

AN ABSTRACT OF THE THESIS OF

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Title: An Analysis of Local Karang Culture, Knowledge, and Natural Resource Use Patterns in the Kaengkrachan National Park, Phetchaburi, Thailand.

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Abstract approved: _____

Lori A. Cramer

This study analyses the culture, knowledge and resource use patterns of the Karang tribe in Phong-Luk village, which is located at the Kaengkrachan National Park. The goal of this project is to reveal the culture-based local wisdom of the Karang tribe that is consistent with sustainable environmental resource management and to recommend guidelines for governments to revise existing policies related to the tribe that are relevant with their cultural ways of life. This project is expected to enhance awareness of local wisdom and offer a strategy to relieve the pressure of resource use between the tribe and the national park.

The specific objectives of this research were to 1) analyze the local production practices, land utilization practices and belief, and 2) identify and analyze the key issues of local wisdom that are consistent with the conservation and sustainable management of the local natural resources and the environment. Finally, the analysis explored the affects of the existing policies (e.g., national park and development promotion policies) on the tribe's livelihood and the expected impact on the natural environments due to the shift in practices of the tribe.



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This research utilized a qualitative research methodology to study and understand the overall picture of the community. Interview and observation techniques were used to identify the important issues, which included the history and settlement of the community, production patterns, land utilization patterns, belief systems, relationships within the community and government policies.

The research indicates that traditional production practices, traditional land tenure arrangements and cultural beliefs provide the tribe a means of self-reliance and environmental sustainability. However, these customary practices and beliefs are being threatened by government policies. Therefore, the recommendations are provided to guide policymakers in ways to incorporate the wisdom of the tribe in future decisions.

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An Analysis of Local Karang Culture, Knowledge, and Natural Resource Use
Patterns in the Kaengkrachan National Park, Phetchaburi, Thailand

by

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AN ANALYSIS OF LOCAL KARANG CULTURE, KNOWLEDGE, AND NATURAL RESOURCE USE PATTERNS IN THE KAENGRACHAN NATIONAL PARK, PETCHABURI, THAILAND

1 INTRODUCTION

1.1 STATEMENT OF THE PROBLEM

As a result of the substantial decline of forest cover throughout the country, Thailand's government has formulated the National Forestry Policy. This policy aims to sustain the supply of forest products for domestic consumption and foreign trade, and to maintain forest cover, particularly for the protection of watersheds (National Forest Policy 1985). Regarding this protection, the government has emphasized the conservation of watershed forests, with the establishment of protected areas such as national parks, wildlife sanctuaries, forest reserves and Class I watershed. The country's highlands are primarily the only areas that the forests still cover, and have been increasingly recognized by the government as the last remaining precious national natural resources worthy of being declared as protected areas.

The Hill Tribes of Thailand are historically forest dwellers. Most of these groups already reside in these highlands, which often are the watersheds for many of the major rivers that feed the lowland plains. As government pressure for forest conservation increases, especially in the form of protected areas in watershed forests, some tribes continue to be evicted from their land, regardless of how long they have lived there. A few tribes have been allowed to reside on their lands with

certain demarcations and restrictions on forest use. This type of arrangement is often allowed because few public land areas outside of protected areas are available for resettlement. Due to a philosophy of establishing protected areas primarily to take care of trees, land, and wildlife, people are often kept away from the forest (Bello et al. 1998, Ganjanapan and Khaosa-ad 1996, Kemf 1993, National Park Act 1981, McCaskill 1997 and Sponsel 2000). This denied access to resources and the restrictions on forest use, is especially constraining for shifting cultivation, an agricultural technique of short cropping periods rotated with long fallow periods of particular the ethnic hill tribes (Peters and Neuenschwander 1998). This restriction on their main production system has made the lives of these types of hill tribe people more difficult. As Ghimire (1994:200) notes: "The forest inhabitants like the hill tribes greatly depend on the forests prior to their becoming protected areas."

1.1.1 Existing Government Policies

Recent government policies illustrate a consistent pattern of trying to minimize human impact on the environment. A fundamental assumption related to the management of the protected area is based on the mainstream idea of disconnection, which separates human beings from the forest. This idea suggests that the forest ecosystem consists of only physical resources such as forests and wildlife. The idea assumes humans damage the forest ecosystem. It does not accept the possibility that humans can co-exist with the forest. In addition,

government policies refuse the cultural-based wisdom of locals that contribute to the conservation of the forest.

This mainstream concept of disconnection can be found in the management objectives of the national park formulated by the 1961 National Park Act. The first objective was the protection of the nation's natural resources, for example, various tree species, animals and the sites themselves. The national park targets the preservation of plants and wildlife in the sites to be left in their natural condition without any human interference. Its aim is to preserve them for the benefit of public education and pleasure. Secondly, it intends to preserve the undisturbed sites for scientific research.

This idea of removing humans from the forest can also be found in the laws related to protected area management. An example is Section 4 of 1961 National Park Act that defined the systems of the park to include land, mountains, creeks, swamps, canals, bogs, streams, lakes, islands and seashores as well as plants and animals that live in the park. Likewise Section 16 prohibits individuals from holding, possessing, occupying, building, clearing or burning the forest, collecting or taking away materials that alter the natural resources, raising animals and altering water ways.

Section 4 of the 1964 National Forest Reserve Act also defines forests in the same way as the National Park Act. Additionally, Section 16 prohibits individuals from holding, possessing or residing on the land, as well as from clearing or burning the forest. It also forbids the collection or any form of alteration to the

natural resources. Any collections of wild products are prohibited, unless permission is obtained from a national park official (Forest Reserve Act 1964 section 15).

An additional Act that aims to protect the wildlife and prohibit hunting is the 1960 Wildlife Preservation and Protection Act (amended in 1992). Its Section 38 prohibits individuals from possessing land, as well as: clearing, burning, mining, graveling, soil-dredging, animal-raising, wild animal release, or water-way alteration activities.

This series of regulations have been enacted to prevent forest encroachment by humans and to conserve the remaining forest and wildlife, similar to the mainstream western philosophy of forest management. However, the historical reality is that many people of Thailand have been residing in the forest for generations. The enactment of these laws has increased the conflict between the government and the local people and cannot be easily resolved. This opposition affects the degradation of the natural resources both in the national park and the wildlife sanctuary due to increased encroachment of the local people into the forests.

Another government policy that has affected forest use practices relates to infrastructure development (Bello et al. 1998). The development of the country has urged the construction of basic utilities and infrastructure, such as roads, as well as electricity and telecommunication lines, all in order to stimulate economic growth and the development of the continuously increasing export-oriented industrial

agriculture. The easy access to the village has increased land acquisition by outsiders resulting in the expansion of more intensive monocropping production. This rapid transition has made it more difficult for local people to adapt, and may force them to further encroach on new areas of the forest.

1.1.2 General Background of the Study Area

The Kaengkrachan National Park is a protected area in southwestern Thailand, where the Karen and Karang hill tribes have established themselves in many locations. The study area, Phong-Luk village, is located at the north forest of Kaengkrachan National Park (figure 1-1). Since 1996, the village has been comprised of two communities: Ban Phong-Luk and Ban Bang-Kloy. The Karang comprise most of the villagers. They practice subsistence agriculture and have lived in the Kaengkrachan Forest for more than one hundred years. Their settlement area is located on the hillside that is also the primary watershed of the Phetchaburi River and its tributaries.

In 1981, the Kaengkrachan Forest was proclaimed a National Park. This protected area was created because of its existing vegetation and likelihood of successful preservation. This is in contrast to other areas of Thailand that have experienced widespread forest destruction. According to the national park policy, there are not certain measures to manage communities residing in the park, therefore, the policy is somewhat dependent on the situation; some communities

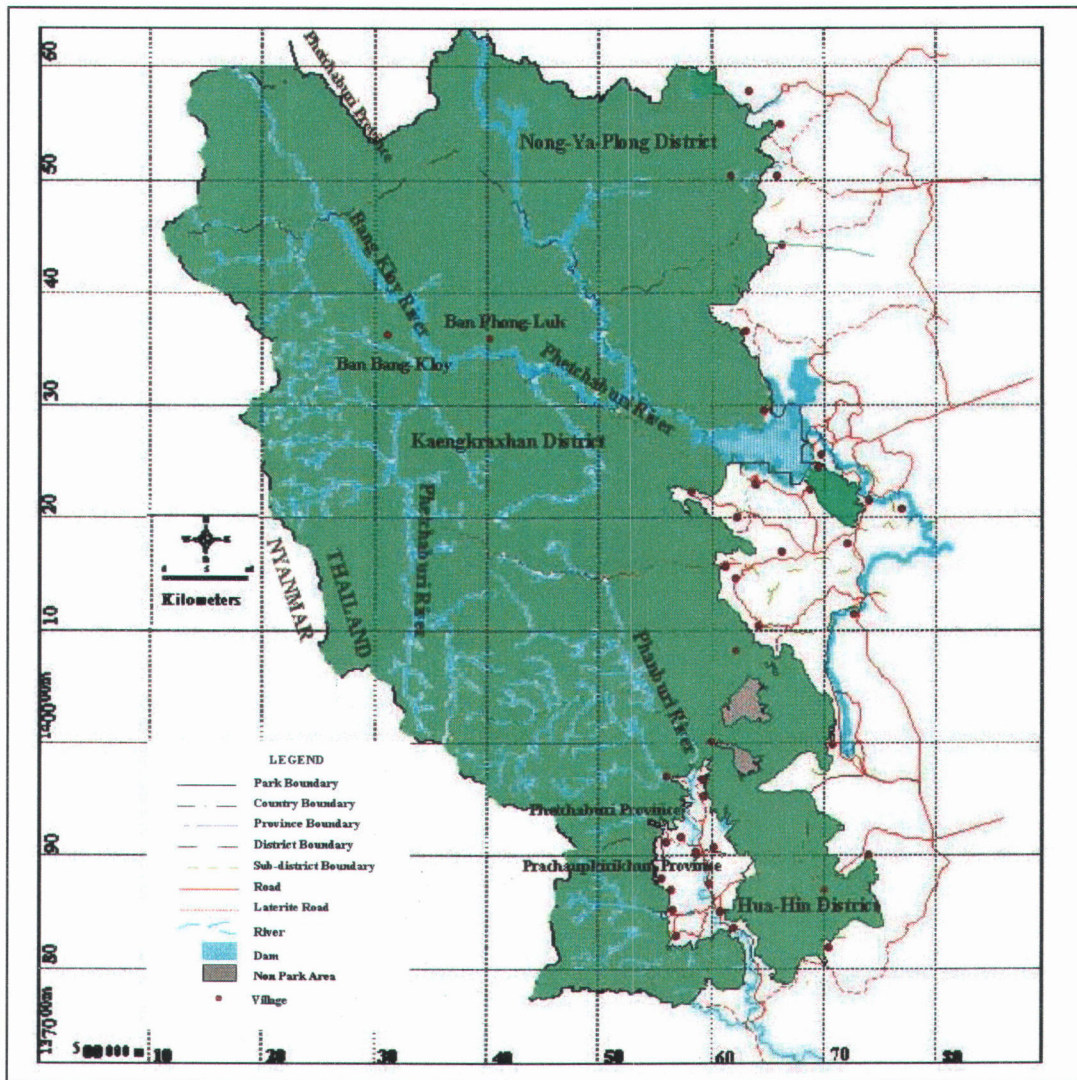


Figure 1-1 Area and Boundary of the Kaengkrachan National Park

have to be evacuated from the park and some have not. In the case of Phong-Luk, due to the long settlement history of the community in the area and the lack of policy of communities residing in the park, the community was allowed to reside in the park with the demarcation of the boundary of its settlement areas. At that time there was not much pressure on the forest, because population density was relatively low and much more land was still available. However, in 1996, the park manager relocated the Bang-Kloy tribe, which had been residing farther north in the park in the forest near the headwaters, to an area adjoining Phong-Luk village. The impact of the Bang-Kloy relocation is having more of an environmental impact than existing villagers. The increased population pressure on the land resulted in resource degradation patterns becoming more noticeable, and the park subsequently restricted the tribe's utilization of the land. The use of forested land has been limited as land becomes increasingly scarce. In the face of these limitations, the Karang, like other tribes, are forced to shorten the rotations of their agricultural production systems which has resulted in less sustainable use of land resources. With this new trajectory of resource limitation, the Karang must find alternatives for their agricultural production and wild product collection practices. This is especially true for particularly sensitive forest resources such as non-timber forest products and wildlife.

As mentioned by Goodland (1985: 24), "Rapid change increases social tension, in the case of tribal populations, the social resources that help tribal members manage and cope with change are limited. Unfamiliar concepts, values and roles

impose additional demands on the coping process of the tribal society.” To ensure their survival during these periods of rapid change, the tribe’s practices toward the environment might change. Examples of this change include encroaching on the forest for cultivation, settlement, firewood collection, wild product collection and hunting. Additionally, when they adopt a market system, their practices tend to be more destructive, as the purpose now is to make profits rather than ensure basic survival. This too, would cause the park’s natural resources to be drastically deteriorated.

When the Thai government became aware of the increased forest degradation resulting from limited access to land and increased restrictions, the government initiated a development program in the village to improve the tribe’s welfare. They attempted to enhance the tribe’s welfare by supporting the community’s living conditions through projects involving occupational promotion, the establishment of a learning center, as well as a primary health care center for the community. These projects are often not helpful to the people because they are inconsistent with the tribe’s ways of life. For example, the promotion of non-local chickens that are fed with special food to lay eggs has been unsuccessful. Because the Karang cannot afford the high price of that food, no eggs were laid and the chickens died when the food ran out. Similarly Goodland (1985) stated, these rural development projects often do not allow these target groups to deal with their resource use restrictions in a way that is most appropriate for their specific needs, and in this case do not allow enough time for the beneficiaries to adapt to these changes.

The development promoted for the tribe by the government has not improved the tribe's quality of life; rather, it has decreased the tribe's sense of identity and self-reliance (McCaskill 1997). This has weakened traditional cultures, and increased tension over the park's resources. An additional, underlying cause that jeopardizes the tribe's quality of life is the management systems of those government agencies, which discount the livelihood and history of the community. As Kampe (1997) argues, these agencies operate without a philosophy of respect for people's wisdom, culture, and traditional knowledge and do not encourage the full participation of the people. The government's assistance and support efforts in this area have been mostly discontinuous, out-of-focus and lack cooperation among the agencies involved (TISTR 1991). TISTR further states that each has its own policy and activities, which sometimes overlap or are even contradictory (1991). As a result, the agencies mainly prioritize their efforts for their own organizations' aims over the community's way of life and culture. This leads to the lack of the community's participation and to the increase of external dependency because villagers might not learn how to properly integrate and adopt the newly obtained knowledge.

“Researchers have recognized that among the hill dwellers, the Karen system of shifting cultivation is known to be environmentally sustainable as long as a sufficient amount of land remains fallow” (Sponsel 2000:145). This means that the Karen system is more conducive to non-expansive, sedentary lifestyles consistent with the traditional practice of highland rain-fed rice cultivation (Bello et al. 1998,

Sponsel 2000, and Minority Right Group International 1999). Because of this lifestyle, these ethnic tribes have been able to depend on the forest for a long period of time. They are considered a group of people whose ways of life and culture are in line and consistent with the natural environment. This local wisdom can and should be applied to development projects aiming to enhance living conditions in addition to the stability of the environment.

Concerned agencies have come to realize that the sustainable management of natural resources in the national parks and other protected areas cannot be accomplished successfully without taking into account the local people (Colchester 1994). Therefore, there is a need to respect their value systems and traditional practices counted as their local wisdom, and to understand their history, which forms the basis of their unique cultures. Resource management based on the knowledge and understanding of existing wisdom would increase people's capability to adapt to change successfully with their full participation (Korten 1987 and Goodland 1985). In addition, the promotion of a participation process of the local community must be done through the available learning networking in the community (Korten and Klauss 1984). This is in accordance with the philosophy of The Ninth Plan development vision framework of "the Wisdom Society," which indicates, "people should have a life-long commitment to the learning processes and be ready for change" (NESDB 2001). Adopting this concept in managing the Kaengkrachan National Park would help its natural resources be more successfully

conserved and rehabilitated with the fuller participation of the Karang tribe and would simultaneously help to maintain the tribe's way of life.

1.2 EXISTING VILLAGE SITUATION

Phong-Luk is a village of Thai Karen and Karang tribes that have subsisted in the Kaengkrachan forest for over one hundred years. The village is located at Huay Mae Preang Sub-district, Kaengkrachan District, Phetchaburi Province, which is approximately 35 kilometers from the Kaengkrachan dam and is just north of the Phetchaburi watershed (see Figure 1-1).

The village has a population of 84 families (Thailand Statistical Survey 2000), consisting of 2 communities, which are Ban Phong-Luk and Ban Bang-Kloy. The tribe of Ban Phong-Luk is the original settlement group with 44 families living in houses scattered along the south bank of Phetchaburi River. The newcomer is the tribe of Ban Bang-Kloy. The Bang-Kloy tribe used to live in the Kaengkrachan forest in the old Ban Bang-Kloy and Ban Jai-Pan-Din areas located at Bang-Kloy River, a branch of the Phetchaburi River watershed, closing at the border of Thailand and Myanmar (see Figure 1-1). The Bang-Kloy tribes have been relocated and have been settling down in Phong-Luk village since 1996. The Ban Bang-Kloy community is located along the north bank of the Phetchaburi River. There are 40 families living in Ban Bang-Kloy. The lay-out of the Phong-Luk village is shown in Figure 1-2.

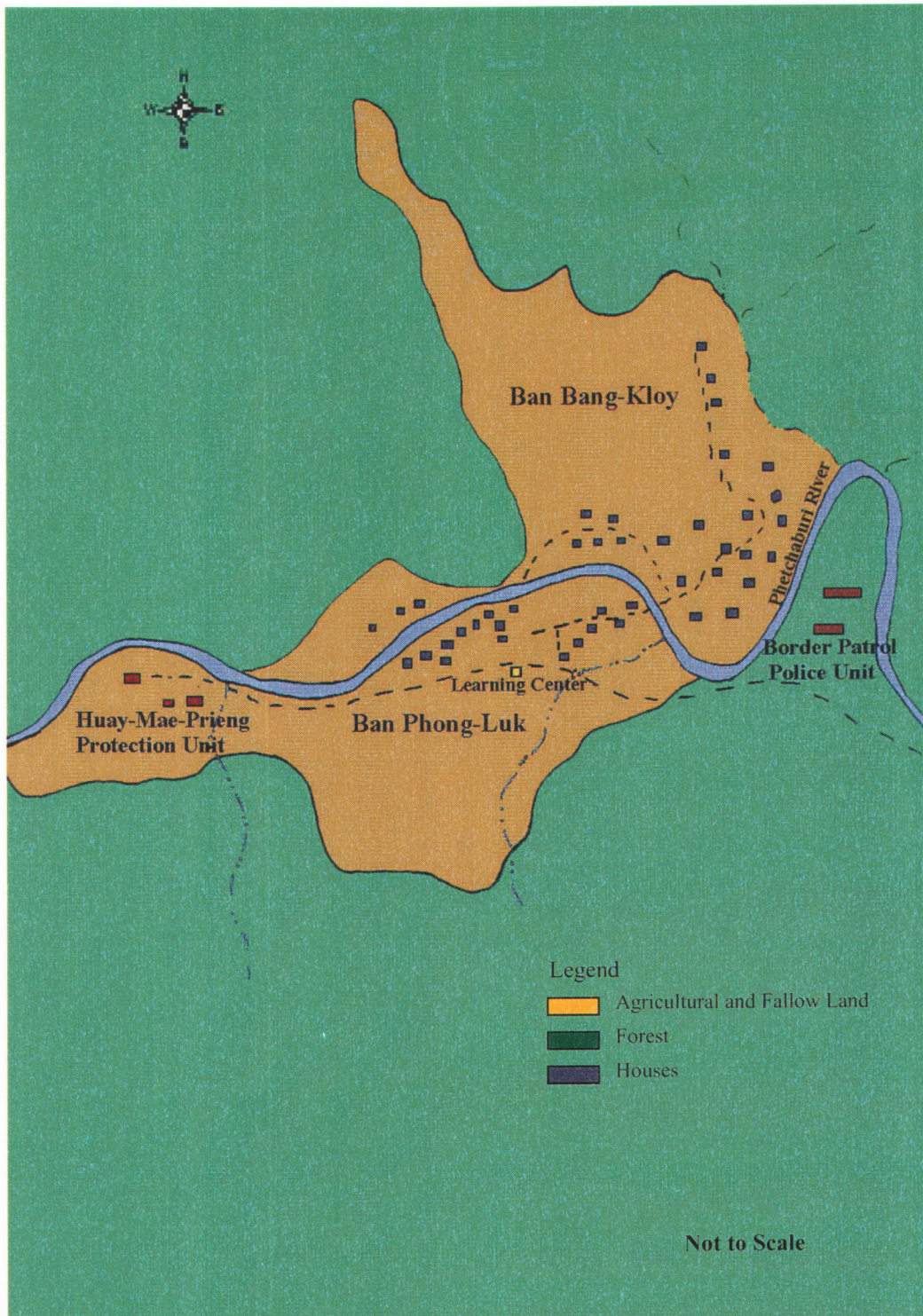


Figure 1-2 Lay-out of Phong-Luk Village

Generally, living conditions in Phong-Luk village are poor. According to the government criteria of poverty, the villagers are poor because their annual earnings are less than the government criteria. So, the village is under the Poverty Solving Project established by the Interior Department. For the Karang, poverty means that there is insufficient rice for year round consumption. This is particularly true for the newcomers, as the government cannot allocate land to all families. The families who have been granted land, have rights to reside on 1 rai of land (1ha = 6.25 rai) maximum, and to cultivate on 7 rai maximum. The tribe mainly makes their living by traditional, rotation rice farming. They also plant some fruit-trees and vegetables, which are supplemental foods, around their houses and on their farms. Fish and crustaceans caught from the river are their main protein diets. Clothes are from donations. Once in a while, the government and charity organizations distribute some goods. Because of the traditional amount of land needed is at least 15 rai for crop rotation, most villagers cannot adapt to those new land tenure arrangements, so they cannot make a sufficient living from the government granted land, especially enough rice yield for year round consumption. Some families, especially the ones who have no land or insufficient land for cultivation, seek work as wage-laborers at local lemon farms. However, their earnings are unsteady for this type of work. Hence, most of them still depend on wild product collection, hunting and squatting to clear the forest in new settlements farther in the forest.

