program	.836			
Farmers can get more income because of forest protection and management activities	.797			
Farmers have benefited from the conservation program	.665			
The national park should be protected for the benefit of our future generation		.806		
The park is our country pride and is essential for a healthy environment		.778		
Although we need more land for agriculture, it is necessary to set aside some land for the protection of plants and animals		.768		
It is important to keep the park for the survival of various plants and animal species		.766		
The illegal cutting of trees, wildlife trapping and hunting should be discouraged		.725		
It is good if some land within the park is allocated to the local people			.750	
The park is for those who enjoy wildlife viewing and we do not enjoy this, as we have to face problems from the park			.680	
Since the wildlife of the park are causing us trouble, wildlife hunting should be allowed under strict supervision			.659	
The park is for outsiders and we are not even allowed to visit the park			.621	
Conservation has taken land thus farmers do not have enough land to cultivate			.616	
Since the park is a waste of land, it is better to distribute the land among local people			.577	
Forest land allocation (FLA) ensures farmers ownership of the forestland				.772
Forest land allocation ensures my ownership over the forest land				.769
Number of Items	**5**	**5**	**6**	**2**
Eigenvalue	**4.44**	**2.77**	**2.38**	**1.38**
Percentage of variance explained	**23.39**	**14.61**	**12.54**	**7.27**
Cumulative variance explained	**23.39**	**38.00**	**50.54**	**57.81**
Cronbach Alpha	**.88**	**.84**	**.72**	**.65**

Table 5-6. Reliability analysis for conservation attitude dimensions

Questionnaire Items	Mean	SD	Corrected Item Total Correlation	Alpha If Item Deleted
Perceived Benefit from Conservation				
Farmers can benefit from forest replanting in the bufferzone	3.66	.84	.77	.84
I can get more income from the forest protection and management activities	3.60	.85	.75	.84
I have benefited from the conservation program	3.65	.88	.70	.85
Farmers can get more income because of forest protection and management activities	3.74	.78	.73	.85
Farmers have benefited from the conservation program	3.73	.76	.61	.87
Overall Index Standardized Item Alpha =.88	*3.68*	*0.82*		
Conservation awareness				
The national park should be protected for the benefit of our future generation	4.35	.60	.70	.79
The park is our country pride and is essential for a healthy environment	4.26	.59	.67	.79
Although we need more land for agriculture, it is necessary to set aside some land for the protection of plants and animals	4.13	.60	.66	.80
It is important to keep the park for the survival of various plants and animal species	4.11	.74	.63	.81
The illegal cutting of trees, wildlife trapping and hunting should be discouraged	4.17	.65	.55	.83
Overall Index Standardized Item Alpha =.84	*4.20*	*0.64*		
Perceived benefit from using the park				
It is good if some land within the park is allocated to the local people	2.20	.93	.55	.66
The park is for those who enjoy wildlife viewing and we do not enjoy this, as we have to face problems from the park	2.47	.91	.56	.65
Since the wildlife of the park are causing us trouble, wildlife hunting should be allowed under strict supervision	2.29	.92	.44	.69
The park is for outsiders and we are not even allowed to visit the park	2.52	.93	.46	.68
Conservation has taken land thus farmers do not have enough land to cultivate	2.17	.90	.42	.69
Since the park is a waste of land, it is better to distribute the land among local people	2.28	1.49	.40	.73
Overall Index Standardized Item Alpha =.74	*2.32*	*1.01*		
Perceived land ownership				
Forest land allocation (FLA) ensures farmers ownership of the forestland	3.61	.78	.48	.
Forest land allocation ensures my ownership over the forest land	3.75	.73	.48	.
Overall Index Standardized Item Alpha =.65	*3.68*	*0.76*		

* Variables coded on 5-point scale with 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree

Analysis of Social Capital Dimensions

To explore the relationship between some of the social capital dimensions and selected variables[6], data were recoded and collapsed into new categories for ANOVA and regression analyses (Table 5-7). The sample respondents were categorized into three ethnic groups as follows: 28% of the respondents were Kinh, 37% were Tay-Nung-Hoa, and 35% were Stieng. In terms of religion, 25% identified themselves as Buddhists, 20% as Christian and 55% indicated that they had no religion,

Table 5-7. Socioeconomic profile of respondents (n=270)

Variables	Frequencies	Percentage
Ethnic groups		
Kinh	74	27.7%
Tay Nung Hoa	99	37.1%
Stieng	94	35.2%
Religion		
No religion	147	54.9%
Buddhism	67	25.0%
Christian	54	20.1%
Length of Residency		
Less than 10 years	51	18.9%
10-20 years	114	42.2%
More than 20 years	105	38.9%
Education		
Under grade 5	127	47.4%
Grade 5-12	141	52.6%
Income		
Less than 10M VND	82	30.5%
10M – 20M VND	68	25.2%
More than 20 M VND	120	44.4%
Age		
18-29 yrs old	39	14.4%
30-39	93	34.4%
40-49	90	33.3%
50 and over	48	17.8%

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[6] ANOVA analysis focused on only six socio-demographic variables because it was thought that these variables would significantly affect social capital and conservation attitude indices.

Approximately 19% of the respondents indicated they had lived in the area less than 10 years, 42% had lived 10-20 years, and 39% had been in the area more than 20 years. About 47% reported that they never finished grade 5, while 53% reported that they had finished grade 5 or higher. About 31% indicated that their income was less than 10 million Vietnamese Dong (VND), 25% with income from 10 to 20 million VND, and 44% with income more than 20 million VND. About 15% were about 18-29 years old, 34% were 30-39 years old, 33% were 40-49 years old, and 18% were 50 years old or greater.

To explore the relationship between social capital dimensions and selected explanatory variables, the ANOVA technique was used to test whether or not social capital indices differed between groups of respondents.

Ethnic Groups

For the ethnic groups (Kinh, Tay-Nung-Hoa, Stieng), four of eight social capital constructs showed significant differences at the $\alpha = .05$ level (Table 5-8). Social trust, voluntary cooperation, familiarity and ethnic interaction did not differ significantly across these ethnic groups. Based on the mean values (a higher value indicates more social capital index), there is higher cohesion among Tay-Nung-Hoa ethnic group (mean = 4.02) than either the Kinh (mean = 3.84) or the Stieng (mean = 3.86). The Tay-Nung-Hoa group also had a higher social commitment index (mean = 4.12) than both the Kinh (mean = 3.83) and Stieng (3.76). The Tay-Nung-Hoa group showed a stronger community support (mean = 4.00) than Stieng ethnic group (mean = 3.76). The Kinh group was more socially integrated (mean = 3.72) than Tay-Nung-Hoa (mean = 3.23) or the Stieng (mean = 3.36) ethnic groups.

These results are supported by the fact that Tay-Nung-Hoa groups who originated from mountainous Northern provinces have been known to have very high community spirits. When

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they moved to the new place, the whole village moved together which created a higher level of population pressure for the buffer zone and the park itself.

Table 5-8. Comparison of social capital components among different ethnic groups

| Index* | Ethnicity groups | | | |
	Kinh	Tay Nung Hoa	Stieng	F value
Cohesion Index	3.84^a	4.02^b	3.86^a	4.57^{**}
Social commitment Index	3.83^a	4.12^b	3.76^a	14.71^{***}
Support Index	3.90^{ab}	4.00^b	3.76^a	7.71^{***}
Social integration Index	3.72^b	3.23^a	3.36^a	8.07^{***}

* Only indices showing significant differences are shown. Values shown are mean importance scores. Values with different superscripts are significantly different at the .05 level based on Scheffe's post hoc test.
**Significance at .01 level (2-tail significance)
***Significance at .001 level (2-tail significance)

Religious Groups

Religion was the next independent variable examined; respondents were categorized as "no religion", Buddhism, or Christian. Based on ANOVA analysis, only two of the social capital constructs differed significantly among religions (Table 5-9).

Table 5-9. Comparison of social capital components among religions groups

| Index* | Religions | | | |
	No religion	Buddhism	Christian	F value
Social commitment Index	4.04^b	3.72^a	3.81^a	11.47^{***}
Support Index	3.94^b	3.86^{ab}	3.76^a	3.71^*

* Only indices showing significant differences are shown. Values shown are mean importance scores. Values with different superscripts are significantly different at the .05 level based on Scheffe's post hoc test.
**Significance at .01 level (2-tail significance)
***Significance at .001 level (2-tail significance)

The first dimension was social commitment. Those respondents who considered themselves as having no religion had a higher social commitment index value (mean = 4.04) than either Buddhism or Christian followers. They also showed higher community support (mean = 3.94) than Christians (mean = 3.76). These results might be conflicting with Emile Durkheim (1965) conviction about religion can provide a certain degree of social commitment. Note, however, that in Vietnam people often report "no religion" when asked, although most of them

are influenced by Confucianism—a religion that believes humans should live in harmony with their surroundings.

Length of Residency

The next independent variable, length of residency, was operationalized as "How long have you been settled in this area?" ANOVA results indicated that two out of eight social capital constructs showed significant differences (Table 5-10). The social commitment index was higher in respondents who were settled in the area less than 20 years, compared to those who had lived there for a longer period of time. The new settlers also showed stronger community support than the residents who have lived there longer. These results may be explained by the fact that those households who are newly migrated to the area have to help and support each others to start their new lives in the forest frontier. They have to be united to struggle for their existence.

Table 5-10. Comparison of social capital components between length of residency

	Length of Residency			
Index*	Less 10 yrs	10-20 yrs	More than 20 yrs	F value
Social commitment Index	3.97^b	4.01^b	3.77^a	7.38^{***}
Support Index	3.99^b	3.92^{ab}	3.79^a	4.55^*

* Only indices showing significant differences are shown. Values shown are mean importance scores. Values with different superscripts are significantly different at the .05 level based on Scheffe's post hoc test.
**Significance at .01 level (2-tail significance)
***Significance at .001 level (2-tail significance)

Education

For levels of education, only two out of eight social capital indices show statistically significant differences (Table 5-11). The first dimension is social commitment index. Those respondents with higher education (grade 5 – 12) had a higher social commitment index value (mean = 3.99) than those with lower education (under grade 5) (mean = 3.83). The second dimension of community support also showed statistically significant differences. Based on the mean values, households with higher education (mean = 3.95) had higher community support index than those households with lower education (mean = 3.82). This result is consistent with

the finding of Helliwell and Putnam (1999) that education is the most important predictor of political and social engagement.

Table 5-11. Comparison of social capital components between levels of education

Index*	Education		
	Under grade 5	Grade 5-12	F value
Social commitment Index	3.83	3.99	6.69***
Support Index	3.82	3.95	6.16**

* Only indices showing significant differences are shown. Values shown are mean scores.
**Significance at .01 level (2-tail significance)
***Significance at .001 level (2-tail significance)

Household Income

For the household income variable, only one social capital construct showed a statistically significant difference (Table 5-12). Based on the mean values, households with annual income more than 20 million VND (mean = 3.56) were more integrated into community than households with annual income 10 – 20 million VND (mean = 3.35). However, there was no statistically significant difference in social integration index between households with annual income more than 20 millions and households with annual income less than 10 million VND (mean = 3.33). There is the fact that people with higher income are more socially integrated than those with lower income. This result is not very clear whether or not income is contributing to the level of social integration of respondents.

