



The Institutional Formation Process of Communal Forest Management in Northeast Thai Villages

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1. Introduction

1.1. Background and Objectives

Community-based natural resource management (CBNRM) has been broadly supported by academics, activists, and aid agencies since the 1980s (Brosius et al. 1998). It aims to achieve environmental protection and social justice by involving local people in resource conservation programs, or by granting them management rights of local natural resources.

During the last 20 years, theories in this regard have developed in many fields of research, particularly in economics and anthropology. Until the 1980s many theorists (especially “property right school” economists) insisted that state or private property rights should be established on the grounds that communal management of resources would inevitably cause negative externalities or “the tragedy of commons” (Demsetz, 1967; Hardin, 1968). In the process of resource nationalization/privatization, however, anthropologists cited many instances of state/market failure, while many traditional communities had successfully managed their local common-pool resources (CPRs) (McCay and Acheson, 1987, Berkes, 1989). In response to this line of field research, some economists and political scientists also developed a “logic of commons (or common property regime)”, which underlined the mechanisms and conditions that can overcome “the tragedy of commons”.

For example, the “CPR school” economists sought conditions of successful collective action by community members under given social settings. They point out that, in many cases, the CPR regime can evade the CPR dilemmas, as the communities can develop institutions to monitor and sanction “free riders” with low transaction costs (Wade 1988, Ostrom 1990, Bromley 1992, Baland and Platteau 1996). They also insist on a rational approach in understanding the dynamics of collective action. For example, some apply a framework of game theory (Ostrom et al. 1994), and others apply induced innovations (Otsuka and Place 2001).

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On the other hand, some anthropologists criticize economists on a number of points and emphasize the social and cultural contexts that affect local, regional and global actors in managing resources. Some point out static, isolated and harmonized images of communities by economists, leading them to neglect the dynamic aspects of community formation itself (Li 1996, Mosse 1997). Others mention an underestimation of external influences, as economists often overemphasize the incentive structures inside a community (Agrawal and Gibson 1999, Leach et al. 1999, Johnson 2001). Most fundamentally, there is a criticism of a one-sided nature in the rational choice approach on the grounds that individual behaviour is embedded in society, culture and history (Clever 2000, Mosse 1997).

Many of these criticisms are worth serious consideration. In fact, the importance of the anthropologic approach seems to be increasing, as rural communities in many developing countries are increasingly involved in the process of social, economic, and cultural globalization, and may also be under the strong influences of external actors such as central governments and business enterprises.

In addition, in some rural regions of Southeast Asia, recent commercialization (Li, 2002), “deagrarianization (Rigg and Nattapoolwat, 2001)”, and the decline of natural resource dependency has brought about the questioning of the premise of local people’s resource reliance. Thus it is important to consider the viable forms of CBNRM in these conditions (Tongpan et al., 1990). In this sense, it is interesting to examine cases in Thailand, which has experienced rapid economic growth and social change since the late 1980s. Various types of collective action, including CBNRM, have been put into practice as a response to recent socioeconomic change in rural areas (Shigetomi, 1996).

This indicates the possibility that local people’s incentives and institutions of resource conservation could be redefined and reconstructed according to socioeconomic change, and gives some implications when we consider the dynamic process of collective action in developing countries which are now in the process of modernization. How then can community members develop ways to manage their resources under contemporary social settings? How are the economic and anthropologic theories related in the real world? And how can we conceptualize the dynamics of local institutions under these social contexts? Based on field surveys in the northeast region, this research examines the process of institutional formation and collective action of communal land management, especially community forest management.

In this paper, I will first introduce recent social conditions surrounding communal forest

management in Thailand, with general information on the research area. Second, I will examine the relationship between resource scarcity and the institutional dynamics of communal forest management. The factors affecting these institutional formations and collective actions are statistically analyzed. Third, four types of institutional formation processes are categorized and examined with case studies, according to resource conditions and governmental intervention. Finally, I conclude with the recent changes of rule formation processes in the study area, and refer to the nature of collective action under a contemporary 'connected' community.

1.2. Communal Forest in Thailand as CPR Management

Before analyzing the results of the field survey, it is also necessary to briefly examine general trends and conditions that communal forest management in Thailand currently faces.

Communal forest¹ is the forest managed collectively by the community members to serve various activities in the community². For instance, sacred forest (*don puta*) and cremation forest (*pa cha*) are basically conserved for ritual purposes. Other communal forests are conserved for the villagers' daily use; gathering forest products, grazing, etc. These are commonly observed in rural areas of Thailand, especially in the northern and northeastern regions.

In the past, like most developing countries, official legislation and policies supporting management of communal forests were weak. According to Shigetomi (1997), Thai Civil Code assures citizens' rights to collectively utilize certain categories of public land (public land in Thailand is the land that is not granted private land ownership). Currently this is regarded as a legal basis for the communities to manage their communal forest. Until recently, however, the government neglected to take serious measures to defend the villager's rights. For example, few public land titles (*no so lo*) were issued for these communal forests until the 1980s. Therefore, most were informally managed by the community members and how these forests are managed simply depended on the community. Most of their management rules were also implicit, and relied on cultural beliefs and community norms³. The boundaries of the forests were not clearly defined,

¹ "Community forest (*pa chumchon*)" is another word indicating forest managed collectively by the community members. In fact this word is more commonly used in Thai academic and policy frameworks. In the community, it sometimes suggests communal forests with official registration. As my analysis includes both informal and formal management, I have applied the term "communal forest" for the paper.

² Local administration in Thailand consists of province (*changwat*), district (*amphoe*), sub-district (*tambon*), and village (*muban*). In many cases in the research area, the management unit of communal forest (regarded as a "community" in this study) coincides with a village or several villages which share the same identity (village group).

³ Villagers believe that destroying a sacred forest angers the village guardian spirit and risks one's fortune.

although there was some consensus among the villagers.

These situations have been gradually changing, however. First, villagers themselves have introduced “tighter” management rules. Shigetomi (1996) pointed out that the expansion of agricultural land in the region made forest resources more scarce and caused conflicts, and this led to the introduction of “tighter” resource management, including clearer definitions of resource users and physical boundaries, introduction of sanction rules, etc. This view is similar to the induced institutional innovation theory, which Otsuka and Place (2001) applied in their comparative study of Asia and Africa. On the other hand, some anthropologists explain that community forest movement was initiated as a tool for villagers to negotiate with the state, in order to defend their customary rights of resource utilization from the state’s threat (Ganjanapan, 2000). In any case, it is clear that many villagers are coming to take collective action to manage or claim their resources.

Second, central and local governments have also been trying to formalize rules in order to narrow the gap between *de jure* and *de facto* rights of management. In the 1980s, the forest department launched a community forest project to support communal forest management including registration, material supply, training, etc. Since the 1990s the budget spending for this project has seen significant increases, except for a period of economic crisis during 1998-2000 (Table 1)⁴. In 1989, the military also started a “Forest Conservation Volunteer Training Project (*ro so tho po*)”, which “educates” villagers on the importance of the forest and awards royal flags from the Queen to the forests with good governance⁵. The ministry of interior has also increased the issuing of public land titles for communal land. Moreover, the Tambon Administrative Organization (TAO), a local autonomy entity which was established after the enactment of “the Tambon Council and Tambon Administrative Organization Act of 1994”, empowered local people to manage their own resources⁶.

They are also afraid of entering the cremation forest, because there are many ghosts there.

⁴ Due to the tight budget policy after 1997, the budget was drastically cut during 1998-2000.

⁵ In 1997 this project was integrated with a similar program carried out by the forest department. After government reforms in 2002, the project was partly transferred from the forest department to a newly established National park, wildlife and plant conservation department.

⁶ As a local autonomy entity, The TAO has been expected to serve as an engine to promote public participation toward the rural development and democracy. Prior to the enactment in 1994, the local administration in Thailand was generally centralized through the vertical administrative line of the Ministry of Interior. Local autonomy was therefore very limited both in terms of quality and quantity. TAO consists of a council and an executive board. The villagers in each village elect two council members for the former. While for the latter, a head of the TAO is directly elected by the people in the Tambon. After the enactment of the 1997 Constitution and the Determining Plan and Process of Decentralization Act of 1999 (referred as the Decentralization Act), the government has implemented the process of decentralization step by step in order to enhance the strength of participation by the people in local communities (Bureekul, 2006). The government granted some level of budgetary and administrative autonomy to the TAO, and has delegated various local development tasks that were previously implemented by the central government agencies to it. Together with the development planning and the provision of local public goods such as public infrastructure

Third, villagers' resource use patterns themselves have changed in accordance with the rapid socioeconomic changes. Though many villagers still rely on natural products from the communal lands for daily life, some of them have gradually substituted natural products with industrial products such as concrete piles for timber and gas for fuelwood (Tongpan et al. 1990). In addition, socioeconomic changes have altered community norms and raised new types of community demands on communal land. All of this has at least altered the objectives of management⁷.

How these complicated changes affect local collective action in resource management, of course, depends on the communities. This is because the dynamics of collective action is basically site-specific and path dependent. I believe, however, that there are some patterns in the dynamics that can be conceptualized. And this attempt is important especially when we consider the effects of government policies that support or discourage CBNRM.

Table 1: Annual Budget of the Community Forestry Development Activities

Fiscal year	Amount (million baht)
1985	9.8
1990	16.5
1995	69.7
1997	84.7
2000	59.2
2003	84.4
2004	114.5

Sources: RFD (1985, 1996, 1997, 2000, 2003 and 2005). Note: Nominal value. 1USD=about 25 THB before 1997 and about 40 THB after the 1997 economic crisis.

2. Study Area and Methodology

Through exploring history and current status of community forest management in northeast Thailand, this research examined the process of community formation and collective action of communal forest management. More generally, it tried to reassess the premises and processes of CBNRM, and examines conditions for “traditional” management to be redefined, reconstructed and strengthened in the modernization process. It also tried to bridge the theoretical gap between “the logic of commons” and

and public health, supporting participation to natural resource management is considered as one of the important tasks of the TAO.

⁷ See Rigg and Nattapolwat (2001) for the transformation of the community culture due to globalization and “deagrarianization”.

cultural anthropology/political ecology in understanding the collective action of CBNRM.

The study area is K district, Yasothon province of northeast Thailand (Figure 1). It is located 25 km southeast of the provincial capital, Yasothon city. The population of the district is 74,165 and its area covers 638.4 km² (Amphoe K, Changwat Yasothon, n.d.). The Sebai and Chi rivers flow along the eastern and western district borders, respectively. The topography consists of flood plains, lowlands (approx. 120m above sea level) and gently undulating hills (approx. 140m above sea level) scattered in the lowlands. Most of the forest patches are distributed in the flood plains, natural levees and hills, while paddy fields are dominated in the lowland area. Accessibility is relatively good, as a highway connecting Yasothon and Ubon Ratchathani city runs through the center of the district.

The villagers' basic occupation is, of course, agriculture. Farmland covers about half of the district area, and ninety percent of this is lowland paddy fields. Most are rainfed and planted with both glutinous rice for self consumption and non-glutinous rice for commercial purposes. Other field crops are planted on the largest hill located in the northern part of the district. Cassava is the most popular field crop, but tree crops such as para rubber and eucalyptus are expanding in the area. In addition, the current cattle boom has drastically increased the number of cattle being bred, and the areas under fodder production are also increasing.

There are no outstanding non-farm industries in the district. In fact, Yasothon province is one of the poorest provinces in Thailand. According to the NSO(2003), the average monthly income per household in the province was 6,045 baht (151USD), the lowest in Thailand in 2002. Therefore, many villagers migrate to Bangkok for non-farm income during off-farm seasons.

On the other hand, the villagers' dependency on natural resources is higher. Official data suggests that 80.6 percent of the households in the province use fuelwood or charcoal for cooking, while the regional average in the northeast is 62.4 percent (NSO, 2001a; 2001b). Together with paddy fields and water bodies, most of the forest patches distributed in the district are important sources of natural products necessary in the daily life of the villagers.

