



The Role of Social Capital in Community Collective Action in Cambodia: The Case Study of Mutual Help and Local Management of Commons

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Summary

The study of determinants of community collective action with particular emphasis on the role of social capital was, in the first instance, motivated by the lack of community collective action with *high level coordination* in rural Cambodia. Definition of Social capital in the study is based on the cognitive phenomena of social relationships such as trust, helpfulness, and fairness that reflect a sense of solidarity and mutual trust among community members. Social capital is defined here as positive attitude of a respondent to interaction among other villagers in terms of trust, helpfulness, and fairness. High level coordination is used to indicate collective action which development practitioners actively assist communities build for the purpose of community development. This collective action is building and maintaining local roads and irrigation systems, protecting natural resources surrounding communities (notably forests, fishes, and water reservoirs). The distinction is made because development practitioners only consider these activities as community collective action by ignoring *primitive* collective action such as mutual help among community members based on their personal relations, financial mobilization for religious ceremonies, etc. That is because the mission of development practitioners is not supposed to involve these activities and these forms of collective action tend to emerge naturally with minimal coordination. There are two competing theories about the lack of community collective action in Cambodia.

The pessimist school of thought of community collective action in Cambodia shares one common observation that villagers are *individualistic*, although the main reasons for this vary among ethnographic studies (see Peang-Meth (1991); Colletta and Cullen (2000,

p.27)), ideological schools (Hou (1955) and Hu (1965)), and structuralism which mentions the lack of specialization and division of labor in rural economies (Kiernan and Boua 1982). Chronic civil war (1970-1998) and failed experiments of forced *collectivization* in two consecutive regimes, communist (1975-1979) and socialist (1979-1989), made Cambodian people even distrustful of *collectivized* action, and have made it difficult to involve villagers in community collective action (see Colletta and Cullen 2000, Hughes 2003, Gottesman 2003). Furthermore, since the late 1980s, the development organization activities and practice of *modified* patron-client relations by Cambodian party politics (Hughes 2003, pp.61—61) have substituted the role of horizontal cooperation among community members for provision of local public goods.

Although the literature is pessimistic on Cambodia's community collective action, the authors do not equate community members' *individualistic* behavior as fragmented or conflictual. The more optimistic schools argue that the capacity of community members and leaders in terms of income and education is low and community members perceive that provisions of local public goods such as building and maintaining all roads and ponds are not their responsibility. Rather they think it is the responsibility of the state and more recently of development organizations as well. Maintaining pagodas, contributing money to pagodas for traditional and religious ceremonies, and assisting other community members in time of need such as funerals and *Sangkeaha*, village-level fund raising for medical treatment practiced in some parts of Cambodia, which are perceived to be their responsibilities, are practiced without fail by villagers.¹

Relative land and resource abundance to the population, rural farmers' livelihood based on subsistent rain-fed cultivation, and a more predictable climate (Danida 2008, p. 12) might be main factors which make community collective action less necessary for community

¹The perception perhaps can be traced back to the Angkorean Period (9th century-14th century) when villagers were mobilized to work on mega-projects such as building many huge temples, reservoirs, and irrigation systems and maintained those projects thereafter. This practice continued even after the Angkorean period until very recently.

members' survival. When it is necessary for their survival, villagers cooperate as in the case of labor sharing activity arrangements which are commonly observed in Africa and other Asian countries (Krishna and Sciubba 2009), and are commonplace in Cambodia when household labor is insufficient due to the seasonal nature of some activities such as rice transplanting and harvesting. Such activities need to follow a seasonal schedule which requires a lot of labor for a short period of time. Usually, it involves about 20 to 25 labor persons that are beyond the total number of household members.

Detailed studies of the cause of lack of collective action will be an important input for development policy makers and practitioners to enhance people participation, which is a pre-requisite for community development and its sustainability after the projects end. A high level of development is not possible without more well-institutionalized organizations at the local level to deal with problems encountered in community daily life—idiosyncratic risks (eg. health and agricultural production shock), lack of productive capital for enhancing income level (absence of rural financial markets), and problems of commons (forests, fisheries, and water reservoirs).