Presently, the community's impact on forest resources has been slowed due to some tribal members incorporating home gardens with their subsistence systems.

This practice of cultivation increases self-sustaining subsistence living among the villagers. Forest impacts have also been reduced due to the park establishing the Huay-Mae-Sarieng protection unit, located in the Phong-Luk area, and a checkpoint at Khao-Ma-Rew. The protection from the destruction of natural resources within the park's boundary is the main purpose of protection units. The purpose of the checkpoint is to screen all people and check for illegal activities (e.g., harvesting forest products). The protection unit and the checkpoint is the main entrance for the villagers to gain contact with the outside. Due to the oversight activities of the protection units and checkpoints, the environmental impact of illegal activities on the park has been lessened, especially the felling of trees, hunting and wild product collecting.

1.3 EXISTING PROBLEMS

According to field research and interviews with key informants, problems of resource depletion, which are still persistent in the Kaengkrachan National Park, were identified. These problems are the result of pressure of the tribal community on the park's natural resources and the impact of the poorly conceived government welfare development program on the community. The underlying natural resource problems that will be explored in this thesis can be summarized as the following:

- 1) Illegal felling of trees and hunting in the national park: The tribes' houses are likely to be temporary, made mainly from bamboo and use woven grass (*Imperata cylindrica*) for roofs. Poles are made from small size woods with a

diameter of 5-7 inches such as *Afzelia xylocarpa* Roxb., *Alphonsea placrifolia* Craib., *Lagerstroemia* spp.). Houses made from these materials have to be repaired at least every 3-4 years. All areas managed by the community have been utilized for cultivation, and additional land utilization has been restricted by the park. Furthermore, there are no more forests to serve the communities. Hence, the tribes have to be sneaky in cutting down trees in the park for repairing their houses. Some families who do not grow rice have moved to grow lemons or to seek employment in the nearby lemon farms. This lifestyle still requires that they cut down the trees in the park for fuel wood for cooking purposes.

Subsistence hunting is a part of the tribes' traditional way of life, and more importantly, it is a major source of protein since they do not have enough earnings to buy meat from the outside. Only some families, particularly the leader groups, have begun to raise chickens or pigs for their households' ceremonies and consumption. However, some tribal members still hunt wild animals for their subsistence.

2) Collecting wild products in the national park: Most tribes spend their off-season in the forest collecting wild products, such as honey, mushrooms, rattan shoots and other vegetables, both for consumption as well as supplemental earnings for the household. In addition, the collection of high value plants, honey and fragrant woods, can provide them with a large amount of earnings compared to their earnings from other wild product collection.

3) Encroaching on the forest in the national park for highland rice farming: Most of the tribes in Phong-Luk village still make their living rotating rice plots. But the unavailability of land for the new families (only 7 rai for cultivation per family), as well as the restriction on land utilization, puts high pressure on the newcomer tribes of Bang-Kloy. Many newcomers cannot adapt to following the track promoted by the government. Hence, most of Ban Bang-Kloy tribes still encroach on the forest near their original residence for highland rice farming.

4) The promotion of inappropriate development programs for the tribal community by the government and other concerned agencies: The government development programs of Phong-Luk village are out-of-focus, both in policy and implementation. The government practices to date have done little to mitigate the problems, such as the allocation of land, and the promotion of different occupations and livelihoods. If this situation continues, it is expected that problems such as encroaching on the forest, wildlife hunting and wild product collecting will become more serious and will increase tension over the park's natural resources.

In summary, the above problems, if unchecked will consistently continue and will then affect the environmental conservation of the park. Therefore, to alleviate these problems, the developmental direction should support the actual process of adaptation of the tribal community. In other words, the development plan and associated projects for promoting and supporting the tribe's livelihood should be relevant to their ways of living, traditional cultures, knowledge and practices. This will help them to build up their capabilities to mobilize for change and to better

participate once they understand that the proposed development program is designed specifically for their needs. As mentioned by Sponsel (2000:105) "the promotion of the Karen traditional wisdom and culture is an alternative way of living to the up-coming market-oriented culture of the Thais."

The welfare programs would have negative impacts on Phong-Luk regardless of the relocation by Bang-Kloy. However, now both culture and natural resources are in danger due to government policies.

1.4 RATIONAL OF THE STUDY AND RESEARCH QUESTIONS

The traditional pattern of production, beliefs, customs, culture and ceremony of the Karang tribe are believed to be rooted in a wisdom that the community passes on from generation to generation. The tribe's wisdom is an important factor to understand for ensuring that their ways of living are in line with their co-existence with natural resources.

The Karang tribe of Phong-Luk village in Kaengkrachan National Park faces the same situation as other ethnic groups who reside in forested areas of Thailand. The government assumes that many tribal production patterns and ways of living cause deforestation, in spite of the fact that some ethnic tribes have been settled near, depended on, and have co-existed with these resources for a long time. The government has intervened by using its policy to freeze the resources and restrict the utilization of resources of the tribe. An additional intervention has been their welfare development promotion. This policy has caused the tribe's accumulated

wisdom to be ignored and eroded. As a result of this threat to their wisdom, the tribe is unable to adapt to social change and becomes a resource violator, especially in terms of forest destruction. According to an Office of Environmental Policy and Planning-funded project on The Establishment of a Master Plan for Kaengkrachan National Park conducted by the Thailand Institute of Scientific and Technological Research (TISTR), it has been found that the Karang tribe that resides in the park is important to the sustainable management of the natural resources in the park. Because the tribe's settlement is located at the vulnerable headwater, care has to be taken to see that no disturbance to this headwater occurs that would affect the lowland plains. Therefore, if all stakeholders (e.g., park management and development agencies) still overlook this issue and do not have any proper management approaches, the park's natural resources may be devastated in the long run. With regard to this issue, TISTR is interested in exploring the cultural aspects of this ethnic tribe and requested the researcher to conduct this study. Likewise, it is a good idea to provide this information to all involved stakeholders especially the park manager who acts as the administrator of the area while trying to coordinate activities around and understand this cultural problem. For these reasons, the study of the knowledge system and local wisdom of the tribal Karang community is important. Given the history of the people and the needs of the government, the following overall research question was developed:

“What does the Thai government need to know about local wisdom (e.g., cultural and environmental practices) in order to establish successful forest policies that are both relevant to local areas and environmentally sustainable?”

In order to address this all-inclusive research question, the following subset of questions were created:

- “What are the traditional tribal practices and ways of life?”
- “How have recent government policies (such as relocations, land restrictions, and development projects) affected traditional tribal ways of life?”
- “What are the environmental impacts that have resulted due to tribal members alteration of their traditional forest practices?”
- “Have government welfare practices been able to mitigate negative environmental and cultural impacts?”

1.5 OBJECTIVES OF THE STUDY

This qualitative research aims to explore the existing knowledge, beliefs, ways of living and culture of the Karang tribe at Phong-Luk village. The study will compile and organize key aspects of local wisdom and ways of living, which can be used to help the tribe to increase the ability to integrate past and current knowledge and to be in line with the environmental conservation and management agenda of the national park. To reach this goal and to address the study’s research questions, the following objectives emerged:

- 1) To collect data on the existing beliefs, customs, ways of life, and cultures of the Karang tribe of Phong-Luk village.

2) To analyze the key issues of local wisdom that are consistent with the conservation and management of the local natural resources and the environment.

3) To analyze the effects of the existing park policy and development promotion on the tribe, and the expected impact on the natural environment due to the shift in practices of the tribe.

4) To provide recommendations to stakeholders involved in the development of the tribal community, which will help the tribal community to develop in a way which is in line with the conservation and management priorities of the national park.

1.6 SCOPE AND FOCUS OF THE STUDY

1.6.1 Scope of the Study

The study area is that which contains the community of tribal Karang in Kaengkrachan National Park. The tribe's livelihood depends on the forest, and conversely, they greatly affect the management of the National Park. The community is Phong-Luk, which consists of Ban Bang-Kloy (village #1) and Ban Phong-Luk (village # 2). Both of these villages are located in Huay Mae Preang sub-district, Kaengkrachan district, Phetchaburi province. This area was chosen for study for the following reasons:

1) It is a Karang tribal community whose chronology indicates settlement in the lush forest at the Phetchaburi watershed occurring around 100 years ago.

2) The community has continued to use the traditional rice rotation and lifestyle patterns which are in line with natural resource conservation.

3) Thai people have begun to influence the community's production patterns, especially with regards to the introduction of lemon farming.

4) Phong-Luk land parcels were acquired and restricted by the government after the proclamation of Kaengkrachan National Park.

5) Phong-Luk villagers are one of several hill-tribes whose cultures and community structures are different from that of lowlanders; therefore, city-wide standards might not be appropriate to all areas of Thailand.

1.6.2 Focus of the Study

The study will focus on the tribe's livelihood pattern and production systems, which are key components of their conservation and sustainable use of natural resources. Their way of life centers around the partnership between humans and the natural world. This study emphasizes collecting information about their production practices, ceremonies, beliefs, and attitudes. The study also focuses on their beliefs about various spirits who protect the forest and nature. This will be done in order to analyze how much these beliefs influence people's minds and practices and the subsequent affects on the management of natural resources.

The practices of the villagers, such as hunting, wild product collection and production patterns will be analyzed in order to understand how this practice depends on the interaction between humans and natural resources.

1.7 EXPECTED RESULTS

As a result of this study, five expectations exist:

1) To know and understand the social conditions, culture and wisdom of the Karang tribe, which produces a knowledge system that is conducive to living in line with the environment.

2) To give stakeholders an approach to enhance the conveying of knowledge on resource management system which is in line with their production practices and original way of life within the Karang community

3) To inform stakeholders about the degree to which the lifestyles and production patterns of this study group are concordant with sustainable management of local resources and the environment.

4) To encourage the acceptance of local wisdom in development projects to promote more sustainable resource management. This might affect policy change for protected area management and other development projects in the area. In addition, it might relieve those persistent conflicts between the local people and park management in this region.

5) To alleviate the environmental impacts, (especially headwater degradation) which have occurred in the areas from the alteration of the tribe's practices.

2 A PROFILE OF THE KAENGRACHAN NATIONAL PARK

The detail of information is provided in order to help the readers to understand the context of the national park and its setting. In this chapter, the existing background information of the Kaengkrachan National Park is described in order to provide the setting of the park, its management and problems faced by the park and the background of the ethnic tribes scattering in and around the park. All information presented in this chapter was gathered during field study from my interviews of key informants: the park officials, development officials, and some ethnic tribes who reside in and around the national park, as well as my observations of the area and government documents.

2.1 GENERAL BACKGROUND OF THE KAENGRACHAN NATIONAL PARK

Kaengkrachan National Park is a protected area that was proclaimed a National Park on June 12, 1981, according to a cabinet resolution. Its total area is 1,821,687.84 Rai or 2,914.7 sq. kms, covering 1,790,687.84 Rai or 2,865.1 sq. kms. of land area and 31,000 Rai or 49.6 sq. kms. of reservoir (National Park Document 2001). Kaengkrachan is the largest national park in Thailand. Its boundary stretches from the districts of Nong-Ya-Plong, Kaengkrachan and Ta-Yang in Phetchaburi Province to the north; to the district of Hua-Hin in Prachauphikhun Province to the south. The north area covers the forests of Yan-Nam-Glad-Nou and Yang-Nam-Glad-Tai located respectively in Yang-Nam-Glad-Nou and Yang-Nam-Glad-Tai

sub-district in Nong-Ya-Plong district. The middle and the south area covers the forests of Kaengkrachan and Song-Pee-Nong sub-districts in Kaengkrachan district and at Klut-Luang sub-district in Tayang district and at Nong-Plub and Huay-Sat-Yai sub-districts in Hua-Hin district (National Park Document 2001).

Phong-Luk is a village consisting of the Karang and Karen tribes; the Karang tribe is in the majority. The tribe has been residing in the Kaengkrachan forest long before the forest was proclaimed a National Park in 1981. Most of Phong-Luk's villagers still retain some of their primitive ways of life in the form of rotational rice farming, subsistence wild product collecting and hunting. Due to a national park policy on restrictions of land utilization and the loss of access to the resources, the tribes' ways of life have suffered. In addition, the welfare development projects promoted by the government have exacerbated their declining livelihoods. These conditions disrupt the tribes' utilization patterns and often cause them to overexploit the natural resources. Therefore, the environment and natural resources of Kaengkrachan National Park will be devastated in the long run if a proper management concept is not developed and introduced to alleviate the problems.

2.1.1 Climate Condition

Kaengkrachan National Park is located in the central part of Thailand, so the three typical seasons of the area are "summer," "rainy," and "winter." Summer is the hottest period of the year. Summer starts in February and lasts until May. The maximum annual average temperature is 31.8 °C from March to April. The rainy

season starts in June and goes until October with an annual rainfall range from 900 to 1,250 mm; the peak rain period is in June and August. The cool weather of winter begins in November and lasts until January. The period of lowest annual temperature is 24.1°C from November to December.

2.1.2 Geography

Kaengkrachan National Park is located along the Tanaowasri Ridge on the west border of the country, which forms a natural border between Thailand and Myanmar. For the most part, the area is covered in highly complex mountains; the highest peak is called Pa-Nouen-Tung and is 1,207 m above mean sea level. Generally, the park's terrain is characterized by steeply sloped mountains, with slopes of 10-30% occupying 40% of its total area. The rest of the area is covered in slopes of more than 30% (Royal Thai Survey Department 1993).

With its highly complex mountain ridges, the park is a vital watershed for the Phetchaburi and Pranburi Rivers. These rivers are the main sources of water supplying the Phetchaburi and Pranburi multipurpose dams. The dams generate electricity and allocate water for irrigation, which are important to the socio-economic status of the urbanite plains of Phetchaburi and Prachuapkirikhun Provinces.

2.1.3 Natural Resources

The complex high mountain geography of the park is not only the source of the watersheds, but also retains the lush forest cover. The five different types of forest cover present are evergreen forest, dry evergreen forest, hill evergreen forest, dry deciduous forest and deciduous-dipterocarp forest. These forests are fertile and are habitats of a diverse variety of wildlife, many of which are the rare and endangered species of the country. The boundary of the park's forestland is connected to other forests; the west border connects to the forest in the south of Myanmar, the north border connects to the western forests of Karnchanaburi Province, and the south border stretches to the Phuket Ridge. These connections keep the park's areas rich in biodiversity. In addition, the intermigration of wildlife among these forests creates an additional level of genetic diversity within the park.

A 1991 study describing land-use classifications in the park by Thailand Institute of Scientific and Technological Research (TISTR) indicated that 95.85 % of the total area was covered with forests and the remaining 4.15% was agricultural and fallow lands (TISTR Final Report 1991). These agricultural lands, converted by the villagers into rice farms, fruit-tree plantations and lemon farms, were found in the south and the east sections of the park. The small patches of fallow lands were scattered along both sides of the banks of Pethchaburi and Bang-Kloy rivers. The TISTR study also describes the conversion of forests to agricultural land, and how this has tended to increase due to the encroaching villagers residing both in and surrounding the national park.

2.1.4 The Management of the National Park

The park manager, the highest administrative position, is the formal administrator and manager of the park. The administrative organization of the park is divided into five units depending on responsibilities and the available personnel. The five units are the administration unit, the protection unit, the technical and recreation unit, the construction and maintenance unit and the special activity unit. There are a total of 259 personnel in these 5 units. Of these positions, 5 are government officers, 12 are permanent employees and 242 are temporary employees.

The main objectives of the park are to protect the natural condition of the forested areas and the headwaters. Protection units have been established in order to undertake the responsibility of the patrolling, prevention and arrestment of illegal collection of wild products, hunting and deforestation in the park. Presently, nineteen protection units are scattered over the entire park. In addition, tourism and recreation are promoted because of the diverse natural beauty of the park, in the form of waterfalls, caves, cliffs, various precious woods and the wildlife habitats of rare and endangered species.

The park also offers a variety of tourism adventures, such as biking, trekking, bird and butterfly watching, boating, and rafting. The Pra-Nuen-Tung peak and Tor-Tip waterfall are the park's main tourist attractions. Other important attractions include the famous Pa-La-Ou waterfall in the south of the Park at Hua-Hin district, as well as the hot spring in Nong-Ya-Plong district in the north. The center of the

park contains the main office, the tourist information center, the reservoir and accommodations in the form of cabins and fields for tents (National Park Information Center 2001)

2.1.5 Problems Facing the National Park

The information on the problems faced by the Kaengkrachan National Park, which are described below come from my interviews with the park officials and key informants during my field survey period.

1) The villagers have encroached on the forest and converted parts of it to agricultural and settlement areas. This process began before the area was proclaimed a National Park in 1981, especially in the area surrounding the Kaengkrachan Reservoir and the inner forest near the creeks and streams. These villagers were both Thai lowlanders and hill tribes residing deep in the forest valleys. The encroachment on forestland in the park's boundary has been slowing due to an increase in effective performance of the park officials and the polices. However, the existing management of the park cannot definitely govern the land utilization and land change lead by human activities at a rate sufficient for long-term control, which directly affects the park's natural environment. Therefore, in order to alleviate deforestation, the park has to cooperate with many concerned stakeholders and requires the participation of local people to take care of the local natural resources.

2) Illegal logging and hunting mainly occurs in the deep forests near the central and southern sections of the park at Kaengkrachan District in Phetchaburi Province, and at Hua-Hin District in Prachaupkirikhun Province. Most often, the culprits are Thai lowlanders who are supported by local influential groups such as local government officials and local politicians. The park has continually protected the area and quelled misuse, but the problems still persist. Illegal hunting occurs all over the park; the hunters are both Thai lowlanders and the hill tribe. Currently, wildlife tends to be hunted for trading due to the high demands of a lucrative, high consumption market, which causes the price of wildlife to go up. It is rather difficult to stop people from hunting because they usually are grouped in small bands, hunting in deep forests. The hunted wildlife are butchered in the park and carried out.

3) Concerned agencies lack unity and support among themselves in working with local people, which has caused a lack of cooperation between these groups. All those concerned mainly adhere to their own policies and benefits, and they will not cooperate if any activities affect or obstruct their operations. For example, the park wants to move the people out of the forest while at the same time, an agricultural agency tries to promote monocropping in the same location. This leads to the expansion of landuse for cultivation and further encroachment on the new forest, going counter to the objectives of the park.

4) According to the park manager, most villagers who reside around the park's boundary do not realize the value and the importance of the forest and do not

participate in conservation. Likewise, the tribe becomes the invaders of the forest and sometimes other local capitalists hire them to encroach on the forest. After the villagers occupy the encroached lands in these border situations, they sell the capitalists these areas of land.

5) The lack of personnel, instruments and facilities to take care of the park is still another problem resulting in the inability to thoroughly protect the park's natural resource.

6) There is also a ripple-effect from the development of surrounding lands on the management of the park. This is particularly true for the larger area of agricultural production that has over-utilized the natural resources for trading. Examples include the promotion of monocropping systems, as well as lemon and pineapple farming.

2.2 BACKGROUND OF THE ETHNIC TRIBES RESIDING IN AND AROUND THE NATIONAL PARK

2.2.1 History of the Ethnic Tribes

Generally, Karen people that reside in central Thailand in the provinces of Kamchanaburi, Ratchaburi, Phetchaburi and part of Prachaupkirikhun in the Districts of Kuiburi, Muang and Hua-Hin have previously lived in southern Myanmar or Mon near the Thai border. The ethnic Karen had a long history of residing in the lowland of Myanmar and still lived in the lowland of Phetchaburi after migrating to Thailand. Due to a preference for solitude, the tribe had to move

to the hills and valleys, which currently are the location of the Kaengkrachan National Park, in order to be away from the intrusion of Thai lowlanders. Some Karen tribe of Phetchaburi and Prachaupkirikhun provinces often call themselves “Karang.” The dressing customs and livings of central Karen are different from that of the northern Karen. Among the central Karen and Karang, the Karang have a few differences in their language and rituals from the larger Karen group, however both tribes can communicate with each other.

The lowlanders, the Karang tribe, once lived in southern Myanmar, or the Mon Territory. They moved from Myanmar to settle down on the plateau of Phetchaburi Province over the last few centuries. According to the need for solidarity among the Karang tribe, they prefer not to mix with other ethnic groups. During this period of establishment, they had to move away repeatedly from the Thai lowlanders, finally settling down in the valley in deep forests, which currently are in the Kaengkrachan National Park.

2.2.2 The Tribe’s Settlement Pattern and Livelihood

2.2.2.1 The Tribal Communities Residing in the National Park

There are both Karang and Karen tribes scattered in and around the Kaengkrachan National Park. The total number of tribal population in the park is 290 families. Most of the Karang and Karen tribes that reside in the park generally settle down in the valleys in the deep forest at elevations lower than 1,000 m above mean sea level. These tribes prefer to live in locations with creeks or streams

flowing through the village. Hence, they prefer to permanently settle down in certain locations in fertile land such as the site of Phong-Luk village.

The tribal houses are scattered along the riverbank. Usually three to four houses in an area are grouped according to kinship. Around each house, a small garden with vegetables and a variety of fruit trees, such as banana, papaya, jackfruit and mango is grown.

The Karang still mainly depend on agricultural production, especially in the form of traditional rotation rice farms with mixed cropping. This traditional cultivation relies heavily on natural processes. Though the use of land is restricted by its scarcity and the park's regulations, the tribe still utilizes the rotational technique by borrowing land from neighbors who at certain times have much land and do not make use of their parcels.

Usually, their settlements are located in the deep forest and are difficult to access. This causes most tribal members to retain their traditional ways of life and to depend on the forest resources in the area. The community accumulates its knowledge and passes it on to the members within the villages. Some basic welfare services, such as those provided by the learning center and the primary health care center, are provided by the government.

Subsistence farming is negatively affected by government-imposed land limitations. Some tribal members have started to plant other commercial crops, such as lemon and castor bean, while others seek employment in the nearby lemon farms, especially during the agricultural off season. Due to insufficient rice crops,

some of the tribe people need to purchase food and other goods, while some people are beginning to spend money for some extra items.