Table 5-12. Comparison of social capital components between incomes

Index*	Incomes			
	Less than 10M VND	10-20M VND	More than 20M VND	F value
Social integration	3.33[ab]	3.25[a]	3.56[b]	3.65[*]

* Only index showing significant differences is shown. Values shown are mean importance scores. Values with different superscripts are significantly different at the .05 level based on Scheffe's post hoc test.
**Significance at .01 level (2-tail significance)
***Significance at .001 level (2-tail significance)

Age

Age was the last control variable examined. Based on ANOVA, six out of eight social capital constructs differed significantly (Table 5-13).

The first significance dimension was trust index. Respondents who were 30 years old or over (mean = 3.90) had higher trust index scores than those who were 18 to 29 years old (mean = 3.64). The same results were found for the cohesion index and social commitment index. For the familiarity index and voluntary cooperation index, those respondents between 30 to 49 years old had higher values than respondents between 18 to 29 years old. For the social integration dimension, 18 to 29 year-old respondents were less socially integrated than those respondents over 50 years old. These results are - in part – consistent with Cramb's findings in Southern Philippines that social capital rises then falls with age (peaking of 50-59 years) (Cramb, 2004).

Table 5-13. Comparison of social capital components between ages

| Index* | Ages | | | | |
	18-29 yrs	30-39 yrs	40-49 yrs	Over 50yrs	F value
Trust Index	3.64^a	3.90^b	3.90^b	3.98^b	4.40^{**}
Cohesion Index	3.72^a	3.95^b	3.95^b	3.95^b	3.24^{**}
Social commitment Index	3.60^a	3.97^b	3.94^b	3.97^b	5.99^{***}
Familiarity	3.82^a	4.07^b	4.06^b	4.03^{ab}	3.00^{**}
Voluntary cooperation	3.82^a	4.07^b	4.06^b	4.03^{ab}	3.00^{**}
Social integration	3.27^a	3.35^{ab}	3.36^{ab}	3.74^b	3.34^{**}

* Only index showing significant differences are shown. Values shown are mean importance scores. Values with different superscripts are significantly different at the .05 level based on Scheffe's post hoc test.
**Significance at .01 level (2-tail significance)
***Significance at .001 level (2-tail significance)

Analysis of Conservation Attitude

To explore the relationship between some of the conservation attitude dimensions and selected variables, data were recoded and collapsed into new categories (Table 5-7). The ANOVA techniques were used to test whether conservation indices vary across groups of respondents. Unlike in the previous section, none of the conservation attitude constructs differed significantly for the age variable. Therefore, this variable is not discussed in this section.

Ethnic Groups

For "ethnic groups", two out of the four conservation constructs showed significant differences (Table 5-14). Based on the mean value (a higher value indicate higher or positive

conservation attitude), Kinh (mean = 4.24) and Tay-Nung-Hoa (mean = 4.40) groups have higher

conservation awareness as compared to Stieng (mean = 3.95). For the construct of "perceived

benefit from using the park", Stieng (mean = 2.46) and Tay Nung Hoa (mean = 2.40) perceived a

higher economic benefit from using the national park then the Kinh (mean = 2.05). This is most

likely because the ethnic minorities such as Stieng, Tay, Nung, Hoa have traditionally used

forests as their main livelihood strategies unlike the Kinh who used to live in the lowland.

Perceived benefit from conservation and perceived ownership of forest land did not differ across

ethnic groups.

Table 5-14. Comparison of conservation attitude among different ethnic groups

| Index* | Ethnicity groups | | | |
	Kinh	Tay Nung Hoa	Stieng	F value
Awareness Index	4.24[b]	4.40[b]	3.95[a]	23.83***
Perceived Benefit from using the park Index	2.05[b]	2.40[a]	2.46[a]	8.79***

* Only indices showing significant differences are shown. Values shown are mean importance scores. Values with different superscripts are significantly different at the .05 level based on Scheffe's post hoc test.
**Significance at .01 level (2-tail significance)
***Significance at .001 level (2-tail significance)

Religion

Religion, the next independent variable, was examined. When the ANOVA techniques

were applied, only one out of eight social capital indices differed significantly (Table 5-15).

Conservation awareness index was higher in respondents who considered themselves as having

"no religion" (mean = 4.35) than someone who belonged to Christian (3.93) or Buddhism (4.09).

Interestingly, even though reported as "belong to no religion" most people in Vietnam are

influenced by Confucianism where rites for the ancestors are important ceremonies.

Table 5-15. Comparison of conservation attitude between different religions

| Index* | Religions | | | |
	Christian	Buddhism	No religion	F value
Awareness Index	3.93[a]	4.09[a]	4.35[b]	18.55***

* Only index showing significant differences are shown. Values shown are mean importance scores. Values with different superscripts are significantly different at the .05 level based on Scheffe's post hoc test.
**Significance at .01 level (2-tail significance)
***Significance at .001 level (2-tail significance)

Most Vietnamese homes have an alter dedicated to the family ancestors, decorated with candlesticks, incense bowls, flower trays and the tablet containing the names of ancestors who have died in the past five generations. Confucianism believes that humans should live in harmony with their surroundings.

Length of Residency

Length of residency was the next independent variable examined. Based on ANOVA, only one out of the four conservation attitude constructs, conservation awareness, differed significantly (Table 5-16). Those respondents who lived in the area more than 20 years (mean = 4.00) had lower conservation awareness index as compared to those who live less than 10 years (4.38) or 10 to 20 years (4.31). This may be because household heads of newly immigrated households are young and they have been benefiting from training on conservation.

Table 5-16. Comparison of conservation attitude between length of residency

| Index* | Length of Residency | | | |
	Less 10 yrs	10-20 yrs	More 20 yrs	F value
Awareness Index	4.38[b]	4.31[b]	4.00[a]	16.846***

* Only indices showing significant differences are shown. Values shown are mean importance scores. Values with different superscripts are significantly different at the .05 level based on Scheffe's post hoc test.
**Significance at .01 level (2-tail significance)
***Significance at .001 level (2-tail significance)

Education

The next variable examined was level of education. Two out of four conservation attitude indices shown significant difference at the $\alpha = 0.05$ level (Table 5-17). The first dimension was conservation awareness. Based on the mean values, those households with higher education level (mean = 4.35) had a higher conservation awareness index than those with lower education level (mean = 4.04). The second dimension was perceived ownership of forest land. Households with higher education had a higher perceived ownership index (mean = 3.76) than those with lower education (mean = 3.59). These results have been support by Infield (1988) that a better

education results in a more positive attitudes and that literacy and perceived rights to collect

forest products (Heinen, 1993).

Table 5-17. Comparison of conservation attitude components between levels of education

| Index* | Education | | |
	Under grade 5	Grade 5-12	F value
Conservation Awareness	4.04	4.35	29.09***
Perceived Ownership	3.59	3.76	4.34**

* Only indices showing significant differences are shown. Values shown are mean scores.
**Significance at .01 level (2-tail significance)
***Significance at .001 level (2-tail significance)

Household Income

Income was the next independent variable to be examined. Based on ANOVA, respondents

reporting income less than 10 million VND a year express higher conservation awareness as

compared to those whose income 10 to 20 million or more than 20 million a year. (Table 5-18).

Table 5-18. Comparison of conservation attitude between different incomes

| Index* | Incomes (VND) | | | |
	Less 10M	10-20M	More 20M	F value
Awareness Index	4.40^b	4.13^a	4.11^a	9.97***

* Only indices showing significant differences are shown. Values shown are mean importance scores. Values with different superscripts are significantly different at the .05 level based on Scheffe's post hoc test.
**Significance at .01 level (2-tail significance)
***Significance at .001 level (2-tail significance)

This is difficult to explain because it is often thought that income will positively affect household

conservation attitude. In this case, there have been some education programs targeting poor

households in the areas, about the value of conservation. This might contribute to raising the

conservation attitude of these households.

Linear Regression Modeling

As mentioned previously, this study utilizes a series of regression models to assess the

effects of each predictor on various conservation attitude variables (measured as continuous

variables). Five dependent variables (**perceived benefit from conservation**, **conservation**

awareness, perceived benefit from using the park, and **perceived ownership of forestland**)

represent different dimensions of conservation attitude and an **overall (aggregated)**

conservation attitude index. These conservation attitude variables were derived from the factor analysis described previously and were calculated as indices. The socio-demographic variables (age, gender, length of resident, level of education, household size, income, ethnicity, religion, marital status) and social capital variable as an index and its individual components (social trust, social cohesion, social commitment, community support, voluntary cooperation, familiarity, social integration, and ethnic interaction) are used as independent variables in the multiple linear regression models.

Five multiple linear regression models were developed for conservation attitude variables. The first model (Model I) was developed for the perceived benefit from conservation. The second model (Model II) focused on the conservation awareness. The third model (Model III) was used to predict the perceived benefit from using the park. The fourth model (Model IV) focused on the perceived ownership. Finally a fifth model (Model V) was used to predict the overall (aggregated) conservation attitude index. The findings for each model are presented in Table 5-19 and Table 5-20.

Model I is presented in Table 5-19; overall, the variables were found to account for 13% of the variance in the Model I (Adj. R^2=0.131). This model indicates that education level has a positive relationship with the perceived benefit from conservation and is statistically significant at the $\alpha = 0.10$ level. This indicates that as education increases, the perceived benefit from conservation also increases. Household income, however, shows a statistically significant negative relationship at the $\alpha = 0.10$ level. This means that as household income increases, the perceived benefit from conservation decreases. This contradicts the general belief that households with higher income are more likely to hold a favorable attitude toward conservation. The Stieng residents were more likely than other ethnic groups to perceive higher benefits from

conservation, as shown in the positive relationship between Stieng ethnic group and the perceived benefit from conservation (statistically significant at the $\alpha = 0.05$ level).

Four out of eight social capital indices (cohesion, community support, familiarity and social integration) showed positive relationships with the perceived benefit from conservation. First, the cohesion index shows a positive relationship with the perceived benefit from conservation, and is statistically significant at the $\alpha = 0.05$ level. This indicates that residents with a higher cohesion index are more likely to perceive higher benefits from conservation than those with a lower cohesion index. The community support index was also found to be statistically significant at the $\alpha = .10$ level. Residents showing more community support also showed a higher perceived benefit from conservation. Familiarity was found to be very significant at the $\alpha = 0.01$ level. The last social capital index, social integration, has significant positive relationship with the perceived benefit from conservation (at the $\alpha = 0.05$ level).

Model II was developed in order to analyze conservation awareness. Explanatory variables in the Model II were found to account for 23% of the variance in the model (Adj. $R^2 = 0.234$). However, only two explanatory variables regressed on conservation awareness were observed to be statistically significant at the $\alpha = 0.05$ level: household income and ethnic interaction. Household income was found to have a negative relationship with conservation awareness, which indicates that households with higher incomes are more likely to have a negative attitude toward conservation than households with lower incomes. This may be due to the increase of the market price for cashew nut, households that derive income from cashew plantations are likely more interested in having additional land for producing this important cash crop. In addition, the promotion of cashew and other industrial crops by the government is likely influential on the observed relationship between household income and conservation awareness. Another

explanation may be that efforts to raise conservation awareness in the low income groups

(recently made from some conservation and development projects) are affecting this relationship.