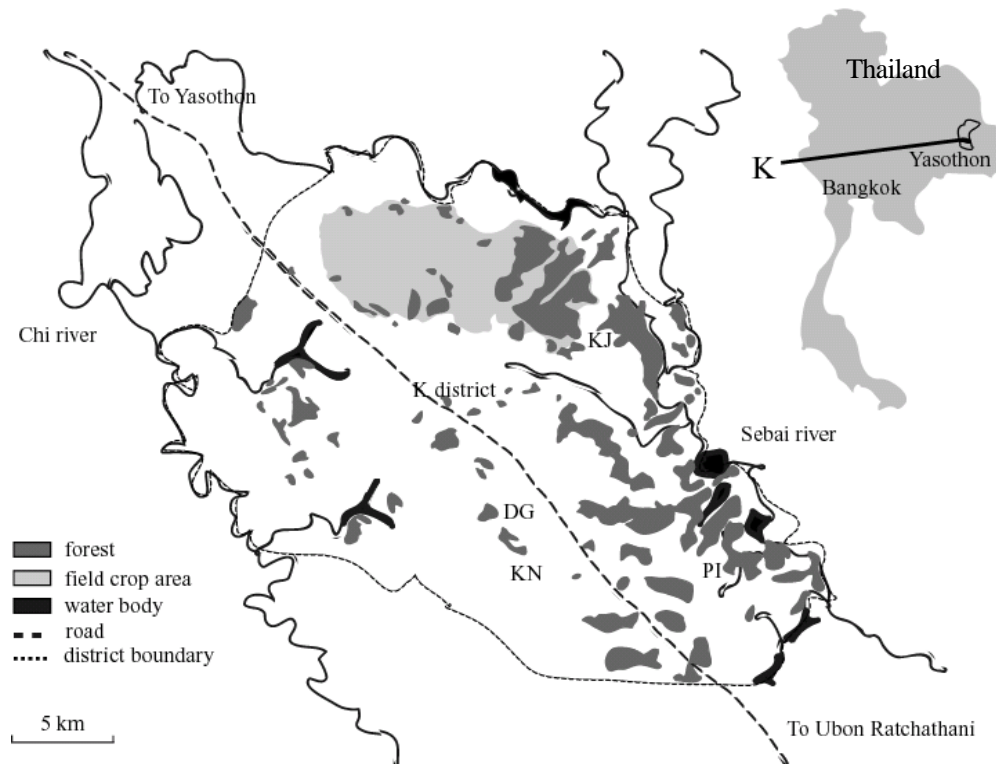


Figure 1: The Study Area (ETM Landsat 2000)

Note: case study villages are indicated on the map.

A field survey was conducted during Aug. – Sep. 2005 and Jan. – Feb. 2007 in K district. Both qualitative and quantitative data was obtained during these two field surveys. Quantitative data related to the basic socioeconomic attributes of the villages was obtained during Aug. – Sep. 2005 by questionnaire surveys, with a list of communal forests, management status, and villagers' resource use status. Secondary sources, such as a “*ko cho cho 2 ko (KCC2K)*” village databases, data from district offices and TAOs, etc. were also utilized to complement the basic data⁸.

In the 2007 survey, I randomly selected 50 communities (village groups) or 77 villages out of a total of 78 communities (115 villages) in the district, and conducted interviews with village heads. The topics were mainly related to institutional formation process of communal land and forest. Both qualitative and quantitative data was collected. During the survey, data on 132 plots (25,860 rai: 4,138 ha) of communal forest was recorded⁹.

Qualitative data was obtained from a series of interviews with the villagers, local officers and members of TAO council, and from secondary sources. To examine the decisive

⁸ *KCC2K* is a village database that covers all rural villages in Thailand. The data covers various kinds of information on the villages and is utilized by the Community Development Department (CDD).

⁹ 1 rai = 0.16 ha.

factors of rule formation and to conceptualize the process of institutional formation, the obtained data was analyzed by both statistical and case study analysis.

Thus, the analytical section here consists of two parts. The first part mainly utilizes quantitative data to examine the determinant factors affecting local institutional arrangements, conservation activities and their performances in communal forest management. The second part mainly examines institutional formation processes themselves and problem identification leading to effective co-management on a case study basis.

Following this, the components of institutional arrangements for communal forest management are first explored, and their connections to conservation activities and performances are examined. Then, I apply multiple regression analysis to examine the effects of both the “top-down” and “bottom-up” factors in institutional formation and conservation activities. Finally, four types of institutional formation processes are categorized and examined with case studies, according to resource conditions and governmental intervention.

3. Research Results

3.1. Institutional Arrangements in Communal Forests

3.1.1. Management Rules

A management institution of communal forest consists of management rules and organizations. First, management rules in communal forests in the study area are classified by two criteria; its content and form. The former is divided into three categories. The first group has implicit rules that simply rely on the villagers’ morals or norms. These somewhat traditional style regulations generally worked well in the past, but if community norms change, the management is prone to erode. The second group has explicit rules but no sanction rules, and the third one has explicit rules with sanction rules as well. The latter is divided into two categories; the rule is oral (including implicit) or written.

Clearly, the third group with written forms has the “tightest” and most sophisticated rules, and the first group has the “loosest” ones. Generally, certain activities including encroachment, burning, and logging without allowances are prohibited, and hunting and gathering are regulated. Basically, only community residents may obtain timber and fuelwood, but non-wood forest products such as resin, mushrooms, herbs, and insects may be collected by outsiders.

Table 2 shows the classifications of management rules. First, we can see that both criteria are positively correlated. There are no written rules in group 1, while 70 percent of group 3 category has written rules.

Table 2: The Classifications of Management rules

Content of the	Form of the Rules			**Avg. plot
	Oral	Written	Total cases	area (ha)
Group 1(norms only)	23 (100)	0 (0)	23 (100)	19.2
Group 2(without sanctions)	14 (93)	1 (7)	15 (100)	18.2
Group 3(with sanctions)	28 (31)	62 (69)	90 (100)	37.8
Total cases	65(51)	63(49)	128(100)	32.1
*Avg. plot area (ha)	20.9	43.9	32.1	

Chi2(2) = 47.1, *F(1, 125) = 3.52, ** F(2, 124) = 0.99

Source: field surveys. Note: Unit; number of cases. The proportions to the total cases of each content of rules are in parentheses.

Secondly, we can see that the average area of forest plot is the largest in group 3 (although statistically insignificant), and the forest area under written rules is larger than those with oral rules. This suggests that larger forests tend to include more sophisticated rules; totally contrary to the scarcity-led induced institutional innovation theory. In fact, Kono et al. (1994) surveyed changes of land use pattern on a northern hill of this district, and insisted that “most of the communal forests seem to have been established for common use after the villagers foresaw a scarcity of accessible forest resources (p. 30)”. How then, can we interpret this remarkable gap?

3.1.2. Organizations

Similarly, organizations in communal forests in the study area are classified into three groups. The first group has no organizations, but simply rely on implicit rules or the villagers’ morals and norms. Again, these somewhat traditional style regulations generally worked well in the past, but if community norms change, the management is prone to erode. The second group delegates the management to general village committees. The third has specific forest management committees that have their own responsibilities and tasks. As in the management rules, the third group has the “tightest” and most sophisticated organizations and the first group has the “loosest” ones.

Table 3 shows the relationships between the management rules (its contents) and organizations. This also indicates that there are strong positive correlations between them. In fact, we can see the same relationships when we replace contents of rules with form of

rules. Table 4 shows the relationships between organizations and fund sources for communal forest management. It is clear that more sophisticated organizations have wider sources of funds, and, notably, a larger possibility of raising them internally. This implies that organizational differences may reflect collective conservation activities by the villagers. To what extent, then, do these differences reflect conservation activities in communal forests? Moreover, how much do the conservation activities affect their performances?

Table 3: The Relationships between the Management Rules and Organizations

Content of the rules	Organizations			
	Not existing	Village committee	Specific organizations	Total cases
Norms only	23(100)	0(0)	0(0)	23(100)
Without sanctions	12(80)	3(20)	0(0)	15(100)
With sanctions	6(7)	24(28)	57(66)	87(100)
Total cases	41(33)	27(22)	57(46)	125(100)

Chi2(4) = 91.0. Source: field surveys. Note: Unit; number of cases. The proportions to the total cases of each content group of rules are in parentheses.

Table 4: Organization and Fund Sources

Content of the rules	Organizations			Total
	None	Rely on external funds	Utilizing internal funds	
Not existing	37(90)	2(5)	2(5)	41(100)
Village committee	17(65)	8(31)	1(4)	26(100)
Specific organizations	16(32)	28(56)	6(12)	50(100)
Total cases	70(60)	38(33)	9(8)	117(100)

Chi2(4) = 33.2. Source: field surveys. Note: Unit; number of cases. The proportions to the total cases of each organization group are in parentheses.

3.1.3. Conservation Activities

Conservation activities of communal forest include monitoring, fire protection, and tree planting. Here let us take these three activities as examples to see the relationships among organizations, activities and conservation performances.

First, Table 5 shows the relationship between the organizations and monitoring activities. It is clear that the introduction of specific organizations provides an opportunity for introducing the monitoring activities. Similarly, we can see the same relationships in

Table 6 and Table 7, which indicate positive relationships between organizations and fire protection, organizations and tree planting, respectively.

Table 5: Organizations and Monitoring Activities

		Monitoring		
		Not existing	Exist	Total
Organizations	Not existing	41(100)	0(0)	41(100)
	Village committee	26(96)	1(4)	27(100)
	Specific organizations	24(43)	32(57)	56(100)
	Total	91(73)	33(27)	124(100)

Chi2(2) = 48.8. Source: field surveys. Note: Unit; number of cases. The proportions to the total cases of each organization group are in parentheses.

Table 6: Organizations and Fire Protection

		Fire Protection		
		Not existing	Exist	Total
Organizations	Not existing	41(100)	0(0)	41(100)
	Village committee	24(89)	3(11)	27(100)
	Specific organizations	34(69)	15(31)	49(100)
	Total	99(85)	18(15)	117(100)

Chi2(2) = 16.6. Source: field surveys. Note: Unit; number of cases. The proportions to the total cases of each organization group are in parentheses.

Table 7: Organizations and Tree Planting

		Tree Planting		
		Not existing	Exist	Total
Organizations	Not existing	35(85)	6(15)	41(100)
	Village committee	9(33)	18(67)	27(100)
	Specific organizations	7(14)	43(86)	50(100)
	Total	51(43)	67(57)	118(100)

Chi2(2) = 48.1. Source: field surveys. Note: Unit; number of cases. The proportions to the total cases of each organization group are in parentheses.

Then we proceed to examine the relationship between conservation activities and performances. Table 8 shows the relationship between monitoring activities and rule violations. Interestingly, it indicates that the introduction of monitoring activities increases rule violations. In fact, rule violations here actually mean “detection of rule violations”, as we cannot see undetected cases. Thus we can say rather that monitoring

activities enhances the detection of rule violations¹⁰.

Similarly, Table 9 indicates the relationship between fire protection measures and fire incidents. In the case of forest fires, degraded and non-degraded forests should be treated separately since the former are more prone to forest fires. Some positive effects of fire protection are observed among non-degraded forests although they are statistically insignificant. With regard to degraded forests, there are no such relationships.

Finally, Table 10 shows tree planting activities in each vegetation category. Tree planting activities in degraded forests are significantly lower than those in non-degraded forests. Villagers tend to plant trees in well-conditioned forests in order to increase their value, whereas degraded forests are treated like waste lands that are not worth investing.

Table 8: Monitoring and Rule Violations

		Violations		
		Not existing	Exist	Total
Monitoring	Not existing	85(90)	9(10)	94(100)
	Exist	19(73)	7(27)	26(100)
	Total	104(87)	16(13)	120(100)

Chi2(1) = 5.3. Source: field surveys. Note: Unit; number of cases. The proportions to the total cases of each monitoring group are in parentheses.

Table 9: Fire Protection and Fire Incidents (Excluding cases of degraded forests)

		Fire Incidents (in 2004)		
		Not existing	Exist	Total
Protection Fire	Not existing	22(37)	38(63)	60(100)
	Exist	6(55)	5(46)	11(100)
	Total	28(39)	43(61)	71(100)

Chi2(1) = 1.2. Source: field surveys. Note: Unit; number of cases. The proportions to the total cases of each fire protection group are in parentheses.