2.2.2.2 The Tribal Communities Residing Around the Boundary of the National Park

Most Karen and Karang tribes that are presently residing around the national park's boundary used to live in the forest within the national park. The tribes have been evacuated and granted land around the park's boundary after it was proclaimed a protected area. The examples of boundary settlements are the villages of Ban-Song-Pee-Nong, Ban-Ta-Ling-Lom, Ban-Pa-La-Ou, Ban-Lin-Chang, and Ban-Pu-Pru. The tribes that have resettled in these villages have the same settlement patterns as their neighbors, the Thai lowland villagers. The layouts of these villages are designed in the same pattern as Thai villages. Most houses are permanent and appear tidy. They are established in rows with a more formal infrastructure such as electricity, tap water and roads constructed of either laterite or pavement, providing vehicular access to every house. Basic utilities and services such as roads, electricity, primary health centers and schools, are provided by the government. A water supply is provided only in some villages. Usually the villagers get water from rivers or rain. In addition, temples are found in all villages.

The communication between tribal villages and outsiders is very easy because of the convenient transportation, so the tribal communities sometimes inter-marry with other Thai villagers, sometimes from other regions of the country. Through this process, the culture of these tribes has been transformed into a multi-ethnic

one. Due to the convenient access to their villages, the tribes are also influenced by a large amount of development projects promoted by the government as well as by the Thai lowlander capitalists. Bombarded by development, the tribes have changed their ways of life in order to be modernized like other Thai urban cultures. In addition, the markets and cash crops have had a large influence on them. The ways of life of the tribe residing around the park, both for teenagers and the middle aged, depend more on cash for consumption than on a subsistence system. They prefer to plant monocrops like lemons than to grow traditional rice farms with intercropping. It is true that monocropping requires a large amount of capital investments for inputs such as fertilizer and insecticides. The tribes that engage in lemon farming commonly have to sell their granted land to the capitalists and find employment in nearby lemon farms after a number of years because they cannot afford the high investments. Some tribes migrate some distances from their villages in order to get jobs in various industries, while other people who have not had any opportunities of this type, return to encroach on the forest in the national park.

2.2.3 Development Encouraged by the Government

The government encourages the development of the Karang and Karen tribes to ensure their stable settlement. In so doing, the government has the ability to control some of their behaviors, ways of life and livelihood. This 'encouragement' by the government can so far be identified as the following:

1) The allocation of land to ensure the permanent settlement of the granted land so that the government can more easily control the tribe.

2) The issuance of individual or private land grants in order to encourage the tribe to make lasting and intensive use of land. This intention seems to go against the traditional agricultural practices of the tribes.

3) The provision of basic utilities by the government, such as roads, schools, primary health services and occupational promotion has changed the tribes' attitudes and practices. They have started to convert their subsistence rice farming to a cash production system of monocropping, such as pineapple and lemon farms. This change has forced them to be more dependent on outside resource to support monocropping.

2.2.4 Summarization of the Overall Existing Situation of the Tribes

Most of the tribal communities residing around the national park's boundary have entirely changed their ways of life from a subsistence system to one based on cash-dependency. This change came from the rapid development that has poured into their communities. The tribes' values have been changed, particularly those of the newer generations as they often forget or ignore their traditional culture. All of these processes have caused the traditional subsistence rice farms to be abandoned with the subsequent sale of their land to either other Thai villagers or the lemon farm capitalists. The landless tribes then seek employment, or in some cases, they return to encroach on the forest in the park yet another time to find new land.

For those tribes residing in the national park, the trespassing on the new forest has happened with the relocated landless tribe, due in part to the insufficient production yields of rice for year-round food consumption. Overall scarcities of land, as well as many restrictions on these granted parcels of land have shortened the periods of time the land can lay fallow and has made rotating farms difficult. This being the case, it is has become more and more necessary for them to have some cash, especially to buy rice. Finally, some of the better-off tribal families prefer to grow some cash crops, such as castor bean and lemons, on their available land. The poor, especially the landless families, then seek employment in these nearby lemon farms.

3 LITERATURE REVIEW

The purpose of this literature review is to provide background information and discuss previous studies that help elucidate key concepts related to this study. This review was conducted in order to guide the researcher to set up the scope of the study.

The term “indigenous knowledge” carries the implications of “native peoples’ ideas and beliefs.” The term “local wisdom” is widely accepted in Thailand as the wisdom of local people, regardless of whether they are indigenous to a given area. They have developed knowledge and understandings of their surroundings based on their experiences and close observations. In this thesis, I prefer to use the term “local wisdom” rather than “local or indigenous knowledge.” Because the terms indigenous and local knowledge have become standardized and are used in a substantial number of publications, they both are frequently inter-changeable with local wisdom in this thesis.

3.1 INTRODUCTION

Due to steady threats to the viability of the natural environment and environmental resources, the building of a sustainable environment and society that are in harmony with nature has been increasingly recognized. Many studies reveal that local people have invented and deployed various techniques to conserve the natural resources and its biodiversity (Gadgil, Berkes and Folke 1993). Likewise, “it is increasingly acknowledged by anthropology that other people have their own

effective science and resource use practices. To assist them we need to understand something about and pay attention to their perceptions, knowledge and management systems” (Atte 1992, Barrow 1992, Morrison, Geraghty and Crowl 1994, quoted in Sillitoe 1998: 223). Many believe that the livelihoods and natural resources of local people will be sustained if they manage their local resources through the employment of local knowledge based on their strengths and capabilities (Goodland 1985). Thus, the self-sustained communities are in a position to retain, or at least reclaim, their autonomy. As a result, they can define their own future, which helps communities create a vision of the future based on their strengths, which helps the outsiders to understand and to communicate with them (Warren 1989, and Warren and Rajasekaran 1993). Indigenous knowledge is important because it finds the best solution that fits with the locality, a given culture, and society (Warren and Rajasekaran 1993, and Hausler 1995). Understanding the successful ways in which people have dealt with their environments encourages participation of local people (Warren 1989). Therefore, the development initiatives that recognize these traditional ways can help to generate sustainable interventions because they are acceptable to local people.

Local knowledge is recognized as an invaluable resource which has a potentiality for maintaining resource quality (Warren 1991 and Buttimer et al. 1991). Studies on local knowledge have become increasingly important to global conservation initiatives and sustainable use of resources (Rajasekaran and Warren 1995). The significance of indigenous knowledge for sustainable development was

recognized in *Our Common Future* in 1987, in the Brundtland Commission's Report, and at the Earth Summit in Rio de Janeiro in 1992. In addition, indigenous knowledge is also conceived in the Agenda 21 documents of the United Nations and International Convention on Biodiversity (Davies and Ebbe 1993).

Indigenous knowledge has emerged as a new approach to overcome environmental problems. It offers a new conceptual dimension to the relationship between humans and the environment. Gadgil, Berkes and Folke (1993: 151) indicated that within the indigenous knowledge system, "human is viewed as a part of the natural world and a belief system stressing respect for the rest of the natural world." This respect creates the ethic which plays an important role in determining the utilization of the resources (Deb and Malhotra 2001). Recent studies of local wisdom examine the social dimension of the concept that suggests indigenous people that live in their local environments for life have the ideas and the practices towards environments different from that of the western world. This literature suggests that the practices and knowledge of indigenous people help them live in harmony with nature by maintaining the balance between humans and their environments. In addition, the study of local knowledge has helped to change the negative attitudes toward shifting cultivation—the primitive agricultural system of local people in many countries which is characterized by "a rotation of fields between relatively short periods of cropping (generally one to two years) and longer fallow periods, sometimes up to twenty years or more (Watters 1964 quoted in Peters and Neuenschwander 1988: 1)." Examples are the studies of Kunstadter,

et al. (1978) and Peters and Neuenschwander (1988) that have contributed to the understanding of shifting cultivation practice. In addition, the studies suggest that this agricultural practice is fundamentally in line with genetic diversity of crops and the circulation of nutrients in tropical ecosystem.

In conclusion, the current studies of local wisdom provide two main expectations. First, the new approach for social development will be provided which is basically based on the acceptance of ways of life and cultural diversity of local people. Consequently, local people will be relieved from the government's control and external influences by taking into account their local wisdom in any social developments. Second, the studies provide a new approach to remedy the natural resource crisis through the studying of local people's experiences and the accepting of their ecological values as well as incorporating their experiences and values in the process of natural resource conservation of the society. This consideration will encourage the participation of local people in conservation projects. Therefore, incorporating local wisdom into development projects can contribute to local empowerment and can provide valuable input for alternative natural resource management strategies to overcome the resources depletion.

3.2 DEFINITION OF LOCAL WISDOM

The term "Local Wisdom" is not used in Western studies, generally the term "indigenous knowledge" is most accepted. The term "indigenous knowledge" sometimes refers to the knowledge possessed by the original inhabitants of an area,

the term "local knowledge" is a broader term, which refers to the knowledge of any people who have lived in an area regardless of whether they are indigenous to the area or not. Literature in related fields uses various terms interchangeably to designate the concept of "indigenous knowledge," "local knowledge," "traditional knowledge," "traditional ecological knowledge," "traditional ecological knowledge and management systems," "community knowledge," "rural peoples' knowledge" and "farmers' knowledge." These terms often refer to similar characteristics (e.g., Howes and Chambers 1979, Reijntjes et al. 1992, Warren 1992, Mathias 1994, Roach 1994, Agrawal 1995, and Lawas and Luning 1997). Although there is a range and variety of definitions of local or indigenous knowledge, the followings are general meanings defined by different western authors.

Warren, the Director of Center for Indigenous Knowledge for Agriculture and Rural Development at Iowa State University, defines the term indigenous knowledge as "local knowledge that is unique to a given culture or society. It is the systematic body of knowledge acquired by local people through the accumulation of experiences, informal experiments, and intimate understanding of the environment in a given culture" (1989: 1), and shapes how local peoples relate to their environments (Fals 1981, and Gadgil, Berkes and Folk 1993). In addition, local knowledge also presents the dynamic character, as it is developed through time (Inglis 1993), integrates with modern technologies (Haverkort 1994) and has been passed on for generations (Lawas and Luning 1997).

A variety of similar definitions have also been proposed for local knowledge systems as mentioned by Johnson 1992, Wavey 1993, Berkes 1993, McCorkle 1994, Quiroz 1996, and Berkes and Henley 1997. "Local knowledge" therefore, seems a useful term to cover the whole, comprising the often extremely detailed and intricate knowledge of local specialists, sub-groups and the community.

Local knowledge is all knowledge and practices, whether explicit or implicit, used in the management of socio-economic and ecological facets of life. It includes the cultural norms, social roles, or physical conditions and is a collective property of a society obtained from past experiences and observation and is transmitted through generations. Examples include knowledge about the use of specific plants, cultivating and harvesting practices and identification of medicinal properties of plants.

According to the above definitions, local knowledge—the product of the direct experience of nature and its relationship with the social world—is used by local people to sustain their livelihoods and their natural surroundings concurrently in a particular environment. Because of its local-specific character, local knowledge is opposite to the knowledge generated within the international system of universities and research institutes (<http://www.nuffic.nl/ik-pages/about-ik.html>). In addition, it is dynamic, changing through contact with other local and international knowledge systems as well as through indigenous mechanisms of creativity and innovativeness (Warren 1991).

Local knowledge may appear simple to outsiders but it represents mechanisms to ensure self-reliance of local people. This is because the knowledge informs them of their own situations, their resources, what works and does not work, and how one change might have an impact on other parts of a given system. Therefore, it meets the needs of local people and the quality and quantity of available resources (Pretty and Sandbrook 1991).

Even though local knowledge has a locality-specific character, this knowledge, the cultural expression, can also be transferred and help facilitate people in adapting to new environments.

In the case of Thailand, "local wisdom" or "Thai wisdom" substitutes for the term "indigenous knowledge." The word local wisdom defined by Kaewdang (1992: 1) means "the body of knowledge, abilities, and skills of Thai people accumulated through many years of experience, learning, development, and transmission." He further explained that this wisdom has helped local people to solve their problems and contributed to the development of people's way of life in accordance with the changing times and environments (Kaewdang 2000). Another Thai educator, Srisala, (1999: 1) stated,

"Thai wisdom means the body of knowledge, ability, outstanding value and skills of the Thais inherited from experiences that are respectively preserved and transmitted through generations. Thai wisdom is accumulated as a common asset of the nation to help younger generations solving problem, improving their quality of lives and at the same time, creating the appropriate balance between their way of lives and their environments (Srisala1999:1)."

In conclusion, the concept of “local wisdom” for the purpose of this study is defined by the researcher as all knowledge and practices of local people achieved from their cultural ways of living--the production system, the social relationship system and the belief system, which are in line with the natural environment and are conveyed through generations. Therefore, the culture-based wisdom, which is “embedded in culturally-based value systems, systems of production and consumption and ways of living and relating to the natural environment is emphasized in this study.

3.3 EVOLUTION OF THE STUDY OF INDIGENOUS OR LOCAL KNOWLEDGE

“The study of local or indigenous knowledge has received increasing attention by researchers, especially those involved in sustainable management” (Winklerprins 1999: 151). Decisions made by subsistence societies are recognized as significant in maintaining sustainable practices, and therefore co-management with local resource managers based on local environmental knowledge has emerged as a topic worthy of consideration (Chambers 1993, and Blaikie and Brookfield 1987). Various fields of studies on local knowledge and its development have been carried out (e.g., Brokensha, Warren, and Werner 1980, Howes 1980, Kante and Defoer 1994, Kidd and Phillips-Howard 1992, Waren, Silkkerveer, and Titilola 1989, and Warren, Silkkerveer, and Brokensha 1995).

The study of indigenous or local knowledge has been developed for five decades and there is much information regarding it all over the world. As Warren

(1989: 1) noted, "each society has a variety of type of knowledge system, some deal with the natural and physical environment (local soil taxonomies), or cognitive and ideational environment (value system) or social environment (kinship system). However, each is inter-related." Generally, the research related to local knowledge showed the success of local communities in sustaining their livelihoods and concurrently conserving or sustaining natural resources and environments. The indigenous knowledge studies were about the varieties of knowledge of local communities such as medicine, agriculture, forestry, soil, land-use, horticulture, botany, zoology, agroforestry, fisheries, ecology, agroecology, economic botany, wildlife management, aquaculture, animal science, soil science, and hydrology.

Although the literature on local or indigenous knowledge is varied and dispersed, Sillitoe (1998:224) mentioned that "there are two groups of literature involved the evolution of the indigenous or local knowledge study perspective, one academic and the other development-focused." A further distinction of indigenous knowledge in academia occurs in two broad areas: ethnoscience and human ecology (Sillitoe 1998). Steward and Murphy (1977) mentioned that the study of human ecology focus at the interaction between humans and their environments. It indicates either the adaptation of humans to the environment or the modification of the environment and resource according to the need of the humans. In addition, cultural ecology also identifies the adaptation of community within the limitation of economic, social, political and physical and biological ecosystem.

The ethnoscience approach does not specifically focus on natural resource management but places more emphasis on a particular community and its resource utilization, as it is the factor related to the production, which is the foundation of the livelihood of local people. Using ethnographic methodology, anthropologists have included the descriptions of ways of life, beliefs and the practices of local people towards their environments. Although this type of study is quite detailed, its limited scope reduces utility for other researchers (Winklerprins 1999).

A further distinction within development-focused research also exists, forming two broad approaches: farming system and participatory development (Sillitoe 1998). Development-oriented studies are more utilitarian and move from the purely descriptive and correlative approach toward incorporating local knowledge into development issues. The information offered by these studies illustrates the richness of local resource knowledge in different environments and emphasizes the need for officials to utilize local knowledge as a way of increasing the people's participation and sustainable utilization. This type of research is very useful and illustrates how local knowledge can be used as a tool for sustainable management.

In conclusion, there are two schools of thought about local wisdom: the study of the knowledge based and of the application based or development-focus. The study of local wisdom on application based is more important nowadays because of its benefits to the relief of environmental degradation crisis. Given the sustainable natural resource management emphasis of my study, the approach used is the

development-focus as it centers around the application of obtained local wisdom to cooperate with the conservation goal of the national park.

3.4 LOCALWISDOM STUDY IN THAI CONTEXT

The literature related to local wisdom in Thailand is concentrated in the north. The studies are based on community-based natural resource management. The recent studies can be categorized into four areas according to the specific interest (Ganjanapan 2001).

1) The research related to data collection and classification of the relationship between community and nature. This research emphasizes the descriptive information rather than analyzing the obtained information, because it aims to collect only the details of all aspects of the data.

2) The research related to the relationship between the agricultural community and its surrounding ecosystem. This research emphasizes natural resource management systems and social relationships in managing and utilizing the natural resources in diverse ecosystems and environments. It identifies the organization, management and the cooperation within local organizations; the establishment of regulations; and taboos to manage and mitigate the conflict in resource utilization. Additional research explores the use of local knowledge in the management of community forest of Karen community in northern Thailand (Chuchart 1993, Panichcharoen 1993, Pornchai 1996, and Luangaramsri 1996)

The interesting aspect of these studies is the focus on local natural resource management systems either through forestry or irrigation. The studies reflect the wisdom of local people in their use of natural resources for subsistence. The findings indicate a need for locality-specific information, because the natural management systems of local people are diverse. Thus, local resource management depends on the livelihood patterns of local people and specific characteristics of the local ecosystem such as the different management of forests between lowland farming and highland farming communities. In addition, the different farming systems of local people also cause them to view forests differently. However, they have the same objective in keeping the balance of the ecosystem for long term utilization. This type of research shows that effective rules and social norms, which are accepted and applied in the community, can manage and take care of natural resources according to a community's guidelines. These local rules and norms are effective management and require no government regulation.

3) Research related to the economic systems of subsistent production of the highlanders or forest dwellers focuses on swidden agriculture or the shifting cultivation of ethnic groups residing in the highland of northern Thailand. These studies try to analyze the relationship in utilizing land and forest resources by traditional agricultural practices. The study of traditional swidden agriculture in highland areas has been extensively studied in ethnic people in many countries. In the context of Thai society, this type of study is limited. A study of particular interest is the book, Farmers in the forest: economic development and marginal

agriculture in northern Thailand edited by Peter Kunstadter, E. C. Chapman and Sanga Sabhasri in 1978. The book provides information about shifting cultivation of Karen and Lua in northern Thailand. The study by Kunstadter et al. provides an understanding of the traditional highland agriculture, as it pointed out the value of soil and environmental conservation of this traditional agricultural system.

Research regarding cultural communities does not directly emphasize ecological knowledge, but studies the local wisdom as a cultural inheritance. These studies can reveal the relationship between humans and their environments. Mentioned by Vechpitak (1990 cited in Panicharoen), the cultural way of life creates the inter-relationships between humans and their environments which can be categorized into 3 dimensions—the relationship between human-human, between human-nature and between human-superstition—as the followings:

1) Human-human relationship: It is a relationship within a family, the kin and among the neighbors. These relationships build support among one another.

2) Human-nature relationship: This connection comes from the dependence of humans on nature. This reliance helps humans to develop their ability to survive in their surrounding environment.

3) Human-superstition relationship: This relationship represents the sacred symbols of nature that can be good or be harmful to humans. This relationship is constructed through the experience of living and working in a given natural environment. It is the belief that humans wish to be safe, and hope that the sacred power can protect them if they keep good practices toward nature.

These relationships indicate the potential of humans to be in harmony with nature since the human-nature relationship is established to assist humans to survive their encounters with nature.

The nature-reliant character of the people has been developed to be the culture of beliefs, ethics, customs and taboos etc. toward nature. Those cultures symbolize the superstition, which construct the link between natural events and the spirits (Woodley 1991). It is true especially in the agricultural community that their subsistence always depends on their local environment.

This supernatural symbolism is embodied in the practices of the community towards natural surroundings with respect to and in harmony with nature (Deb and Malhotra 2001). Hence, the respect plays a vital role in regulating the significance of the elements of the natural resources (Deb and Malhotra 2001). Consequently, this respect-based superstition guides the ecological knowledge which is an important historical foundation of the subsistence agricultural community's cultural way of life (Luangaramsri 1996, Woodley 1991, and Deb and Malhotra 2001). This subsequent ecological knowledge is undermined and is not found by the western science and market-oriented culture (Luangaramsri 1996, and Deb and Malhotra 2001). This cultural community research also lacks the analysis of the ceremonial beliefs that are related to resource management (Luangaramsri 1996). As a result, the clear picture on the harmonious relationship between the community and the nature--in terms of production practice and ways of living--is not documented.

3.5 RELATED STUDIES

A comprehensive literature review related to indigenous knowledge can be summarized into four styles. These four areas are listed in the book, The cultural dimension of development edited by Warren, Slikkerveer and Brokensha (1995). The first styles are the studies of indigenous knowledge systems, which focuses only on the collection of knowledge information in various arenas such as botanical knowledge, medicinal plants, local soil knowledge, agriculture and agro-forestry. The second styles are the studies of how the knowledge is used in decision-making. The third styles are the roles that indigenous organizations play in the decision-making process. These studies demonstrate that by working with and through existing organizations, the development can be greatly facilitated. The fourth style is the indigenous experimentations and innovations. These studies illustrate the dynamic nature of indigenous systems. They indicate that people are constantly creating and experimenting in response to a constantly changing set of circumstances. This innovation process provides an internal dynamic to the existing knowledge systems. People are also evaluating, adopting, and adapting new technologies presented through a variety of channels external to the local system.

The above four styles of studies indicate how appropriate, skillful and cost-effective many of the indigenous contributions can be, but they emphasize discrete aspects of knowledge, rather than exploring more of the culture-based knowledge, or a holistic approach.

Another interesting study on local wisdom is the study related to the utilization of the people's local wisdom or local knowledge. Though, there are the varieties of literature in this area, but most of them contribute to the field of agriculture and medicine. An example is the study of the role of indigenous agriculture experimentation in development in the book, Biological And Cultural Diversity edited by Gordon, Fujisaka and Warren in 1999. The studies illustrate how the farmers use their knowledge in solving the problem on present food production, agrobiodiversity conservation, and crop genetic-improvement. The book also indicates the important of the knowledge of farmers in crops in promoting diversity and the conservation of species and varieties.