Table 5-19. Linear regression models for conservation attitude variables

	Model I Perceived benefit from conservation Standardized Coefficients	Model II Conservation awareness Standardized Coefficients
Socio - demographic variables		
Age	0.082	0.087
Gender (male=1)	0.021	0.094
Length of residence	-0.023	-0.108
Education	0.131*	0.105
Household size	0.062	-0.040
Household income	-0.135*	-0.142**
D_ Stieng (Stieng=1)	0.224**	-0.091
D_ Tay (Tay=1)	-0.026	-0.008
D_ Religion (Yes=1)	-0.081	-0.074
D_ Marital (Yes=1)	0.029	0.004
Social capital variables		
Trust Index	-0.117	-0.028
Cohesion Index	0.178**	0.118
Social commitment Index	-0.063	-0.007
Community support Index	0.136*	0.054
Voluntary cooperation	-0.061	0.103
Familiarity	0.286***	0.077
Social integration	0.142**	0.028
Ethnic Interaction	0.050	0.123**
Intercept	0.531	2.358
Adjusted R^2	0.131	.234
F-value	3.219***	5.478***
Cases	264	264

* Significance at the .10 level   ** Significance at the .05 level   *** Significance at the .01 level

Ethnic interaction was found to have a positive relationship with conservation awareness, statistically significant at 0.05 level. This can be explained by the fact that respondents who are more interactive with individuals from other groups are also more aware of conservation.

Model III was developed for the perceived benefit from using the park. There was only one socio-demographic variable that had a statistically significant positive relationship with the dependent variable. The Tay-Nung-Hoa ethnic group was more likely than the other groups to

perceive higher benefit from using the park. This can be explained by the fact that this group has immigrated from the mountainous Northern provinces as mentioned earlier, and they are known to be skillful hunters.

Three of the social capital indices were found to have a significant relationship with the perceived benefit from using the park. The voluntary cooperation index has a negative relationship with the dependent variable at the $\alpha = 0.05$ level. This indicates that respondents with a higher voluntary cooperation index perceived lower benefit from using the park. However, the familiarity index has a positive relationship with the perceived benefit from using the park, and is statistically significant at the $\alpha = 0.10$ level. The social integration index has a very significant and negative relationship with the perceived benefit from using the park at the $\alpha = 0.01$ level. This indicates that respondents who are more socially integrated perceive lower benefits from using the park. One explanation might be that when people are more integrated into community they tend to recognize the conservation value of the park more than those who just see the obvious benefit from using the park. Overall, this model accounted for approximately 17% of the variance in the model (Adj. $R^2 = 0.165$).

Model IV was developed for the perceived ownership of forestland. Household size is statistically significant and positively related to the dependent variable at the 0.10 level. Two social capital indices (social commitment, community support) were both found to be positively related to the perceived ownership of forestland. The significance of these variables indicates that residents with higher social commitment and community support indices were more likely to perceive higher ownership of forestland. The independent variables accounted for about 5% of the variance in the model (Adj. $R^2=0.051$).

Table 5-20. Linear regression models for conservation attitude variables

	Model III Perceived use benefit of park Standardized Coefficients	Model IV Perceived land ownership Standardized Coefficients	Model V General conservation attitude Standardized Coefficients
Socio - demographic variables			
Age	0.004	0.048	.079
Gender (male=1)	0.004	0.114	.050
Length of residence	0.102	-0.132	-0.139
Education	-0.060	0.090	**0.175****
Household size	0.002	0.128*	0.079
Household income	0.032	-0.125	**-0.186*****
D_Stieng (Stieng=1)	0.074	0.108	0.037
D_Tay (Tay=1)	0.192**	-0.129	**-0.170****
D_Religion (Yes=1)	0.064	-0.081	-0.109
D_Marrital (Yes=1)	0.102	-0.099	-0.066
Overall Social Capital Index			**0.357*****
Trust Index	0.044	-0.148	
Cohesion Index	-0.129	-0.044	
Social commitment Index	0.103	0.147*	
Community support Index	0.027	0.200**	
Voluntary cooperation	-0.142**	-0.025	
Familiarity	0.131*	0.104	
Social integration	-0.301***	0.067	
Ethnic Interaction	-0.050	0.023	
Intercept	2.782	2.215	9.353
Adjusted R^2	0.165	0.051	.203
F-value	3.893***	1.791**	7.117***
Cases	264	264	264

* Significance at the .10 level   ** Significance at the .05 level   *** Significance at the .01 level

In addition to these four models, another multiple linear regression equation was developed using the general (aggregated) conservation attitude index as the dependent variable with the overall social capital index as an independent variable (Model V).

The results show that education has a positive relationship with the overall conservation attitude and is statistically significant at the 0.05 level. This indicates that as this variable increases, the general conservation attitude also increases. This result has been supported with other findings from various countries such as Nepal (Mehta and Heinen 2001) and South Africa (Infield 1988). Similar to the Model I, household income was found to a have negative

relationship with the general conservation attitude, which indicates that households with higher income are more likely to have negative attitude toward conservation than households with lower income. The explanation for this may be the same that gave to the result in Model I, that is, households that derive income from cashew plantations are likely more interested in having additional land for producing this important cash crop.

Tay – Nung – Hoa minority group was more likely than the other groups to have negative conservation attitude. The explanation is that this group has moved into region from the mountainous areas and they have been traditionally relied on hunting for their livelihood. These people, who are known as skillful hunters, may have believed that conservation efforts will limit their hunting activities.

Finally, in this model (Model V) aggregated social capital was found to have positive and very significant relationship (at the 0.01 level) with the overall conservation attitude. This indicates that respondents with higher social capital will have a higher conservation attitude toward the Cat Tien National Park. This was expected and supported by theories that are guiding this study.

Logistic Regression Modeling

The four dependent variables representing participation in conservation activities were measured as binary values: 1 (Yes) and 0 (No). Therefore, logistic regressions were used to model these four variables as well as two composite models. To predict the effects of social capital and conservation attitude variables on the participation of households in conservation activities, six logistic regression models were developed; they are given the prefix "LR" to distinguish them from the linear regression models discussed previously.

Model LR-1 was developed to examine household participation in forest protection training. Model LR-2 used "meeting to discuss conservation agreement" as the dependent

variable. Model LR-3 was used to predict household participation in the agroforestry training program, and the dependent variable for Model LR-4 was the participation in land use planning. Model LR-5 was developed to predict whether or not households participated in at least one of these conservation activities. As in the previous linear regression modeling (and for a more practical policy purpose), an additional logistic regression model (Model LR-6) was developed using overall social capital index and overall conservation attitude index as independent variables. The results for these 6 models are presented in Table 5-21, Table 5-22 and Table 5-23.

Model LR-1 shows a positive and significant relationship between household income and respondent participation in forest protection ($\alpha = 0.05$), suggesting that households with higher incomes are more likely to participate in training on forest protection. For every unit increase in household income, the odds of participation (vs. non participation) increased by a factor of 1.78^{7} ($e^{.575}$). This is explained by the fact that households with higher incomes are less likely affected by the restrictions associated with the CTNP management and are more likely to participate in forest protection activities. The Tay-Nung-Hoa ethnic groups show a very significant positive relationship in term of respondent participation in training on forest protection. Table 5-21 shows that the odds of being participating in forest protection activities are 4.64 times better if the household belongs to the Tay-Nung-Hoa group. This can be explained by the fact that the FPRD has generally paid more attention to this group, encouraging them to participate in forest protection activities. This has subsequently restricted their forest dependent activities such as hunting and clearing forest for crops cultivation.

For the social capital variables, voluntary cooperation was found to be negatively related ($\alpha = 0.05$) to the participation in forest protection training. This indicates that people having a

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[7] The logistic regression coefficient for household income is .575 (see Table 5-21). Therefore, the odds ratio is calculated as $e^{.575}=1.78$.

higher voluntary cooperation index are less likely to participate in training in forest protection than those with a lower index. This implies that for every unit increase in voluntary index, the odds of participation (vs. non participation) decrease by a factor of 0.23.

Familiarity, however, is positive and very significant at the $\alpha = 0.01$ level. This means that the higher familiarity index, the more likely the respondent is to participate in training for forest protection. For every unit increase in familiarity index, the odds of participation (vs. non participation) will increase by a factor of 3.47. Conservation awareness is another variable that was found to be negative and statistically significant at the $\alpha = 0.01$ level. This implies that people having a higher conservation awareness index are less likely to participate in forest protection training than those with a lower index. Further, for every unit increase in the conservation awareness index, the odds of participation (vs. non participation) decreased by 0.35. This contradictory result reflects the fact that many households participate in forest protection training activities with their main motivation being the economic benefit they will get afterward. Recently, the government made a huge financial investment to encourage people to participate in forest protection on a contractual basis. Attracted to this new source of income, many households participated in the program even though they had a low their awareness levels.

Model LR-2 shows a positive and significant relationship between ethnic Tay-Nung-Hoa and "meeting to discuss conservation agreement" at the $\alpha = 0.10$ level. This indicates that the Tay-Nung-Hoa group is more likely to participate in the meeting to discuss conservation agreement than are the other groups. The odds of meeting to discuss about conservation agreement are 2.78 times better if the household belongs to the Tay-Nung-Hoa group.

Table 5-21. Logistic regression analysis of households' participation in conservation activities

	Model LR-1 Participate in training on forest protection		Model LR-2 Meeting discuss conservation agreement	
	b	e^b	b	e^b
Age	.112	1.119	.231	1.260
Gender	1.115	3.049	.763	1.260
Length of Residence	-.076	.927	.301	1.351
Education	.189	1.208	.007	1.007
Household size	.097	1.102	.056	1.058
Household income	**.575****	**1.777**	.076	1.079
D_Stieng (Stieng=1)	.275	1.317	-.842	.431
D_ Tay (Tay=1)	**1.535*****	**4.643**	**1.022***	**2.778**
D_ Religion (Yes=1)	.286	1.331	.593	1.809
D_ Married (Yes=1)	.758	2.135	.407	1.502
Social Trust	.209	1.232	**-2.146*****	**.117**
Social Cohesion	.019	1.019	**1.260****	**3.524**
Social Commitment	.773	2.165	.323	1.381
Community support	-.116	.890	.493	1.637
Voluntary cooperations	**-1.489****	**.226**	.189	1.208
Familiarity	**1.243****	**3.466**	-.209	.811
Social integration	.276	1.318	.237	1.267
Ethnic Interaction	.647	1.909	.007	1.007
Perceived Cons. Benefit	.352	1.421	.222	1.248
Conservation Awareness	**-1.041*****	**.353**	-.464	.629
Perceived Use Benefit	-.146	.864	.086	1.089
Perceived Ownership	.303	1.354	.142	1.153
Intercept	-9.976		-4.417	.012
-2LL	239		268	
Weighted N	265		265	

* Significance at the .10 level   ** Significance at the .05 level   *** Significance at the .01 level

Trust—a major component of social capital—was found to be negative and statistically significant at the $\alpha = 0.01$ level. This is hard to explain in the absence of data on the real behavior of the local households. Information from key informants revealed that households within the community trust each other but do not seem to trust the outsider—in this case – the project personnel.

Cohesion was observed to be statistically positive and significant at the $\alpha = 0.05$ level. For every unit increase in the cohesion index, the odds of attending meeting (vs. non attending)

increased by a factor of 3.52. The cohesion variable was operationalized as someone who shares common interests and was connected through an association. This can help explain the fact that people who are more cohesive are more likely to participate in activity in which they are have a common interest (e.g., discussing conservation agreement).