If the lack of collective action is intrinsic in the system due to a low level of social capital in a community, building social capital should be explicitly included as one of the community development goals. If the lack of it is not due to a low level of social capital, development policy should be designed to utilize existing social capital and in a way not to crowd out community social capital to lower the threshold for success of collective action by assisting a community in: 1) designing a rule which provides economic incentive to cooperation; 2) lowering costs of monitoring and sanctioning defectors; and 3) extension services and trainings for awareness of advantages and management of collective action.

Mutual help and CMF management are selected for the study because both forms of collective action fit two criteria which allow for testing the hypothesis that lack of collective action is attributed to whether low social capital or low community capacity can be identified. One is that both forms of collective action are necessary for community members'

survival. The other criterion is that community members perceive that it is their responsibility to contribute money and labor to both forms of collective action and benefit from collective action.

The first type of collective action is mutual help among community members without involvement of any authorities or development organizations. In this case, we select contributions in *Sangkeaha* and funerals to represent community collective action because both events are costly for any individual household and are necessary—the former for saving life and the latter for traditional and religious reasons—so collective action is needed when an insurance system is not available for these two events. Also households in the same village perceive that it is their responsibility to contribute, although kinship is more important for funerals than for *Sangkeaha*. The other type of collective action is local management of commons with involvement from the state and development organizations, which are collectively called external agencies. Local management of community-managed forests (CMFs), which had been abundant and have become relatively scarce in the last two decades. Therefore it is necessary for a community to act together to safeguard forests which they partly depend on for their livelihood.

Also because government policy empowers community members to take ownership on these community resources, community members clearly understand their responsibilities to contribute and benefit from these collective action. The hypothesis is that if lack of collective action is not intrinsic in a community, social capital will play a positive role in *Sangkeaha* and funerals; and it still plays a positive role in people participation in CMF activities when the success of it also depends on support from external agencies.

To answer the question and achieve the objective, the doctoral dissertation is organized as follows. Chapter one introduces country background of collective action, social capital, reciprocal mutual help in contributions to *Sangkeaha* and funerals and an overview of community commons, especially forests. Chapter one also provides the justifications for field site selection, selection of *Sangkeaha* and funerals and community managed forests to

represent collective action.

Chapter two studies the determinants of amount of contributions to *Sangkeaha* and funerals in rural Cambodia with special emphasis on the role of social capital and risk-taking behavior (the amount bet in an experimental game), and income level of both a contributor and a recipient for the subsample of relatives and the subsample of non-relatives. Our data is from 13 *Sangkeaha*'s and 11 funeral contribution lists from two and four villages respectively. The villages located along National Road 3, a hundred Km south of Phnom Penh where *Sangkeaha* is commonly practiced. Social capital, risk-taking behavior, and income level of contributors but not of recipients are positively correlated with the amount of contributions as expected. The contribution in both events, which can be considered as natural experiments, validate the measure of risk-taking behavior in a laboratory experimental game. By juxtaposing *Sangkeaha* (more urgent) and funerals (less urgent) for relatives and non-relatives, we find that the estimation result of *Sangkeaha* for non-relatives is generally parallel with the estimation result of funerals for relatives. So social capital functions as kinship in time of urgent need. The estimation results in *Sangkeaha* for relatives and the estimation result of funerals for non-relatives are opposing. This can be concluded that *Sangkeaha* is a form of obligation for relatives while funerals is more of charity for non-relatives.

Chapter three studies the role of social capital in people participation of 590 households from 59 villages involved with CMFs in Cambodia in the Northern Tonlé Sap Region, which extends from high land and low populated areas in the north to low land and high populated areas in the south. In this chapter, another measure of social capital indicating a behavior which describes whether a household was original members who participated in a CMF in the year of CMF establishment is used to check the validity of our measure of social capital in chapter two and this chapter. From the same measure, we use years as a member of a CMF as another measure of social capital to see whether the nature of social capital is a characteristic or social pressure. Three measures of social capital have positively impacted

people participation with added affects from the externalities of social capital in a village. The results show no impact of years as a member of a CMF when we limited our sample to those who were not members from the year the CMF was established in a village so social capital is more of characteristics than social pressure.