3.6 CONCEPTUAL FRAMEWORK

This research focuses on the analysis of wisdom of the Karang tribe in conserving their local environments and natural resources. This wisdom is believed to be in line with the natural environment and can be applied to the conservation objective of the national park. This conservation practice is explicitly observed from the structure of their cultural ways of life in terms of production system, relationship system and belief system (Vechpitak cited in Panicharoen 1993).

The analysis of this study is based on the relationships of human and the environment: the human-nature-superstition relationship as mentioned earlier in

3.4. According to the foundation beliefs of the Karang in supernatural power, the analysis of the relationship between human and superstition is warranted.

The local knowledge of ecosystems will be explored in this thesis. The relationship between humans and nature is a basic concept of sustainable development. However, few studies explore the local wisdom of ecosystems and the complementary relationships between human and nature. This idea accepts not only the mainstream concept of ecosystem, biodiversity and cultural diversity but also includes the role of human's activities within the biodiversity of a rain forest system (Choochat 1995). Beyond the acceptance of the existence of humans in forest ecology, this thesis also accepts the existence of animism or superstition in ecosystem management and its potentiality to control the people's behavior toward the natural environment that might affect the forest ecosystem.

4 RESEARCH DESIGN

This research employed qualitative research using a case study and field survey techniques incorporating descriptions from both secondary and primary data. The exploration of Phong-Luk village is required in order to get in-depth information of the village and understand the overall picture of the community, therefore a case study is the appropriate approach for this study. The secondary data provides the baseline information of the study area. However, this information must also be supplemented by other data collection methods in order to obtain a complete picture. Therefore, in this study, observations, interviews and questionnaires were the supplemental primary information collected. The primary data documents the existing situation and identify the problems of the study area. Finally, the results of this data collection help draw conclusions and make recommendations to the stakeholders involved in the region, particularly the Thai Royal Forestry Department, the government agency that is responsible for establishing and administering the national parks of the country.

4.1 RESEARCH STEPS CONDUCTED IN THE STUDY

This research was carried out in 5 steps: Figure 4-1 expresses a summary of the organization and research design of this study.

1) A Preliminary Conceptual Study: This step focused on an exploration of the tribe's current situation, concepts and ideas related to their ways of life, traditional production practices, traditional ecological knowledge, beliefs, cultural and ritual

practices relating to natural resource conservation and management, as well as their experience with factors contributing to the erosion of their knowledge and practices. This was done both through a survey of literature and through informal discussions with researchers and local experts who have experience with these issues.

2) A Preliminary Site Visit: This was done in order to acquire a clear understanding of existing conditions and for the selection of the study area. This site visit lasted for 5 days from January 4-8, 2001. The Karen and Karang villages visited on this trip included Ban Pa-La-Oou-Noi, Ban Song-Pee-Nong, and Ban-Wang-Won, all of which are located around the Kaengkrachan National Park and can be easily accessed. Data collection techniques were designed and the questionnaire was prepared after the site visit.

3) Preparations for Field Study: In this step, the questionnaire was finalized. A pretest of the questionnaire was conducted in a Karang village located at the border of the park outside the study area in order to make any necessary modifications. Due to work load and time restrictions, the recruitment and training of a field assistant was arranged a week before conducting the interviews. Two additional Karang field assistants from the Phong-Luk village who were fluent in both Thai and Karang languages were employed as interpreters. These field study preparations also included requests for permission from the village head and park manager. Then, key informants and questionnaire respondents were identified for

the study sample and informed about the interview and field activities that were to follow.

4) Conducting the Field Research: The field research was conducted from mid-January through March 2001. The trained field assistant was responsible in helping researchers with household interviewing. All other field work such as field observation for profiling the study area, taking field notes of any events relating to the study objectives, interviewing the key informants and park managers were conducted by the researcher.

5) Data Analysis: In accordance with standard qualitative data analysis techniques, the data were analyzed in two different periods, both during and after the implementation of field activities. In the first period, during the fieldwork, the recorded notes were reviewed and checked to see whether any information required further clarification or follow-up. Then the notes were interpreted and analyzed according to the research objectives in order to obtain the most complete information possible. In addition, this method also gave the informants the chance to be involved in reviewing and validating the data. The second period in the data analysis occurred after the fieldwork was completed. The data were re-analyzed together with other relevant research papers and was then interpreted and conclusions were developed in a more concrete form. These results are presented in a descriptive format in this thesis.

4.2 SELECTION OF THE STUDY AREA

Since the main goal of this study was to reveal the benefits of local wisdom and resource use, along with the problems of cultural erosion, the Karang tribe community at Phong-Luk of Kaengkrachan National Park was selected for the following reasons:

1) The community is located in the national park, which has restricted access and is accessible only by a few old logging roads. With this isolation, the tribes depend highly on the local forest resources.

2) The management policies of the park have caused conflict over control for resources between the park's manager and the tribes, and have resulted in increasingly severe impacts on the park's natural resources.

3) The community has been affected by the introduction of short-sighted, rapid development projects by the government for public facilities, transportation, and economic condition in a way which could affect people's attitudes towards forest conservation and contribute to resource competition and depletion.

4.3 NATURE AND SOURCES OF DATA

Both primary and secondary data were collected for this study. Secondary data such as national park policies and plans, previous studies related to the thesis, district plans and general information regarding the hill tribe were collected for preparing the literature review, and analyzing the current situation and providing a profile of the study area.

Literature was gathered from various sources such as the Oregon State University's library and the academic institutes in Thailand such as the National Research Council of Thailand's library, Kasetsart University and Silpakorn University. Primary data were obtained through observation, questionnaires, interviews of key informants and interviews of the tribal household members.

4.4 METHOD AND TECHNIQUES OF THE STUDY

Given the qualitative method applied in this study, it was difficult to choose any one approach in order to obtain sufficient data, so a triangulation approach was used (Norman and Lincoln 1994, and Marshall and Rossman 1999). Three main techniques were used for primary data collection: open-ended questionnaires, interviews of key informants, and field observation.

1) The structured questionnaire (everyone participant gets asked the same questions). This was designed to be an interview of the head of targeted households and included five main sections: (see Appendix 1)

(1.1) General features of respondents in the household, such as: family size, age, sex, education, occupation, as well as their migration history.

(1.2) Land tenure and land utilization such as: the land area occupied, the type of title, the method and period of obtaining the title, the type of cultivation, the various problems relating to land utilization and the buying and selling of land.

(1.3) Economic status of households such as: annual income and expenses, debt and the problems in procuring wages.

(1.4) Social activities and relationships such as: the relationship between the tribes and the ways they communicate with each other as well as to find out who were the informal and formal leaders in the community.

The interview questionnaire was designed to generate some concrete information about the study area. Each household was considered as a sample unit. The respondent was the head of the household, who was usually the husband of each household. Due to the timing of the field survey period and the lack of availability of most respondents, the application of the snowball sample technique based on the available respondents was employed. Therefore 15 respondents were interviewed including five tribal members from Ban Bang-Kloy and ten from Ban Phong-Luk.

2) Interviews of key informants. A total of 32 key informants were interviewed in this study which were classified into 4 groups: 1) the formal leaders such as the village headman (interviewed a village headman of Phong-Luk), the village committee members (interviewed five committees members), public health volunteers (interviewed three health volunteers) and the teachers (interviewed four teachers); 2) the informal leaders such as senior villagers (interviewed ten persons), traditional midwives, medicinal doctors and traditional-ritual headman (only one person performs these three roles); 3) five rangers who take care of the forest in this area: three persons were from Huay-Mae-Prieng Protection Unit at Phong-Luk and two were patrolling officers from Kaengkrachan head office. 4) the development officials of Huay-Mae-Prieng Sub-district who take care of Phong-Luk village

(interviewed three officials). These key informants provided historical background on the study area, political structures, patterns of people's relationships, local institutions, traditional beliefs and ceremonies, and development projects promoted. Repeated interviews were conducted with key informants from the villages in order to confirm the information obtained from the community. The single repetition was done with all key informants after the first interviews of every group of key informants.

The semi-structured interview style was applied in key informant interviews. The outline of the interview topics was prepared in advance to help guide the researcher and ask questions which were in open-ended format, allowing the villagers to talk and exchange ideas naturally. The interviews helped to draw out the perceptions and experiences of individuals, expressed in their own words. In this way, in-depth information on specific aspects of local knowledge could be obtained. These interviews were conducted according to the interview topics shown in Appendix 2. In addition, a tape recorder was utilized to help the researcher keep up with the pace of the conversations through the tapes transcribed.

3) Field Observation. The purpose of this process was to collect supplementary data and to validate information already gathered through other means (such as the interviews). Formal observations were undertaken in order to record any visible information in the study area. Since the time frame of the field data collection phase was not optimal (due to forest product gathering), both participatory and non-participatory methods were utilized for the study. The

participatory method of observation was applied as much as possible because this is most valuable in helping the researcher to have a clear understanding of community ways of life together with other information relating to ritual and ceremony. With regard to participatory observation during my field study, I stayed with the Karang family and joined in daily life activities. However, a non-participatory observational method also took place to supplement the participatory method. This process entailed surveys using guidelines of checklists with things such as settlement patterns, public utilities, road networks, land use patterns, forestland areas and existing forest management practices (see Appendix 3). All data obtained from both participatory and non-participatory observation were recorded in the researcher's field notebook.

4.5 DATA ANALYSIS

This case study research mainly consists of a qualitative analysis aimed to provide in-depth and diverse information from key informant interviews and field observations. However, basic descriptive statistics such as percentages, averages and frequencies from the questionnaire interviews are occasionally presented for a more concrete representation of the data. Aside from these descriptive statistics, tables, maps and photographs are also used to illustrate the findings. The data was analyzed in order to identify characteristics of local wisdom.

4.6 LIMITATIONS OF THE STUDY

1) Time of fieldwork. The time period during which fieldwork was conducted was a major factor affecting data collection with the interview questionnaire. As the period of field survey during January to March was the off-season, most of the male heads of the households were in the forest for wild product collection. Some male tribe members stayed in the forest for several days, and some who did not go into the deep forest got back home in the evening. Therefore, most of the elders and women were available because they did not enter the forest. The Karang women commonly did not respond to the questions and did not provide sufficient information. One reason for this is the Karang tradition for women to not respond openly to strangers. To solve this problem, I enlisted the assistance of the informal Karang Leader with whom I stayed, and who has the respect of the villagers of Phong-Luk. We identified available people with whom I could interview. The informal leader escorted me to the households of key informants in Phong-Luk.

2) Interpreter Availability. It was difficult to get a female interpreter who spoke Thai and was also available to do the interviews. In this culture, women are not encouraged to receive additional education and are likely to marry at young ages. Therefore, two male interpreters were used.

3) The language. Most key informants were elders who were not fluent in Thai. When I first started to interview them, language was an obstacle in conveying information because some Karang language was too difficult even for the Karang interpreters to interpret into Thai. In opposite, some Thai words were

too complicated to translate into Karang language to allow the Karang elders to understand. Therefore, the researcher tried to avoid using complex questions and language in order to alleviate this problem.

4) The lack of availability of Ban Bang-Kloy villagers. The official relocation of the tribes of Ban Bang-Kloy village to Phong-Luk village has ended. In practice, the Bang-Kloy villagers have not been being fully settled because of the unavailability of grant land. Therefore, the tribe still moves back and forth between their original Bang-Kloy Village and Phong-Luk Village. For this reason, villagers of Ban Bang-Kloy were missed in this study, even though their households are recorded in the district's population statistics.

These problems are somewhat remedied because the tribes of these two villages Phong-Luk and Old Bang-Kloy are relatives and still keep in touch, and some villagers of Phong-Luk used to live in Old Bang-Kloy. After interviewing the five villagers from Old Bang-Kloy village, I learned that the collected data did not show significant differences between these two groups.

STEP	METHOD	REMARKS
<p>→ Step 1 Conceptual Study</p>	<p>Literature review →</p>	<p>Study of existing situation Concept about Ways of life and Culture of the tribe National Park Management and Its management problems</p>
<p>→ Step 2 Preliminary Site Visit</p>	<p>Research conducted during three days in the study area →</p>	<p>Acquired a clear understanding of existing conditions in the study area, activities included:</p> <ul style="list-style-type: none"> → Site selection → Designing the questionnaire → Designing techniques for data collection
<p>→ Step 3 Preparation for the field survey</p>	<p>Questionnaire → Chose the sample → Field Assistance → Legal Activities →</p>	<p>Pre-test and modifications Phong-Luk village identified as the target area Training <ul style="list-style-type: none"> — Informed the village head — Identified key informants — Informed the park manager </p>
<p>→ Step 4 Conducting a field research</p>	<p>Questionnaire interview → In-depth interview → Observation →</p>	<p>Interview 15 Households Village head, village committee, teacher, elder, traditional midwife and medicinal doctor etc. General information by researcher</p>
<p>→ Step 5 Data Analysis</p>	<p>Analyzing and interpreting obtained data →</p>	<p>Qualitative approach: descriptive format</p>

Figure 4-1 Research Design

5 THE CULTURE-BASED WISDOM OF THE KARANG IN PHONG-LUK VILLAGE

This chapter describes the background of the study community of Phong-Luk village. The detail of information is provided in order to guide the readers to understand the context of the study area and its setting.

In the first section, the existing background information of Phong-Luk village and related data obtained during my field research period is presented. Most information came from my interviews of key informants and observation, and some of the information came from the government's documents.

In the second section, the local wisdom of the Karang tribe of Phong-luk village, a community that is located in a valley with a natural setting, is presented. As a result of their isolated location, the tribe's lifestyle depends on nature. This dependence of human beings on nature creates a respect for the local environment. The values of Karang tribes towards nature are illustrated in their daily activities, which are passed on through the generations. These practices originate from the basic knowledge, understanding and beliefs of the Karang tribe regarding the importance of nature to their lives.

The details of this cultural way of life are based mainly on my interviews of key informants, some village members, and observations during the field study period. The information obtained from these approaches is summarized by the researcher while retaining all main ideas, and is presented in a descriptive format.

Some interviews are quoted in order to strengthen and illustrate the summarizations of the researcher.

5.1 THE AREA OF PHONG-LUK VILLAGE

According to the settlement history, the Karang tribe of Phong-Luk has been coming from the Myanmar side of the Tanowasri ridges, the natural border between Thailand and Myanmar, for a long period of time. They moved across the Myanmar border, and found a fertile valley with a river running through it, and many wild animals. They then decided to settle in this area and named it "Phong-Luk," because there was a big and deep salt lick, a formation of salt in the soil that attracts wildlife to feed on these supplemental nutrients. Historical records indicate that the tribes have been residing in Phong-Luk for over a hundred years.

Phong-Luk village is located in the forest in the valley north of the Phetchaburi River in the hinterland of Kaengkrachan National Park in Huay-Mae-Prieng Sub-District, Kaengkrachan District, Phetchaburi Province. The village is 35 km away from the Kaengkrachan Reservoir. The tribes' households are scattered along both banks of the Phetchaburi River. The village consists of 2 communities, Ban Phong-Luk and Ban Bang-Kloy, which are separated by the river. The ancestors of the Ban Phong-Luk are the pioneers of the area, and the community is now located on the south bank of this river.

Ban Bang-Kloy represents the new comers, and is located on the north bank. The tribes moved to Phong-Luk in 1996 by the park manager from their original

settlements at Old Ban-Ban-Kloy because of no available public lands outside the park. The park manager has granted available land at Phong-Luk to these newcomers 7 rai per family. The granted land is still not given to all the Bang-Kloy families, therefore some landless families have to go back to the Old Ban-Ban-Kloy to grow rice in the new forests or in their old rice farms during the season in some other years. This practice is similar to families that obtain infertile granted land.

Because of the mountainous topography, the houses are mostly located on the higher lands; a number of small patches of houses are scattered along the river's bank. The average is three to five households in each patch; most households in the same patch are related by kinship. Currently, Phong-Luk village has ninety-eight households and 416 villagers. Forty-two households and 168 villagers are in Ban Phong-Luk, while the newer settlement, Ban Bang-Kloy, has fifty-six households and 248 villagers.

Houses in Phong-Luk are all built in the same fashion with materials available from the forest. A house is built on stilts. A typical house is made from bamboo and thatch; its floor is raised 2 -2.5 m above the ground, and walls and floors are made of longitudinally-split sections of bamboo. All roofs are covered with thatch, and the softer woods are used for the houses' poles.

Most houses have only 3 walls; the uncovered wall is in the front part of the house that has the steps. Only one completely enclosed room can be seen in some houses. The Karang tribes prefer not to separate their houses into many rooms with

closed walls. Instead, they split the areas within a house according to the various functions by constructing different levels of the floor for each of the wall-less rooms. A typical house is divided into three main areas, according to the various functions: a bedroom, a kitchen, and a porch. The floor of a porch might be level with or lower than that of the bedroom, but the floor of a kitchen is usually lower than the other floors because the tribes prepare food and cook in the houses. The house is very open with good ventilation and light. The small granary is built inside or separately from the house, but with the same materials. Not every house has a traditional rice pounder or mortar, one pounder is used by several households. Consequently, they are focal points for social gatherings. Some families raise pigs and poultry.

The more well-off households have replaced the bamboo floor with wood, and the roof with corrugated tin instead of thatch. Generally, most households have gardens with fruit trees and vegetables around their houses. These home gardens are often supported by welfare development agencies. The products from the gardens, such as papayas, bananas, mangoes and jackfruits are mainly for household consumption.

5.1.1 The Physical and Biological Appearance of the Village

5.1.1.1 Geography

The village is located in a valley which is a part of the watershed of the Phetchaburi River. The forests in the area are mixed-deciduous forests, which are

the dominant plant community before fallow rotations. Most cropping and settlement areas are highlands mixed with hills; the elevation averages around 700 m above mean sea level. The tribe mainly makes use of this land for traditional mixed rotating rice farms and some castor bean and lemon farms.

The Phetchaburi River flows through the village; it is a big river and can supply enough water to sustain the village throughout the year. The river flows from the high mountains at the north of Kaengkrachan National Park. The two communities, Ban Phong-Luk and Ban Bang-Kloy use its water for both consumption and other household purposes. Presently, the government has set up water pipes within both communities under the MIYASAWA project, a loan and donation funding project provided by the Japanese Government to activate the economy of Thailand during the economic downturn of the country, in order to maximize benefits from the river and utilize it for home gardens and horticulture. Unfortunately, this project did not work, so precipitation is still the main water source for plant production. With this system, if there is a drought, the village will suffer a poor crop yield.

Due to the easy access to the large river, the tribes have not faced any troubles with available water for household utilization. In order to ensure that every house has sufficient water storage, Huay-Mae-Prieng Tambon Administrative Organization (TAO), the local administration at sub-district level of Thailand which is recently the government's decentralized system, has distributed two fifty-liter storage tanks to each household.

5.1.1.2 Public Services

The villagers in Phong-Luk are rather isolated and have little contact with outsiders. This being the case, most villagers still maintain their rural ways of life. Since there is no electricity in the village, villagers use the cheaper and more basic sources such as kerosene lamps, flashlights, or candles, for providing light at night.

A solar cell of twelve volts at the learning center is the only electrical power source in the village. It is usually used only for electricity needs in the school. Two households in the villages charge their batteries from this solar cell; one has a television and the other has a stereo.

5.1.1.3 Transportation

Generally, the two major routes in to and out of the village are the river and a dirt road.

The Phetchaburi River is a major river route. The villagers prefer not to use it because it is often inconvenient. During the dry season, many rock outcrops emerge, making it difficult and time consuming to navigate a boat. During the rainy season, it is more convenient to navigate than in the dry season, but a huge runoff and a strong current makes the route dangerous. Moreover, the villagers feel that the river is not as direct a route as the road. There are no continuing networks from the river to reach a final destination. The river ends at the Kaengkrachan Reservoir, and the villagers have to continue by car, which is another main reason they do not

want to use the river. Presently, there are six boats in the village; most of them are used for loading agricultural products and for short trips to nearby areas.

The one road is a major route for transportation, even though it is a narrow dirt road climbing along the hillside. It used to be an old logging route. Even though travel on this road is faster than the river, and it links to a network of outside roads, its rugged, slippery and high sloping characteristics confine the types of vehicles that can be used. In addition, some parts of the road will consistently be cut-off (flooded) every year during the rainy season. When this happens, the villagers can not go outside for two months or more.

Presently, there are two pick-up trucks and eight motorcycles in the village. There are only foot tracks within the village; the villagers are accustomed to walking and all houses are within walking distance of each other. Those villagers who need a ride to or from the village will generally ask for a ride from a ranger or a driver at a nearby lemon farm. They might rent a car from neighbors during emergency situations. In order to prevent smuggling, only certain permitted cars can access this road. All cars leaving the national park are checked at the Huay-Ma-Rew's checkpoint.

5.1.1.4 Grocery Stores

The grocery stores in the village have been open only two years. The government established its project named "The Poverty Solving Project," which aims to promote the occupations and general welfare of the villagers. The project

offers loans to the villagers with no interest and long-term obligation. All the grocery owners are supported by the project.

There are two small groceries in the village; one is at Ban Phong-Luk, another is at Ban Bang-Kloy. The owners of each shop separate a part of their houses into a section for the grocery store. Besides these grocery stores, there are also a few informal shops selling different kinds of commodities in the village. The grocery at Ban Phong-Luk is open all day; the owner is a Thai married to a Karang woman from the village. Another shop at Ban Bang-Kloy is owned by the Karang.

So far, it has been found that the groceries do not quite succeed because the villagers often buy goods with credit and most of them can not pay for their credits when payment is due. These shops provide a valuable service to the community because the poor villagers can buy some necessary commodities on credit when they have no money during certain times.

5.1.1.5 Learning Center

The village has a learning center located in Ban Phong-Luk. It was established by the border police patrol unit in 1985. The center offers education for children ranging from kindergarten to the fourth grade level. Currently, there are 115 children attending the center who are taken care of by four teachers. One teacher is Karang, and the rest are Thai. One Thai teacher is from the border police patrol unit and the two others are from the non-formal education center. The Thai teachers from the non-formal education center take turns teaching every month. The Karang

teacher is the principal of the center. Recently, a Karang student who graduated from the center joined the center in a teaching assistant position.