Model LR-3 (Table 5-22) shows a positive and significant relationship between participation in agroforestry training and Stieng and Tay-Nung-Hoa groups. The odds of participation in agroforestry training are 6.11 times better if the household belongs to the Stieng ethnic, and 3.88 times better if the household belongs to the Tay-Nung-Hoa group. This indicates that both Stieng and Tay-Nung-Hoa groups are more likely than the Kinh group to participate in this training activity.

The familiarity, social integration and interaction indices found a positive and significant relationship at the $\alpha = 0.05$ level. These results are expected because familiarity, social integration and ethnic interaction would help households know more about the benefit of agroforestry techniques can help to improve the production and conserve the environment at the same time. For every unit increase in familiarity index, the odds of participation in agroforestry programs (vs. non participation) is expected to increase by a factor of 3.049 and for every unit increase in social integration index, the odds of participation will increase by a factor of 1.46. Similarly, for every unit increase in ethnic interaction index, the odds of participation (vs. non participation) is likely to increase by a factor of 2.09.

Table 5-22. Logistic regression analysis of households' participation in conservation activities

	Model LR-3 Participate in training on agroforestry		Model LR-4 Participate in land use planning	
	b		B	e^b
Age	-.077	.926	.154	1.166
Gender	.676	1.966	-.506	.603
Length of Residence	-.367	.693	.229	1.257
Education	-.041	.960	.152	1.164
Household size	.212	1.236	-.113	.894
Household income	.241	1.272	**.353***	**1.423**
D_Stieng (Stieng=1)	**1.810*****	**6.109**	.040	1.041
D_ Tay (Tay=1)	**1.356*****	**3.880**	1.125**	3.081
D_ Religion (Yes=1)	.534	1.705	.558	1.748
D_ Married (Yes=1)	1.137	3.118	.994	2.702
Social Trust	.091	1.095	**-1.583*****	**.205**
Social Cohesion	**-.821***	**.440**	**1.429****	**4.176**
Social Commitment	-.425	.654	.212	1.237
Community support	-.154	.858	.216	1.241
Voluntary cooperation	**-.699***	**.497**	-.095	.909
Familiarity	**1.115****	**3.049**	.228	1.256
Social integration	**.378****	**1.459**	.282	1.326
Ethnic Interaction	**.740****	**2.095**	.445	1.560
Perceived Cons. Benefit	.357	1.429	.356	1.428
Conservation Awareness	-.198	.820	-.346	.708
Perceived Use Benefit	-.355	.701	-.093	.911
Perceived Ownership	.339	1.404	.051	1.052
Intercept	-4.835	.008	-8.434	.000
-2LL	360		290	
Weighted N	265		265	

* Significance at the .10 level   ** Significance at the .05 level   *** Significance at the .01 level

Model LR-4 shows a positive relationship between household incomes and participation in land use planning, statistically significant ($\alpha = 0.10$). This is can be explained by the fact that the households with higher incomes are more accessible to land use. Model results also show that the odds of participating in land use planning activities are 3.08 times better if the household belongs to the Tay-Nung-Hoa group. This implies that Tay-Nung-Hoa is more likely than the other ethnic groups to participate in land use planning because this group migrated from the mountainous

Northern provinces, having been driven by scarcity of land in their native place. This helps to explain why they are more interested in land use issues.

Again, like the previous models, trust was found to be negative and statistically significant with respondent participation in land use planning. This reason can be explained in the same manner. People tend to trust each other within the community and not toward the outsiders. Cohesion is another social capital variable found to be positive and statistically significant with participation in land use planning at the $\alpha = 0.05$ level. For every unit increase in cohesion index, the odds of participation (vs. non participation) increases by a factor of 4.18. Social cohesion is an important aspect for households to deal with the important issues in rural society, especially land use and land tenure.

Model LR-5 was developed as a general model to predict whether or not a given household participates in at least one conservation activities. This model shows that both the Stieng group and the Tay-Nung-Hoa group variables are positive and significantly related to the dependent variable. This means that these groups are more likely than the Kinh to participate in at least one conservation activities. These relationships were very significant at the $\alpha = 0.01$ level. Religion was also found to be statistically significant and positive at the 0.05 level. People who belong to a religion are more likely to participate in at least one conservation activity. Once again, trust—the very important dimension of social capital—was found to have a negative relationship. However, familiarity was positive and significant.

Similar to Model LR-1, in this model conservation awareness was found to be negative and statistically significant. Perceived ownership has a positive and statistically significant relationship with respondent participation in at least one conservation activity. This can be explained by the fact that when people feel more secured with land tenure, they are more likely

to participate in conservation activities. According to various studies, land security leads to a farming system that is productive, stable and sustainable (Fortmann and Bruce, 1988; Persoon, 1992).

Table 5-23. Logistic regression analysis of households' participation in conservation activities

	Model LR-5 Participate in at least one activity		Model LR-6 Participate in at least one activity	
	b	e^b	b	e^b
Age	.164	1.179	0.047	1.048
Gender	-.032	.969	0.068	1.071
Length of residence	-.038	.962	0.046	1.047
Education	.184	1.202	0.158	1.171
Household size	.137	1.147	0.251	1.285
Household income	.281	1.325	0.224	1.251
D_ Stieng (Stieng=1)	**1.778*****	**5.916**	**1.630*****	**5.104**
D_ Tay (Tay=1)	**2.122*****	**8.345**	**1.727*****	**5.622**
D_ Religion (Yes=1)	**.891****	**2.437**	**0.866****	**2.377**
D_ Married (Yes=1)	.851	2.342	0.761	2.141
Overall SC Index			-0.034	0.966
Social Trust	**-2.206****	**.110**		
Social Cohesion	.171	1.187		
Social Commitment	-.060	.941		
Community support	.244	1.276		
Voluntary cooperation	.182	1.199		
Familiarity	**1.626*****	**5.086**		
Social integration	.042	1.043		
Ethnic Interaction	-.079	.924		
Overall CA Index			**0.214****	**1.239**
Perceived Cons. Benefit	.392	1.480		
Conservation Awareness	**-.767***	**.464**		
Perceived Use Benefit	-.190	.827		
Perceived Ownership	**.579****	**1.785**		
Intercept	-3.433	.032	-5.560	
-2LL	272		304	
Weighted N	265		265	

* Significance at the .10 level   ** Significance at the .05 level   *** Significance at the .01 level

Finally, Model LR-6 was developed to answer a more practical question of how overall social capital and general conservation attitude affect the household's participation in conservation activities. Result shows that both Stieng (indigenous ethnic) and Tay-Nung-Hoa

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group variables (migrated minorities) are shown to have a positive and significant impact. Results show that the odds of participation in one or more conservation activities are 5.10 times better if the household belongs to the Stieng ethnic and 5.62. Religion was also found to be statistically significant and positive at the $\alpha = 0.05$ level. The odds of participating in conservation activities are 2.38 times better if the household belongs to religion.

Overall (aggregated) conservation attitude was found positive and statistically significant. For every unit increase in overall conservation attitude index, the odds of participation in at least one conservation activity (vs. non participation) is shown to increase by a factor of 4.18.

Summary

This chapter presented the analysis and results of the study. A range of the statistical analysis methods were used to test the conceptual model of this study. In doing this, numerous important findings were identified. Overall descriptive statistics have shown the diverse characteristics of household respondents and the various groups/organizations to which they belong. Factor analysis identified eight different components of social capital (e.g., social trust, social cohesion, social commitment, community support, voluntary cooperation, familiarity, social integration, and ethnic interaction) and four components of conservation attitude (e.g. perceived benefit of conservation, conservation awareness, perceived use benefit, perceived ownership) that serve as basic for social capital and conservation attitude indices. All of these components were later used either as dependent or independent variables in the linear and logistic regression models.

Five linear regression models explored the impacts of the various social capital variables and the socio-demographic variables on the various conservation attitude variables. (Table 5-19 and Table 5-20). Six logistic regression models were used to assess the impact of social capital

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and conservation attitude on the participation in conservation activities of the sample households. (Table 5-21, Table 5-22, and Table 5-23). The summary of the results of these linear and logistic regression models as well as their policy implications will be presented in the next chapter.

CHAPTER 6
SUMMARY AND CONCLUSIONS

Overview

This last chapter contains four sections. The first section summarizes the study and major

findings. In particular, the effects of social capital on conservation attitude and the household's

participation in conservation activities of the World Bank-supported Forest Protection and Rural

Development Project (FPRD) are discussed. The second section discusses the policy implications

of this work, specifically as it regards the ability of the FPRD to protect the forest and improve

living standards for local rural inhabitants. Recommendations are provided that might help

redesign and improve the FPRD project. The third section describes a few limitations of this

study. The last section suggests some future work and areas of focus that are worth investigating

further.

Summary of the Findings and Results

This study is based on the premise that the social capital of local households impacts

household's conservation attitude towards the Cat Tien National Park, Vietnam. Drawing on the

literature from common property resource management and public choice theory, it was argued

that social capital would have a negative impact on households' positive and negative apathy

towards collective resource conservation and management. Accordingly, it was thought that

improvements to social capital may be an effective strategy to muster public participation and

address the "tragedy of the commons" problem. In order to operationalize this proposition 270

households, covering three communes, were interviewed in order to collect various sets of

information. The survey instrument was designed to solicit a wide range of information on

household characteristics, social capital and conservation attitudes, and the participation of

households in conservation activities such as FPRD. The data collection effort was instrumental

in exploring the research objectives of the study: to identify differences between households groups in terms of social capital, conservation attitude and participation in the FPRD; and to identify the key factors influencing households' attitude towards conservation activities and their participation in conservation activities of the FPRD project.

Membership and Local Groups/Organizations

Both the qualitative data and quantitative data of this study indicate that households are very diverse in term of age, gender, ethnicity, education, income. In addition, results of the frequency plots show that respondents belong to different social groups/organizations and exhibit a diverse level of involvement in community activities. Although these data suggest that most of the household heads hold membership in various groups/organizations, their actual participation in the activities of these groups/organization suggests otherwise. This is likely due to the fact that these organizations are mainly sponsored and promoted by the government under the umbrella of the Vietnam Fatherland Front, which is a pro-government "mass movement" under the direct leadership of the Vietnamese Communist Party. Thus, they should not be considered "authentic" civil society groups/organizations because they have not originated spontaneously and independent of government influence. Nevertheless, organizations such as the Farmer's Union, Women's Union, and the Veteran Association still play an important role in implementing conservation and development projects.

Effect of Social Capital on Conservation Attitude

In exploring the effect of social capital on conservation attitude, several useful results emerged that will have significant implications for future conservation decisions and policy in the study region. These results will also be useful for similar studies conducted in the future.

First, factor analysis identified eight social capital components (Social Trust, Social Cohesion, Social Commitment, Community Support, Voluntary Cooperation, Familiarity, Social

Integration, and Ethnic Interaction) and four conservation attitude components (Perceived Conservation Benefit, Conservation Awareness, Perceived Use Benefit, Perceived Ownership) that serve as the basis for the social capital and conservation attitude indices. All of these components were later used either as dependent or independent variables in linear and logistic regression models.