Chapter four studies the determinants of successful management of CMFs in Cambodia with special emphasis on the role of people participation and support from external agencies such as donors and forest officers. We use a CMF-level data set in 66 CMFs from Kampong Thom and Siem Reap provinces. In measuring the successful management of CMFs, forest growth evaluated by support staffs and a total score of management index of CMF committees with around 80 indicators ranging from practical management, awareness of relevant regulations, to communication and relations with local authorities, specialized government agencies, and supporting NGOs to check the consistency of the staff evaluations because these two variables are highly correlated. Support from external agencies, proxied by frequency of visits by external agencies' staff to a CMF, is endogenous; and when instrumented, the impact on people participation is still highly significant. This can be interpreted that the impact of frequency of visits is underestimated because the staff tends to pay more visits to a CMF with characteristics that negatively affect successful management of a CMF. So the role of external agencies is even more important in the case where the capacity of a community is still weak, as in the case of collective action in Cambodia's communities.

Finally we conclude that social capital plays an important role in people participation in the two types of collective action; and that lack of community collective action in Cambodia is attributed to low capacity of communities rather than to being intrinsic to Cambodia's communities. At an early stage when the capacity of a community is still weak and no village-level well-organized institution exists, the external agencies are even more important to lower the threshold for success of collective action by assisting a community in designing a rule which provides economic incentive to cooperate, lowering costs of monitor-

ing and sanctioning defectors, and providing extension services and trainings for awareness of advantages and management of collective action, but simultaneously not crowding out a community's natural strength such as community preference, resources and endowments, and informal networks among community members.

Chapter 1

Introduction

1.1 Background and Rationale of the Study

Due to the failure attributed to the central government and market-oriented policy in managing local commons in developing countries, community-based natural resource management, based on self-governance and volunteer community participation, has been widely adopted (Baland and Platteau 1997, Leach, Mearns and Scoones 1999, Agrawal 2003, Agrawal and Gupta 2005, Nygren 2005, Maskey, Gebremedhin and Dalton 2006, Antinori and Rausser 2007, Araral 2009).¹

Elinor Ostrom was awarded the Nobel Prize in Economics with Oliver E. Williamson in 2009 for her contribution to the analysis of roles of communities in local management of commons. Moreover, local commons managed by communities in developing countries in general are of low quality and limited scale. The argument of comparative advantage holds that small-scale local commons are better managed by local users for motivational and informational reasons (Araral 2009).

¹Baland and Platteau (1996, chapter11) examine many countries case-studies in Africa under French colonial rule and South Asia under British rule and even in post-independence. Those countries tend to embrace a centralized top-down, and bureaucratic theoretical approach in order to improve the management of village-level natural resources. In consequence, the governments came to regard forests as resources to be protected against their inhabitants and former users by mistrusting communities' abilities to safeguard forests.

There has also been sufficient empirical evidence to justify the community-based management of local commons in spite of theoretical and analytical pessimism among theorists.² The extensive case studies by Wade (1987, 1988) and Ostrom (1990, 1998) on local management of commons suggest that under certain circumstances communities can organize collective action without external force—state enforcement or private ownership—as an alternative to the theories of Hardin’s “tragedy of the commons” and Olson’s “private production of public goods.”

The structure of these two latter theories is similar to a Prisoners’ Dilemma game. These differences between these two theories and others related to the commons are mainly from the assumptions that community members are not able to create, devise and enforce the rules for adapting to local commons environments (Wade 1988, p. 204).

A community-based approach puts people participation and management at the central stage and social capital is widely recognized for its role in people participation and management. In Cambodia, like other developing countries, employing and enhancing *social capital* is normally used by development policy makers and practitioners as one of their development strategies. There is lack of community collective action in Cambodia even though communities in rural Cambodia are relatively more homogeneous. Typical caste, class, religious, or ethnic-linguistic heterogeneity, which is mainly prevalent in South Asian societies, is nearly absent in rural Cambodia.