¹⁰ Agrawal (1994) made a similar interpretation in his analysis of rule breaking in Indian forest management.

Table 10 : Tree Planting and Forest Vegetation

Tree planting	Forest Vegetation		
	Degraded	Non-degraded	Total
Not existing	23(45)	28(55)	51(100)
Exist	15(22)	53(78)	68(100)
Total	38(32)	81(68)	119(100)

Chi2(1) = 7.1. Source: field surveys. Note: Unit; number of cases. The proportions to the total cases of each tree planting group are in parentheses.

These results suggest that there are some positive relationships among organizations, activities and performances. Now, let us reconsider the factors that influence these management institutions and activities. This question is particularly important when we consider the effect of resource scarcity. As shown in Table 2, more sophisticated rules have been devised for larger forests. However, previous studies such as Kono et al. (1994) and Shigetomi (1996) have insisted on scarcity-led institutional formation. How, then, can we interpret this remarkable gap? What affects these management institutions and activities?

3.2. Determinants of Management Institutions and Activities

In order to provide more detailed information on the determinants of institutional formation, I applied two-stage logistic regression analysis as Meinzen-Dick et al. (2002) applied it in their analysis of Indian irrigation system.

First, the factors affecting the type of organization are analyzed using an “organization model.” Then, the predicted value of the model’s dependent variable is placed in two “activity models”— “monitoring model” and “tree planting model”—which analyze the factors affecting conservation activities (I excluded the analysis of fire protection). For simplicity, I applied dummy variables as the dependent variables, namely, the existence of specific organizations, monitoring activities, and tree plantation activities were applied as dummy variables for the organization, monitoring and tree planting models, respectively. Thus, the first stage analyzes the likelihood of specific organizations as a function of a number of physical, socioeconomic, and other variables. The second stage examines the likelihood of monitoring or tree planting activities as functions of organizations (predicted) and other factors.

3.2.1. Organization Model

Independent variables are associated with (1) the physical attributes of the forest, (2)

resource scarcity, (3) socioeconomic attributes of the community and households, and (4) external support by government agencies. The first three variable groups are basically categorized as “bottom-up” factors, while the last group represents a “top-down” initiative. They are assumed to affect institutional formation through the following mechanisms.

First, physical attributes such as natural and geographical factors function as potential benefits or natural constraints that limit villagers’ capabilities to utilize or conserve the resources. Larger and better-conditioned forests are supposed to provide higher potential benefits to villagers. Thus, a positive sign is expected for this group of variables. I applied two variables for this group, namely, “plot area” and “degradation dummy” (a vegetation dummy indicating degraded forests).

Second, resource scarcity directly affects the internal incentives for facilitating local collective action. According to the induced institutional innovation theory, greater resource scarcity is associated with higher shadow prices of local resources, which may provide villagers with higher incentives to introduce “tighter” management institutions. If the model supports this theory, a negative sign would be expected¹¹. In contrast, if the model supports the previous analysis in Table 1, a positive sign would be expected. In this case, I applied “forest area per household in the community” as a variable.

Third, socioeconomic attributes, such as income/asset, resource use, market access, social capital, and heterogeneity are associated with both the benefits and costs involved in forming management institutions. With regard to income/asset, the effect appears to be ambiguous. Households with larger income/asset are likely to consume less inferior goods (e.g., fuelwood), while they may feel a smaller need to conserve resources. Owing to the difficulty in obtaining income data at the community level, I applied the asset variable “Number of pickup trucks per hundred households” as a proxy.

Similarly, the effect of substitute goods (such as kerosene and gas) seems to be ambiguous. A higher rate of resource substitution may lower the opportunity cost of limiting fuelwood consumption, while villagers’ incentives to conserve resources may diminish. As a variable, I applied the weighted average of subjective evaluation (rated as one for the lowest and five for the highest) by village heads for the villagers’ daily “use rate of gas.”

¹¹ It may be reasonable to assume that people cannot find incentives if the resources become too scarce. Bardhan (1993) posits an inverse U-shaped relationship between resource scarcity and participation. In this model “plot area” is likely to capture this effect.

The effect of accessibility is generally considered to be detrimental for resource conservation, as easier market accessibility can stimulate commercial resource exploitation (Panayotou and Sungsuwan, 1994). This effect, however, may be mitigated in some cases. One of these is that the market for certain non-timber forest products may increase villagers' interest in forest conservation. Further, forest officers may tend to exercise their influence in the communities near their offices, which are often located near the district center. Hence, I applied "the distance from the district center" as a representative variable.

With regard to villagers' social capital, I applied the weighted average of the "performance of village fund" evaluated by the community development department as a proxy (village fund index).¹² A village fund (*kong thun muban*) is a microfinance program introduced in all villages by the government after Thaksin Shinawatra became the prime minister in 2001. Here, higher performance is assumed to generate larger social capital, which in turn lowers the cost of institutional formation by the villagers. In addition, heterogeneity of the community is believed to be another related variable that affects the cost of institutional formation. However, as compared to other areas in Thailand, I did not observe any notable social stratification among the villagers in the study area. Therefore, I ignored this effect as it can be included to some extent in the variable of social capital, although some inter-village heterogeneity remains to be considered.

Fourth, the external factors such as governmental interventions in the area create frameworks that facilitate or discourage local institutional formation. In the study area, governmental intervention tends to promote villagers' participation rather than controls. Thus, it is assumed that governmental intervention has positive effects on local institutional formation. Two dummy variables concerned with (1) officers' influence (Officers' advice in institutional formation) and (2) land titling (*no so lo* dummy) are applied in the model.

3.2.2. Activity Models

The same independent variables are applied for these models, except for two considerations. The biggest difference from the organization model is that these models include the predicted value of the first-stage dependent variable as "organization index." The effect of this variable is assumed to be positive.

¹² Some may argue that village fund is another parameter that many socioeconomic indicators influence. I considered alternative models that incorporate this factor as the function of other socioeconomic variables; however, the results obtained were similar to those of the model in the paper.

Another difference is that some variables are replaced with others because “somewhat different sets of variables must be used for stage 1 and 2” (Johnston, 1991, cited in Meinen-Dick et al., 2002, p.655). For example, “village fund index” is replaced with “number of villages involved” as a proxy for social capital in the monitoring model.¹³ “Officers’ advice in institutional formation” is similarly replaced with “project dummy (the existence of a community forest project during the past 6 years)” as a proxy for governmental intervention in both the monitoring and tree planting models.

3.2.3. Results of the Models

Variables are compared across the groups in Table 11, and the results of the regression analysis are presented in Table 12. Independent variables with the multicollinearity problem are excluded from these models.

First let us consider the organization model. All coefficients are statistically significant and the predicted signs in the model are mostly as expected. The effect of resource scarcity is the most interesting finding. According to Table 11, forest area per household is larger in the group with specific organizations; however, Table 12 indicates a contrasting result. In fact, the coefficient of this variable becomes statistically insignificant when socioeconomic variables—particularly “use rate of gas”—are excluded from the model. This suggests that by controlling other variables (particularly use rate of gas), the scarcity-led institutional innovation hypothesis can be applied in this area to some extent.

Variables for socioeconomic attributes yielded expected results. Negative signs for number of pickup trucks and use rate of gas suggest that when villagers consider new institutional arrangements, the effect of benefits from forest products for their self-sufficiency outweighs the effect of cost reduction through their income/asset and resource substitution. Consistently, market access appears to negatively affect institutional differences. Considering the low incomes and relatively high dependence on natural products in the region, these results are reasonable. Village fund is positively associated with the dependent variable, indicating that social capital is an important factor. Moreover, this effect is stronger and has higher statistical significance than resource scarcity.

Finally, it is also clear that governmental supports are highly significant factors. The probability of organization formation is higher in forests where public land title (*no so lo*) was issued or officers had provided advice. Again, these effects are stronger and have

¹³ This may rather be associated with inter-village heterogeneity. In this case, the expected sign will be negative because the larger the number of villages, the higher will be the organizational costs.

higher statistical significance than the effect of resource scarcity.

We now consider the activity models. The comparison between the monitoring model and tree planting model provides interesting results. First, it is clear that in both cases, “organization index” and “project dummy” positively and strongly affect the likelihood of the activities. This indicates that the introduction of specific organizations or governmental aid enhances the likelihood of these activities.

We now examine the difference between these two models. Interestingly, the coefficient of forest area per household has a positive sign and is significant in the monitoring model, while it is negative (although insignificant) in the tree planting model. Similarly, the coefficient of the number of the villages has a significant positive sign in the monitoring model, while the village fund index has a positive sign in the tree planting model. These results suggest that by controlling the effect of specific organizations, larger forest area or a larger number of villages requires more sophisticated monitoring systems. This also indicates the “top-down” nature of institutional formation in the study area.

In addition, it is also interesting that accessibility positively (although significance is low) affects tree planting activities when organizational effect is controlled. This may imply that tree planting requires external material inputs such as seedlings, in whose production the government agencies are more directly involved.

These overall results show that external factors such as governmental support are crucial both in the organization model and activity models. This implies that the “soft enclosures” by the government has been taking place in this area, and that such “top-down” institutional formation has been somewhat effective in resource management.

Three aspects should be considered when interpreting the results in a more generalized context. The first point relates to how such “top-down” institutional formation can be enforced. In the study area, government agencies and villagers generally share a healthy relationship. In other words, government agencies have acted as “benevolent actors” toward the villagers. However, in general, governmental intervention is not sufficiently benevolent. Rather, many researchers depicted the government (particularly the forest department) as an “intruder” in villagers’ customary rights (cf. Ganjanapan, 2000). Such a tendency is particularly strong when the area belongs to a national park or some other policy-sensitive zone (Sato, 2002). In India, Ballabh et al. (2002) point out that the increasing control of the government over the self-regulated institutions leads to the degeneration and erosion of their management capacities. In short, whether the

institutional formation from “above” is successful depends on how it relates to the appeal from “below.”

The second point is very relevant in this regard. Given that the government is generally benevolent toward villagers, how do some villagers obtain aid from “above”? Notice that in the models, social capital positively affects institutional formation and activities. It is said that communities with larger social capital, together with capable leaders, tend to withdraw higher resources from “above” (Krishna, 2002). Moreover, the government also tends to sponsor such communities because of a higher participation rate.

The third point is the most fundamental one. Compared with other regions in Thailand, villages or communities in the study area currently seem to have a greater social base of collective action. For instance, relatively low heterogeneity both in terms of ethnicity and social strata helps villagers to cooperate. The villagers have more or less experienced collective activities in some spheres of life (such as common rituals or management of a funeral society), which can more easily diffuse to other spheres of life (cf. Shigetomi, 1996; Bryant and Prohmno, 2002). These social settings and experiences can more or less foster social norms that are favorable to cooperation, and ability to manage institutions that is necessary for various activities. In this regard, it is important to mention that the norm to conserve communal land is traditionally embedded in the communities. In this sense, the notion of conservation is not new to them. Institutional formation in communal forest is regarded as a redefinition and reconstruction of this tradition according to the new socioeconomic opportunities and constraints.

Table 11: Variables in the Models

Factors	Variables	No specific organizations	With specific organizations	Total avg.	Remarks	
Physical attributes of forest	Plot area (ha)	21.1	46.1	32.1		
	Degradation dummy**	0.41	0.16	0.30		
Resource scarcity	Forest area per HH (ha)*	0.75	1.41	1.04		
Socioeconomic attributes of HH and community	Assets	Pickup truck per 100HH**	11.63	7.42	9.76	From KCC2K database in 2003
	Resource use	Use rate of gas**	3.13	2.25	2.73	Ranked 1-5 (five is the highest)
	Market access	Distance to district center (km)**	10.01	13.13	11.40	
	Social capital or heterogeneity	Village fund index**	2.34	2.61	2.46	From the provincial CDD office. Ranked 1-3 (three is the highest)
		Number of villages	1.46	1.72	1.58	
Governmental support	Officers' advice in institutional formation**	0.14	0.67	0.38	Dummy variable	
	<i>No so lo</i> dummy*	0.66	0.82	0.73	From the district land office	
	Project dummy	0.17	0.30	0.23	From the provincial forest office	

Sources: Field surveys, KCC2K village databases, and documents at the TAO and district offices. Note: HH and CDD denote households and the Community Development Department, respectively.