Second, assessment of the relationship between the households' perceived benefit of conservation and both demographic variables and social capital indices suggested that household education has a positive impact on the perceived benefit of conservation. Social cohesion, familiarity and social integration components of social capital are found to influence the perceived benefits of conservation. The cohesion factor in this study means that households share common interests, are connected through associations, and get involved in community activities. These characteristics (of the cohesion concept) are very crucial in common resources conservation and management which is dependent upon cooperative behavior and collective action. The familiarity and social integration components were also found to impact household's perceived benefit of conservation. Both familiarity (how individuals familiarize and get along with each other) and social integration (whether or not households know most people in the community, feel to be part of the community, and socialize in the community) are vital to "the process of building relationships that increase the capacity of local people to unite and act" (Brennan and Luloff, 2007, p.54).

Third, assessment of factors influencing households' conservation awareness indicated that ethnic interaction has a positive impact. This finding is key because, as individuals build a better and more diverse ethnic community, it provides a mechanism to facilitate the expression of

common interests and needs across diverse segments of local society (Wilkinson 1991; Brennan 2007).

Fourth, analysis of the household's perceived benefit from short-term, direct use of the park indicated that migrated minorities from the Northern provinces (i.e. Tay, Nung, Hoa) perceived higher benefits from exploiting the park. As such their resentment toward the conservation of the CTNP is higher relative to other households. Another result that came out of this analysis is that households that are taking part in more voluntary cooperation, and that are more socially integrated, tend to perceive less direct-use benefits of the park. This also means that they are more conservation oriented. These findings help decision makers formulate target specific activities to promote conservation of the park.

Fifth, the assessment of perceived ownership of forestland suggested that the social commitment and community support indices have a positive relationship with the perceived ownership of forestland. Social commitment was measured by the extent to which the respondents have confidence in their associations, their willingness to help each other, and their concerns about the community welfare (i.e., making community a better place to live). Community support was operationalized as a respondent's support for a cause that benefits the community, such as attending several community functions or obeying community codes and covenants. As perceived ownership is central for long-term investment of scarce resources (time and capital), this finding suggests that investing in social commitment and support is an effective way to improve collective action in cooperative behavior.

Finally, examination of household's conservation attitude toward the CTNP indicated that education was found to have a positive impact on the conservation attitude of a given household. The Tay-Nung-Hoa minorities are found to have less favorable attitude toward conservation

efforts relative to other groups. The aggregated social capital variable was found to have a positive impact on conservation attitude toward CTNP.

Household Participation in Conservation Activities

In order to assess the impact of social capital and conservation attitude on the participation in conservation activities of the sample households, six logistic regressions were developed. The first four logistic regression models examined whether or not a given household participated in the FPRD conservation activities such as training on forest protection, meeting to discuss conservation agreement, training on agroforestry and participation in land use planning. The last two models examined whether or not a given household participated in at least one conservation activity mentioned above. One of these two models (Model LR-5) used multiple variables to represent (i.e., proxy for) social capital and conservation attitude while the other model (Model LR-6) used a single overall social capital index and a single overall conservation attitude index as independent variables. The results highlighted in this summarized section below, however, are focused on the last two models.

In both of these logistic regression models, ethnicity and religion variables were found to have positive and statistically significant relationships with household participation in conservation activities. The ethnic minorities such as Stieng, Tay, Nung, Hoa are more likely than the Kinh to participate. Households that practice a religion are more likely than those reported as "no religion" to participate in conservation activities.

One of the seemingly counter intuitive findings is that the social trust component of social capital has a negative impact on households' participation. One explanation might be trust was measured as the level of trust that respondents trust each other within the community but not to the outsiders. In this case, people do not participate in conservation activities simply because they do not trust the project personnel. As observed in the field, sometimes, people in community

informed each other of the presence of forest guards so that they could avoid them while they were clearing forest for crop cultivation. This action is considered as a forest violation and can be fined heavily. Model LR-5 shows that both familiarity and perceived ownership of forestland have a positive impact on participation in conservation activities ($\alpha = 0.05$). The familiarity factor means that individuals get along with and know each other. These characteristics (of the concept familiarity) are important in building relationships that increase the local people's participation in collective action. The perceived ownership of forestland (or feeling security of land tenure) encourages households to participate in conservation activities.

In the overall logistic regression model (Model LR-6) which used overall (aggregated) social capital index and overall (aggregated) conservation attitude index as independent variables, the overall conservation attitude was found to have a positive impact on participation thereby supporting the theoretical premise used in this study.

Policy Implications

The main conclusion that can be drawn from this study is that education greatly influenced conservation attitude. Therefore, conservation programs should focus on improving human capital by providing more training and better education for local people. Diverse ethnic groups exist in the CTNP with different histories and languages. However, the current government education program seems to present shortcomings when only Kinh language (Vietnamese official language) is being used in class. As a result, many children from ethnic groups such as the Stieng have dropped out of school early simply because they cannot keep up with the rest of the class. This implies that parallel to the study of the Kinh language, these children should have the opportunity to learn in their own language. Such improvement to education would help contribute to conservation awareness and community involvement in local conservation efforts.

The results from the linear regression suggest that in order to effectively protect the CTNP, it is necessary for local inhabitants to recognize the value of biodiversity conservation or to improve the households' perceived benefit from conservation. The study has shown that when households perceived higher benefits of conservation, they are more likely to protect the forests and wildlife in the park through the participatory management of the national park. As highlighted in the previous section, social cohesion, familiarity and social integration strongly influenced the perceived benefit of conservation. These results imply that more networking is needed to improve social cohesion among households. In the Vietnamese socio-political context, the strengthening of local associations such as farmers' union, women 's union, veteran 's associations are the best strategy to promote collective behavior in natural resource conservation. Through these existing organizations, conservation programs can help improve local people's conservation attitudes and their participation in conservation activities.

Results from the study also reveals that in the natural resource conservation area, community based efforts building upon familiarity and social integration will facilitate the collective action thus help protecting the park. For the CTNP management, in order to improve familiarity and social integration park managers should facilitate more interactions between individuals, thus leading to more understanding about community issues, including biodiversity conservation issue. At the same time this strategy will help individuals to integrate into social groups thus raising their perceived benefit of conservation and should eventually lead to a positive conservation attitude toward the CTNP.

This study suggests that ethnic interaction is very important. When individuals from different ethnic groups interact with each other, they tend to be more aware of conservation. In the CTNP, it is necessary that conservation programs design activities which can help to

facilitate ethnic interaction. Activities such as cultural festivals and other events as well as

venues for facilitating interaction, should be organized so that different ethnic groups can interact

on a formal and informal basis. Such interaction increases the awareness and familiarity

necessary to improve local conservation attitudes. Included in these activities can be

environmental education programs and opportunities for citizen involvement that help raise

conservation awareness.

Conservation programs should direct efforts to help the minorities that recently immigrated

from the Northern provinces (e.g., Tay, Nung, and Hoa groups) to recognize the long-term value

of conserving the park. These programs should provide income opportunities such as facilitating

ecotourism projects, etc. that help them to generate an alternative source of income. This could

aid in changing their perception about short-term direct uses of the park. Many conservation

projects have successfully included local people to their sustainable ecotourism project (Boo,

1992; Lindberg *et al.*, 1994; Dubin *et al.*, 1996; Goodwin *et al.*, 1996). These can provide good

lessons and suggestions for the CTNP manager to learn and apply.

Many efforts from government agencies and NGOs have been made towards conserving

biodiversity of the CTNP. However, there is still not enough effort in supporting local

communities by inspiring them to work together, thus building their social commitment and

community support. One option which should be considered is to revive local traditional culture,

such as buffalo sacrifice festivities, where the whole community comes together to drink and

dance. In this manner they can also conserve their traditional culture as well. In fact, in recent

years, the Vietnamese government has taken some steps to revive these traditional cultural

activities. Unfortunately, the approach that government uses to conduct this policy is

controversial. Much funding was allocated to each hamlet to build a "communal house" (which

is named "hamlet cultural house"). Without the participation of local villagers, however, these structures looks like a modern government building rather than a common house that the ethnic minorities have had in the past. This has thus alienated them.

Participatory approach should be used as part of any rural development and conservation project. By encouraging local participation, government can avoid obvious short-comings as was demonstrated above. Vietnamese rural societies have been transformed rapidly in recent years when the communist government started to adopt market-oriented economic policy. A vibrant civil society needs to be further developed in order to help the poor to cope with some of the negative market forces as well.

Recommendations for Encouraging Households' Participation in Conservation Activities

Results have shown that the World Bank-supported Forest Protection and Rural Development (FPRD) project has a special focus on ethnic minorities. While it is necessary to include the Kinh (some are very poor and landless people) as participants in conservation activities, a comprehensive approach for protecting the CTNP should include all local households with different demographic backgrounds, i.e. gender, religion, ethnicity, age, education. Currently this type of broad inclusion is lacking. In the same way, conservation efforts should pay more attention to the "no religion" group so as so encourage them to participate in conservation programs. This can only be done when the FPRD project is able to support more activities that can help households interact and can also facilitate households helping each other.

In order to improve familiarity and social integration, the project should facilitate more interactions between individuals that can lead to greater understanding about community issues, including the issue of biodiversity conservation. For example, in conducting the environmental education program targeting inhabitants of the bufferzone, the project should identify and

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support/sponsor the local Youth Union as a strategic partner because the mandate of this organization is to promote youth group activities (e.g., cultural events, sport game festivals, annual camping trips). Promotion of these activities will hopefully facilitate increases in the level of social integration and familiarity among local people.

The study shows that land tenure security can improve participation in conservation activities. It is, therefore, necessary for the government to design a better land tenure regime that can encourage household participation in conservation activities. In fact, it has been one objective of the FPRD project. However, as seen in the study site, even though the project has financially been supporting the land allocation process, the implementation of this task is still very slow. That is, in part, due to the lack of technical personnel in various government agencies. The project, therefore, should take immediate action to expedite this land allocation process and thus improve household access to institution credits and promote sustainable land use.

The Limitations of the Study

Even though the principal investigator (PI) was familiar with the area and had conducted some PRAs exercises before undertaking the field research, the author believes that spending more time within the study communities would have helped. The most limiting factor in terms of the survey was that preliminary fieldwork was insufficient prior to the initiation of the final survey. The survey instrument would have been strengthened by advance work but budget constraints had hindered this activity.

More time would have allowed researchers to conduct more in-depth interviews. This would have been more informative in term of collecting more detailed information on local associations/organizations. Especially how these local organizations performed their function vis-à-vis the issues facing biodiversity conservation.

Future Works

First, Structural Equation Modeling (SEM) can help capture the path of impact of independent variables on dependent variables. Specifically, in order to deal with latent variables such as social capital and conservation attitude, SEM provides an effective mechanism to assess the relationships. Second, one of the key variables that was not included in this study but may have significant influence on household's conservation attitude and participation in conservation activities is its dependency on collective resources. Future studies can incorporate the dependency variable into the model. Third, social capital varies over time and space. This study focused on one time and was limited to only three communities. Longitudinal studies with more spatial variability would be useful. Fourth, how ecotourism activities are impacting household income and livelihoods and if these in turn influence household's conservation attitude and behavior are also worth exploring.