While there is consensus about the lack of collective action in rural Cambodia’s communities, there is no coherent explanation for this lack of collective action. Those influenced by Marxism’s International Political Economy of Colonialism tend to blame the lack of collective action in Cambodia on French colonialism (Hu 1965) and the influence of the Capitalist system (Hou 1955). Those focusing on religion blame the lack of collective ac-

²See more on theoretical issues in incentive design (Seabright 1993), evolution of social norms in common property resource use (Sethi and Somanathan 1996), collective action and evolution of social norms (Ostrom 2000). Lise (2000), Heltberg (2001), Adhikari and Lovett (2006), and Maskey et al. (2006) have contributed particularly to the issue of forest resource management.

tion from Theravada Buddhism, which is practiced by more than 95% of the Cambodian population. These above explanations are distinguished in that the former attributes the lack of collective action to external factors while the latter on internal factors intrinsic to Cambodian society—from cultural influence and racial characteristics. A more materialistic explanation is the structure of the community economy itself, which has little specialization and division of labor (Kiernan and Boua 1982, p. 33). This past theoretical explanation is accumulated by the legacy of the Chronic Civil War (1970-1998) and forced collectivization of agricultural units by consecutive communism (1975-1979) and socialism (1979-1989) which make Cambodian people skeptical of any kind of collective action.

However, these above explanations do not sufficiently address external factors such as the capacity of a community in terms of education and income, the perception of communities that it is not their responsibilities for providing local public goods, and necessity of collective action for community life. Taking for example, contribution to pagodas through seasonal ceremonies is practiced without fail by community members because community members perceive the contribution to be their responsibility. This can be tracked back to the Angkorean period (9th century to 14th century) in which a cluster of villages was responsible for maintaining the temples and people were mobilized to build ancient mega-projects (temples, reservoirs, and irrigation systems) and for war.³

Until very recently, Cambodia's agro-climate was more predictable for traditional rain-fed rice cultivation which does not involve building an irrigation system.⁴ The high ratio of land to population and abundance of surrounding natural resources such as forest and fish make collective action not necessary for subsistent living, although according to Kawaguchi and Kyuma (1977) cited in (Slocomb 2010) soil quality is less fertile compared to neighboring Asian countries.

³There is no independent space for local communities to organize their own villages. This is different from Japanese rural communities in the Tokugawa period, in which villages as a units assumed responsibilities and settled almost all local affairs and problems on their own (Smith 1959, p. 202-203).

⁴Rain-fed wet rice cultivation accounts for more than 75% of the total rice production in Cambodia (Yu and Diao 2011).

In 1965, forest covered 73.04% of Cambodia's total land area of 18,110,500 ha, and declined to 59.09% in 2006 (FA 2007).⁵ Due to rapid change of the surrounding environment in the last couple of decades such as degradation of natural resources (forest and fish) that people partly depend on for their livelihood and the *fragile* rice ecology through a series of floods and droughts, Cambodian communities are left with no experience for collective action, so external assistance is important for assisting communities at least at the early stage through training and building organizations to cope with the collective action problem in a balanced way, which avoids destroying the natural strength of a community such as informational advantage of resource condition, resource user group preferences, etc.⁶

1.2 Research Questions and Objectives

There are sufficient game-theoretical models, empirical evidence, and experiment results in social psychology revealing that community collective action is an alternative option to private property rights and state centralized control on community local commons. This community based approach also applies to other areas of community development such as mutual help, insurance, and risk-pooling. While the community role in collective action is widely accepted by development practitioners and researchers alike, collective action in Cambodia's rural community is evidently insufficient. However, many theories, on which explanations of the lack of collective action are based, have not come with a coherent theory and sometimes are even contradictory.

These theories in our study can be grouped as pessimistic and optimistic views. Pessimists attribute the lack of collective action to be intrinsic; put more simply, community

⁵Cambodia's official total land area is 181,035 Km², about half the size of Japan.