*P<0.05, **P<0.01

Table 12: The Results of Regression Models

Model	Organization model			Monitoring model			Tree planting model		
Independent Variables	B	Wald statistic	Sig.	B	Wald statistic	Sig.	B	Wald statistic	Sig.
Ln (Plot area)	.561	5.340	.021	.016	.006	.939	.437	4.766	.029
Degradation dummy							-.589	.990	.320
Ln (Forest area per HH)	-.784	5.154	.023	.618	4.480	.034	-.016	.005	.941
Pickup trucks per 100HH	-.395	16.230	.000	.038	.228	.633			
Use rate of gas	-1.178	11.696	.001	.253	.852	.356	.038	.023	.880
Ln (distance to the district center)	3.000	6.289	.012	.135	.017	.896	-1.345	2.941	.086
Village fund index	2.536	11.189	.001				1.810	10.212	.001
Number of villages				1.063	8.123	.004			
Officers' advice dummy	3.577	16.737	.000						
No so lo dummy	2.674	7.418	.006						
Project dummy				1.534	3.973	.046	1.587	3.746	.053
Organization index*				4.036	11.902	.001	3.262	11.565	.001
Intercept	-12.133	10.358	.001	-7.682	9.858	.002	-4.027	3.495	.062
Number of observations	127			126			119		
Chi square (df=8)	108.65			57.04			67.24		
Log likelihood	-32.82			-42.88			-47.65		
Pseudo R-squared	0.770			0.537			0.580		

Source: Refer to Table 5.

* denotes the predicted values obtained using the organization model.

In this section I quantitatively analyzed institutional arrangements of communal forest management, and a number of decisive factors affected the level of these institutions and collective actions. The following three results are worth pointing out.

First, by controlling other variables, particularly those of resource substitution, resource scarcity positively affects institutional formation in this area. In this sense, the results are similar to previous studies. However, compared to other factors such as social capital or governmental supports, its effect is relatively minor and the statistical significance is lower.

Second, governmental supports are strong and highly significant factors affecting the introduction of organizations and conservation activities. This indicates that “soft enclosure” has been taking place in this area. The involvement of government agencies in village life has increased greatly as compared to the early 1990s, when Kono et al. (1996) and Shigetomi (1998) conducted surveys.

Third, the existence of specific organizations positively and strongly affects the conservation activities. This suggests that the introduction of institutional arrangements is not merely nominal; rather, it has some positive effects on management performance.

Overall, these results may allow people to feel optimistic about the “top-down” institutional formation process. However, I do not believe that it is enough to merely explain that the institutional formation of communal forest management in the study area is characterized by “soft enclosures.” The fact that social capital is of crucial significance in the models implies the importance of villagers’ abilities to appeal from “below.” Moreover, the interventional approach itself may entail dangers of eroding the villagers’ own capacities to manage resources, as many studies suggest. In short, institutional formation and activities for communal forest management arise from the common ground between “top-down” factors and the “bottom-up” incentives.

What combinations, then, will determine the institutional change? Are the changing processes path-dependent? If so, how do the patterns of combination or the time order affect the institutional paths? Further, how will these paths influence the possibilities, constraints, and performance of conservation activities? Comparative case study analysis that can conceptualize the processes of institutional change is important in this regard. The following case studies can provide some insights on how certain combinations lead to certain types of processes.

3.3. Variations of Institutional Formation: Four Case Studies

Based on field interviews from 113 villages in the district, I selected 4 cases that can well represent the emerging trends of communal forest management in the study area. These case studies seek to exemplify the variations of rule formation process seen in the area¹⁴. They are categorized with regard to two factors; the physical amount of resources and governmental interventions (Figure 2). The former seems to affect the villagers' internal incentives, and the latter represents external forces and support.

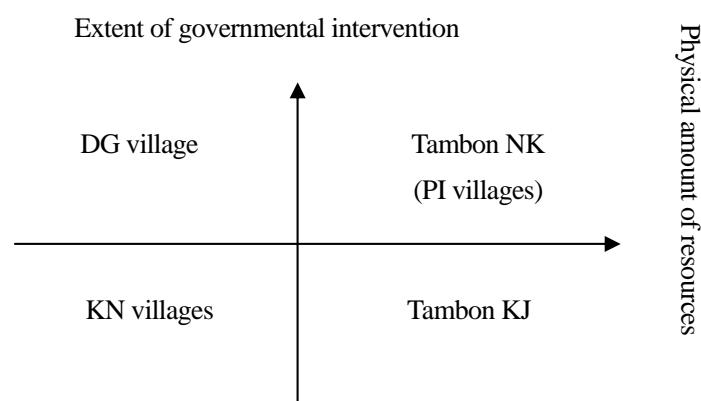


Figure 2: Configurations of Case Studies

3.3.1. Strong Governmental Initiatives: Tambon NK (PI villages)

PI villages in Tambon NK, consisting of 202 households, are located in the southeast of the district (Figure 1)¹⁵. There are abundant forests in the area, including along the flood plain of the Sebai river and scattered hills. Most of them are communal lands utilized by the villagers. There are 7 communal forests in the village, covering more than 270 ha. Of them, the forest named “*ban kao* (old village)” is particularly famous for its richness¹⁶.

As the name tells us, this forest is located where an old village once stood. In 1932 the village was abandoned because malaria broke out and many villagers died there. At that time, some moved to the current location, 4 km away¹⁷. The area has been communal land ever since. Like the other communal lands in the village, it was a source of forest products, and in some parts, villagers planted various crops such as beans and gourd by shifting cultivation. During the kenaf boom in the 1960s, kenaf was planted in the area

¹⁴ The actual name of Tambon and the village are not stated here, as some information may be considered sensitive to the villagers.

¹⁵ There are 2 villages (*muban*); village no.2 and no.8, which share the same name and origin. Village no.8 diverged from village no.2 in 1978. They also share the same school, temple and communal lands. In the description, therefore, I regard them as a single community.

¹⁶ There are other local names for the forest; *wat kao* (old temple), *pa cha kao* (old cremation forest) and so on.

¹⁷ In the forest, we can still find large mango trees and old trails, recalling the old village.

and some parts of the forest were degraded.

The situation changed in 1983. A monk came to live in the forest and started meditation there. He initiated forest conservation, and after that shifting cultivation stopped¹⁸. Under his initiative, communal forests in the village were managed by a forest care committee. Managing rules with sanctions were formed to punish violators. The remaining forest was well conserved and the degraded area gradually recovered.

Then the year 1999 became another turning point. The provincial forest office noticed that the forest here was well conserved, and chose it as a target of the “*ro so tho po*” project (see previous explanation in P.9). The officers then nominated the forest for the award. To meet the project standard, certain conditions had to be met, including forming a forest care committee, management rules, violation controls, volunteer patrols. In all, about 100 people from PI and neighboring villages in the two Tanbols (Tambon NK and DY) participated in the training project. After the training, a new committee consisting of forest conservation volunteers in the 9 villages was established and new management rules were formed. The volunteers build signboards and firebreaks, and “educated” villagers on the importance of the forests. As a result, they were awarded a royal flag by the Queen in 1999. The Queen came to the forest and gave a flag directly to them. This was a significantly honorable event in the history of the village. The forest was renamed “*Pa chum chon charoem prakiat 72 pansa* (the community forest in honor of H. R. H. the Queen’s 72nd birthday)”. In 2002 the conservation area was expanded to 20 plots (around 700 ha) in 16 villages, and at the same time the committee was re-organized (Khana Kamakan Phitcharana..., n.d.). These plots were then registered as “community forests” by the forest department.

This is a brief history of the PI village case. The institutional formation process here is, in short, outsider-oriented. The first-stage institutional formation was from the monk’s initiative, and during the second stage the government expanded its area and formalized its management. The whole process was underpinned by cultural apparatus; such as religion, and state apparatus; such as the royal family.

The villagers’ everyday life is much more pragmatic, however. Thus there is a wide gap between such cultural and state discourses and everyday life. During the survey, a village elite and his wife in NK village, a village neighboring the PI villages, asked me how they

¹⁸ He was born in the PI village. After living in Bangkok as a taxi driver and for a while in a military camp in Lopburi, he decided to become a monk at the age of 30. He is a pupil of a famous abbot residing in Ubon Ratchathani, and many city-dwellers come to worship and contribute to the temple. During the interview, the village head told me that the forest would have disappeared if this monk had not initiate conservation at the time.

could increase benefits from the forest. They told me, “We wish to get something from the forest, but now we cannot fully utilize it because of the strict management rules. We are now discussing this issue and if you have some good ideas please tell us.”

In fact, NK village participated in the forest care committee in 1999, but did not participate in the re-organization of the committee or register its communal forests in 2002. According to them, “Registration causes other problems. When we registered (the communal forests in Tambon NK and DY), we had conflicts concerning which Tambon to register first. Management by committee members results in the villagers being uncooperative, as they rely entirely on the committee members. We have successfully managed (the forest) for a long time, and we will continue to do so. We do not have to register.¹⁹”

Thus they felt that their communal forests would be beyond their control if they accepted formalization. In this context, ironically, the formalization may deprive villagers’ access to the forest²⁰. The names of the communal forest in PI village, “*pa chum chon charoem prakiat 72 pansa*” and “*ban kao*” seem to symbolize the gap between the discourse and everyday life, and the dilemma of formalization. The NK villagers may eventually become critical due to this dilemma.

3.3.2. A Response to Outside Threats: Tambon KJ

Tambon KJ, which is located in the northeast of the district (Figure 1), consists of 12 villages with 1,263 households (6,187 people). The forests here (25 plots with 520 ha) are distributed along the natural levees of the Sebai river and on a hill in the western part of the Tambon. Most of these forests are communal forests, and villagers have utilized them for a long time. Up to now the management of these forests was done by each village (or villages), therefore, there were significant differences of management rules between them. For instance, NG village, located in the western part of the Tambon has had strict rules since 1989, while there were no such rules in KS village, located along the Sebai river. Even with the variation in rules, the forests here were not seriously depleted because of the mild pressure of land and forest (Kono et al. 1994).

The situation, however, has changed recently. New road constructions and repairs in the 1990s improved access to the Tambon. After access improved, many outsiders from various places came into the forests and extracted significant amounts of forest products

¹⁹ Citation from Ms. Yuki Onodera’s field notes (2004). She is a former graduate student in the Graduate School of Asian and African Area Studies, Kyoto University, and her contributions are generously appreciated.

²⁰ Ballabh et al. (2002) refers to similar type of dilemma in their Indian case studies.

to sell in the market. Especially during the beginning of the rainy season (May – June), they arrive in pick-up trucks in groups of 10 or more. They often appear early in the morning and look for mushrooms in the forests²¹. As a result, many villagers in the Tambon have felt uneasy, for “*the outsiders* are benefiting from our forests while *we*, the owners, are still poor”. In addition, the outsiders often disturbed the forests by cutting, setting fires, disposing waste, and so on. The village elite felt that something must be done to save the forests from this destruction.

As the outsiders come in vehicles, the accessible range is large, and the conventional management was not effective. Members of the TAO council then started to discuss the unification of the management rules in the Tambon. After several rounds of discussion, they asked forest officers to hold a training session. After the training, a public meeting was held on June 3, 2005. The attendants included members of the TAO council, village heads, TAO officers, school teachers, district forest officers and ordinary villagers. After the meeting, new management rules were introduced and a forest volunteer committee was formed by 61 members from 12 villages.

The new rules consist of 11 articles. It prohibits tree cutting, fires and cultivation in the communal forests in the Tambon. Villagers can ask the committee for construction poles from the forests. The articles also regulate hunting in the forests and fishing in the water bodies²². Violators are fined by the committee, according to the nature of the violations.