HOUSEHOLD SURVEY QUESTIONNAIRES

The School of Natural Resources and Environment at the University of Florida is conducting an independent research study about the Cat Tien National Park, Vietnam. In order to understand the factors affecting conservation, research assistants are conducting face-to-face interviews with households around the forest park. The households are randomly selected, in order to get representative data from the various communities around the forest park.

You have been randomly selected from this community to be a respondent. Privacy is a key principle of this survey. There are no wrong or right answers, most importantly candid and honest answers are the most useful. If you have any questions about this survey, please feel free to contact either the following offices: the Department of Rural Development, University of Agriculture and Forestry, Thu Duc, Ho Chi Minh City, or the Cat Tien National Park's Management Board.

Commune:_____Hamlet:_____

Date and time:_____

Name of respondent:_____Age:_____Sex:_____

Occupation: (list all)_____

Education:_____

Section I: SOCIO-DEMOGRAPHIC QUESTIONS

1. What is your gender?
   - ❍ Male
   - ❍ Female
2. What is your ethnicity?
   - ❍ Kinh
   - ❍ Tay
   - ❍ Hoa
   - ❍ Stieng
   - ❍ Other, specify _____
3. What is your religion
   - ❍ Buddhism
   - ❍ Catholic
   - ❍ Protestant
   - ❍ Other
4. How long have you been settled in this area?
   - ❍ Less than 10 years
   - ❍ 20-30 years
   - ❍ more than 30 years

5. What is your highest level of education
- ⭕ Grade 1-5
- ⭕ Grade 6-9
- ⭕ Grade 10-12
- ⭕ College

6. How many people live in your house (including you)
- ⭕ 1-4 persons
- ⭕ 5-8 persons
- ⭕ more than 8 persons

7. What is your current annual household income from all the members of the household?
- ⭕ Less than VND 1,000,000
- ⭕ VND 1,000,000 – 5,000,000
- ⭕ VND 5,000,000 – 10,000,000
- ⭕ More than VND 10,000,000

8. To what age group do you belong to:
- ⭕ 18-29
- ⭕ 30-39
- ⭕ 40-49
- ⭕ 50-59
- ⭕ above 60

9. What is your marital status:
- ⭕ Single
- ⭕ Married
- ⭕ Divorced
- ⭕ Widowed

Section II. SOCIAL CAPITAL QUESTIONS

1.   Of the groups/associations/organizations listed below (check one for each A and B)

   1.1. Are you <u>aware</u> of this group's existence in your community?

   2.1. Do you <u>belong</u> to this group?

Groups/Associations/Organization	A. Aware of		B. Belong to	
	No	Yes	No	Yes
a. Religious groups				
b. Farmers' Union				
c. Women Union				
d. Youth Union				
e. Veteran Union				
f. Old People Union				
g. Gardener association				
h. Credit group				
i. Other, please specify: _____				

2. In the past year have you participated in the following activities with your neighbors or other people in the village? For each activity indicate how often you performed the activity (For each, circle one).

	Never	Once/Year	Few times/Year	Once/ Month	Few times/ Month
Community events like village festivities (harvest, officiating sacrifices, …)	1	2	3	4	5
Sport events like tournament or games	1	2	3	4	5
Meetings like hamlet meeting, garden club meeting, ..	1	2	3	4	5
Training (extension, conservation)	1	2	3	4	5
Work project like tree planting on Lunar New Year, clean up village	1	2	3	4	5
Meeting to resolve problems inside and outside the village	1	2	3	4	5
Other, please specify_____	1	2	3	4	5

3. Please tell us how you feel about the following statement using the scale of 1 to 5, 1 being Strongly Disagree (SD), 2 being Disagree (D), 3 being Neutral (N), 4 being Agree (SA) and 5 being Strongly Agree (SA). Circle one appropriate number of every statement.

	SD	D	N	A	SA
a. I know most people in my village	1	2	3	4	5
b. People in this village look out for one another	1	2	3	4	5
c. Most people in this village are willing to help each other whenever they can	1	2	3	4	5
d. Most people in this village are concerned about their own welfare	1	2	3	4	5
e. I can count on my neighbor for help any time	1	2	3	4	5
f. I trust my association to make decision on my behalf					
g. People in this village have mutual respect for one another	1	2	3	4	5
h. For the most part, people are willing to make the community a better place to live	1	2	3	4	5
i. People in this community do get involved in community activities	1	2	3	4	5
j. I always greet my neighbors when I first see them					
k. This community is a safe place for children	1	2	3	4	5

l. Most people in my community do voluntary work for community	1	2	3	4	5
m. Most people in this community can be trusted	1	2	3	4	5
n. Most people in the neighborhood are connected through the association	1	2	3	4	5
o. Most people in this community are involved in activities that benefit the community	1	2	3	4	5
p. People in this community are easy to contact	1	2	3	4	5
q. For the most part, people in this community are friendly	1	2	3	4	5
r. I know some people in this community, most are strangers	1	2	3	4	5
s. Usually people in this community greet one another	1	2	3	4	5
t. This community offers enough chance for a person to do volunteer work	1	2	3	4	5
u. People in this community work together to solve problems	1	2	3	4	5
v. Most people in this community do not feel they are a part of this community	1	2	3	4	5
w. People in this community get along with each other	1	2	3	4	5
x. I volunteer in my community	1	2	3	4	5
y. For the most part, people in the community obey community codes and covenants	1	2	3	4	5
z. Very few people socialize in the community	1	2	3	4	5
aa. People in this community show support for a cause that may not directly benefit them but benefits community at a whole	1	2	3	4	5
bb. Some of my neighbors attend several community functions	1	2	3	4	5
cc. I think people in this community can be trusted	1	2	3	4	5
dd. People in the community share common interests	1	2	3	4	5
ee. My actions have impacts making this community a better place to live in	1	2	3	4	5
ff. The community is a mix of different cultural ethnic groups					

Section III: PARTICIPATION IN FPRD PROJECT ACTIVITIES

1. We would like to know how much your household participates in the FPRD project. We are going to ask you about activities that you have involved in during the past 12 months

In the past 12 months have you ….	No	Yes
Participated in training on forest protection	1	2
Attended meetings to discuss conservation agreement	1	2
Participated in training on water management	1	2
Participated in land use planning	1	2
Participated in Training on Agroforestry	1	2

2. Have you ever participated in …   1) No   2) Yes

Attended training on improved use and management of cash crops and trees	1	2
Been provided with new and improved seedlings for agricultural crops	1	2
Participated in training on animal husbandry	1	2

3. Have you ever …   1) No   2) Yes

Had electricity connection (through FPRD project)	1	2
Worked on dyke construction against flooding	1	2

4. Credit support   1) No   2) Yes

Training on micro credit management	1	2
Got a loan for fertilizer and pesticide	1	2

Section III: CONSERVATION ATTITUDE AND BEHAVIOR

A. CONSERVATION ATTITUDES

Please tell us how you feel about the following statement using the scale of 1 to 5, 1 being Strongly Disagree (SD), 2 being Disagree (D) 3 being Neutral (N), 4 being Agree (A), 5 being Strongly Agree. Circle one appropriate number of every statement.

	SD	D	N	A	SA
It is important to keep the park for the survival of various plants and animal species	1	2	3	4	5

Although we need more land for agriculture, it is necessary to set aside some land for the protection of plants and animals	1	2	3	4	5
The park is our country's pride and is essential for a healthy environment.	1	2	3	4	5
The national park should be protected for the benefit of our future generations	1	2	3	4	5
The illegal cutting of trees, wildlife trapping and hunting should be discouraged	1	2	3	4	5
If hunting and grazing are allowed, all the animals will soon disappear	1	2	3	4	5
Conservation has taken land thus farmers do not have enough land to cultivate	1	2	3	4	5
Since the wildlife of the park are causing us trouble, wildlife hunting should be allowed under strict supervision	1	2	3	4	5
It is good if some land within the park is allocated to the local people	1	2	3	4	5
Since the park is a waste of land, it is better to distribute the land among local people	1	2	3	4	5
The park is for outsiders and we are not even allowed to visit the park	1	2	3	4	5
The park is for those who enjoy wildlife viewing and we do not enjoy this, as we have to face problems from the park	1	2	3	4	5
Farmers have benefited from the conservation program	1	2	3	4	5
Forest land allocation (FLA) ensures farmers' ownership of the forestland	1	2	3	4	5
Farmers can get more income because of forest protection and management activities	1	2	3	4	5
Farmers can benefit from the forest replanting in the buffer zone	1	2	3	4	5
Conservation agreement allows farmers to share responsibility in park management	1	2	3	4	5
Conservation agreement allows farmers access to NTFP	1	2	3	4	5

B. BEHAVIOR TOWARDS THE PARK

1. Do you ever go to the forest park? ☐ Yes ☐ No

   (If no, go to # 10, if yes go to #11)

2. If NO why don't you ever go there?

   ☐ Fear of rangers ☐ Fears of animals ☐ No interest

   ☐ No time ☐ Too far ☐ Other- Specify

3. If YES, why do you go there?

☐ Health related   ☐ Hunting   ☐ Building materials

☐ Fuelwoods   ☐ Grazing   ☐ Worship

☐ Others - specify

4. How many working hours do you spend per trip, including time of travel to and from, to collect items from the park? _____ hours

5. How many trips do you make per week? _____ trips

6. How many items do you collects per trip? _____ items

Items	Hours/trip	Trips/week	Amount/trip	Total/month
Fuelwood				
Building materials				
Handcraft materials				
Honey				
Hunting				
Medical plants				
Fishing				

7. How many people from your household collect items from the park? _____persons

8. What is your income from the forest (if any) per month?

BẢNG CÂU HỎI ĐIỀU TRA HỘ

Trường Tài nguyên Thiên nhiên và Môi trường của Đại học Florida thực hiện một nghiên cứu độc lập về Vườn Quốc Gia Cát Tiên, Việt Nam. Để biết về những yếu tố ảnh hưởng đến công tác bảo tồn, các nghiên cứu viên sẽ thực hiện một cuộc phỏng vấn trực tiếp các hộ sống chung quanh vườn quốc gia. Những nông hộ được chọn lựa một cách ngẫu nhiên để có thể thu thập được thong tin từ những cộng đồng khác nhau chung quanh vườn quốc gia.

Bạn đã được chọn ngẫu nhiên từ các cộng đồng này để phỏng vấn. Tôn trọng sự riêng tư là nguyên tắc bắt buộc trong cuộc điều tra này. Sẽ không có câu trả lời đúng hay sai, quan trọng nhất là sự trả lời thật thà và thẳng thắn sẽ rất giúp ích cho chúng tôi. Nếu bạn có thắc mắc gì về các câu hỏi của chúng tôi, xin vui lòng liên lạc với các đơn vị sau đây: Bộ môn Phát triển Nông thôn, Đại học Nông Lâm Tp Hồ Chí Minh, hoặc Ban Quản lý vườn Quốc Gia Cát Tiên.