⁶According to Danida (2008, p. 12), since the 1990s the frequency of flooding has increased. The flood in 2000 was said to be the worst to hit Cambodia in 70% years, and was followed by two floods with the same intensity in 1984 and 1996, so it can be derived that the intensity of floods has become stronger, although data before the 1980s is not available. Moreover, a household survey conducted as part of the study by Danida (2008, p. 12) reveals that 71% of villagers have noticed an increase in frequency of drought, while 58% of villagers have noticed the increase in frequency of floods.

members are not willing to work together due to their *individualistic* behavior or low social capital, while optimists attribute the lack to it being either less necessary for survival, perception of community members about the responsibility for providing local public goods, or low capacity of communities as explained above.⁷

Which view is more appropriate in Cambodia's community development context?

This question so far has been analyzed mostly based on a case study basis. To fill the gap, we empirically and systematically analyze two types of collective action with distinctions of whether there is involvement of external agencies with the objectives to directly contribute to answer the above question on one hand and the relationship between social capital, people participation, collective action, and the role of external agencies on the other hand.

Mutual help and CMF management are selected for the study because both forms of collective action fit two criteria which allow for testing the hypothesis that lack of collective action is attributed to low social capital or to low community capacity. One criterion is that both forms of collective action are necessary for community members' survival. The other criterion is that community members perceive that it is their responsibility to contribute money and labor to both forms of collective action and benefit from collective action.

To achieve these objectives, we first test whether social capital contributes positively to community mutual help, without any involvement or support from any external agencies. Then we test whether social capital is still positively associated with people participation in community management of commons, namely forests, with some involvement of external agencies. While for mutual help, community participation in terms of contributions in cash and in kind is an end itself, people participation in management activities is just a means to successful management of community managed forests. We therefore extend our study to analyze the main determinants of the successful management (forest growth) and find

⁷It is important to note that development practitioners tend to consider only collective action with a high level of coordination usually at the village or commune level, such as building and maintaining rural roads, irrigation systems, and natural resource management. It is obvious that their mission is to help develop these forms of collective action while community mutual help has survived until the present time is overlooked because it does not need their involvement.

whether people participation still plays an important role alongside support from external agencies.

1.3 Significance of the Study

Many forms of informal insurance, altruistic behavioral transfers, and norms of mutual help are prevalent in rural societies, especially in developing countries where formal insurance and banking systems normally do not come into existence. In Cambodia, *Sokhapheap Kroursar Yuoeng*, a less informal rural health insurance scheme, and volunteer savings groups have been experimented with and promoted by health-related NGOs and micro-credit agencies respectively, but have had little success. *Rice banks*, *cow banks*, and *fertilizer banks*, which had been initiated by development-oriented NGOs, have not been sustained after those agencies completed their projects. The limited success and sustainability of those *in-kind banks* might be attributed either to low capacity of village leadership, or low support from higher levels of administration, or the lack of an institutionalized organization to manage those banks, or social capital of villagers themselves, or a combination of everything mentioned. In some cases, banks are neglected and unused after their leaders pass away meaning that those initiatives rarely evolved into well-structured organizations. According to Kim (2011, p.153):

many of Cambodia's anthropologists in the 1960s found that socioeconomic relations in Cambodia are based on a line of kinship resulting from the influence of interpersonal relations, and before the 1970s there was no village-level institutionalized organization beyond relatives and close friends in some parts of Cambodia.

Therefore, at the present moment, norms of mutual help based on personal networks play a very important role in rural Cambodia's villages to fill the gap of the non-existence of more formal ones, which are largely based on membership and clear rules of contribution and

received payments. For mutual help, we use the case of *Sangkeaha* and funeral contributions from other community members. *Sangkeaha*, a fund raising system for seriously ill people for medical treatment organized once in their lifetime and mainly limited to a village, and funerals are selected to study the determinants of intensity of mutual help with amount of contributions in *Sangkeaha* and funerals are regressed on characteristics of a recipient and contributors and their relationship.

Sangkeaha and funeral contributions are community-wise collective action because they involve all members in the village; however, relatives are more important in funerals than in *Sangkeaha*. By juxtaposing contributions in *Sangkeaha* and funerals for relatives and non-relatives, the significance of our study is that social capital is linked and in the case of *Sangkeaha* (more urgent need) for relatives are a form of obligation and funerals (less urgent need) for non-relatives are a form of charity.