The most unique point of the rules lies in its regulations on outsiders. It stipulates that outsiders need to ask permission to the committee before they obtain resources, and they pay fees of 20 baht each. Resources are also limited to 4 kg each (Khana Kamakan Klum Rasadon..., 2005). Violators are penalized up to 1,000 baht and informants are rewarded 25% of this. Fines and fees collected are part of the committee’s revenue, and are utilized for conservation activities. Some measures are to be taken for collecting fees. For example, the members of the committee patrol the Tambon regularly. Many signboards stating the rule are posted at check points.

Quite naturally, these rules created a stir among the villages nearby. For a long time they had utilized the forests and water bodies in the Tambon to obtain natural products for their livelihoods. With these rules, however, they became “outsiders” and were excluded. Some of them appealed to the district to allow them use of the resources, but the district

²¹ Some of the mushrooms have a high value. According to the villagers, a mushroom called *het puak* is valued at 170-200 baht (4-5USD) per kilogram in the local market. They say there are a lot of such mushrooms in the forests there.

²² It bans the capture of aquatic animals during periods of fertility (May – July). Illegal means of capture both in the forests and water bodies are also prohibited.

and TAO tried to defend themselves, explaining that they do not totally exclude outsiders²³.

On the other hand, some villagers were also against the rules. Outside influences varied significantly across the villages and the motivations were different. Some villagers also utilized resources in other Tambons. For example, some NG villagers often fish in the Tambon LH, which has a lot of marshes in the flood plain of the Sebai river. They feared that the introduction of such rules would anger Tambon LH villagers and result in the same kind of rule formation there. After all, they accepted the proposals because they were in the minority.

In the case of Tambon KJ, I can point out three notable points. First, there was strong motivation for the institutional formation by the villagers, even though the resources were abundant. The improvement of access induced outside disturbances in the forest, and this led to high motivations for the institutional formation. As in this case, many anthropologists studying in Thailand reported that outsiders' threats triggered villagers' collective action (Wittayapak and Dearden 1999, Ganjanapan 2000, Johnson 2001). Moreover, this logic is also easy to explain using the logic of game theory (Ubukata 2007, See also the "Protest Game" in the Appendix).

Secondly, the villagers did not recognize "scarcity" but rather the "affluence" of the forest resources in the area during the process. In other words, they were incorporated into the broader system of "scarcity" by the invasion of outsiders whose resources were already scarce. In this sense, "scarcity" is not necessarily an actual concept that is identical to the physical amount of resources. As Aguilera-Klink et al. (2000) and Mehta (2001) pointed out, it is a human perception, which is socially and politically constructed, and depends heavily on the social context itself. It seems, at least, that something should be mediated between the physical amount of resources and the recognition of scarcity (or recognition of the need for rule making) by the villagers. Some events, or a diffusion of ideas or feelings create a common recognition among the people. In this case, "a sense of deprivation" by the outsiders was diffused in the Tambon (or at least among the village elite). This constructed a "Tambon identity" (i.e. *we* as forest owners and *they* as invaders), and created incentive structures for rule making.

Third, the introduction of the rule created conflicts both inside and outside the Tambon.

²³ When the issue was raised during interviews, the villagers around the Tambon often passionately appealed to me regarding the current situation. In fact, during the year 2005, the committee only cautioned outsiders and did not collect fees. This may have been a temporal compromise by the committee. And in 2006, villagers in Tambon LH gained silent approval (*anulom*) in their forest use, for their forests are adjacent to Tambon KJ's forests.

This is because the villagers' original resource use pattern was not territorially restricted, but rather created geographical networks with various options. For instance, villagers in an area sometimes depend on resources in other areas, and vice versa. There are many cases in which villagers move beyond village borders to obtain resources for daily living (Figure 3 shows such networks in the study area). The attempts to “territorialize” the resources, as in this case, necessarily forced these networks to change²⁴. It is likely that the neighboring Tambons will take on similar measures and at the same time, such conflicts will also increase.

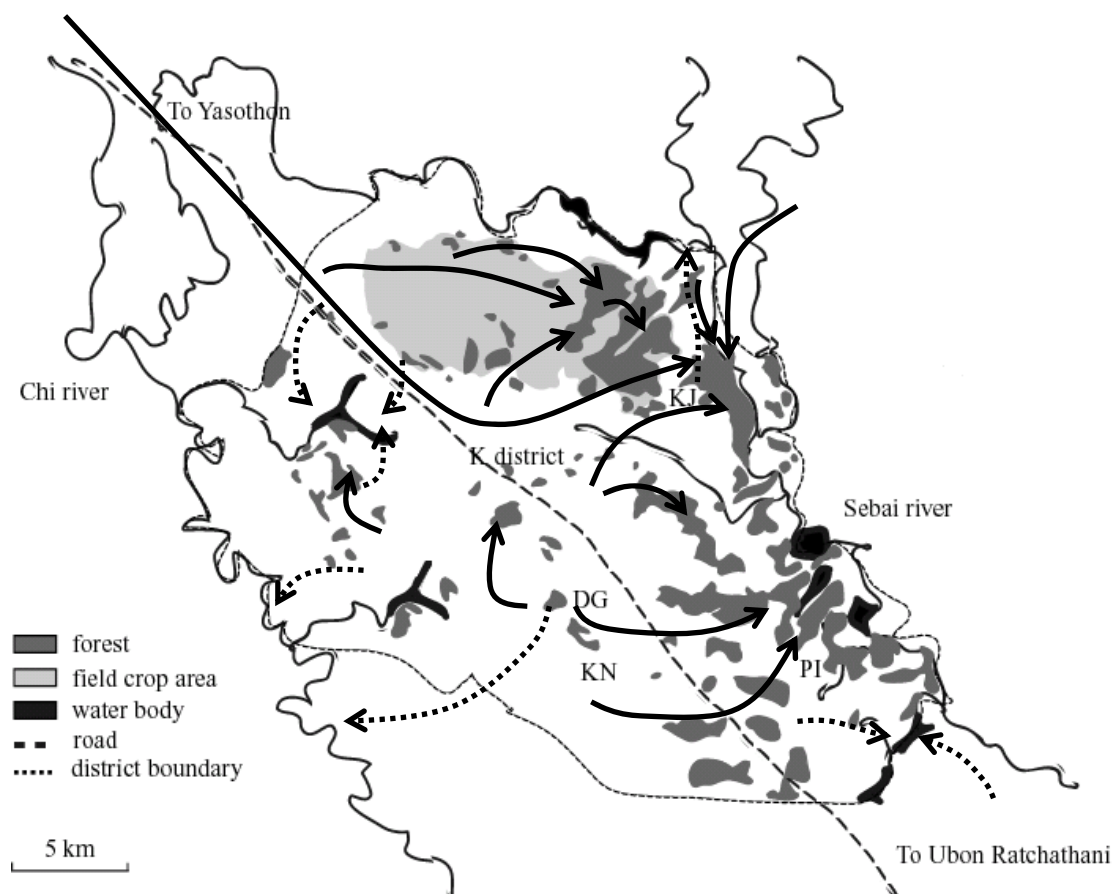


Figure 3: Cross-village Resource-seeking Activities in the Study Area
 Source: field surveys. Note: black arrows indicate seeking for forest resources, while dotted arrow shows that for fishery resources.

3.3.3. Norms in Transition: KN Villages

KN villages (village no.1 and no.2) are located in the south of the district (Figure 1), with 330 households (1,622 people). It is said that the rice produced in the area is of high quality. Here the demand for paddy field is high and few forests remain in the Tambon area. Due to this scarcity, villagers in the Tambon sometimes rely on forest products from

²⁴ Tubtim and Hirsch (2005) refer to similar phenomenon in southern Laos. Peluso (2005) also comments that “the politics of both commons and CPRs are becoming increasingly territorialized (p.1).”

outside, as I previously explained in Figure 3. There are 5 communal forests in KN villages; 50 ha of communal forests in all, but this has been degraded and partly encroached on due to high demands of land and forest. The land encroachment in the “cremation forest” (18.4 ha) has created a serious conflict among the villagers.

This forest, as the name indicates, was once utilized as a burial place for the villagers. For the last since 25 years, though, villagers have been buried in the temple and not in the forest. The area has been gradually encroached on from the border by those who own the land nearby. Currently paddy fields encroach on about 10 meters inside the border.

In the village there are some rules concerning this forest, but both formal and informal rules are incomplete. They are oral and without sanctions. Moreover, the forest area has not been issued with a public land title (*no so lo*). Thus, the management of the forest largely relies on the villagers’ social norms. According to a village head, “we did not have to introduce sanction rules, for everyone knows about the rules. We have many encroachers here but we understand most encroachers are poor, and they need land. In addition, most of them utilize the land temporarily, and do not claim ownership”. This implies that social norms are woven with sympathy in actual management.

Recent cases concerning three households have been different, however. In 2003 they boldly opened up paddy fields in the center of the forest (around 6.4 ha), although they have enough land, have stable incomes, and are relatively affluent. When they started cutting trees and leveling the ground, a village head and his supporters feared that the forest and communal land would vanish if they overlooked this conduct. They preferred to conserve the forest “for the common good” of the villagers, even though their natural resource use had gradually been declining²⁵.

The village head then tried to negotiate with the three households to return the encroached plots. They refused, insisting that they had official land documents called *no so 3* for their plots²⁶. Both sides appealed to the district land office about the issue, and TAO offered a budget for the land office to measure the plot. To date, however, the

²⁵ The villagers feel that diffusion of cooking gas and concrete poles is gradually replacing their natural resource use, but they still believe that the forest is one important source of natural products needed for everyday life, particularly in times of hardship. Using the word of PI village head, “Living in this village (with plenty of natural resources), we will not starve to death.”

²⁶ In Thailand it is widely known that many official land documents for private ownership or use are issued for land which cannot be privately owned or used. In most cases this indicates that there were some illegal conducts in the process. In this case, two of the three households are the offspring of the *ex-kamnan* (the head of the Tambon: now deceased), and the remaining one is the offspring of the *ex-assistant kamnan*. The village head, therefore, suspects that *ex-kamnan* asked the head of the district at that time (he was a close friend of the *ex-kamnan*) to issue the documents illegally.

conflict continues.

In this case, land and resources are scarce and conflict levels are high. This is exactly the kind of situation which induced institutional innovation theory assumes. Of course with this situation the demand for institutional innovation may be high, but it is not likely that the villagers will solve the conflict and formulate new institutions. The solution will depend on the outside authorities in the district and province. Currently the social norms regarding the villages are in transition. If the villager side wins, the norms will be maintained, and new rules may emerge. If the three households win, however, such norms will totally collapse and the forest will surely vanish quickly.

3.3.4. Following Authority: DG Village

DG village, with 115 households (579 people), also belongs to the same Tambon as KN villages (Figure 1). The resource conditions are similar to KN villages, whose resources are scarce with only a few degraded forests. There are only 3 plots of communal land in the village: a pond (0.64ha) utilized for tap water, “sacred forest” (0.4 ha) and “cremation forest” (4.8 ha). The “sacred forest” has no vegetation, and is currently a children’s playground. The cremation forest is a part of degraded forest extending over the neighboring LF and NL villages²⁷. Due to the poor soil fertility, villagers did not create paddy fields and the place has remained as communal forest for forest products, as well as for burial purposes. Since 2003, it has been partly used as a garbage dump in the Tambon.

Like the KN village case, villagers ceased to bury their dead here in the 1980s, and since then the forest has been gradually encroached on by them. LF and NL villages probably reacted by forming written rules in their own areas during this time, but DG villagers did not. Thus encroachments continued, especially by the LF and NL villagers.

The situation changed in 2000. Forest officers came to the village and asked villagers to participate in a conservation project. LF and NL villages, though they already had written rules, also joined the project. Interestingly, the attitudes toward the project varied among the villages. In LF villages, some village elite repeatedly emphasized that “there should be forest in the communal land”. They thought they should get ahead on reinforcing the conservation, as they saw many conflicts over the communal lands in the surrounding villages. To protect the forest from encroachment and fire, they got a budget from TAO and started to construct a surrounding road. In 2003 forest measurement was done by the forest office and in 2005 a total of 80 thousand tree seedlings were planted.