The purpose of the center is to teach Thai language to the tribal children. The educational standards of the center do not equal those of Thai schools. Tribal children who finish the highest educational level here have to take an exam if they want to continue their higher education in the Thai schools.

The center's buildings are simple and are made from thatch and cut bamboo. There are two buildings; the first building is for junior and senior children and the second is for the youngest children. The structure of the buildings is warehouse-like, with a high roof, cement floor with cut bamboo walls. The building for the older children is the main building, which is separated into four separate classrooms by walls. In three of the rooms, there are no chairs; the students have to sit on the floor. The fourth room has fewer walls. This room is filled with many hand-made tables and chairs. It is used for many purposes besides learning activities. These include village meetings, primary health care center activities and any other village activities.

The other building for the youngest children is located at the west of the main building. The building's structure is similar to that of the main building, but with only one big room. There are three to five year old children and some older children who can not speak Thai who have to attend this first level. The children will be assessed in their ability to speak Thai before they are allowed to attend the higher level. The children who complete fourth grade can continue their study with

teachers from the informal education center until they complete the sixth grade. If they want to study higher, they have to attend the local Thai school in the town. However, there are few children who finish fourth grade and want to study at a higher level. Usually, they will help their families take care of the house or the farm, or they marry.

The health care center is located at the learning center as mentioned above. The center provides primary health care and a referral system to the Kaengkrachan hospital. Its main responsibility is to do blood testing and to provide primary treatment for suspected malaria patients due to the fact that the village is isolated and located in an area with a high incidence of malaria. The Karang teacher at the school was trained to do blood testing and he is in charge of the health care center.

Besides being the learning and health center, this building is the main center for formal activities in the village. It serves as the place for government and visitor meetings, as well as being a supply-loading site for the border police.

The relationship between the school and the villagers is very good. The teachers are deeply respected by the villagers, especially the Karang teacher, being the principle of the learning center. Also, he is a person who acts as a liaison between the villagers and the government officers. This affair was attested by the interview of park official at Huay-Mae-Prieng protection unit and the government officials. They all suggested me to have a contact with this Karang principle for three main reasons. Firstly, he could communicate Thai very well. Secondly, his father was a former village headman who was known by the government officials and was

respected by the tribal villagers. Thirdly, the learning center is the only one center that supports all activities within the community such as clothes donation. Therefore all government officials or other concerned agencies, who get into the village, have to contact the Karang principle who take cares of learning center and ask him to help for communication with other tribal villagers. This is because the villager headman always stays at Kaengkrachan district and takes care of his rice shop.

5.1.2 The Demographic, Socio-Economic Structure and Land Tenure Arrangement

5.1.2.1 Demographic Structure

The whole community has 98 households and 416 villagers, comprised of 206 males and 210 females. Ban Phong-Luk has 42 households and 168 villagers. Ban Bang-Kloy has 56 households and 248 villagers. Most of the villagers are related to each other.

From table 5-1, it can be seen that both male and female villagers aged from 18-49 are high in numbers. This age group serves as farm labor for the family. From interviews it was found that there are only two villagers that moved to town, one went to continue education in the local Thai school and another went to work. There are some villagers seeking temporary employment in the nearby lemon farms during the off-production season. The villagers who have worked outside of the village commonly mention that they prefer not to work outside of the village. They

usually stayed away for a while and moved back to the village because they were not able to get used to the urban way of life. One important reason why there are relatively few migrants among the Karang is their unique level of close relationships with their family members as well as bonds of various forms to their hometown.

Table 5-1 Total population separated by age in Phong-Luk village

Villages Age	Ban Bang-Kloy			Ban Pong-Luk			Total	Percentage
	Male	Female	Total	Male	Female	Total		
<1 yrs	6	1	7	1	1	2	9	2.16
1-2	4	4	8	1	3	4	12	2.88
3-5	23	16	39	12	11	23	62	14.90
6-11	21	28	49	20	18	38	87	20.91
12-14	4	11	15	4	5	9	24	5.77
15-17	4	7	11	2	5	7	18	4.33
18-49	53	50	103	36	36	72	175	42.07
50-59	4	5	9	6	4	10	19	4.57
60 and+	4	3	7	1	2	3	10	2.40
Total	123	125	248	83	85	168	416	100

Source: Thailand Population Statistics, 2000

Both nuclear and extended families are found in Phong-Luk village. The nuclear family units are the most common because the Karang try to keep their families small according to their customs. Generally, a nuclear family has 3-5 children. The extended family has 2-3 families staying in the same house.

The Karang tribe is similar to the Karen in being female-dominated, in terms of the matrilineal system. The female's family is expected to be respected by male Karang which is obviously seen in a new couple. When a couple is married, traditionally the husband has to stay with his wife's family for an initial period, while respecting the parents and kinship of his wife, including her ancestor's

spirits. After they are ready to build a new family, the couple will move out. It is a custom that the couple assists the wife's family on the farm. This custom is not currently strictly enforced; the couple can stay with the husband's family if there is no one else to take care of his parents. Presently, a common practice is for the couple to indicate whether they want to stay with one of the families, or to stay by themselves. However, they are still obliged to work on the farms of either of the families. This significant matrilineal characteristic of the Karang is obvious from the family rituals. The eldest daughter is the highest priority for the inheritance of the rituals of the family from her mother. With this, it is expected that she has to continue these rituals. Even after she has been married, she has to maintain these inherited rituals in her new family. During childhood, the female Karang have to attend the family's rituals in order to learn how to practice them.

The Karang tribes at Phong-Luk village still maintain a traditional way of life. The division of labor is for the male to be the 'head' of the house and farm operations, while the female is responsible for taking care of the children, the house and the animals. In some families, the wives will help the husbands in the fields when their children are past the age when they need intensive supervision.

The villagers still emphasize strong relationships among the members of their ethnic group because most of them are connected by direct kinship. The marriages are usually only between members of the Karang tribes. Only one female Karang has married a Thai in this community. The overall levels of cooperation and respect

among the villagers are high, making many of the activities in the village go smoothly.

Karang language is the main language of the tribe. Some villagers can speak Thai. They speak Thai only to communicate with the outsiders. Most villagers can understand Thai but can not speak it well. The children who attend the learning center can speak Thai very well.

Most of the villagers are Buddhist and respect the monks, however, their traditional beliefs and rituals of showing respect for spirits are still kept in mind and are passed on from generation to generation. Even though some of the spirit-worship beliefs and practices have been lost, there are some that are kept in practice, such as the ceremonies of "chicken sacrifice," "making an offering to the moon," "wrapped rice eating," "rice farming" and traditional treatment of diseases.

5.1.2.2 Economic Structure

Most Karang tribes at Phong-Luk retain a simple way of life compared to that of the Karang and Karen tribes that reside outside the park. The economic system of the village is based mainly on subsistence rice farming. Cash earnings for other necessary expenses are derived mainly from selling dried castor bean and extra dried chilies. Some villagers get cash from selling wild products such as honey, or by working in the lemon orchards nearby. Wage-labor opportunities are perceived as a minor occupation, secondary to rice farming. Most middle-age Karang villagers work as wage laborers in nearby lemon orchards during the off-season,

while only few seek employment in town at Kaengkrachan District. Agriculture in Phong-Luk depends on rainfall, so the harvest varies depending on the climate.

From my survey, the occupation that villagers perceive as their main career is rice farming, and other minor occupations include the selling of castor beans, dried chilies, wild products, as well as from general employment and acting as a merchant. The tribal villagers have to grow rice because it is a staple food for their daily consumption and never think about buying rice from the outsiders, even when there has been an insufficient harvest. In order to remedy this problem, the villagers have started to mix subsistence and commercial farming. The castor beans and the surplus chilies are for trading. Rice, vegetables and other crop plants are the local breeds selected and bred by the villagers themselves during and after harvesting.

Therefore, agriculture in the villages can be categorized as rice farming with chilies and castor bean cultivation, and gardening. All plant and vegetable crops are managed with relatively 'natural' methods of low inputs of chemicals and pesticides.

Highland rice is the main crop in the farm. Every family farms rice. Harvested rice is kept for household consumption only. The rice is cultivated when the rainy season starts in the month of August and is then harvested in November, requiring a period of five months for crop development. Highland rice farming requires rainfall during the crop development phase. Chilies are also planted on the rice farm, and any surplus is sold. The castor bean is planted around the house, which can also offer the tribes some cash for other necessary expenses. The use of money has

become more and more necessary in the village as the land for cultivation becomes increasingly scarce, not allowing the villagers to apply their rotating technique to these limited land parcels. They often have to repeat farming on the same parcel of land causing low rice yields, which is often not enough for year-round consumption. Presently, the villagers are starting to replace their rice farms with lemon orchards, introduced by Thai lowlanders. Another factor causing a reduction in rice farming is that Thai lowlanders have begun to rent land from the Karang tribe to create lemon orchards, and then hire the Karang to be laborers on these same farms. From my interviews, currently two plots of rice farm in the community, which were about 40 rai, were converted to lemon orchards.

Gardening is practiced in the available land around the house. Most of these plots are supported by development agencies. The plants common in these home gardens include banana, papaya, jackfruit, mango and some vegetables. They are for household consumption, and are shared within the village. The surplus of some plants such as papaya is sometime sold.

Animals raised by the tribes are for household consumption and for traditional ceremonies. Most of them are small animals such as chickens, ducks and pigs; they are raised under the floor supported by 1.5-2 meter stilt and fed by the leftover food which drops between the widely-separated floor boards in the kitchen. However, only the well-off villagers raise these animals.

Most Karang men go further in the forest to collect some wild products for trading such as aromatic woods and honey. This activity provides surplus cash for the family.

Most villagers have at least some contact with the outsiders, but in general they are not influenced by the market system. They still maintain their simple livelihood in a subsistence system for the most part, so they do not depend much on cash. In addition, modern technology and infrastructure facilities are not widespread in the community. The tribes have learned that they can get food from nature and there is usually enough food for local consumption in the forest, so there is little need for cash. Generally, the Karang tribe is a totally self-sustained community in terms of economics and livelihood. Any cash earned is mainly from selling castor bean and chilies. The tribes have no large-scale cash earnings; instead, their earnings are obtained in the rice and vegetable harvests. Taking this into consideration, total estimated annual income of the family ranges from 5,600-9,200 baht per years (~\$124-204, 45 baht/\$1 US dollar). All cash earnings are usually spent immediately for rice and medical expenses. Some families have cash expenses for various aspects of their livelihood such as paying for water to be pumped, or renting a long-tail boat for loading and transport of agricultural products.

The villagers have established a saving and credit group and can request funds based on need. Presently the group has a total amount of 30,000 baht (~\$ 667). The money is still recruited from the members but it has not been invested.

In addition to this saving group, there is a loaning source offered by the government named "The Poverty Solving Project." This project was established in 1995 and is managed by the Internal Department. It aims to promote the occupational opportunities among the poor tribe. This system of loans has no interest and long-term obligations. Currently, 24 out of 67 poor families, according to the project standard, at Ban Bang-Kloy benefit from this project. Twenty one villagers borrowed money for agriculture and the 3 remaining villagers borrowed money for trading. In Ban Phong-Luk, currently 28 out of 37 poor families borrow the money from the project.

5.1.2.3 Social Structure

The social structure of the village is composed of three broad areas: politics, administration, and development projects

The local village administration consists of the Huay-Mae-Prieng Tumbon Administration Organization (TAO). A "tumbon" (sub-district) is the name for the next largest administrative unit above a village in Thailand, usually consisting of several villages. Ban Phong-Luk has had a long connection with the Thai government. Because of this relationship, Ban Phong-Luk now has a number of its formal leaders organized into the formal Thai village political structure of a "phuyai-ban" (village headman), along with a village committee. This local formal leader and the committee connect the villagers to the larger government and help continue the government's promoted activities in the village.

This formal village's political structure consists of one village headman, one assistant, and five additional committee members. The village headman is the main person responsible for coordinating the activities in the village and others are expected to assist in any work assigned by the village leader. Village meetings are occasionally arranged to share information. Every household has a representative who is expected to attend the meetings in order to follow the news that may benefit them and the village.

The current formally-appointed village leader lives and spends most of his time in the larger Kaengkrachan District town and goes back to the village from time to time. In Phong-Luk, however, it is the informal village leader (also the principal of the learning center) who has the most respect of, and functional control over the community. The Karang principal acted as the mediator between me and other villagers. When he walked along with us and walked by the houses in the village, most members of the houses recognized him and ask him "where are you going?" and invited him to have water or some food. In addition, his father was a previous village respected headman.

The development projects and activities which have emerged in the village aim to keep the tribes permanently settled in Phong-Luk. These projects and activities have been implemented by the park manager and other concerned agencies with the overall aim of controlling the behavior and livelihood of the villagers. Like the villagers of Ban Bang-Kloy, they were moved from their original settlements to live in a single, prepared site with the expectation that they will settle in Phong-Luk

village permanently. The past and continuing activities provided by the government are as follows:

1) The learning center: This center was established through the cooperation of the individuals in the national park, the border police patrol unit and informal education unit. The center aims to help the Karang children to read, write and speak Thai. In addition, some Thai customs and practices such as Father's day, Mother's day, and Loy-Kra-Thong day have been introduced. This introduction might affect the traditional beliefs as they are passed on to the children from their parents and other ancestors. The promotion of study at higher levels beyond what is offered at the learning center is difficult because the village is very far from the nearest town. In addition, because their parents are refugees most children still have no Thai identification card which is required to attend Thai school.

2) Health care center: This center serves as a primary health care consultation clinic and provides primary treatment within the village. This center employs techniques of modern medicine. These methods have often made the villagers believe that they will rapidly recover from their ailments. Presently, modern medicine is now preferred over their traditional remedies. This has caused the practice of traditional medicine to gradually disappear from the village.

3) Water development project: This project was funded by the MIYASAWA Project and from TAO. Its purpose is to provide water for the gardens year round. The high elevation tank and plastic tubing has been installed. Unfortunately, the pump did not work, and the current status of this project is "stopped."

4) The poverty solving project: This is a project supported by the Department of the Interior, its purpose is to provide no interest loans to the villagers so that they can invest in any occupational development created by them. This project was started in 1998 and still continues.

5) The rice bank project: It is a project of building a big granary which aims to store the amount of rice yield of the community for a certain period with maintains its good quality and then sell it to get a good price. This project imitates the lowland rice farmers who grow rice for marketing, the extending period helps the farmers to get the good price for rice. This project did not succeed and currently is also discontinued because the Karang grows rice only for consumption and the small amount of rice harvesting each year which can be kept in their own small granary, therefore it is no use for the tribe to store rice in a granary of the rice bank project.

6) The water storage tank project: This project was supported by the Huy-Mae-Prieng TAO. They distributed two 500 liter containers to each household. From personal observation, it could be seen that most houses did not store water in those containers, instead they use them for other purposes due to the easy access to other water sources.

7) The road improvement project: This project is expected to start in 2001. Due to the fact that the existing dirt road is not accessible at certain times of the year, the TAO has planned to pave the road in order to provide continuous access to the village throughout the rainy season. The park manager feels that this project

would be detrimental to the park. The main point of dispute is that good transportation will affect the park's management, especially the land acquisition by the outsiders and the illegal encroachment into the forest. He agrees that the road should be improved in only some specific parts that are too rugged for any vehicle to pass, but that access by outsiders should still be generally limited.

It can be concluded that some of the introduced projects have not been successful. Based on interviews with the villagers and personal observation, it can be seen that most of the projects do not provide continuous support, and that they meet the government's needs more than the villagers' needs. Most promoted projects come from the central government, at the policy level, without any input from the local government and people. This is compounded by the lack of new knowledge and understanding of the tribe to properly continue the project once the government leaves the area.

5.1.2.4 Land Tenure Arrangement

Formerly, the tribe of Phong-Luk managed their land through communal rights, all members of the community have the rights to use the land. This is because they believed that the land cannot be created by humans but by the creation of superstition power, everybody have to pay respect to this power. Therefore, to use the land, the tribe has to ask a permission for the superstition power. As a result, nobody feels of owing the land, but they feel the land is equally distributed to all members.

After the Kaengkrachan National Park was established in 1981, the park manager gave individual rights to the tribe in order to confine the utilization of land in a particular area as an approach to conserve the forest in the national park. For villagers of Ban Phong-Luk, the original dwellers of the area, most of them have much more land than the villagers of Ban Bang-Kloy, the newcomers who were granted only 7 rai per family in the available land in Ban Phong-Luk.

Despite the issuance of individual rights, the tribe still practices the traditional communal rights among a small group of kin. The landless tribe especially in Ban Bang-Kloy can borrow the well regenerate fallow land from the kin in Ban Phong-Luk who have much land to grow rice.

5.2 CULTURAL WAY OF LIFE, A BASIS TO CONVEY LOCAL WISDOM

5.2.1 Customs, Beliefs, and Practices

5.2.1.1 Customs

The meaningful customs of Krang tribe in Phong-Luk village are conveyed mainly among kinships. Beginning January of each year, every family starts to organize their inherited ceremonies. The significant ceremonies that are still in practice are the: “Chicken sacrifice” ceremony (Pithi-Kin-Khai in Thai); “Making an offering to the moon” ceremony (Pithi-Wai-Pra-Chan in Thai); “Wrapped rice eating and sacred red cord tying” ceremony (Pithi-Kin-Khaw-Hao- Puke-Dai-Dang); and “Sacred yellow cord tying” ceremony (Phiti-Puke-Dai-Reung).

These ceremonies are arranged in the households to pay respect to their ancestral spirits. Either one of those four different ceremonies mentioned above is chosen to perform according to the housewives' inheritance from her mother. In all ceremonies, a housewife is in charge with the aid of her husband. All female offspring who inherit these ceremonies from their mothers can give up the practices after their mothers die. This relinquishment is carried out by telling the corpse that her daughter wishes to return the ceremonies upon her death.

5.2.1.1.1 *Chicken Sacrifice Ceremony*

The Chicken Sacrifice Ceremony is a family reunion ceremony where all family members are required to attend. This ceremony is arranged once every year after harvesting from January to February. The ceremony is not marked by a day but rather by the readiness of the members of the family. It is strictly forbidden for non-family members to attend the ceremony. Therefore, the following ceremonial procedure described here were from my interviews rather than direct observation. The Karang tribes believe that the chicken's spirit will cause some misfortune to the family if they do not follow tradition and do not arrange the ceremony properly and seriously.

Chickens are the prime components in the offerings and only a proper size young chicken will do. A female and male chicken, along with various flowers, candles and incense sticks are the basic requirement. However, the number of items might be much more dependent on the economic status of the family.

Generally, two consecutive days are required for this ceremony. The first day is for preparation; the main preparation that has to be made is to clean the house so that no objects are knocked over or fall out of the house. At night, the male and female chickens are kept in the house. On the second day the ceremony is performed in the early morning. All members sit in a circle. The male head of the family brings the two chickens into the middle of the circle. He then holds their mouths together with the help of other members, and starts asking the spirits to forgive and to bless his family. After that, the two chickens are killed and then boiled. The members, starting from the oldest to the youngest, eat the well-cooked chickens taking only one bite each. This process will be repeated three times, and then the ceremony is over. If liquor is included, it should all be consumed before the ceremony is concluded. Usually, the household members who attend the ceremony cannot go outside the houses while the ceremony is still going on. The head of the family is the first person to leave the house; other members then follow him after the ceremony is completed. The remains of the chickens are sometimes given to the neighbors. The Thai teacher from Police Patrol Border who I interviewed mentioned, "I used to be invited to have the chickens after this ceremony was over." Currently, most households of the Karang tribes of Phong-Luk still practice this ceremony.

5.2.1.1.2 *Making an Offering to the Moon Ceremony*

The offering to the moon ceremony is a custom that is arranged once a year after harvesting. A ceremony date is flexible depending on the readiness of the inheritable person. However; it has to be during any full moon in the month of February.

The elaborateness of the offering required for this ceremony differs depending on the order of inheritability: a primary order or a stem of a family tree and the subordinate order or a branch of a family tree. The stem which is the first order has to provide much more items for offerings than the branch. The basic requirements for making an offering are flowers, incense sticks and candles. However, the wealthier families might provide more items for such an offering.

The inheritable housewife performs the ceremony in her house after the moon is full. Male members of the family may attend the ceremony if they desire; but the inheritor and her female offspring are required to attend. The offering is placed on a particular shelf over the window, so the participants can see the moon. Its objective is to ask the moon to bless all the family members with good health. Then the ceremony is over. In cases where food is offered, it may be shared with neighbors.

From my observation, I learned that the distinction between level of inheritability, which is a branch or a stem, is the length of the shelf pole. The stem has its pole going down under the floor through the ground, while the branch has a shorter pole that stands within the house. From my interviews, it can be concluded

that there are only three families in Phong-Luk village that practice this ceremony presently; two of them are in Ban Bang-Kloy, and only one is in Ban Phong-Luk.

5.2.1.1.3 *Wrapped Rice Eating Ceremony and Sacred Red Cord Tying*

A traditional custom of Karen tribes aims to recall their souls or spirits. It is performed once every year on the date of the first half of the lunar month of August. Each family arranges the ceremony according to the readiness of the family members. It is a day when the family gathers together. Only one family in Ban Bang-Kloy still practices this ceremony, due to this reason, my interview came directly from the practicing family.

Cooked sticky rice covered with coconut flakes mixed with sugar wrapped by banana leaves is a main item. The amount of sticky rice depends on the economic status of the family.

The male head of the family starts the ceremony by calling the souls by saying “the souls...where are you... are you in the forests? in the streams? in the valleys? please return back to the owners.” After the statement is ended, then the red cord tying is performed. The head of the family ties the red cords to both wrists of his wife, then she binds her husband. After this, the tying will be in order according to seniority; mother ties the red cords to the first child, and the first child ties them to the second child. This process is continually repeated until all members are tied by the red cords, then the ceremony is over. The neighbors can have wrapped sticky rice after the ceremony. The same Thai teacher as mentioned earlier indicated “I

used to be attend this ceremony and have wrapped sticky rice, it tasted like the typical Thai desserts.”