There has been an increasing number of CMFs and households involved with CMF management in the last ten years due to the government's commitment to reverse the trend of rapid depletion of forest resources by empowering local communities to maintain ownership of their livelihood, which can be seen throughout the developing world. In Carson and Hou (2009), there are 570 CMFs in Cambodia covering 366,000 ha of forest land involved with 724,700 households from 784 villages in 2005; and the number of CMFs increased to 872 in 2009. The study of CMF management is significant for studying the role of social capital in people participation and the role of people participation with the presence and necessity to involve external agencies on the successful determinants of CMF management.

Consequently, social capital plays an important role in people participation in any kind of collective action—without and with involvement of external agencies. Along with the presence of external agencies, people participation plays an important role in successful management. The above findings contribute to verify that lack of collective action in Cambodia is not attributed to low social capital.

1.4 Criteria for Field Site Selection, Unit of Collective Action, and Data

1.4.1 Criteria for Field Site Selection

The study was carried out in two separate areas in the plain area in Cambodia. The study of contributions in *Sangkeaha* and funerals was conducted in Takeo and Kampong Spue provinces located along National Road 3 in the Southern part of Cambodia while the study of management of CMFs was done in Kampong Thom and Siem Riep provinces in the Northwestern part of Cambodia. There are four criteria set to choose the study area which represents a large part of Cambodia's territory, economic activities, and ethno-religion.

Rice-producing Village

More than 85% of Cambodian people live in rural areas; and according to Yu and Diao (2011) more than 80% of Cambodian farmers grow rice. Rice cultivation area occupies more than 80% of total cultivated land area. Rain-fed wet season rice production accounts for more than 75% of total rice production.

Modernity

Due to the tendency of all parts of Cambodia to be exposed to modernity through its improvement and expansion of physical infrastructure connecting to even remote parts of Cambodia, we choose the study areas which can be accessible at least by secondary road (rural roads connecting to National Roads) that are relatively closed to external influences, in particular to those villages which bring in a market mechanism and significant technological change as opposed to traditional villages.

Moderate Density of Population

Most people are located in the plain areas in Cambodia. Usually the study area has a density of population lower than urban areas in the central plain but higher than the remote and less populated mountainous North and Northeastern part of Cambodia. The purpose of choosing the study area located in the plain area is because it better represents general development activities and patterns which are not related to lineage-based ethnic minority people. Moreover, forests are scarce in the plain, which is more necessary for community members' survival.

Khmer Buddhists Reside

Khmer ethnics and Buddhists tend to be overlapped and by far the largest ethnic group in Cambodia. We limit our study to the majority of the population because ethnicity and religion tend to have different characteristics which may complicate our analysis. Moreover, 95% of Cambodian people practice Buddhism.

1.4.2 Unit of Collective Action

There are 13,046 villages in Cambodia according to the result of a population census in 2008 (NIS 2009b). Village level is used as a unit of collective action for the reasons to follow. 1) The psychological boundary of a community is limited to a village and many Cambodian anthropologists also use a village to represent a community. Kim (2011) argues that Cambodia's rural economic integration emerges most visually only at the intra-village level and that integration does not link to outside the village. 2) A village is not an administrative unit. It is one level lower than the commune level which is composed of many villages and is the lowest level of democratically elected administrative units in Cambodia's administrative hierarchy. 3) The collective action in our study consist of contributions in *Sangkeaha* and funerals and community managed forest management which is village-wide.

Contributions in *Sangkeaha* are mainly limited to a village and contributions in funerals are done by almost all villagers although relatives from outside the village contribute with greater amount. For community managed forest management, a CMF usually involves a village. There are also frequent cases that a CMF includes many villages but the operational level of management is still at the village due to its federal structure of management.