²⁷ The total area covers around 40 ha (27 ha for LF villages, 8.3 ha for LN village, and 4.8 ha for DG village).

On the other hand, LN and DG villages did not seem to feel it was necessary²⁸. The village head of LN village told me that they just joined “because the forest officer urged us”. Anyway, DG village took action, as the communal forest was being cultivated by neighboring villagers. In 2000 the village head negotiated with the encroachers, and some part was returned as communal land. After that, eucalyptus was planted on the border to show the border line clearly. And finally in 2003, written management rules were introduced.

In 2005, LF, NL, and DG villages joined another conservation project called “New Forest Village Project (*khrongkan muban pamai phen mai*)”, launched by the forest department. The “new” point of the project was that 70 thousand baht (1,750USD) per village of subsidies were granted to cover management costs. This seemed to please the village elite. In March 2005, they were invited to a training course held in Khon Kaen; a regional center. After the training, the village head in DG village delightedly explained to me how nice the hotel was, and how generous the department was.

In this case, there are mixed motivations for the institutional formations in the three villages. One is scarcity-led internal initiatives by the villagers in LF villages, and another is government-led external initiatives in DG village (and partly in NL village). This indicates that, like previous examples, the physical scarcity does not necessarily create the villagers’ need to tighten management rules. The former and latter belong to different Tambons, and each has different management rules. Thus the future consequences will also be different. In fact the latter type, which is based on the patron-client relationship between the village elite and officers, are quite common in government-led community forest projects. The establishment of a long-term conservation system would be questionable, though the village elite do at least temporarily follow the official guidance.

3.4. The Pattern of Institutional Formation in the Study Area

The above case studies exemplify the outstanding institutional formation processes in the district. As the studies indicate, recent social, economic, and cultural transformation in the villages caused new type of problems in resource management, which prompted villagers to change management institutions of communal forest. Their formation processes differed according to the geographical conditions and type of interactions between community members and external actors (namely, the government and outsiders), and this led to different consequences and problems in managing the resources. I categorized these into four types of process by two conditional axes; “internal incentives” and

²⁸ This may partly reflect inverse U-shaped relationship between resource scarcity and participation.

“external forces” toward institutional formations (Figure 4). Each process appears to require different explanations, which varies from economic theory to anthropological interpretations.

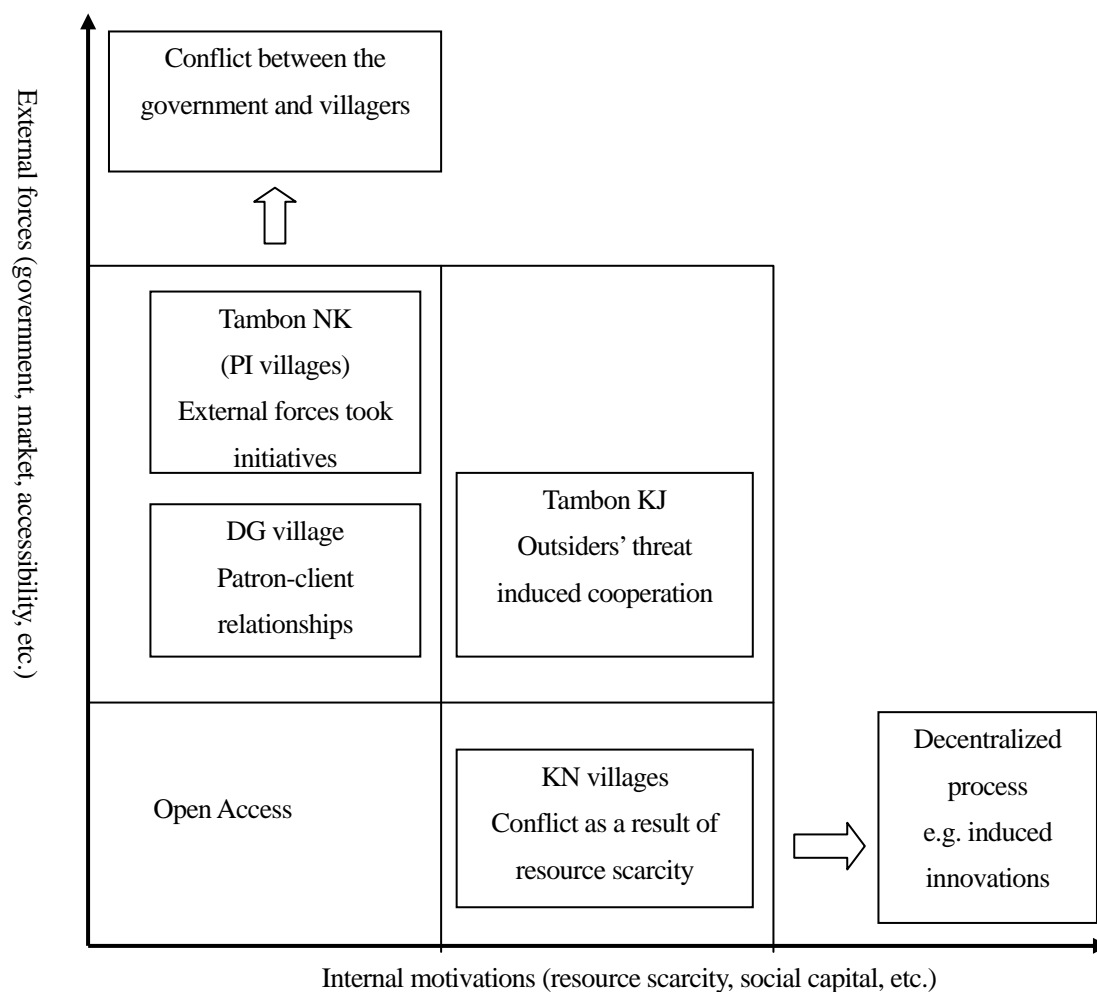


Figure 4: Institutional Formation Processes in the Case Study Villages

In the PI village case, strong external forces such as cultural and state apparatus took initiatives. In Tambon KJ, the outsiders’ threat induced local collective action. The logic of the former is similar to other cases where there are conflicts in forest use between the government and villages (i.e. national park etc.), and is regarded as one end of the spectrum in Figure 4. In the latter, both internal and external factors seem to be well-mixed. Villagers’ motivation was high enough to take the initiative in rule making, and government aid helped them.

In these two examples, it is also noticeable that conservation units have been expanding beyond the communities, although the institutional formation process differs between two cases (bottom-up style process in Tambon KJ, while outsider-oriented process in Tambon

NK). In general, the proponents of CBNRM regard the smallness of the community and resources as one of the main reasons that enable CBNRM to reduce transaction costs regarding rule enforcement. In many cases, decentralization of natural resource management thus aims to “scale-down” formal operational management units in order to achieve better resource governance. In the study area, however, the administrative decentralization has actually led “scaling-up” of informal operational management unit²⁹.

These contradictory movements necessitate some form of coordination among communities and upper authorities through institutional design. Through such a formal and informal coordination of management units, it appears that communities and authorities try to “optimize” the size of the management unit, or to establish “nested enterprises (Ostrom 1990)” of resource management. In this context, the roles of TAOs and district offices were important. In particular, TAO offered an “arena” of institutional formation, as Ostrom (1990) explained. “A sense of community” is growing among the village elite, as they frequently meet at the TAO office. Thus, it is likely that the governance of TAO will take on more and more important roles in local institutional formations.

On the other hand, the KN villages may have the nearest conditions to that of induced institutional innovation theory, though rule formation in the near future is unlikely. This is almost a completely decentralized process and can be regarded as another end of the spectrum in Figure 4. The case of DG village can be characterized as a patron-client relationship. The village elite here may be taking advantage of the governmental project. This is also very common when the government initiates top-down conservation projects. In addition, it is also noticeable in these two cases that cultural norms in utilizing “cremation forest” have been declining. The introduction of rules or institutions can be interpreted as the replacement of norms by them. In this sense, the institutional formation processes are not only the issues of resource use and management itself, but the issues of culture which has been rapidly changed during the past several decades. As in these cases, these cultural transformations are very important, even though we could not capture in the statistical analysis.

Thus we can see how the institutional formation processes vary among the villages. It is

²⁹ In contrast to the attempt to “scale down” the management, there are some factors that prefer larger units of management. First, the benefits from resources may sometimes have an economy of scale, which requires a larger area as a management unit. Second, the communities with abundant resources may face difficulties in motivating resource conservation, which justify strong governmental intervention that sometimes results in enlargement of the management unit. Third, formalization of resource management or involvement of local government may sometimes require unification of management institutions in some level, mainly due to administrative simplification.

only in KN villages (and maybe LF villages) that the logic of rule formation can be clearly explained by scarcity-led innovation explained as “Forest Conservation Game” in the Appendix. In other cases, the influences from external actors were outstanding and villagers’ reactions to them held a key. As a result, physical resource scarcity does not necessarily associate with the demand for institutional formations. In addition, even the situation in the KN village case does not assure scarcity-led institutional formations. Something should be mediated between a physical amount of resources and recognition of the need for institution making by the villagers. It can be some event, or diffusion of some ideas or feelings to create a common recognition (and incentive structures) among them. That is why social contexts are very important in considering the logic of collective action.

It is also noticeable that the logic of collective action in right-based approach, which is often referred by anthropologists (cf. Ganjanapan 2000), is similar to that of the Tambon KJ case³⁰. Thus an anthropologic approach is very important, as it can provide detailed information on a particular process, as we can see scarcity-related arguments in this case. This is not to say, however, that the rational approach does not give an explanation both in the KJ case and right-based approach. For example, their process of collective action can be at least partly captured by combining “Forest Conservation Game” with “Protest Game” (Ubukata, 2007, See also the discussion in the Appendix).

One notable difference between the KJ case and right-based approach lies in the governmental action itself. In the KJ case the government had a supportive role in their institutional formation process, while the main argument of right-based approach basically regarded government as outsider and intruder. Whether the governmental action is “benevolent” or “oppressive” may depend on various factors. Site effect or Zoning effect is surely one of the important factors. Currently it is not likely that the government behaves as a consistently “benevolent” actor to villagers in national parks or wildlife sanctuaries (cf. Sato, 2002).

Let us turn to notice the work of Kono et al. (1994) again. They pointed out that many communal forest managements were introduced after villagers foresaw resource scarcity. Before the 1990s, external forces such as governmental interventions or outsiders’ invasion were considered to be less influential. Therefore the players of the repeated CPR games were confined only to the villagers. In the 1990s, however, these external actors

³⁰ The proponents of the right-based approach tend to empower community’s negotiating ability vis-à-vis the state, in order for the state to recognize “community rights” in various development activities. They emphasize the process that community members redefine and reconstruct their notion of rights as a response to the conflict toward the state.

could no longer be neglected, as their influences became stronger. The effect of these actors into the games varied, as we see in the case studies. As a result, their entrance as players has transferred and diversified the institutional formation processes of communal forests.