5.2.1.1.4 *Sacred Yellow Cord Tying*

The Sacred Yellow Cord Tying is not a traditional ceremony and is practiced only by the Karang tribe members who engage in Buddhism. Currently, there are two families in Ban Phong-Luk practicing this ceremony. The information presented here comes directly from interviews of these two families. It is a social gathering in a family performed once every year after the New Year. The date is flexible in each family depending on the readiness of the members of the family. The particular items required are seven rice balls, seven betel leaves, flowers, candles and scented sticks.

Members of the household and their offspring attend the ceremony, which is performed in the house during the morning. The male leader of the family gives his respect to the Buddha and asks him to bless his family. After the statement is ended, his wife ties both of his wrists with yellow cords, he then does the same to his wife. Both wife and husband tie the yellow cords to their offspring.

5.2.1.2 Beliefs

5.2.1.2.1 *Beliefs and Customs on Medical Treatment*

The Karang tribes of Phong-Luk village believe in two traditional health treatments: the herbal treatment and the sacrificing to spirits. Currently, only a

village shaman knows this traditional treatment. He inherited this knowledge from his father-in-law. The herbal treatment has almost vanished because the villagers have easy access to the hospital. Modern medicine is widely accepted for its faster recovery. In addition, the herbs are becoming more difficult to find and require going deeper into the forest. The treatment of making a sacrifice to spirits is a traditional cultural belief. The Karang tribes employ this treatment to treat their symptoms, particularly headache, backache and leg pain. They believe the illness results from supernatural action, so this treatment through offerings is accepted. The place that the symptom occurred is always chosen to perform this ceremony. Generally, the village shaman is in charge of carrying out the ceremony, however the elders or any senior persons in the family who could perform it are allowed. It is prohibited for the same people to conduct this ceremony more than once in one day. This forbiddance is practiced and followed for generations by the Karang members without any reason.

This ceremony consists of two-steps. First is the prediction of the causes of sicknesses and of the suitable offering. The shaman predicts by drawing lines on the wood or grounds if it is more convenient and the number of lines drawn determines a type of sickness and its offering. The second step is to make offerings and pray to the spirits. Generally, the basic items required for this type of offering are liquor, chickens, and sweet and non-sweet desserts, flowers, incense sticks, candles, betel nuts and leaves, and rice. However, many more items may be

required, there are different requirements depending on the prediction. So patients with the same symptoms might need different items for ceremonial offering.

According to the shaman's apprising during my interview, "the many illnesses are called by different names in Karang: kao, ta-ka-kae, ta-to-se, ta-clo-rao, ta-nee-saeu-nue, ta-nee-ruy-nue, na-tee-na-po, pa-mue-maw, and ba-pa-yo-mue." The shaman starts with asking the symptoms of the patients. Then he draws lines on the wood with charcoal while praying and asking the symptoms from the patient. He continually draws lines while praying. An example of his praying is "if the patient has this disease, the drawn lines should come up in even number." If the even lines appear, his prediction is right. If the lines are odd, he then repeats the same procedure until he knows what disease the patient has. The offering required for the ceremony is also carried out with the same prediction procedure.

After the prediction is finished, the patients and their kin have to bring the offering to make a sacrifice to the spirits at the place that they got the symptoms using the schedule recommended by the shaman.

During my visit to the shaman's house, I had opportunities to observe the ceremonies and to interview the patients. There were two patients requesting the shaman to predict the diseases and required offering. In the case of the first patient, when I first met at the primary health center in the village, her blood smears test showed malaria infection, she was primarily treated with some medicine from this health center. Then, I met her again at the shaman's house. I asked her about her symptom. She mentioned "I was still bothered with a headache after I took the

medicine.” So she requested the shaman to treat her. Her symptom was forecasted Pa-Mue-Maeo. Her offerings to the spirit were three betel nuts and leaves, one candle, one flower, one well-cooked rice ball and a paper with the picture of a sun. The patient had to make a sacrifice to the spirits in the morning in her front yard. Her offerings and the picture of a sun had to stand towards a direction of the sunrise. The father of the patient was the person who led this ceremony; he asked the sun to bless his daughter and to release her from illness. In the afternoon, I met this first patient and she told me “ my headache had not disappeared yet, however I was getting better.”

In the second case, the patient apprised me that “I had a backache and could not bend over. This symptom appeared while I was working in my farm. The day after I had back pain, I could not work and had to stay at home.” Her sign was predicted Pa-pa-yo-mueo, it resulted when a dragon hit her back when she worked in her farm. Her offerings required three sets of these items:-liquor, chickens, non-sweets and sweet desserts, betel nuts and their leaves, and candles. Her husband led this ceremony by making an apology for the dragon and praying for his wife to get better. This ceremony was performed at her farm in the evening. A few days after the ceremony, I met her husband and ask him about her symptom, he told me “my wife feels better and she went to work in the farm today.”

5.2.1.2.2 *Beliefs about Birth*

The difficult access to Phong-Luk village is a reason that a traditional midwife is required for delivery. The shaman, who is respected and well known for his versatility in curing by herbal and cultural belief systems, is currently the only midwife in the village.

The following are the summarization of my interviews. According to this custom, the Karang parent of the newborn baby will take its umbilical cord to hang on the big tree near the house. When the child is born, the traditional midwife uses a thin and sharp bamboo strip to cut the umbilical cord of a baby. Then the Karang parents put the cord in the bamboo stem and hang it on the tree. If a baby is delivered late during a day or at night, its umbilical cord is tied to a stove. It will be put in a bamboo's stem and hung on the tree early the next morning. After the umbilical cord is hung over seven days, it will be buried close to the umbilical cord hanging tree. This selected tree must be fertile because the tribe believes that the spirit of a child will stay in the umbilical cord hanging tree. So the life of the child depends on that tree. The tree grows up together with a child and the tree is taken care for its whole life by the child and all community's members. The tree is prevented from falling; the collapsing of the tree equals the death of the child. If that tree is cut by anybody else who does not know about its history, that person has to perform a ceremony to call the spirit of the child back.

Informants further indicated that, currently, this belief ceremony has been changed. Instead of hanging the umbilical cord on the trees; the cord is buried

underground. This is primarily due to the lack of big trees near their houses to hang a cord.

5.2.1.2.3 *Beliefs in Funeral Ritual*

The information on the funeral rite came from only the interviews with the key informants, which can be summarized as the following:

When anybody in the village dies, his or her body is wrapped with a white cloth and then placed over a bamboo mat supported with wood. It is a traditional practice of keeping a dead body. Mostly a corpse is kept only a few days, waiting for the offspring and kinship to attend the cremating ceremony. During the keeping period, the shaman acts like a mediator to convey the information between the corpse and the relatives. The communication is done because the relatives could ask the deceased person about their health. This contact is practiced everyday until the body is cremated

On cremation day, a wrapped body is tied with rope in three different parts of the body, and then the corpse is moved to an open-air crematorium. Traditionally, there are some desserts placed in front of the crematorium. Before cremation, all guests ask forgiveness of the corpse while watering the body with either water or liquor. During cremation, the participants have to sing to allow the corpse to listen in his last moments.

The remaining ash from cremation is buried at a village's graveyard. There are two graveyards in the village, a child and an adult graveyard. The traditional burial

ceremony advises to place the remains of the head part toward the west because the Karang tribes believe their ancestors are from that direction. In addition, a bamboo gutter lying across two poles of differing heights is built. This leaning gutter will drip a droplet of water on the grave, as they also believe the corpse's spirit needs water.

5.2.1.2.4 *Beliefs about Marriage*

Information about marriage beliefs came from my interviews. Most informants indicated that nowadays, the ceremony is strictly practiced, except the activity of proving the groom's endurance that may or may not be included in the ceremony.

After a male and a female Karang are pleased with each other and decide to marry, their parents have to give their support. The elders of both sides talk and come to an agreement, then the elders of the male ask for the female's hand in marriage from her elders. The elders from both sides make a decision about marriage and a date is set.

The wedding ceremony is arranged at the bride's house. An important part of this ceremony is for the groom to prove his endurance and industry and that he can take care of the bride in the future. To verify the groom's capability, the bride's kinship blocks a groom from entering a house. The most common method is to have the groom uproot a tree deeply rooted by the bride's relatives. In other cases, the house's ladder is removed and the groom has to find a way to get into a house.

5.2.1.2.5 *Belief about a Guardian Spirit of Land*

Information about the guardian spirit of the land presented was from one informant who showed me the picture he took during this ceremony together with his explanation of the ceremonial procedure regarding this belief. This ceremony aims to make an apology or a sacrifice to guardian spirits. The Karang tribes believe the difficulties they encounter- such as a seriously diseased family member- can be healed by the spirits. In regards to this belief, the tribes have to vow the offerings to spirits. When the diseased family member gets better they will make a sacrifice to the spirits including a declared offering.

The amount and specific items of the offerings for this ceremony vary depending on what was promised by a person. However, the basic elements are chicken, liquor, and seven colors and kinds of desserts.

A ceremony is occasionally and simply performed. Generally, it is conducted when a vowing person is recovered. It could be carried out at a place a person vows or any place outside the house. A shaman or any elder can lead a ceremony by providing a prepared offering and expressing a gratitude to the spirits, and then the ceremony is completed. Family members and kinship are welcomed to attend. After the ceremony is over, all participants can eat the offerings.

5.2.1.2.6 *Beliefs about Harvesting*

My field study period was carried out after the harvesting period, so, I did not see any related activities. Therefore, all presented information is from my summarization of my interviews with key informants.

When rice is mature from the end of October until November, harvesting is started. The period of harvesting and taking the rice out of its ears takes about a month, and then the rice are stored in a granary. The processes of harvesting still employ a traditional practice of gathering neighbors to voluntarily help.

The harvesting first starts from a ripen plot, the rice is reaped and bound. The bound rice is stored in a heap. After harvesting is finished, the bound rice is laid over a bamboo mat on a flat terrain and is beaten to drop the rice from its ears.

According to a tribal tradition, the harvest period is an enjoyable time. It is a social gathering event that both male and female Karang youth have a chance to meet and to sing together. Before paddies are stored, the tribes have to perform a ceremony to express their gratitude to Phi-Bu-Yeo, a god who takes care of the rice during the season. The tribe prepares flowers and food and places them into a basket. These offerings are foods for a god while he stays in heaven. During a ceremony, the tribes also ask a god to return to taking care of their rice in the next season.

5.2.1.3 Practices and Taboos towards Nature

This information came from my interviews of key informants, the listed practices are still in use. Some of the following practices were known from the interview of the Karang tribe at Pa-La-Ou-Noi, a village I visited during my preliminary field trip.

The tribe has set up some “Do” and “Don’t” practices, which have been passed on from generation to generation. These customs have come from their beliefs that spirits can harass them if the tribes would behave wrongly, especially as it relates to agriculture and forest practices.

1) Certain Do and Don’t practices are related to making a living and include the following:

- The habitation and farmland are prohibited upland from a spring. It is forbidden to plant rice on the land that has a spring in its heart. The Karang tribes believe that if the landholder disobeys these practices, he or she would die because of the vehemence of guardian spirits of the spring.

- If the tribe were to hear the cry of the Tu-Ta--Por bird during the clearing of the farm, the farmland would be abandoned. This is similar to seeing a barking deer in the farmland. The tribe believes the rice would be infertile and would turn yellow because the deer is colored yellow. Likewise, if a lemur is seen on the farm, the tribe believes someone in the seer’s family would die.

- If a person has a nightmare, he or she has to find a new farmland. Conversely, if a person dreams of elephants or untidy weeds, it is believed by the tribe that the land is good for cultivation.

- A practice to predict the fertility of rice is carried out every year before the season. The tribe hits a half-meter stick on the ground on the west and the east three times each. If that stick gets longer prior to hitting, it indicates good soil and fertile rice. If a stick shows opposite, the rice will be infertile.

- The tribe believes a good burning practice on the farm enhances soil fertility and productive rice, but only on certain days. As a result, the tribe believes both Thursday and Saturday are good for conducting farm burning while Monday and Tuesday are not.

- It is prohibited to uproot big stumps in the farmland because the tribe believes they are legs of Phi-Bu-Yeo, a god who takes care of rice.

- The Karang tribe believes rice is the milk of Phi-Bu-Yeo, the god of the rice. So, they always perform a ceremony to express their gratitude to Phi-Bu-Yeo both before sowing and after harvesting. Calling the rice's soul is a ceremony performed before sowing. In this ceremony, the Karang tribes dig seven holes and put paddies in and pray to the god. Harvested rice from these holes is kept as breeding seeds for the next season.

- The Karang performs a ceremony to ask the goddess of the earth called Song -Tari permission to use a piece of land for cultivation.

- The Karang believes that to obtain good production, the rice must contact directly with sunlight. So, the tribe slashes and burns the fallow before cultivation.

2) Prohibitions and practices concerning wild hunting and collection

- Before entering the forest, a husband has to ask permission from his wife to take a ladder out. Customarily, his wife should say yes. It is believed that this trip would bring him good luck.

- The tribal member who enters the forest has to avoid telling a lie.

- If the tribal member stays over-night in the forest, before sleeping he has to tell the goddess of the land to protect him.

3) When a person gets a symptom of being scared from spending too much time away from the village or in the forest, the tribe has a particular practice to relieve this symptom. The practice of tying the wrists with sacred cords is believed to alleviate the person from the symptom of being scared.

4) The tribe has a customary prohibition on cutting particular big trees: Pradoo (*Leguminosae* sp.), Ta-Kien (*Hopea* sp.) and Bodh (*Hopea* sp.).

5) The Karang have a practice of building a house on new land. First a person has to perform the ceremony to buy the land. Offerings required are one baht coin, incense sticks, candles and flowers. Then, when building the new house, the person has to perform the ceremony of burying a main post. The tribe also has a traditional technique to detect the right location of the main post. This approach is to lay non-defect rice on the location that the main post will be buried, then cover the rice with a utensil. Rice covered with a utensil is left for a night. If the rice

does not crack, the main post can be buried in that location. In contrast, if the rice is broken, a new location for a main pole will be explored and the process will be repeated until the right location is discovered.

5.2.2 Livelihood Patterns

The information on livelihood patterns are from my observations both participant and non-participant observation. I spent all my field study period in the village and stayed with a Karang family. Any practices of the Karang that I did not understand from my observation, I always discussed with some key informants in order to ensure that I understood the information.

The daily life of tribal Karang of Phong-Luk village starts in the morning no matter whether it is in- or off-season. During the season, men will go out to the rice farm, while women have to take care of the children and the house. If a family has no babies or small children to take care of, a wife will perform fieldwork with her husband. The Karang females are fecund because they marry early and do not prefer birth control, and they can give birth through their fertility age. Actually the female Karang has many children but most children die after birth. The average number of living children in a family is 3-5 children.

During the off-season, the males of the tribe go into the forest to collect wild products, such as vegetables and fishes, as supplements for consumption. Some tribe members may seek work in nearby lemon farms. The tribe members who are hunters may spend many more days in the deep forest to collect more precious wild

products, such as fragrant wood and honey, for trading. When going out to the farms or the forest, the tribes customarily take shoulder bags with them in order to carry supplies and put the supplemental foods in on the way back home.

The simple ways of life are also found in their consumption patterns. The daily main diet is rice, fish paste in chili sauce and vegetables; most of the foods are locally found. Vegetables are from farmlands and gardens around the house, while fishes are from the Phetchaburi River. Fish paste is a main source of protein in the daily diet of Karang. The Karang's households have to prepare the preserved fish paste during the off-season, in order to have it for the whole year. Fish paste is prepared by keeping fish a couple of days until they start to rot with a strong smell. Then they are chopped into small pieces and kept four to five days until their meat starts to get tender; soon after, some salt is put in. These tender salty fish are kept until they turn to paste. The tribe puts this fish paste in a bamboo stem and dries it over a stove. The people's daily diets are simple and easy to be composted. Consequently, most tribes dispose of their leftover food into pits. Some households that raise domestic animals, such as chickens, pigs and ducks, feed them with those left over foods.

The Karang have a prohibition against immorality. This practice I learned about from my Karang male interpreter. When I went with him for household interviews, he always avoided going into the house where the male leader of the household was gone. I asked him and other key informants about this issue. In case the husband has to leave the house for many days to hunt or to farm, the wife

who stays home must pursue a customary prohibition to help her husband remain safe. In order to avoid adultery the wife cannot go and stay overnight anywhere. Evidence from my observation has shown that most women whose husbands stay away from home are cautious and avoid talking with strangers. Because the male Karang knows about this restriction, they avoid getting involved with those female Karang who's husbands are gone. In some cases, the female Karang try to keep themselves busy in their houses with preparing local liquors for their husbands. If their husbands come back with some wild animals, then they will arrange parties with kinfolk and neighbors. According to this prohibition, the tribal women generally do not go anywhere alone; they have to go together with their husbands and children.

The interviews support my learning on the matrilineal system which can be explained by the risky life of male tribe members as they have to go into the forest particularly for hunting. As a result the tribe accepts the matrilineal system. This system of the tribe is illustrated in the ceremonies described earlier. In the case of Ban Phong-Luk and Ban Bang-Kloy, most tribal families perform the Chicken Sacrificed Ceremony. This reflects their inheritance from the same spirit. In addition, the respect given to seniority and between one another, is because they believe that most of them are kin. From interviews, most tribe is clan. The clan system results to the establishment of communal land right within the community. Regarding to the traditional practice, male head of the family clears the land, this land would be sub-divided and give to the off-springs if that land is not used in the

next season. Then head of the family rotates to the new land. Most of the farmland is the flat land between the valley. When the Karang couple is married, their parents will give them the land through the simple method of buying with one baht coin.

In all social interaction the “senior-junior” relationship is of vital importance. The young are always expected to defer to their elders, whether in the family, the village or inter-village relationship. The elders, both male and female have the important role in the village because they are the persons who have gained much life experience. This interaction binds the tribes together and increases the positive relationships. The male elders have more important roles than woman, and will be the religious or ceremonial leader. The relationships within the tribe’s society create supportive and hospitable practices among them. This relation still builds cooperation in carrying out activities in the village.

5.2.3 Production System

5.2.3.1 Highland Rice Farming, Chili and Vegetable Plantation

The information on rotating rice farm came primarily from my interviews and from some observation. The following is my summarization of this rice practice.

There are two types of production in Phong-Luk: the highland rice farm and chili and vegetable plantations. Rice farming is a major production because it is a staple food. All the tribe members know about the importance of rice, so I can summarize their beliefs with “if we have no rice, we have nothing to eat, then we

will die.” In addition, rice farming is their major concern because of unavailable land to farm. Likewise, the tribe highly recognizes the ecological significance of rice farms in sustaining their lives. As one of the Karang interpreters said “I grew variety of crops in my rice farm, the crops will support each other, and I can have plants for consumption all year.” They are still concerned with well-grown rice and enough production for consumption during the entire year as well as enough land for cultivation.

The permanent settlement is a significant component for a sustainable management system of natural resources in the village. There is much concern that future generations are able to make their living from existing resources.

The rice farming of the Karang tribe is a rotational system in which a utilized plot of land is left fallow for a period of time to allow the soil to be fertile. Currently a one or two year fallow period is practiced because of limited available land. It is a mixed-crop farm, in which vegetables and fruits are planted before the rice is cultivated. Most vegetables are fast growing annual crops such as chili, egg plant, melon, watermelon, corn, banana and papaya. These crops bear fruit year round for household consumption. When mature, these crops will die and become fertilizer for rice.

Due to a shortened fallow period for some farmers, land turns infertile and rice production becomes diminished. Most interviewees indicated that “ Besides infertile soil, the weed invasion in rice farm were the min problems that they faced because of short fallow.” Therefore, some tribes have rented their lands to lowland

villagers who have turned the lands to lemon farms. Presently there are two lemon farms managed by the lowlanders. In addition, some tribes have started small lemon farms in their granted lands without any fertilizer input, so they gain only low yields in return.

Formerly, the tribe of Phong-Luk had more freely moved their farmland around, and the used lands were left fallow longer. In addition, the tribe might not reuse the same fallow lands. If fallow land is not used, the neighbors can use it because the tribes perceive the lands as communal properties. Although there is increasing pressure on the land due to restricted use of land by national park officials and the increasing population by newcomers from Ban Bang-Kloy--the tribe still maintains their rotating farms. From my interviews, I learned that most dwellers of Ban Bang-Kloy who have not been granted the lands or their lands are not applicable to rice farming, borrowed the fallow lands from other tribal members of Ban Phong-Luk who have many plots of land that completely lay fallow and do not use that land in a given year. However, the tribes who have no lands can seek employment in nearby lemon farms.

Most households have small patches of gardens, which are planted with some vegetables and fruit trees such as papaya, banana, and mango. These typical home gardens are not the traditional production system of the village. Instead, these plants have been promoted by development agencies that worked in the village. Castor bean is another product recently promoted to the village. Castor bean and papaya cultivation can provide some earnings from selling. During my field study,

castor bean was harvested and dried in order to take the shell out and sell the seeds. From my observations, the tribe preferred to grow castor bean because it required no fertilizer, no insecticides, and little care. From interviews, most tribe members who grew castor bean mentioned "I could sell castor bean this year at 18 baht per kgs. (\$1= 45 baht and 2.2 lbs. = 1 kg.). Then I earned some money to buy some necessities, particularly the rice, because I did not get enough rice for year round consumption."

Generally, the production season of the tribes depends on climate and the household's laborers. The time spent in each activity during the production period is summarized in Table 5-2,

From February to March, the climate is dry. So, this period is suitable for clearing the land and to allow slashed shrubs to dry properly. Then, beginning at mid March until April, the farmland is burned. The unburned big stumps are left on the farm, while the remaining branches are gathered for firewood. This means the land is ready for cultivation. Afterwards, the mixed vegetable seeds are sowed before the rain starts at mid April. These crops are harvested for household consumption after a couple months and they can be rotationally harvested for the entire year.