Xã:_____ Thôn:_____

Thời điểm phỏng vấn: Ngày_____ tháng _____ giờ:_____

Tên người trả lời phỏng vấn._____Tuổi _____ Giới_____

Nghề nghiệp: (liệt kê tất cả) _____

Trình độ văn hoá:_____

Phần I: CÁC CÂU HỎI VỀ ĐẶC ĐIỂM DÂN SỐ XÃ HỘI

1. Xin cho biết giới ?
   - ❍ Nam
   - ❍ Nữ
2. Xin cho biết dân tộc nào?
   - ❍ Kinh
   - ❍ Tày
   - ❍ Hoa
   - ❍ Stiêng
   - ❍ Khác, nêu tên _____
3. Xin cho biết bạn theo đạo nào?
   - ❍ Phật giáo
   - ❍ Công giáo
   - ❍ Tin lành
   - ❍ Khác, nêu tên _____
4. Bạn đã định cư ở vùng này được bao nhiêu năm rồi?
   - ❍ Dưới 10 năm
   - ❍ 20-30 năm
   - ❍ Hơn 30 năm

5. Trình độ học vấn cao nhất?
- ❍ Lớp 1-5
- ❍ Lớp 6-9
- ❍ Lớp 10-12
- ❍ Đại học

6. Nhà bạn có bao nhiêu người (kể cả bạn)
- ❍ 1-4 người
- ❍ 5-8 người
- ❍ hơn 8 người

7. Thu nhập hiện nay của gia đình bạn của mọi người trong hộ gia đình?
- ❍ Ít hơn VND 1,000,000
- ❍ VND 1,000,000 – 5,000,000
- ❍ VND 5,000,000 – 10,000,000
- ❍ Hơn VND 10,000,000

8. Bạn thuộc vào nhóm tuổi nào?
- ❍ 18-29
- ❍ 30-39
- ❍ 40-49
- ❍ 50-59
- ❍ trên 60

9. Tình trạng hôn nhân của bạn:
- ❍ Độc thân
- ❍ Có gia đình
- ❍ Ly dị
- ❍ Goá bụa

Phần II. CÁC CÂU HỎI VỀ VỐN XÃ HỘI

1. Trong số những nhóm/đoàn thể/tổ chức kể tên dưới đây (Đánh dấu một cho mỗi trường hợp A và B)

1.1. Bạn có <u>biết</u> sự hiện diện của các nhóm đoàn thể trong cộng đồng của bạn không?

2.1. Bạn có <u>thuộc</u> nhóm nào dưới đây không?

Nhóm/Đoàn thể/Tổ chức	A. Biết		B. Thuộc	
	Không	Có	Không	Có
a. Nhóm Tôn Giáo				
b. Hội Nông dân				
c. Hội Phụ nữ				
d. Đoàn Thanh niên				
e. Hội Cựu Chiến binh				
f. Hội Phụ lão				
g. Hội làm vườn				
h. Nhóm tín dụng				
i. Nhóm khác, kể tên: _____				

2. Trong năm vừa qua, bạn có tham gia vào các hoạt động sau đây với những người hàng xóm hay những người khác trong làng này không? Đối với mỗi hoạt động liệt kê dưới đây cho biết mức độ thường xuyên mà bạn tham gia (mỗi hoạt động, khoanh tròn).

	Không bao giờ	Một lần/ Năm	Vài lần/ năm	Một lần/ Tháng	Vài lần/ Tháng
a. Sự kiện xảy ra trong cộng đồng như các lễ hội (lễ hội thu hoạch, cúng tế thần, …)	1	2	3	4	5
b. Hoạt động Nhóm/CLB như tổ chức đi chơi	1	2	3	4	5
c. Hoạt động thể thao như thi đấu thể thao, các hội thao	1	2	3	4	5
d. Hội họp (như họp thôn, họp xóm, ..)	1	2	3	4	5
e. Tập huấn (Khuyến nông, bảo tồn)	1	2	3	4	5
f. Lao động công ích như Tết trồng cây, dọn vệ sinh làng xóm, …	1	2	3	4	5
g. Họp dân để giải quyết các vấn đề trong cộng đồng	1	2	3	4	5
h. Họp dân để giải quyết các vấn đề ngoài cộng đồng	1	2	3	4	5
i. Khác, Xin nêu rõ_____	1	2	3	4	5

3. Xin vui lòng cho chúng tôi biết bạn cảm thấy thế nào về những phát biểu sau đây, sử dụng thang điểm từ 1 đến 5, 1 là Rất không đồng ý (SA), 2 Không đồng ý (D), 3 Sao cũng được (N) 4 Đồng ý (A), 5 Rất Đồng ý (SA). Xin khoanh tròn một số thích hợp.

	SD	D	N	A	SA
a. Tôi biết hầu hết mọi người trong làng này	1	2	3	4	5
b. Mọi người trong làng này quan tâm đến nhau	1	2	3	4	5
c. Mọi người trong làng này sẵn lòng giúp đỡ nhau khi họ có thể	1	2	3	4	5
d. Mọi người trong làng này đều quan tâm đến phúc lợi chung của họ.	1	2	3	4	5
e. Tôi có thể nương tựa vào hàng xóm bất cứ lúc nào	1	2	3	4	5
f. Tôi tin tưởng đoàn thể của tôi ra quyết định thay mặt tôi	1	2	3	4	5
g. Người dân trong làng này tôn trọng lẫn nhau.	1	2	3	4	5
h. Nói chung mọi người trong làng này sẵn sàng xây dựng làng trở thành một nơi sinh sống tốt	1	2	3	4	5
i. Người dân trong cộng đồng này đều tham gia vào các hoạt động của cộng đồng.	1	2	3	4	5
j. Tôi luôn chào hỏi hàng xóm của tôi (khi gặp)	1	2	3	4	5
k. Cộng đồng này rất là an ninh cho trẻ nít.	1	2	3	4	5

l. Hầu hết người dân trong cộng đồng đều làm công việc tình nguyện cho cộng đồng.	1	2	3	4	5
m. Tôi nghĩ là người dân trong cộng đồng này đều có thể tin tưởng được	1	2	3	4	5
n. Hầu hết mọi người trong xóm giềng này đều có quan hệ với nhau qua các đoàn thể	1	2	3	4	5
o. Hầu hết mọi người trong cộng đồng này đều tham gia vào các hoạt động giúp ích cho cộng đồng	1	2	3	4	5
p. Dễ dàng liên lạc với người dân trong cộng đồng này	1	2	3	4	5
q. Nói chung, người dân trong cộng đồng thì thân thiện	1	2	3	4	5
r. Tôi biết một vài người ở khu dân cư, còn phần lớn là người lạ	1	2	3	4	5
s. Người dân trong cộng đồng này luôn luôn chào hỏi nhau	1	2	3	4	5
t. Cộng đồng này luôn tạo điều kiện cho mọi người làm những công việc tình nguyện	1	2	3	4	5
u. Người dân trong cộng đồng cùng nhau giải quyết những vấn đề	1	2	3	4	5
v. Hầu hết người dân trong cộng đồng này không cảm thấy họ là một phần của cộng đồng	1	2	3	4	5
w. Người dân trong cộng đồng này chung sống hoà thuận với nhau	1	2	3	4	5
x. Tôi tình nguyện làm việc cho cộng đồng của tôi	1	2	3	4	5
y. Nói chung, người dân trong cộng đồng tuân theo những điều luật và nội quy của cộng đồng	1	2	3	4	5
z. Rất ít người dân hoà nhập xã hội trong cộng đồng này	1	2	3	4	5
aa. Người dân trong cộng đồng ủng hộ những nghĩa cử có thể không trực tiếp có lợi cho họ nhưng có lợi cho toàn thể cộng đồng	1	2	3	4	5
bb. Những người hàng xóm của tôi giữ một vài vai trò trong cộng đồng	1	2	3	4	5
cc. Tôi nghĩ người dân trong cộng đồng đều có thể tin tưởng được	1	2	3	4	5
dd. Người dân trong cộng đồng này cùng chia xẻ những mối quan tâm chung	1	2	3	4	5
ee. Hành động của tôi rất có ảnh hưởng đến việc làm cho cộng đồng này trở thành một nơi sinh sống tốt hơn.	1	2	3	4	5
ff. Cộng đồng là một hỗn hợp các sắc dân và văn hóa khác nhau	1	2	3	4	5

Phần III: Tham gia dự án Bảo vệ rừng và Phát triển Nông thôn

1. Chúng tôi muốn biết mức độ tham gian của hộ gia đình bạn vào dự án Bảo vệ rừng và phát triển Nông thôn. Chúng tôi sẽ hỏi bạn về những hoạt động mà bạn đã tham gia trong suốt 12 tháng qua.

Trong 12 tháng qua bạn đã …	Kh ông	C ó
Tham gia các khoá huấn luyện về bảo vệ rừng	1	2
Dự các buổi họp thảo luận về giao kèo bảo tồn	1	2
Tham gia huấn luyện về quản lý nguồn nước	1	2
Tham gia vào quy hoạch sử dụng đất	1	2
Tham gia huấn luyện về Nông Lâm kết hợp	1	2

2. Bạn đã từng tham gia …   1) Không   2) Có

Tham dự huấn luyện về cải tiến sử dụng và quản lý cây nông sản hàng hóa	1	2
Được cung cấp giống mơi và giống được cải thiện cho mùa vụ nông nghiệp	1	2
Tham gia khoá huấn luyện về chăn nuôi	1	2

3. Bạn đã …   1) Không   2) Có

Hoà mạng lưới điện	1	2
Tham gia làm đập ngăn lũ	1	2

4. Hỗ trợ về tín dụng   1) Không   2) Có

Huấn luyện về quản lý tín dụng nhỏ	1	2
Vay một khoản tiền mua phân bón và thuốc trừ sâu	1	2

Phần IV: THÁI ĐỘ VÀ HÀNH VI ĐỐI VỚI BẢO TỒN ĐA DẠNG SINH HỌC

A. THÁI ĐỘ ĐỐI VỚI BẢO TỒN

1. Xin vui lòng cho chúng tôi biết bạn cảm thấy thế nào về những phát biểu sau đây, sử dụng thang điểm từ 1 đến 5; 1 Rất không đồng ý (SA), 2 Không đồng ý (D), 3 Sao cũng được (N) 4 Đồng ý (A), 5 Rất Đồng ý (SA). Xin khoanh tròn một số thích hợp.