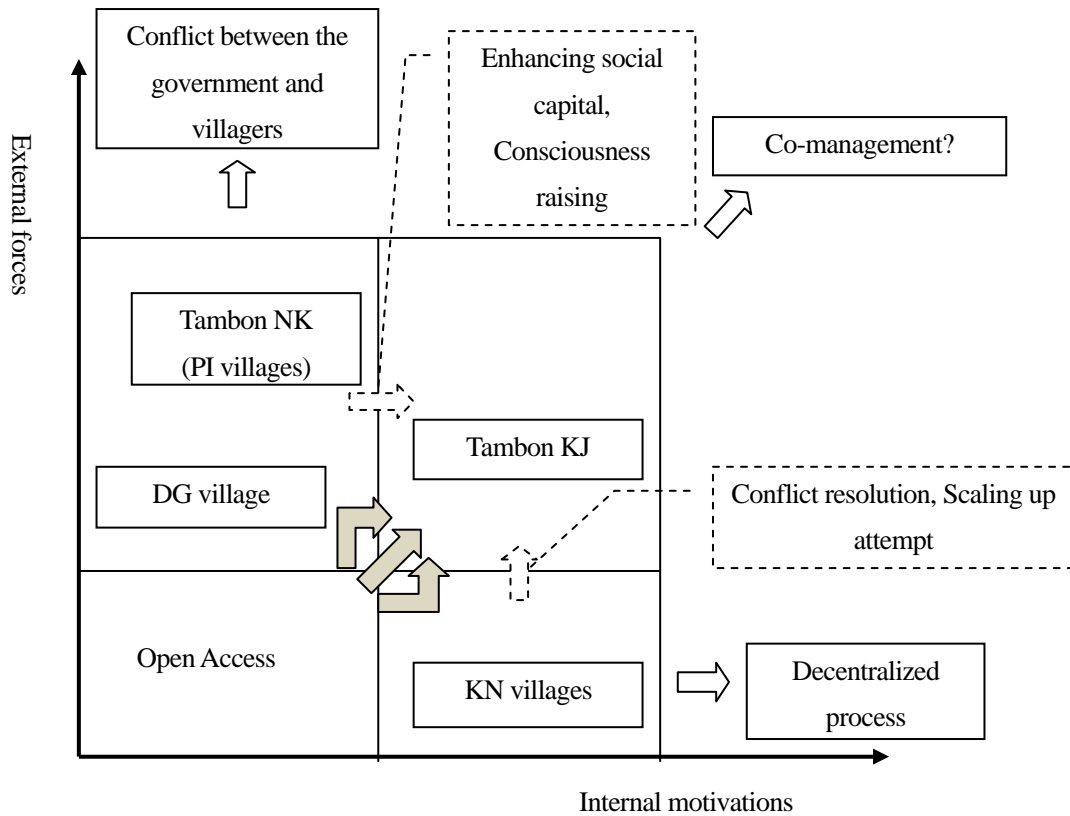


Figure 5: The Pathways to Co-management

Up to this point, we have tried to conceptualize case differences as cross-sectional. On the other hand, these can be regarded as path differences from open access situations, if we simply (perhaps too simply) posit transitions from “loose” to “tight” institutions or to co-management practices. We can identify three different paths in this regard (showed as gray arrows in Figure 5); 1) high internal motivations were followed by external forces (Tambon KJ and LF village cases), 2) strong external forces were followed by internal motivations (Tambon NK and DG village cases), and 3) both of them taking effect simultaneously. When we compare the first and second paths in the case study, we may notice that there are a different set of problems that each path is facing toward effective co-management of communal forests³¹.

³¹ I exclude the third path from my analysis as it can be treated as a combination of the first and second paths.

For instance, the current fundamental problem lying in the activities of Tambon KJ is how to persuade neighboring villagers to agree on the fee imposition. The measures and problems are thus heading outward. In contrast, how to coordinate between the outsiders' intentions and villager's livelihood is the central theme in Tambon NK (or PI village) and the DG village cases. Here the focus of problems are rather inward-looking; how to persuade villagers to participate.

These different problems also make differences in potential measures in order to attain more fruitful co-management practices in the case study area. Currently it is possible to discuss three possible measures for the external agents to help facilitate effective co-management (showed as dotted arrows in Figure 5). For the first path, mediation by third party (other than legal procedure) will help KN villages to introduce conflict resolution mechanisms. At the same time further scaling up attempts in Tambon KJ conservation through involving neighbors may also be important to pursue scale economies of resource conservation, as well as to resolve conflicts.

For the second path, it is necessary for Tambon NK and DG to enhance internal motivations through consciousness raising and through investment in social capital. Long term soft projects other than resource management, e.g. microcredit, may nurture social capital both in intra and inter community (and agents). Finally for the third path, where both internal motivations and external forces are high, it is important to consider whether the direction or strategy of both can be consistent with each other. Otherwise, serious conflicts may occur between community and aid agents. It is important to say, however, that these measures do not assure a path-independent consequence of successful co-management³². For instance, it is incorrect to assume that the investment in social capital in Tambon NK can achieve the same performance as that in Tambon KJ.

As discussed above, we can conclude that both the patterns of internal/external (or top down/bottom up) combinations and the time order affect path dependency of the communal forest management in the study area. It is important to add, however, that this schematic figure is confined to the research area only, where the government basically behaves like a "benevolent actor". In the other areas, it may act differently. For example, villagers' activities inside national parks are in many cases suppressed by the government. Under these conditions the result can be totally different even though a case may have both high internal and external initiatives.

Although we have such limitations, this study may provide useful information on what

³² This is the reason why I put a question mark in the box of "co-management" in Figure 5.

will happen when the government changes its behavior in resource management. Since the early 1990s, the Community Forest Bill has been in a long process of legislation. Whether to allow villagers in the national park the right to establish community forest is one of the hot issues in the legislation process. If the bill grants this right to villagers, the governmental role will drastically change from “oppressive actor” to “benevolent actor”. This study, though not related to national park issues, may have insightful results in considering the pattern of villagers’ resource management process and the role of government and TAOs after the legislation take effect.

4. Conclusion

This study attempts to explain the dynamics of institutional change in the commons, by examining the institutional formation processes in the communal forest management in Yasothon province, northeast Thailand.

The study consists of two parts; statistical analysis which identify the relative importance of determinant factors affecting institutional formations and collective actions regarding communal forest management, and case study analysis which examines the institutional formation processes themselves and problem identification toward effective co-management.

In the statistical part, it was found that, by controlling other variables, particularly those of resource substitution, resource scarcity positively affects institutional formation in this area. However, compared to other factors such as social capital or governmental supports, its effect is relatively minor and the statistical significance is lower. Governmental supports are stronger and highly significant factors affecting the introduction of organizations and conservation activities.

In the case study analysis, I tried to look at some of the important contextual events which statistical results cannot capture. It was found that the outsider effect on resource use and management has become stronger throughout the 1990s and to date, which has transferred and diversified the institutional formation processes of communal forests. Both the patterns of internal/external (or top down/bottom up) combinations and the time order affected path dependency of the communal forest management in the study area.

The results suggested that, first, the induced institutional innovation theory, which insists that resource scarcity is the main driving force for local collective action, cannot solely apply to the current study area. Meanings of “scarcity” or how it is recognized by the actors should be seriously considered. Second, different institutional formation processes

were observed according to geographical conditions and type of interactions between community members and external actors. This led to different consequences and problems in managing the resources. I categorized these into four types of processes by using two conditional axes; “internal incentives” and “external forces” toward institutional formations. Each process seems to require a different explanation, which varies from economic theory to anthropological interpretations.

In addition, the study also found that there are some emerging trends where conservation units of communal forests have been expanding beyond the communities. These “scaling-up” trends of communal forest management imply that the management unit is not a given condition in the actual institutional formation process of CBNRM, but a variable which is decided as a result of the coordination process in order to “optimize” the size of the management unit, or to establish “nested enterprises (Ostrom 1990)” of resource management. These trends appear to be very important when we consider how we can construct a co-management system which effectively connects local resource governance with those on a regional, national, and global level. Using cases in the study area, we discussed some of the prospects toward such co-management practices.

In the study area, the strong impact of the external actors after the 1990s altered and diversified the logic of collective action, along with the situation of resource management. This means that we can no longer assume “isolated communities”, but should examine how the global, national and local external actors affect collective action in contemporary “connected communities”. Even Tachibana et al. (2001), a proponent of induced institutional innovation, refer to “a dilemma of forest management policy (p. 311)”; community forest management will not be effective in the case of resource abundance unless truly strong support measures are provided by the government. This necessitates consideration of social contexts and actor-based models of collective action.

Currently a number of economists are also considering the effects of such contextual factors and external actors (cf. Husain and Bhattacharya 2004). Further efforts on both theoretical and empirical research would help in developing an integrated understanding of the dynamics of collective action under contemporary social settings.

5. Appendix: Some Conceptual Models Explaining Collective Action in the Research Area

5.1. “Forest Conservation Game” and the Effect of Resource Scarcity

Suppose that two players with a symmetric payoff matrix (for simplicity) are facing an independent decision as to whether to conserve communal forest or convert it to a ranch. If we assume $b < d < a < c$, then the game becomes Prisoners’ dilemma game (PD game), in which the inferior outcome (conversion, conversion) becomes Nash equilibrium (Table 13).

Table 13 Forest Conservation Game

		Player 2	
		Conservation	Conversion
Player 1	Conservation	a, a	b, c
	Conversion	c, b	d, d

Note: payoffs are shown as (player1, player 2). $(0 <) b < d < a < c$ (assuming PD game). Arrows show players’ strategic preference, and circle shows Nash equilibrium by the pure strategy.

If the forest becomes scarce, however, its shadow price will rise (assuming price increase; $a \Rightarrow a+e$). Under this situation, the game will alter to Assurance Game if $e > c-a$ (Table 14). This means the increase of the value of forest due to resource scarcity will make cooperation easier. Some forms of external support (i.e. governmental subsidy) may temporarily create this situation, though long term effects are questionable unless the players incorporate such additional values into their internal valuation³³.

³³ In this sense culture is very important.

Table 14 Effect of Resource Scarcity

		Player 2	
		Conservation	Conversion
Player 1	Conservation	$a+e, a+e$	b, c
	Conversion	c, b	d, d

Note: if $e > c - a$, then the game alters from PD game to Assurance game. Two-direction arrows mean strategic preference can change according to the payoff comparison.

5.2. Combining “Protest Game” with “Forest Conservation Game”

This game assumes the situation that outsiders are threatening to obtain benefits from the communal forest, and two players (again, symmetric payoff matrix is assumed) are facing independent decisions as to whether to protest the outsiders’ conduct. Let us assume the protest bears cost $\{g (>0, g < f)$ per player $\}$ and it can succeed with the probability p ($0 < p < 1$) only if both players jointly do so. Finally each player will lose f because of the outsiders’ intrusion if the protest does not succeed or in case of non protest. In this situation the payoff matrix is explained in Table 15.

Table 15 Protest Game

		Player 2	
		Protest	Non protest
Player 1	Protest	$-g-(1-p)f, -g-(1-p)f$	$-g-f, -f$
	Non protest	$-f, -g-f$	$-f, -f$

Note: Assuming $0 < g < f, 0 < p < 1$

Like the KJ case, there are many instances where community members introduce “tighter” rules after an outsiders’ intrusion. Thus it is reasonable to combine protest with conservation in the combination game, which is expressed in Table 16³⁴. In this situation, the game alters from PD game to Assurance game if $pf-g>c-a$. This means the smaller the cost g , or larger the potential loss f , or larger the probability of success p or combinations of them will enhance the possibility of collective action³⁵.

Table 16 Combining Forest Conservation Game with Protest Game

		Player 2	
		Conservation and protest	Conversion and non protest
Player 1	Conservation and protest	$a-g-(1-p)f, a-g-(1-p)f$	$b-g-f, c-f$
	Conversion and non protest	$c-f, b-g-f$	$d-f, d-f$

Note: if $pf-g>c-a$, then the game alters from PD game to Assurance game.

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³⁴ Logically it is possible to combine “conservation” with “non protest” or “conversion” with “protest”, but I do not deal with these choices here, for these are not considered either in the case study area nor in the existing literatures from the community rights approach (cf. Ganjanapan 2000). In fact the existence of these choices can raise an interesting question when we consider how local collective action can or can not lead to good governance.

³⁵ In fact it is naïve to assume a symmetric game, because in reality villagers’ preferences vary according to their resource endowments, political stances, and other factors. As a result, many factions may be created within the community, which disable villagers from complete cooperation as a community unit. Tannenbaum (2000) provides an interesting example in this regard: how villagers politically compete under such circumstances. She regards rituals such as tree ordination as “signs of the increasingly complex relationships that are ... tying different actors in the community into the wider political framework in ways that were not possible before (p. 109).”