During July, the rain starts and the soil begins to be tender and the tribes sow their rice seeds. As the rice matures, the tribes are busy with weeding. If the rice is too dense, some of it is taken out to get a more bountiful harvest. From October until November, rice produces ears. At the end of November, the rice is mature and

Activities		Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	Clear the land and let it dry	■	■									
2	Burn and collect leftover unburned wood		■	■								
3	Sow vegetable seed			■								
4	Harvest some vegetables through time				■	■	■	■	■	■	■	
5	Put in rice seed						■					
6	Take care and weeding							■	■	■	■	
7	Rice bearing ear									■	■	
8	Harvest rice										■	■

Table 5-2 The Schedule of the Activities of the Highland Rice Farm

ready to be harvested through January. Harvested rice is threshed and the paddy is stored in a granary. Overall, the tribes are busy with their farmland almost the whole year.

Rice farming is very meaningful to Karang's lives. An understanding of the rice farming practices is necessary in order to assess the usefulness of local knowledge for future forest practices. The prominent characteristics of rice farming activities can be summarized as the following:

1) Site selection: Tribes prefer to select a one to two year fallow period for rice farming. This fallow area has some mature forest canopies, which prohibits the growth of weeds. Therefore, the weeds can not disturb the rice development during its growth season.

2) Rotational cropping: Although their utilization of lands is confined by the park, the tribes still practice their traditional crop rotation. They have rotated their lands with other neighbors instead of encroaching and opening new forests. From interviews, I learned that most tribes, especially from Ban Bang-Kloy, who have no or small amounts of land asked permission to use the lands from their neighbors who do not use those lands during a certain year.

3) Breeding seeds: The tribes employ traditional selecting method of grain and vegetable seeds by observing the recent production. They select good grains that are free of insects and diseases from their farms. The breeding grains have to be used year to year; they will be spoiled if they are kept too long. The technique in taking care of the breeding grains is to dry them first by sunlight, then the seeds

will be kept in the shelf over a stove. The tribes believe that smoke from fuel-wood will coat the seeds and prevent them from ants and rice-worm.

4) Burning down: A well-known characteristic of highland rice farming is clearing the land and leaving all plant and vegetables dry. The dry land is then burned down. This technique is asserted by most literatures as the only method that can bring nutrients from plants back to the soil (Luangaramsri 1996). In addition, the tribe will collect the remaining unburned small stems, called “wood bone” for households’ fuel-woods.

5) Highland rice farm pattern: The most interesting of highland rice farm system of the tribe Karang is nature-based and mixed crop-based agriculture. These practices are unique characteristics of the traditional agricultural system. The assorted vegetables and plants are cultivated in the farm along with rice. The tribes believe that this mixed or multiple cropping system is very helpful in sustaining their livelihoods.

The tribes have knowledge on choosing an appropriate time to sow the seeds because different seeds require different condition. As the interviewed members indicated “before planting rice, chili, melon, is planted first, and then rice goes after. The vegetables will be harvested prior to rice.” Additionally, they are good at planting layout, which helps increase the symbiosis among the plants and better utilizes the land. The varieties of plants are planted among the rice helping to fertilize the rice, attract insects, and therefore prevent damage to rice. The tribes also grow flowers in the farm to use in ceremonies; as a result these flowers attract

some insects, which aid pollination and increase new breeds. The varieties of plants in the farm indicate a practicing system that is unlike a monoculture. Its design keeps the small annual crops like shrubs inside, while long-age fruit trees which bare fruits year round stand at the perimeter of the farm. In addition, these fruit trees give shade to other understoreys.

Another essential role of the multiple cropping system is its self-sustaining process. For subsistent production like the Karang, this system ensures them food because all crops cultivated are edible. Therefore, the system provides them enough food for consumption year round with little or no external dependency. Some extra crops such as chilies can be sold; this cash is reserved for necessity.

5.2.3.2 Wild Product Collection and Hunting

The information for forest harvesting came from the interviews of both the Karang key informants and the park officials.

During the dry season especially in the off-season from March until April, the Karang youth and middle-aged men prefer to travel several days in the deep forest. Their trips aim to collect wild products such as honey, fragrant woods and wild animals. In the case of hunting, a dry season is most preferred because of the high possibility of finding many wild animals. The Karang have learned from experience that most wild animals live near water sources or salt licks, therefore making it is easy to catch them.

The external development pressures have influenced the tribes' practices and behaviors. Formerly, they gathered wild products just for household consumption. Nowadays, the wild product collection is aimed not only for consumption but also for commercial purposes. At present, the hunting has decreased due to the other occupations by the development agencies.

However, the honey and fragrant wood are still collected during the off-season. The most agreeable perceptions of the tribes on the benefits they obtain from the forestland in the park are the acquiring of woods for house repairing and areas for cultivation. There are some tribal members who still collect wild products for both consumption and commercial use. Fish from Phetchaburi River are caught for the entire year and white mushrooms are gathered during October until November. The fish and mushrooms are gathered for consumption, while honey is collected during April for trading. Generally, honey can be gathered about 30 liters per person annually.

The tribal members who collect honey follow a traditional practice of collecting only honey, and do not damage the hives or use any pesticides. They avoid the improper practices because they are afraid there will no longer be honey to collect.

5.3 LAND UTILIZATION AND MANAGEMENT

In general the Karang prefer to settle down among others of the same ethnic groups at the watershed of a high mountain. The Karang prefer to locate their

houses near water sources and to stay close together in a small group of approximately two to four houses among their kinship. Their current establishments are located on a high riverbank causing their houses to be located a bit farther from the Phetchaburi River. The wild flora and fauna still remain along the riverbank. The area connecting the houses is usually planted with fruit trees and vegetables. Some big trees are still seen in the areas around the groups of houses and particularly in strips along the inner riverbank. Each group of houses has its path toward the river.

The land is used as communal family property and it is divided to the new generations by their ancestors. The tribes prefer to choose small patches of land, 2 to 5 rai, scattering in the valley for rice and vegetable cultivation. This cultivating land is located some distance from the main river and its tributaries. It is a rain-fed agriculture, which establishes on the bamboo grove forest. This typical forest is preferred because it is easy to clear. Historically, the Karang do not prefer to cultivate in dense or old forest because of the difficulty in clearing the land and in preparing it well before the production season.

Rice and vegetable are cultivated in the form of rotational mixed cropping farm. The fallow land is cleared and burnt during the beginning of the season. Then the vegetables are planted following the rice and then harvested. Formerly, the tribe uses the farmland only one year and leaves it lay fallow for 6-7 years. Due to the restrictions of the land by the government, they cannot practice in their traditional manner. So if the tribe finds their cultivation land is disturbed by weeds,

they have to move to the new land and leave the local plant to grow up to cover and to control the weeds. They will return back to that land if it is suitable to cultivate.

6 RELEVANCE OF KARANG LOCAL WISDOM FOR SUSTAINABLE USE OF NATURAL RESOURCES IN THE NATIONAL PARK

This chapter analyzes the contributions of local wisdom of the Karang tribes of Phong-Luk toward the conservation of their local natural resources. The wisdom described in the previous chapter contains their beliefs, ceremonies and practices which have been conveyed from generation to generation. It is concluded that those actions have set the patterns of a livelihood that are in line and in balance with the surrounding natural resources. The contents in this chapter include a description of the potential of local wisdom to be incorporated into resource management, as well as the factors affecting the use of their wisdom in the study area.

The information presented in this chapter follows the analysis of information contained in Chapter V. The conclusions derived in this chapter will then be applied to recommendations for an appropriate development plan for this community in a later chapter.

6.1 LOCAL WISDOM THAT IS IN BALANCE WITH THE ENVIRONMENT AND MANAGEMENT OF NATURAL RESOURCES

The traditional existing subsistence production practices, the way of life and beliefs of the Karang tribe indicate the community's local wisdom of living in harmony with the natural environment and a capability of wisdom that is consistent with conservation.

The Karang tribe prefers to farm in deciduous secondary forest, in which bamboo is dominant. They believe this particular forest is fertile because it has high nutrient dark soil and because the bamboo forest is rapidly regenerated (Luangaramsri 1996). This is attested by the tribe members and key informants that I interviewed, who concluded, "selecting the farmland, bamboo forest is the most preferred because good burning, good soil, give good yield." In addition, the soil of fallow bamboo forests that has complete succession, will be fertile and some disturbing weeds will be diminished due to the crown cover of fast growing plants. As a result, it requires fewer laborers and less time to look after the farm. Mentioned by most interviewees "In the completed succession fallow land, the land is good because it have few weeds, high fertilizer and give good yield."

The agricultural practices of the Karang tribe of Phong-Luk are similar to that of the Karen and Lua rotating rice farm of short cultivation with long fallow (Garnjanapun, 2000). Their main characteristic of rotating rice farms is to allow utilized land to lie fallow for a period of time to permit the soil to regenerate. Then the tribes rotate back to that restored fallow land in subsequent year. Therefore, all their rice farms are cultivated after one year in a fallow land, which is then left unaltered for a period of time, generally 5-10 years, in order to allow soil to recover before re-cultivation. From my interviews, the tribe informants believe that if they use the land for several years in a row, the soil will be infertile and offer poor crop yields. So, the rotating farms help maintain the fertility of land.

The rice farming systems are still based on subsistence purposes, and the farm production is exchanged within the community only. Therefore, the land is not utilized extensively each year. Furthermore, only household labor is required for clearing the land each year. As a result the amount of available land for farming is limited by this family labor. From my interviews, I learned the Karang's family is generally small averaging 3 to 5 persons, and an average farm size of 3 rai can produce enough rice for year round consumption. However, from my interview, the Tribe prefers 12-15 rai to allow long fallow periods. As mentioned by the tribes "15 rai is a good size for rotation farm year, which provides enough production for round consumption of a household of 5 persons." And "15 rai can leave for 3 year then return back to use the left fallow land"

Presently, the utilization of cultivation lands is restricted by the national park. This policy especially impacts new comers of Ban Bang-Kloy. They have been granted by the park only 7 rai of land. During my interviews, I was told the 7 rai of granted land does not provide sufficient time for land to leave fallow according to traditional rotation techniques. Consequently, the rice field will be severely disturbed by the weeds. As a result of government intervention, their current harvested yields have declined by this short fallow period.

The application of the fallow land technique is considered to increase soil efficiency and accumulate moisture in dry areas like highlands, control weeds and reduce soil erosion. As mentioned by the tribe "The non- forest fallow has a lot of weeds invasion because the weeds are easy to spread and there are more insects

than in the well regenerated forest. The regenerated forest has its own cycle.” And “the problems result from the insufficient fallow period are weeds invasion, therefore, they increase the difficulty for manual weeding.” And “I got low yield of rice because of the weed invasion due to I repeat farming on my land.”

Garnjanapun (2000) notes that during the succession, the calcium would be retained and the nitrogen will increase at the soil surface due to the long accumulation of dead plants. Additionally, Sabbasri (1978) indicated no evidence of the gully erosion of soil in the farm that is left fallow, even in high slope areas. There is only rill erosion in the area that the river flows through, however, it is normal given that natural weathering such as water flow and wind erodes highland soil. Additionally, the compacted soil caused by overstepping is another cause of erosion, because it prevents the penetration of water into the soil. The high erosion of soil in rotating farms happens while the soil surface is bare during the beginning of the rainy season. When the plants thoroughly cover the soil, erosion will be reduced. This erosion is alleviated respectively from the middle of the rainy season to the second year. Therefore, the long fallow system is better than the cultivation that constantly opens the soil surface or tightens the soil by overstepping. Chutimataewin (1998) has indicated the erosion of only two tons per rai produced by mixed cropping farm. This soil loss is less than the loss from monocroppings that have to open soil surfaces such as the lemon and pineapple farms that have been promoted by government for cash crops.

This rotating process is the significant production technique that sustains the survival of the Karang highlanders. This approach is also considered by locals to be the wisdom of production that creates an economizing practice of land utilization. Stability occurs when a small amount of new forest is used, if any is used at all. A summarization of comments of tribal members was "Our rice farms are located only around our villages and they are fallow lands, we prefer to select the secondary forest for rice cultivation because they are easy to slash." Furthermore, the rotational manner in the highland agriculture benefits soil fertility and conservation (Nye and Greenland 1960:134 quoted in Garnjanapun 2000) which shows that the rotational practice of short cultivation and long fallow maintains the humus in soil.

Highland rain-fed rice farming serves as the primary focus of the Karang's household. Various kinds of vegetables are planted during a season. This type of cultivation serves two main purposes (Kunstadter 1978, Garnjanapun 2000 and Luangaramsri 1996). First, mixed-crops guarantee an amount of output, which contributes to the stability of the production system and allows the tribe to sustain themselves. Second, the varieties of crops themselves will reciprocally support each other; this combination of crops helps to eradicate weeds, insects, and plant diseases, and to preserve the mineral and organic content of the soil.

From my interviews, the tribe believed that the dead crops in the mixed cropping farm, especially the short-life growing plants, will become fertilizers in the soil, while some remaining crops will attract or repel insects which prevents

them from damaging the rice. This natural technique requires no pesticides, herbicides or fertilizer. Weeds do not grow well in perfect mixed-cropping therefore manual uprooting is employed to get rid of the few weeds.

Mixed-cropping is significant because it allows for efficient production under a management system that is consistent with the local natural production process. The mixed cropping itself conserves the diversity of biogenetics of foods and drugs (Santasombat 1999). As mentioned by the tribe "In the past, there were plenty of lands, therefore the planted vegetables were more varieties comparing to unavailable lands nowadays. Also, the long fallow period suppress the growth of weeds." Local knowledge of the ecosystem contributes to low investment and self-sustainment because the production relies only on the rainfall and the household labor. The reciprocal support of the plants as well as the absence of fertilizer and pesticides contributes to the stability of the ecosystem. The mixed cropping practice requires no plowing and the crown covers during the cultivation period, so it effectively decreases the erosion of the highland cultivation. An interviewee mentioned "In the past, when I was in Bang-Kloy, I did rice farm. Money was not necessary because we got everything from our farmland." And "We do mixed cropping rice farm, no water, depend only on rain and we can have rice and crops to eat all year. But, now we have not enough land to do rotation farm, not enough rice to eat."

Land preparations for highland rice farm of the Karang tribes employ the slash and burn technique. This method is preferred due to the limitation in labor,

geography, and that the land has to be cleared before rainy season. Proper slash and burn is the best technique for increasing soil fertility through the passing of nutrients from plants to soil (Kunstadter 1978). The necessary nutrients to fruit bearing trees--particularly calcium, phosphorous and potassium--are returned to the soil in the form of the ashes that remain after burning branches and leaves (Peters and Neuensvhwander 1988). This process of fertilizing the soil sufficiently supports the growth of rice during its growth period of six-months.

Burning creates high surface soil temperatures which then creates an aseptic condition up to 2 centimeters below the surface. This prevents the spread of plant diseases and ripens the seed so it will be ready to grow during the rainy season (Sabbahsri 1978). In addition, this burning retains the moisture content of the soil. Zinke and Sabbhasri (1978) mentioned that nutrients in the old forests would be diminished if they were undisturbed. So, the proper slash and burn will release the nutrients back to nature.

In case of the soil fertility, the article of Zinke and Sabbhasri (1978) and Peters and Neuensvhwander (1988) argued that the burning of rotating farms is not too long and a second burning not necessary. The ashes have abundant carbon and the sunlight increases the temperature, which kills pests. Zinke and Sabbhasri (1978) also indicate that burning fallow has more phosphorous than unburned natural dense forest. The response of soil to the accumulation of phosphorus during the cultivation results in lower acidity on the soil surface than the old forest. Slash and burn is considered the tribes' technical knowledge in returning nutrients

to soil naturally. This technique provides sufficient earnings for their living within the limitation of highland ecology and irrigation. In addition, no input fertilizer prevents the tribe from becoming externally dependent on outside sources.

Table 6-1 illustrates a summary of the traditional rotational farm process. This agricultural practice has historically contributed to the conservation of natural resources. The sustainability of the land and the Karang culture may be threatened by the new government policies.

As noted above subsistence rice farm is a significant production system of the Karang of Phong-Luk village. Even though more than half of the villagers cannot produce enough rice for year round consumption, the community still survives because of their supportive culture based on their close relationships. According to current practices, the landless tribe can ask permission to use the lands of neighbors who have many lands and do not use those lands during the season. It is obvious from interviews that most tribes of Ban Bang-Kloy can borrow the lands from Phong-Luk neighbors, who originally resided in the area, if they are not currently using those lands. For example, one respondent commented. "I just came here and haven't received granted land, I asked permission from my relative 2 rai to cultivate rice and chilies in his fallow land that he did not utilize it." Another respondent indicated "I moved from Bang-Kloy, I got only 1 rai of granted land but have not received another 7 rai of land for cultivation. Currently, I ask permission to use my relative's fallow land to plant rice and vegetables."

Production Step	Practices Contributing to Natural Resource Management	
	Practices	Contribution to Conservation
Site Selection	<ul style="list-style-type: none"> • Prefer secondary forest (bamboo dominated) • Prefer fallow land 	<ul style="list-style-type: none"> - Rapid forest regeneration, does not disturb old growth forest - No need to open up new forest or only new small forests are used - Increase soil efficiency and conservation
Land Preparation	<ul style="list-style-type: none"> • Land clearing applying different techniques for different tree sizes 	<ul style="list-style-type: none"> - No tillage maintains soil fertility and moisture - Remaining snags and the trunks will rapidly grow and regenerate after the land is left fallow
Burning	<ul style="list-style-type: none"> • Fire protection line is well prepared 	<ul style="list-style-type: none"> - Unused land will not be burned - Ashes will enrich soil - Unburned woods will be utilized as fuel-woods, no need to cut down the trees
Planting Method	<ul style="list-style-type: none"> • Dig holes and put seeds in, no plowing • Mixed cropping • Rotation farming 	<ul style="list-style-type: none"> - Keep the moisture in the soil - The soil surface will be covered - Slows the run-off - Decaying of the rotating plants will increase soil fertility - Different root systems increase the plant's Nutrient up taking - Conserves biogenetic of foods and drugs - Ensure the self-sustaining practices - A small patch of land is required - Economizing utilization of land
Weeding	<ul style="list-style-type: none"> • No pesticide and herbicide use 	<ul style="list-style-type: none"> - No residual chemical left in soil. Soil is not spoiled and resists eroding
Harvest	<ul style="list-style-type: none"> • Stubble will be left in the rice farm 	<ul style="list-style-type: none"> - Stubble will be digested and will become organic fertilizer, increasing soil fertility - Stubble will cover soil surface, helping to reduce the impact of rain striking the soil surface

Table 6-1 The Contribution of Highland Rice Farm Production to Resource Conservation

Due to their embedded perceptions of traditional rights, the tribe believes that nobody owns the land; the person who opens up the land has rights as long as that person still utilizes it. If the person does not use it, other persons can ask permission to use that land. With regard to this aspect, any members of the community can utilize this communal land equally without trading. This communal right is practiced by some tribal members especially among their kin and close neighbors regardless of the government introduction of individual land rights.

This communal right concept is important to the natural ecosystem because it allows flexibility in selecting the land which reduces intensive use on any particular piece of land. Everybody has an equal right and is guaranteed to equally utilize the land. In addition, the number of rice farms depends on the number of the households in the community and the size of land depends on the number of the household's members. With no individual rights of the land it maintains its subsistence utilization. In addition, no land is over used because it wastes labors. Therefore, the traditional practice of communal land right is considered part of the local wisdom of the Karang tribe because it ensures land for cultivation. The equal right to use as well as the subsistence use of land is important to the sustainable management of natural resources. (Luangaramsri 1996)

6.2 THE BELIEFS THAT CONSTRUCT THE CONNECTION TO SUSTAIN NATURE

The Karang tribe has inherited strong beliefs of supernatural power from their ancestors. These beliefs are reflected in both practices and prohibitions, and that this power can bring misfortune to them and their families. The basic concepts of practices and prohibitions are related to their ways of life and their reliance on nature and instill respect and fear. These beliefs have created the careful utilization of natural resources and few negative affects to the environment.

Although mentioned in the previous chapter, this section will analyze the underlying beliefs of practices and taboos toward nature and how they relate to the conservative practices.

The tribe believes that nature—such as water, land and trees—has guardian spirits to protect it. The belief in guardian spirits of spring water brings about the fear to use the spring and surrounding area. This prohibition produces good benefits to the conservation of water sources and their surrounding environments. The belief in guardian spirits of big trees causes the tribe to respect and not to cut those big trees, thereby conserving the natural environment of the area. The belief in guardian spirits of land prohibits the uprooting or vertically cutting the big stumps in a farm. These remaining stumps will become fertilizers to the soil when they decompose. Conversely, the living stumps will increase the rapid regeneration when the land is left fallow.

Some prohibitions directly aim to protect the tribe's subsistence production, and indirectly contribute to the protection of the dense forest and the wildlife

habitat. Examples are no farming in evergreen or dense forest or at the wildlife habitat or a salt lick. The fixed burning date of the field actually aims to encourage the tribal members to perform burning at the same time, therefore, they can get labor support from one another on a certain date. Furthermore, the belief related to the burning date contributes to the prevention of the occurrence of forest fire.

The belief to avoid seeing a lemur (an animal that lives in the deep and dense forest) helps to confine the utilization of land because this dictates that the tribe's farms are relocated only in deciduous forests.

Another belief of the tribe is that they clear the field in order to obtain sufficient sunlight and rainfall at the beginning of the growing season of the rice and other crops enhance the mature growth of vegetables before planting rice. This technique also helps to reduce the weeds in the farm during the season. Indirectly, this belief prevents the Karang from the application of herbicides.

6.3 LOCAL WISDOM OF MAKING THE CONNECTION WITHIN THE COMMUNITY AND ITS IMPORTANCE TO THE ENVIRONMENT

The Karang tribe of Phong-Luk is a community whose way of life still depends on nature. The traditional leadership and relationship connection within the community are important to maintaining a subsistence and sustainable way of life. Although there is assistance from the government in establishing the formal administration within the village by electing a formal village headman and the Tumbon Administration Organization (TAO) committees, the everyday living in

the village, is much more informal. This relationship starts from the smallest to the biggest unit, which are households then relatives and finally the community.

The local wisdom related to the power of these connections within the village creates the supportive, the generosity, and good relationships within the family, kin and community. The areas where this is most evident are: ceremonies, health care, births and deaths.