	SD	D	N	A	SA
a. Cần phải có vườn quốc gia để bảo tồn các lọai cây và thú khác nhau	1	2	3	4	5

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b. Mặc dù cần đất để sản xuất nông nghiệp, việc để giành đất nhằm bảo vệ cây và thú là cần thiết	1	2	3	4	5
c. Vườn là niềm tự hào của đất nước và để giữ cho môi trường được trong sạch	1	2	3	4	5
d. Vườn quốc gia nên được bảo vệ cho thế hệ mai sau	1	2	3	4	5
e. Cần hạn chế việc chặt phá cây rừng và săn bắn thú	1	2	3	4	5
f. Nếu việc săn bắn và chăn thả được cho phép trong vườn thì thú hoang sẽ bị biến mất	1	2	3	4	5
g. Bảo tồn đã lấy hết đất đai của chúng tôi nên không còn đất canh tác	1	2	3	4	5
h. Bởi vì thú trong vườn tạo phiền tóai cho chúng tôi, nên cho phép săn bắn với sự hướng dẫn của cán bộ vườn	1	2	3	4	5
i. Nếu đem đất trong vườn QG chia cho người dân địa phương thì thật là tốt	1	2	3	4	5
j. Bởi vì đất để làm VQG là lãng phí – nên chia đất cho người dân địa phương	1	2	3	4	5
k. VQG chỉ giành cho người ngòai. Chúng tôi thậm chí không được vào bên trong vườn	1	2	3	4	5
l. VQG chỉ giành cho nhưng người thích xem thú, còn chúng tôi phải gặp nhiều rắc rối	1	2	3	4	5
m. Nông dân được hưởng lợi từ chương trình bảo tồn	1	2	3	4	5
n. Giao đất rừng đảm bảo quyền sở hữu đất của người dân	1	2	3	4	5
o. Nông dân có them thu nhập qua các họat động quản lý bảo vệ rừng	1	2	3	4	5
q. Việc giao đất rừng bảo đảm quyền sở hữu đất đai của tôi	1	2	3	4	5
r. Tôi có thêm thu nhập nhờ vào các hoạt động quản lý và bảo vệ rừng	1	2	3	4	5
s. Tôi được hưởng lợi từ việc trồng rừng ở vùng đệm	1	2	3	4	5

B. HÀNH VI

1. Có bao giờ bạn vào vườn quốc gia chưa?_____Có/Không (Nếu không, sang câu hỏi #12, nếu có sang câu hỏi #13)

2. Nếu KHÔNG, tại sao bạn không vào đó?

    a) Sợ kiểm lâm   b) Sợ thú dữ   c) Không quan tâm

    d) Không có thời gian   e) Xa quá   d) Nguyên nhân khác- Kể ra

3. Nếu CÓ, tại sao bạn vào đó?

    a) Liên quan đến sức khoẻ   b) Săn bắn   c) Vật liệu làm nhà

    d) Củi   e) Thả trâu bò   f) Thờ cúng

    g) Khác - kể ra

4. Mỗi chuyến đi rừng kéo dài bao lâu, bao gồm cả thời gian đi và về, để thu nhặt lâm sản trong vườn quốc gia _____ giờ

5. Một tuần đi mấy chuyến? _____ chuyến

6. Có bao nhiêu vật dụng được thu nhặt mỗi chuyến _____ vật dụng

Vật dụng	Giờ/chuyến	Chuyến/tuần	Số lượng/chuyến	Tổng cộng/tháng
Củi				
Vật liệu xây dựng				
Vật liệu làm đồ thủ công				
Mật ong				
Thú săn				
Cây thuốc				
Cá câu				

7. Có bao nhiêu người trong hộ đi thú hái lâm sản trong vườn QG? _____ người

8. Thu nhập từ rừng của hộ gia đình (nếu có) hàng tháng? _____ VND

APPENDIX C
FREQUENCY OF RESPONSES ANALYSIS ITEMS

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-29 yrs	39	14.4	14.4	14.4
	30-39 yrs	93	34.4	34.4	48.9
	40-49 yrs	90	33.3	33.3	82.2
	50-59 yrs	34	12.6	12.6	94.8
	60 yrs and above	14	5.2	5.2	100.0
	Total	270	100.0	100.0	

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	240	88.9	88.9	88.9
	Female	30	11.1	11.1	100.0
	Total	270	100.0	100.0	

Education

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not at all	19	7.04	7.0	7.0
	Grade 1-5	108	40.00	40.0	47.0
	Grade 6-9	109	40.37	40.4	87.4
	Grade 10-12	32	11.85	11.9	99.3
	College	2	.74	.7	100.0
	Total	270	100.00	100.0	

Marital Status

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Single	5	1.85	1.9	1.9
	Married	253	93.70	93.7	95.6
	Divorced	2	.74	.7	96.3
	Widowed	10	3.70	3.7	100.0
	Total	270	100.00	100.0	

Annual Income

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 5M VND	25	9.26	9.3	9.3
	5-10M VND	57	21.11	21.1	30.4
	10-20M VND	68	25.19	25.2	55.6
	More than 20M VND	120	44.44	44.4	100.0
	Total	270	100.00	100.0	

TOTAL_AWARE

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	2	.7	.7	.7
	1	3	1.1	1.1	1.9
	2	3	1.1	1.1	3.0
	3	24	8.9	8.9	11.9
	4	19	7.0	7.0	18.9
	5	26	9.6	9.6	28.5
	6	55	20.4	20.4	48.9
	7	60	22.2	22.2	71.1
	8	57	21.1	21.1	92.2
	9	21	7.8	7.8	100.0
	Total	270	100.0	100.0	

Aware of Religious groups

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	73	27.0	27.0	27.0
	yes	197	73.0	73.0	100.0
	Total	270	100.0	100.0	

Aware of Farmer Union

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	14	5.2	5.2	5.2
	yes	256	94.8	94.8	100.0
	Total	270	100.0	100.0	

Aware of Women Union

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	30	11.1	11.1	11.1
	yes	240	88.9	88.9	100.0
	Total	270	100.0	100.0	

Aware of Youth Union

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	59	21.9	21.9	21.9
	yes	211	78.1	78.1	100.0
	Total	270	100.0	100.0	

Aware of Veteran Union

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	32	11.9	11.9	11.9
	yes	238	88.1	88.1	100.0
	Total	270	100.0	100.0	

Aware of Old People Union

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	105	38.9	38.9	38.9
	yes	165	61.1	61.1	100.0
	Total	270	100.0	100.0	

Aware of Gardener Association

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	230	85.2	85.2	85.2
	yes	40	14.8	14.8	100.0
	Total	270	100.0	100.0	

Aware of Red Cross Association

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	64	23.7	23.7	23.7
	yes	206	76.3	76.3	100.0
	Total	270	100.0	100.0	

Aware of Credit Group

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	141	52.2	52.2	52.2
	yes	129	47.8	47.8	100.0
	Total	270	100.0	100.0	

TOTAL_BELONG

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	47	17.4	17.4	17.4
	1	37	13.7	13.7	31.1
	2	87	32.2	32.2	63.3
	3	47	17.4	17.4	80.7
	4	37	13.7	13.7	94.4
	5	8	3.0	3.0	97.4
	6	3	1.1	1.1	98.5
	7	3	1.1	1.1	99.6
	9	1	.4	.4	100.0
	Total	270	100.0	100.0	

a. Community events

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	145	53.7	53.7	53.7
	Once/year	39	14.4	14.4	68.1
	Few times/year	63	23.3	23.3	91.5
	Once/month	12	4.4	4.4	95.9
	Few times/Month	11	4.1	4.1	100.0
	Total	270	100.0	100.0	

b. Activities of clubs/groups

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	225	83.3	83.3	83.3
	Once/year	28	10.4	10.4	93.7
	Few times/year	5	1.9	1.9	95.6
	Once/month	11	4.1	4.1	99.6
	Few times/Month	1	.4	.4	100.0
	Total	270	100.0	100.0	

c. Sport events

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	185	68.5	68.5	68.5
	Once/year	30	11.1	11.1	79.6
	Few times/year	42	15.6	15.6	95.2
	Once/month	12	4.4	4.4	99.6
	Few times/Month	1	.4	.4	100.0
	Total	270	100.0	100.0	

d. Meetings

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	10	3.7	3.7	3.7
	Once/year	14	5.2	5.2	8.9
	Few times/year	166	61.5	61.5	70.4
	Once/month	63	23.3	23.3	93.7
	Few times/Month	17	6.3	6.3	100.0
	Total	270	100.0	100.0	

e. Training

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	96	35.6	35.6	35.6
	Once/year	75	27.8	27.8	63.3
	Few times/year	70	25.9	25.9	89.3
	Once/month	25	9.3	9.3	98.5
	Few times/Month	4	1.5	1.5	100.0
	Total	270	100.0	100.0	

f. Work project

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	45	16.7	16.7	16.7
	Once/year	93	34.4	34.4	51.1
	Few times/year	99	36.7	36.7	87.8
	Once/month	30	11.1	11.1	98.9
	Few times/Month	3	1.1	1.1	100.0
	Total	270	100.0	100.0	

g. Meeting to resolve problems

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	40	14.8	14.8	14.8
	Once/year	43	15.9	15.9	30.7
	Few times/year	135	50.0	50.0	80.7
	Once/month	35	13.0	13.0	93.7
	Few times/Month	17	6.3	6.3	100.0
	Total	270	100.0	100.0	

Ethnicity

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Kinh	74	27.41	27.4	27.4
	Tay	60	22.22	22.2	49.6
	Nung	35	12.96	13.0	62.6
	Hoa	4	1.48	1.5	64.1
	Stieng	94	34.81	34.8	98.9
	Others	3	1.11	1.1	100.0
	Total	270	100.00	100.0	

Recoded Ethnicity

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Kinh	74	27.4	27.7	27.7
	TayNungHoa	99	36.7	37.1	64.8
	Stieng	94	34.8	35.2	100.0
	Total	267	98.9	100.0	
Missing	System	3	1.1		
Total		270	100.0		

Belong to Religious groups

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	205	75.9	75.9	75.9
	yes	65	24.1	24.1	100.0
	Total	270	100.0	100.0	

Belong to Farmer Union

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	88	32.6	32.6	32.6
	yes	182	67.4	67.4	100.0
	Total	270	100.0	100.0	

Belong to Women Union

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	233	86.3	86.3	86.3
	yes	37	13.7	13.7	100.0
	Total	270	100.0	100.0	

Belong to Youth Union

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	232	85.9	85.9	85.9
	yes	38	14.1	14.1	100.0
	Total	270	100.0	100.0	

Belong to Veteran Union

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	214	79.3	79.3	79.3
	yes	56	20.7	20.7	100.0
	Total	270	100.0	100.0	

Belong to Old People Union

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	247	91.5	91.5	91.5
	yes	23	8.5	8.5	100.0
	Total	270	100.0	100.0	

Belong to Gardener Association

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	252	93.3	93.3	93.3
	yes	18	6.7	6.7	100.0
	Total	270	100.0	100.0	

Belong to Red Cross Association

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	156	57.8	57.8	57.8
	yes	114	42.2	42.2	100.0
	Total	270	100.0	100.0	

Belong to Credit Group

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	215	79.6	79.6	79.6
	yes	55	20.4	20.4	100.0
	Total	270	100.0	100.0	

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	30	11.1	11.1	11.1
	Male	240	88.9	88.9	100.0
	Total	270	100.0	100.0	

Belong to Women Union

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	240	88.9	88.9	88.9
	yes	30	11.1	11.1	100.0
	Total	270	100.0	100.0	

Belong to Women Union

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	245	90.7	90.7	90.7
	yes	25	9.3	9.3	100.0
	Total	270	100.0	100.0	

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BIOGRAPHICAL SKETCH

Born in a central province of Vietnam, Thuy Nguyen came to study at the University of Agriculture and Forestry (UAF) in Ho Chi Minh City, where he graduated with a B.S. degree in agronomy in 1994. Three years later, he received a scholarship from the Ford Foundation to pursue a master's degree in social development at the Department of Sociology and Anthropology, Ateneo De Manila University–Philippines. He then returned to his home country and joined the UAF as a lecturer, mainly teaching undergraduate courses in the field of rural development. In 2002, with a four-year fellowship from the Ministry of Education of Vietnam, he came to the United States to begin the Ph.D. program in interdisciplinary ecology at the University of Florida and received his Ph.D. in August 2007. He, his wife, and his five-year-old daughter have benefited from exploring and experiencing American culture. While residing in the US, his family has expanded by the addition of another daughter. Upon completion of his studies, he intends to go back to Vietnam and continue as a lecturer with his present employer, UAF.