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7. References

- Agrawal, A. 1994. "Rules, Rule Making, and Rule Breaking: Examining the Fit between Rule Systems and Resource Use." in Ostrom, E.; Gardner, R.; and Walker, J., *Rules, Games, and Common-Pool Resources*. The University of Michigan Press. Ann Arbor. pp. 267-282.
- Agrawal, A. and Gibson, C. C. 1999. "Enchantment and Disenchantment: The Role of Community in Natural Resource Conservation." *World Development* 27(4). pp. 629-649.
- Aguilera-Klink, F.; Perez-Moriana, E. and Sanchez-Garcia, J. 2000. "The Social Construction of Scarcity. The Case of Water in Tenerife (Canary Islands)." *Ecological Economics* 34. pp. 233-245.
- Amphoe K, Changwat Yasothon (K District, Yasothon Province). n.d. Phen Phatthana Amphoe Prajam Pi 2546 (The year 2003 Development Plan of the District). (in Thai).
- Baland, J. -M. and Platteau, J. -P. 1996. *Halting Degradation of Natural Resources: Is There a Role for Rural Communities?* Oxford University Press. Oxford.
- Ballabh, V.; Balooni, K. and Dave, S. 2002. "Why Local Resources Management Institutions Decline: A Comparative Analysis of Van (Forest) Panchayats and Forest Protection Committees in India." *World Development* 30(12). pp. 2153-2167.
- Bardhan, P., 1993. "Analytics of the Institutions of Informal Cooperation in Rural Development." *World Development* 21(4). pp. 633-639.
- Berkes, F. ed. 1989. *Common Property Resources: Ecology and Community-Based Sustainable Development*. Belhaven. London.
- Bromley, D. W. 1992. "The Commons, Property, and Common-Property Regimes," in Bromley, D. W. ed., *Making the Commons Work*. Institute for Contemporary Studies. San Francisco. pp. 3-16.
- Brosius, J. P.; Tsing, A. L.; and Zerner, C. 1998. "Representing Communities: Histories and Politics of Community-Based Natural Resource Management." *Society and Natural Resources* 11. pp. 157-168.
- Bryant, J., Prohmmo, A., 2002. "Equal Contributions and Unequal Risks in a North-east Thai Village Funeral Society." *The Journal of Development Studies* 38(3). pp. 63-75.
- Bureekul, T. 2006. "Participation of Civil Society in Decentralization in Thailand: Lessons Learned from Natural Resource Management and Community Economic Development." in Rathamarit, N. ed., *Eyes on*

Thai Democracy: National and Local Issues. King Prajadhipok's Institute, Nonthaburi. pp. 73-102.

Cleaver, F. 2000. "Moral Ecological Rationality, Institutions and the Management of Common Property Resources." *Development and Change* 31. pp. 361-383.

Demsetz, H. 1967. "Towards a Theory of Property Rights." *American Economic Review* 57(2). pp. 347-359.

Ganjanapan, A. 2000. *Local Control of Land and Forest: Cultural Dimensions of Resource Management in Northern Thailand*. RCSD, Faculty of Social Sciences, Chiang Mai University. Chiang Mai.

Hardin, G. 1968. "The Tragedy of Commons." *Science* 162. pp. 1243-1248.

Husain, Z. and Bhattacharya, R. N. 2004. "Common Property Resources and Contextual Factors: Evolution of a Fishermen's Cooperative in Calcutta." *Ecological Economics* 50. pp. 201-217.

Johnson, C., 2001. "Community Formation and Fisheries Conservation in Southern Thailand." *Development and Change* 32. pp. 951-974.

Johnston, J., 1991. *Econometric Methods (Third ed.)*. McGraw-Hill, New Delhi.

Khana Kamakan Phitcharana Khatluak Muban/chumchon Anurak Saphayakon Pamai Diden Prajampi 2545 (The year 2002 Selection Committee of Excellent Village/community in Conserving Forest Resources). n.d. Ekasan Prakop Kan Banyai Sarup Lem thi 2, Pa Chumchon Chaloem Phrakiat 72 Phansa, Tambon DY lae Tambon NK Amphoe K, Changwat Yasothon, Phua Kho Rap Prarachathan Thong lae Khem 'Phithak Pa Phua Raksa Chiwit' (Reports of Abstract Vol. 2, The Community Forest in Honor of H. R. H. the Queen's 72nd Birthday, Tambon DY and Tambon NK, K District, Yasothon Province, for Applying Royal Flag and Badge 'Protecting Forest for Conserving Life'). (in Thai).

Khana Kamakan Klum Rasadon Asasamak Phithak Pa Tambon KJ Amphoe K Changwat Yasothon (Villagers' Forest Protection Volunteer Group Committee, Tambon KJ, K District, Yasothon Province). 2005. Rabiap Chumchon wa duai Kan Dulae Raksa Pa Chumchon Satpa lae Satnam nai Rudu Wang Khai Pho So 2548 (The Year 2005 Regulations on Conserving Community Forest, Wildlife and Aquatic Life during the Egg-laying Season). (in Thai).

Kono, Y.; Suapati, S. and Takeda, S. 1994. "Dynamics of Upland Utilization and Forest Land Management: A Case Study in Yasothon Province, Northeast Thailand." *Southeast Asian Studies* 32(1). pp. 3-33.

Krishna, A., 2002. *Active Social Capital: Tracing the Roots of Development and Democracy*. Oxford University Press, New Delhi.

- Leach, M.; Mearns, R. and Scoones, I. 1999. "Environmental Entitlements: Dynamics and Institutions in Community-Based Natural Resource Management." *World Development* 27(2). pp. 225-247.
- Li, T. M. 1996. "Images of Community: Discourse and Strategy in Property Relations." *Development and Change* 27. pp. 501-527.
- Li, T. M. 2002. "Engaging Simplifications: Community-Based Resource Management, Market Processes and State Agendas in Upland Southeast Asia." *World Development* 30(2). pp.265-283.
- McCay, B. J. and Acheson, J. M. 1987. "Human Ecology of the Commons." in McCay, B. J. and Acheson, J. M. eds., *The Question of the Commons: The Culture and Ecology of Communal Resources*. The University of Arizona Press. Tucson. pp. 1-34.
- Mehta, L. 2001. "The Manufacture of Popular Perceptions of Scarcity: Dams and Water-related Narratives in Gujarat, India." *World Development* 29(12). pp. 2025-2041.
- Meinzen-Dick, R.; Raju, K. V. and Gulati, A. 2002. "What Affects Organization and Collective Action for Managing Resources? Evidence from Canal Irrigation Systems in India." *World Development* 30(4). pp. 649-666.
- Mosse, D. 1997. "The Symbolic Making of a Common Property Resource: History, Ecology and Locality in a Tank-irrigated Landscape in South India." *Development and Change* 28. pp. 467-504.
- Ostrom, E. 1990. *Governing the Commons: The Evolution of Institutions for Collective Action*. Cambridge University Press. Cambridge.
- Ostrom, E.; Gardner, R. and Walker, J. 1994. *Rules, Games, and Common-Pool Resources*. The University of Michigan Press. Ann Arbor.
- Otsuka, K. and Place, F. (eds.). 2001. *Land Tenure and Natural Resource Management: A Comparative Study of Agrarian Communities in Asia and Africa*. John Hopkins University Press. Baltimore and London.
- Panayotou, T., Sungsuwan, S., 1994. "An Econometric Analysis of the Causes of Tropical Deforestation: the Case of Northeast Thailand." in Brown, K. and Pearce, D.W. eds., *The Causes of Tropical Deforestation: the Economic and Statistical Analysis of Factors Giving Rise to the Loss of the Tropical Forests*. UCL Press. London. pp. 192-210.
- Peluso, N. L. 2005. "From Common Property Resources to Territorializations: Resource Management in the

Twenty-first Century.” in Cuasay, P. and Vaddhanaphuti, C., eds., *Commonplaces and Comparisons: Remaking Eco-political Spaces in Southeast Asia*. RCSD, Faculty of Social Sciences, Chiang Mai University. Chiang Mai. pp. 1-10.

Rigg, J. and Nattapoolwat, S. 2001. “Embracing Global in Thailand: Activism and Pragmatism in an Era of Deagrarianization.” *World Development* 29(6). pp. 945-960.

Sato, J. 2002. *Kisho Shigen no Poritikusu: Thai Noson ni Miru Kaihatsu to Kankyo no Hazama (The Politics of Scarce Resources: Development and Environment in Thai Villages)*. Tokyo University Press. Tokyo (in Japanese).

Shigetomi, S. 1996. *Tai Noson no Kaihatsu to Jumin Soshiki (Development and Villagers' Organizations in Thai Villages)*. The Institute of Developing Economies. Tokyo (In Japanese).

Shigetomi, S. 1997. “Thai ni Okeru “Kyoyuchi” ni Kansuru Tochi Seido (Land Tenure System on Communal Lands in Rural Thailand).” in Mizuno, K. and Shigetomi, S., eds., *Tonan Ajia no Keizai Kaihatsu to Tochi Seido (Economic Development and Land Tenure in Southeast Asia)*. Institute of Developing Economies. Tokyo. pp. 263-303 (in Japanese).

Tachibana, T.; Upadhyana, H. K.; Pokharel, R.; Rayamajhi, S. and Otsuka, K. 2001. “Common Property Forest Management in the Hill Region of Nepal.” in Otsuka, K. and Place, F., eds., *Land Tenure and Natural Resource Management: A Comparative Study of Agrarian Communities in Asia and Africa*. John Hopkins University Press. Baltimore and London. pp. 273-314.

Thailand, National Statistical Office (NSO). 2001a. The 2000 Population and Housing Census: Northeastern Region. NSO. Bangkok.

Thailand, National Statistical Office (NSO). 2001b. The 2000 Population and Housing Census: Changwat Yasothon. NSO. Bangkok.

Thailand, National Statistical Office (NSO). 2003. Raingan Choeng Wikhro Ruang Raidai lae Kan Krajai Raidai Khong Kruaruang Pho So 2545 Radap Changwat. NSO. Bangkok (A Report of Analysis on Household Income and Income Distribution, 2002, Provincial Level). (in Thai).

Thailand, Royal Forest Department (RFD), 1985. Raingan Prajampi 2539. Royal Forest Department, Bangkok (in Thai).

Thailand, Royal Forest Department (RFD), 1996. Raingan Prajampi 2539. Royal Forest Department, Bangkok (in Thai).

Thailand, Royal Forest Department (RFD), 1997. Raingan Prajampi 2539. Royal Forest Department, Bangkok (in Thai).

Thailand, Royal Forest Department (RFD), 2000. Raingan Prajampi 2539. Royal Forest Department, Bangkok (in Thai).

Thailand, Royal Forest Department (RFD), 2003. Raingan Prajampi 2539. Royal Forest Department, Bangkok (in Thai).

Thailand, Royal Forest Department (RFD), 2005. Raingan Prajampi 2546. Royal Forest Department, Bangkok (in Thai).

Tannenbaum, N. 2000. "Protest, Tree Ordination, and the Changing Context of Political Ritual." *Ethnology* 39(2). pp. 109-127.

Tongpan, S.; Panayotou, T.; Jetanavanich, S.; Faichampa, K. and Mehl, C. 1990. *Deforestation and Poverty: Can Commercial and Social Forestry break the Vicious Circle?* Research Paper No. 2. The 1990 TDRI Year-end Conference on December 8-9, 1990. Thailand Development Research Institute. Bangkok.

Tubtim, N. and Hirsch, P. 2005. "Common Property as Enclosure: A Case Study of a Backswamp in Southern Laos." *Society and Natural Resources* 18. pp. 41-60.

Ubukata, F. 2006. Diversified Process of Collective Action: the Cases of Communal Forest Management in Northeast Thailand. The final report submitted to The National Research Council of Thailand. The research project on 'The Process of Collective Action in Community Forestry: the Dynamic Relationship between Community and Natural Resources in Thailand'. Dec. 2006.

Ubukata, F. 2007. "Komonzu ni Okeru Syugokoi no Futatsu no Kaishaku to Sono Sogo-hokansei (Dual Explanation for the Collective Action in the Commons: How Can They Complement Each Other?)." *The Journal of International Development Studies* 16(1). pp. 55-67 (in Japanese).

Wade, R. 1988. *Village Republics: Economic Conditions for Collective Action in South India*. Cambridge University Press. Cambridge.

Wittayapak, C. and Dearden, P. 1999. "Decision-Making Arrangements in Community-Based Watershed Management in Northern Thailand." *Society and Natural Resources* 12. pp. 673-691.