The significant customs and ceremonies of the Karang of Phong-Luk are inherited by female tribal members. Each ceremony has its ritual that emphasizes mainly the relationship within the family. The tribes prefer to perform these ceremonies after harvest at the beginning of January. The size of the ceremony depends on the economic status and the obtained production in a certain year of the household.

These ceremonies have the rites that aid to construct the strong and close relationship at the family level. In addition, these customs are closely tied to their livelihood conditions and yearly agricultural production.

Although the herbal treatment is currently almost disappeared because of the access to the primary health care provided by the government in the village, the villagers still retain the practice of traditional prediction treatments together with the modern treatment. The treatment starts with the patient asking the village shaman to diagnose the disease with the advice on the offerings by taking a chance. Then the patient will assign the respected elders who are that patient's relatives to perform the ceremony. If the patient does not recover with the treatment of herbs,

the primary health center will be used to supplement treatment. The diseases diagnosed by the shaman are mostly related to the action of guardian spirits of land, superstitions, and sacred prohibitions and practices due to the beliefs of each kin group. The belief on making the offering and the apology to the guardian spirit of the land is the ceremony performed due to the sickness of the member of the household. Then the tribe prefers to make a vow to the spirits. The offering in the ceremony is provided as declared and the kin elders perform the rite.

This belief reflects the internal value of a person. Performing the ceremony, the person feels confident, in addition, the ceremony reinforces the strong supportive and generous nature within the family and among the kin of the person.

The important issue related to the beliefs about birth is the hanging of the umbilical cord on the tree near the house. The tree is considered the child's soul. The tradition does not allow the tree to be cut, which is taken good care of as the child grows. This belief is directly related to the conservation of forest resources and environment of community. So, the big trees will be left to shade the soil and to protect wildlife, which create the stability of ecosystem in the areas.

The Karang beliefs about death are that the spirit of the dead person will protect the living person. In the ritual, the shaman acts as a mediator to communicate between the corpse and the living kin. The corpse will be cremated and the remaining ashes will be buried. The Karang respects the ancestors and has the wisdom in managing the properly rite through cremating the corpse and burying the ashes as mentioned in the chapter V. This practice creates a bond between the

living and the dead, at the same time it can prevent the spread of disease and the digging out by the wildlife.

In conclusion, it is clear that the local wisdom of the Karang tribe of Phong-Luk has deep connections in conservation of natural environments. In addition, it is a strongly held wisdom that is inherited. The wisdom can be applied to the conservation management of the natural environment of the area. It is this threatened wisdom that requires the acceptance, the promotion and the support from the government and related agencies through learning of the traditional ways of life of the community. The encouragement of the local community to participate in management should be strictly and continually supported. This could lead to the sustainable development of the Karang of Phong-Luk as well as the long-term stability of the environment.

6.4 FACTORS AFFECTING THE RELEVANCE OF KARANG LOCAL WISDOM

Until now, the development and incorporation of wisdom of the Karang tribe of Phong-Luk has been ignored. This lack of awareness combined with the government development promotion practices tends to erode their ways of life. This erosion turns the development within the community and the tribe's livelihood to pressure on the natural environment in the national park and this tension would be increased over time.

6.4.1 The Negative Factors

The following presented information are the factors that hinder the development of the potential of local wisdom in sustainable resource management and contribute to the degradation of the environment. These negative impacts that will be analyzed in this section are the affects of the national park policy, the impacts of the promotion and development on the community, and the impacts resulting from the adaptation of the tribe to the welfare development. In addition the analyses of positive impacts are included.

6.4.1.1 The Affects Resulting From the National Park Policy

As described in the introduction, the park policy gives primary attention to the environment and outlined ways for people to be excluded from the forest. For instance, the section 16 of the Nation Park Act prohibits individuals, which can be seen from its following details (National Park Act 1961):

1. Hold or possess land, or clear or burn the forest.
2. Collect, take out, or do by any means whatsoever things endangering or deteriorating woody plant, gum, yang, wood-oil, turpentine, mineral or other natural resources.
3. Take out animals or do by any means whatsoever things endangering the animals.
4. Do by any means whatsoever things endangering or deteriorating soil, rock, gravel or sand.

5. Change a water-way or cause the water in a river, creek, swamp or marsh to overflow or dry up.
6. Close or obstruct a watercourse or way.
7. Collect, take out, or do by any means whatsoever things endangering or deteriorating orchids, honey, charcoal, barks to guano.
8. Collect or do by any means whatsoever things endangering flowers, leaves, or fruits.
9. Take in, take out any vehicle or drive it on the way not provided for such purpose, unless permission is obtained from the competent official.
10. Cause any aircraft to take off or land in the place not provided for such purpose, unless permission is obtained from the competent official.
11. Take cattle in or allow them to enter.
12. Take in any domestic animal or beast of burden, unless he has complied with the rules prescribed by the Director General and approved by the Minister.
13. Carry on any activity for benefits, unless permission is obtained from the competent official.
14. Post notifications or advertisements, or scratch or write on any place.
15. Take in any gear for hunting or catching animals or any weapon, unless permission is obtained from competent officials and the conditions prescribed by the later have complied with.
16. Fire any gun, cause any explosive article to be exploded or set off any fireworks.

17. Make a noisy disturbance, or do other act causing trouble or nuisance to any person or animal.

18. Discharge rubbish or things at the place not provided for such purpose.

19. Leave any inflammable article which any cause fires.

Regarding the list of measures above, the government has established the policy that set the people aside from the forest regardless of the fact that the tribe has been residing in the forestland for ages. As a result, these measures create the conflict between government and local people and it are not easily resolved.

6.4.1.2 Negative Impacts from the Promotion and Development in the Community

6.4.1.2.1 *Establishment of the Community*

The original settlements of the tribe were dispersed from Phong-Luk to the north of the Phetchaburi and the Bang-Kloy River, a tributary of the Phetchaburi River, near the border of Thailand and Myanmar. The tribe has the traditional culture of staying in a small kin group. Boating and walking were two main modes of transportation that were used by the tribe to have contact with the outsiders, which were rarely used. When the Kaengkrachan National Park was proclaimed, the tribe from Bang-Kloy, the newcomer, was later relocated to Ban Phong-Luk and established the new village named Ban-Bang-Kloy of Phong-Luk. Since then, Phong-Luk has become crowded because the tribe has to live as a large group on a limited piece of land. Furthermore, the forests along the both banks of the Phetchaburi River are extensively opened up. The government now provides the

basic utilities and improves the old logging route. This forced shift in population has directly led to changes in beliefs, customs and practices, particularly the attitudes related to the production and consumption pattern of the tribe.

6.4.1.2.2 *Land Tenure Pattern*

The allocation of farmland at Phong-Luk is done by the Kaengkrachan National Park's manager through the application of individual land rights. The average size of land granted is 7 rai per household, except the former households of Ban Phong-Luk may occupy land over 7 rai. The individual rights and increased allocation of land create the insufficient farmland to practice the crop rotation technique accordingly to their local wisdom and occupational proficiency. The tribe actually requires at least 15 rai for their rotation practices. The repeated cultivation in the same farmland every year will allow the grasses (*Imperata cylindrica*) to grow in the farm. Therefore, several laborers are required and crop yields are lessened, resulting in insufficient rice for yearly consumption. Finally, that farmland is temporarily abandoned. In order to survive, the tribe may seek new fallow land, which is hard to find, or open up into new forest areas which the park can not thoroughly guard against. As a result, the forestland is steadily degraded.

The traditional highland rice farm with mixed crops has been changed to the horticulture of castor bean and other economic plants. This new cultivation pattern

has changed the tribe's attitude towards land utilization. This new pattern of land utilization encourages them to fell the trees and plant monocrops instead.

Government promotion of these production patterns imitates the cultivation of Thai lowlanders. The tribe replaces the land with monocropping such as a lemon farms. As a result, the amount of land for highland rice farms is diminished. Generally, this new farm practice requires some external inputs, such as fertilizer and insecticides in order to obtain abundant yields. Most Karang grow the lemon farm with low investment because they can not afford the high cost inputs, so low yields are obtained. At this point, they therefore have no rice because the lands have been changed to lemon farms, and they have to buy rice. The low yield of the lemon farm provides them not much money in return. Some households give up their own lemon farm and seek work in the lemon farms nearby, while others enter the forest for hunting and fragrant wood collection. This typical new way of life increases the conflicts on the management of the national park. Contributing to the land use problems has been the influence of outsiders. The government provision of more access routes to Phong-Luk attracts the capitalist or lowland farmers to the area. Most capitalists have offered high benefits to the tribe for their land and labor. This causes the tribe to sell lowlanders their farmlands and then the tribe encroaches on new forest. The free contact with other ethnic groups results in the weakened community. The external commodities change the consumption and production pattern of the tribe and lead them into debt. As a means of survival the

tribe needs to continue to benefit from the forest: opening up new forest, hunting and wild collection for trading.

6.4.1.2.3 *Welfare Promotion*

Government welfare activities are arranged according to the responsibility and requirement of the concerned outside agencies. In addition, many of the programs are disruptive to local customs. One example is the clothes distribution that replaces their traditional clothes and also results in the vanishing of traditional woven practices. Currently, there are only two households that still have the looms, however, the tribe abandoned their use. A second example is the government promotion of the school children to raise the chickens to obtain their eggs. The problem is the chickens require special food in order to lay eggs daily. This food is expensive, and the tribe can not afford it. The lack of special food has resulted in the drop in the number of eggs and eventually no eggs afterwards. These government welfare promotions do not upgrade the tribe's welfare, instead they erode the application and the development of the tribe's wisdom.

6.4.1.2.4 *Promotion of the Community's Knowledge*

The promotion of a standardized school system has replaced the traditional learning process of the community. Formerly, the tribal children learned or gained experience and knowledge from informal networks such as the farmland, the family and the kin.

Currently, the tribal children obtain their knowledge from the school by the Thai lowlander teacher. This new knowledge pattern aims to continue on to higher education. However, most Karang who finish school can not attend the higher education because of many obstacles—the lack of an identity card, low economic status, and poorer education system. Therefore, this type of education system can produce a new generation of only wage labors for the town. The educational system does not respond to the traditional ways of making a living in the community. In addition, this knowledge pattern seems to encourage the new offspring to look down upon their traditional knowledge and wisdom.

6.4.1.2.5 *Leadership in the Community*

The introduction of a formal local administration in the form of village headman and TAO causes this formal leadership to separate from the other villagers. Typically the headman acts as the middleman between villagers and outsiders. Because of new opportunities this formal headman is often viewed as out for personal gain and therefore violates the law. In the case of the headman of Phong-Luk, he was caught smuggling the wild products and fragrant woods from the park. This situation makes some villagers disrespect him, while there are also some villagers who support his illegal activities because he provides them with cash.

6.4.1.3 Impacts of Tribal Adaptation to Rapid Development

Due to the rapid development introduced to the tribe, it may affect the attitude of the tribe towards the natural resources. The tribe's attitude toward traditional environment friendly production would be replaced with the production-based resource development. The deforestation would be increased due to new growth practices and most in of the cases, these new practices would be a major reason of increased environmental degradation of the watershed. The tribe's attitude toward consumption has been changed and influenced by the urbanist's consumption patterns. It tends to create the pollution in the long-run, especially the surrounding environment of the community and the water sources.

In summary, the potential incorporation of local wisdom should have a sustainable pattern and direction relevant to the local area. If local wisdom is eroded, the tribe would practice in the same pattern as lowlanders who have been influenced by the market-oriented economy, which has had negative environmental impacts.

6.4.2 THE POSITIVE FACTORS

The management effort by the government has the potential to support local wisdom and reduce the pressure on the environment and resource utilization. The community attachment brought to the community in the form of learning together, can contribute to conserving the environment. To promote or develop the community learning, an area approach should be recognized. This can help the

tribe to adapt and to develop their wisdom to facilitate them to accommodate the changing situation.

The existing appointment of a member of the Karang tribe, to be the principal of the school by the park is important because it helps to lessen some conflicts between the local people and the national park on resource utilization. The park should strictly continue to support this practice in order to maintain the good relationship with the community.

The aggregate of the settlement of the Ban Bang-Kloy and Ban Phong-Luk Karang tribe in Phong-Luk opens up them opportunities to provide basic utilities which could increase the livelihoods of the Karang tribe.

The natural beauties along the Phetchaburi River to Phong-Luk as well as the Karang tribe's culture provide an opportunity to develop eco-tourism. This tourism will attract the tourists who want to experience nature and the local culture. Therefore, this activity is expected to offer the tribe of Phong-Luk an opportunity to participate in and to learn to utilize the local natural resources indirectly, which will lead to the sustainable practice and conservation of the park's natural resources.

7 CONCLUSION AND RECOMMENDATIONS

7.1 CONCLUSION OF THE STUDY

The original research question guiding this study was “What does the Thai government need to know about local wisdom (e.g., cultural and environmental practices) in order to establish successful forest policies that are both relevant to local areas and environmentally sustainable?” There are three general conclusions that can be drawn from the presented case study that answer this question.

First, the major factor contributing to the survival of the Karang tribe is the traditional subsistence rice farming. Their patterns of practices, such as rotating, mixed-cropping, and the fallow period, indicate the ways of living in harmony with nature. In addition, it is a system contributing to the accomplishment of self-sustainment. Thus, the self-reliance of the tribe will decrease the degree of direct dependency of the Karang on the natural environment. Therefore, their traditional production system shows a clear linkage between “production practices” and their potentiality in conservation of natural resources.

Second, the pattern of land tenure is an interesting issue inter-linking rice farm production quantity and equity distribution of land. It is important because the pattern of land tenure may obstruct the capability of development of the community in natural resource conservation. This is because the government applies a strict criterion to check a land right through certification and accepts only two forms of land right:- “government” and “private or individual” rights, and overlooks the traditional land tenure system such as communal rights.

According to the tribe Karang, a simple social relation within the community is clearly defined into two levels of relationship: the family and kinship level. Traditional norms are still in use for social problem solving in the community. The recent introduction of "individual" land rights is inconsistent with their pattern of agricultural productions. Furthermore the individual land rights are not suitable to the increase population from the relocation of newcomers. Therefore, the cultivation of land is not providing enough production for year round household consumption. This increases the pressure on some Karang members who have little land, or none of all, and are forced to be landless laborers or illegal encroach on the forest.

Third, a nature dependent community and cultural beliefs in superstition or animism is a vital foundation keeping the Karang from not trying to control nature. As a result of this belief system, they are forced to practice with respect toward nature as nature is viewed to be a patron of human lives as well as humans are an integral part of the entire ecosystem. This cosmology of beliefs of the Karang society has shaped an ecological ethic. Their ecological ethic emphasizes the interconnectedness of people and the rest of the nature and is reflected in the various forms of nature worship and prohibitions. This ethic plays a significant role in determining the extent of use, maintenance and conservation of the local natural environments.

The above conclusions imply that local knowledge of nature is based on wisdom, illustrating their capabilities to conserve and to manage the natural

resources. Therefore, the more the tribe is allowed to retain their relationships to nature, the more their subsistence ways of life are sustained.

7.2 RECOMMENDATIONS FOR THE STUDY

A main point that should be focused by the outside development agencies in working with the Karang tribe community--in order to assist them to survive and to be self-sustained while contributing to natural environment conservation--is the land utilization pattern. The three important issues are as follows:

1) Land right: Standardized format of private or individual rights issued by the government might not be suitable for their current traditional production practices because the available lands are limited. Communal right is the most appropriate land right for the traditional rotation rice farm that the tribe practices currently. In the future, land right may be shifted due to the population pressure, therefore, an appropriate land right pattern may be explored. It is necessary for the government to find out what is the appropriate land right that suits people and their production practice the most.

2) Right to make use of land: How does the tribe use the land? What is an appropriate land utilization pattern in the community? An answer to these questions cannot be decided by the government. However, the government should be a supportive and let the community make a decision themselves because the utilization pattern of land might be changed through time.

3) Right to manage the land: This issue points out the contemporary land allocation. The government has granted a certain amount of 7 rai per household and has an amount of regulations to control tribal livelihoods, which is not consistent with their ways of life and obstruct their utilization at the same time. Therefore, land right and utilization of land should be decided by the community in order to be self-sustaining.

It is important to realize that the community is dynamic and subject to alteration as both internal and external influences change (Ghai, 1994). The community could be damaged by rapid development, as the community cannot readily adapt to it. Therefore the community needs the help of the government and other concerned agencies to support and to guide any introduced developments. This will increase their ability to mobilize to change.

7.3 SUGGESTIONS OF THE APPLICATION AND DEVELOPMENT OF THE POTENTIALITY OF LOCAL WISDOM

This study demonstrates how the wisdom of the Karang of Phong-Luk can be applied to conserve the natural resources of the national park. Therefore, to accomplish the natural resource conservation while enhancing the preparation of local community, the following guidelines should be recognized by concerned stakeholders and included in the management of the national park and development projects:

1) The development policy should be reconsidered and emphasis placed on the area-approach management, which includes locality specific policies.

2) The implementation plan for the development of community and the community welfare, as well as sustainable natural resource management should integrate local wisdom. This plan should allow the participation of local people and involved stakeholders. These collaborative plans should include four key areas: land tenure pattern plan, land utilization and environmental plan, occupational plan, and livelihoods promotion plan.

3) The promotion of the plan should include eco-tourism which focuses on the nature and local culture in order to encourage the adaptation, learning and extra-income of the community through cultural products such as handicrafts. The specific study of the benefits and impacts of eco-tourism to the community should be conducted before the plan is proposed. This typical eco-tourism should have low impact to the community and no need for infrastructure. An example is the tourist has to function the same as the people do, to live and eat with local people.

4) The development plan should recognize the family and kin system. Furthermore the plan should support the traditional informal village leadership patterns.

5) The development plan should limit external influences to only the basic infrastructure (e.g., transportation, school, and health care). These infrastructure changes should be introduced slowly in order to allow the people time to learn and adapt to social change. Furthermore, suggested infrastructure changes need to be consistent with the traditional cultures and sustainable land use practices of the people.

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APPENDICES

APPENDIX 1 HOUSEHOLD INTERVIEW FORM

Part I General Information

1. What is your place of origin?

Village.....District.....Amphoe.....Province.....

Number of household members who live in the house within last year.....persons
(Including you)

Relationship with respondent	Gender		Age	Education	Occupation		Last year income	
	Male	Female			Major	Minor	Major	Minor
Respondent								

3. How long have you lived in this village.....years

4. Why has your family moved here?.....

5. Is there any migration of members in your family within the past 5 years?

() No

() Yes

() There were persons moved-in

- They had moved in for year(s)

- They were from Amphoe Province.....

- Their reasons for moving in, because.....

() There were persons moved-out

- They had moved out for year(s)

- They moved to Amphoe Province.....

- Their reasons for moving out, because.....

6. Do you have a plan to move to other places?

() No

() Yes, I plan to move to Amphoe..... Province

The reason for moving out, because.....

Part II Land tenure and land utilization

7. The establishment of your house

() is in your farmland

() is apart from your farmland, it is km. far from your farmland

8. Farmland you occupy is approximately.plot (s) with all total areas rai

Land use pattern	Areas (rai)	Land right	Obtaining method	No. of years obtained
1 st plot 1) Residential area 2) Residential area + farmland				
2 nd plot Farmland				
3 rd plot Farmland				

9. Did your farmland already cultivated before you occupy it?

() Yes What was it?

() No

10 Do you utilize all of your land for agriculture?

() Yes

() No, use only rai

11. Your reason for not utilizing all the land because of

12. Do you have an idea to expand more farmland?

() No, I don't because.....

() Yes, I do, By which method?

13. Within the 5 past years Do you sell or buy a piece of land, if so do you know what does the land has been utilized afterwards

In case of sold

() Not sold

() Sold amount of land rai in year.....its utilization afterwards.....

In case of Buy

() Not buy

() Buy amount of land rai in year.....its utilization afterwards.....

Part III Occupation, income, expense and household economic status

14. Do you have agricultural problems you are facing?

() No

() Yes What is it?.....

14. Last year total household expense.....Baht.

15. At present, is your household in debt?

() Yes Go to Q. 16

() No Go to Q 17

16. Please specify an amount of debt are you in

Sources of credit	Amount in baht	Interest (rate/y)	Purpose

17. In case of you have some money left; an amount of saving is.....baht

18. Have You or other family member had an idea of changing to other occupations

() Never because.....

() Would like to work on..... at.....

() Other

19. In the past 2-3 years what do you feel about your living condition?

() Nothing change () Better than before because.....

() Worse than before because.....

20. How do you sell you agriculture production?

Part V Social Activities and Relationship in the Community

21. Are your household members engaged in any activities promoted by the government.? In what projects?

.....

22. Where do you get the information about occupation and any development projects?

.....

23. Where do you get the on going information within the community?

.....

24. Whom do you often consult with when you encounter the problems?

.....

25. Who is a main person that is always assigned by the villagers to arrange the activities within the community?

.....
.....

APPENDIX 2 A CHECKLIST FOR KEY INFORMANT INTERVIEWS

Topics	Key Informant
1. Social Aspects - Village History - Ethnic Group - Type of people's interaction - Existing Traditional Ceremony	
2. Local Leader - Who are formal leaders? - Who are informal leaders? - What are their roles? - Who are the effective leaders?	
3. Local Institutions - Type of local institutions - Type period in operation - What are its activities? - No. of members - People's participation - Benefits and effectiveness	
4. Land and Forest Situation - Current land use - No. of landless household - Land right situation - People's utilities - Traditional forest management	
5. Crop Production - What are the major crops? - Average yield per rai - Purpose of each crop - Marketing of each crop - Source of water	
6. Problems of the People in the Study Area - How are many poor families? - How are many landless families? - What are the main problems of people of study area?	

APPENDIX 3 A CHECKLIST FOR FIELD OBSERVATION

1. Location and Boundaries
2. Housing and Settlement Pattern
 - What is a settlement pattern? : Scattered or clustered.
 - Housing material (wood, bricks, etc.)
 - Housing pattern
3. Geography
 - Topography
 - Climate
 - Natural Resources
4. Land Use Pattern and Forest Area.
5. Public Facilities and Its Location
 - School
 - Temple
 - Health Center
 - Shop
 - Wells
 - Village Broadcasting Tower
6. Transportation
 - Road condition
 - Road network
7. Public Utilities
 - Electricity
 - Telecommunication