1.4.3 Data

In chapter two, we study determinants of contributions in *Sangkeaha* and funerals. We selected areas in Kampong Spue and Takeo provinces located along National Road 3 around 100 Km South of Phnom Penh. Although funerals are everywhere, *Sangkeaha* are mainly practiced in the two provinces. We used 13 lists of contributions in *Sangkeaha* from two villages and 11 lists of contributions in funerals from four villages, which also cover the former two villages. The study of four villages was conducted to take advantage of existing data on a laboratory experimental game measuring risk taking behavior in 2010. Chapter three and chapter four use the data set conducted in Siem Reap and Kampong Thom provinces in the Northern part of the Tonlé region on villages involved with CMF management. Chapter three uses household-level data on 590 households from the two rounds of surveys conducted separately in 2007 and 2011 to study people participation in CMF activities. Chapter four uses CMF-level data on 66 and 59 CMFs to analyze successful management of CMFs such as forest growth and performance of CMF management committee respectively.

1.5 Organization of the Study

To answer the question and achieve the objective, this doctoral dissertation is organized into five chapters. Chapter one introduces country background of collective action, social capital, reciprocal mutual help in contributions to *Sangkeaha* and funerals and overview of community commons, especially forests. Chapter one also provides the justifications for

field site selection, selection of contributions in *Sangkeaha* and funerals and community managed forests to represent collective action. The following three parts are on independent and self-contained chapters but jointly test the hypothesis of the cause of the lack of collective action in rural Cambodia. The three main chapters are: the determinants of contributions in *Sangkeaha* and funerals; the determinants of people participation in community managed forest management; and the determinant of the successful management of community managed forests. The final chapter concludes the results of the last three main chapters jointly and provides lessons learned and policy recommendations.

Chapter 2

Determinants of Amount of Contributions to *Sangkeaha* and Funerals in Rural Cambodia

This chapter studies the determinants of amount of contributions to “Sangkeaha”, village-level fund raising for medical treatment, and funerals in rural Cambodia. Our data is from 13 “Sangkeaha” and 11 funeral contribution lists from two and four villages respectively. Social capital, risk-taking behavior, and income level of contributors but not of recipients are positively correlated with the amount of contributions. By juxtaposing contributions to “Sangkeaha” and funerals among relatives and non-relatives, we further find that high social capital of non-relative functions as kinship in “Sangkeaha” contributions. Moreover contributions to “Sangkeaha” is more obligatory for relatives while contributions to funerals is a form of charity for non-relatives.

Keywords: *Sangkeaha*, funeral, social capital, risk-taking behavior, Cambodia.

2.1 Introduction

Many forms of informal insurance, altruistic behavioral transfers, and norms of mutual help are prevalent in rural societies, especially in developing countries where formal insurance and banking systems normally do not come into existence. In Cambodia, *Sokhapheap Kroursar Yuoeng*, a less informal rural health insurance scheme, and volunteer savings groups have been experimented with and promoted by health-related Non-governmental Organizations (NGOs) and micro-credit agencies respectively, but have had little success. *Rice banks*, *cow banks*, and *fertilizer banks*, which had been initiated by development-oriented NGOs, have not been sustained after those agencies completed their projects. The limited success and sustainability of those *in-kind banks* might be attributed either to low capacity of village leadership, or low support from higher levels of administration, or the lack of an institutionalized organization to manage those banks, or low social capital of villagers themselves, or a combination of everything mentioned. In some cases, banks are neglected and unused after their leaders pass away meaning that those initiatives rarely evolved into well-structured organizations. Many of Cambodia's anthropologists in the 1960s found that socioeconomic relations in Cambodia are based on the line of kinship and before the 1970s there was no village-level institutionalized organization beyond relatives and close friends in some parts of Cambodia (see Kim 2011, p.153).

At the present moment, norms of mutual help based on personal networks play a very important role in rural Cambodia's villages to fill the gap of the non-existence of more formal ones, which are largely based on membership and clear rules of contribution and received payments. Therefore, social capital, defined in this chapter as a positive attitude of a respondent to interactions among other villagers in terms of trust, helpfulness, and fairness, comes to the forefront of our analysis. In our study, we use an additive score of a respondents' binary response to other villagers' trust, helpfulness, and fairness as a measure of social capital. However, we ask a respondent to evaluate interactions among

other villagers rather than his own interactions with the rest of the village to avoid the self-bias of “virtuous” responses.

Inter-dependency of villagers for *pravas dai* (labor exchange), interest free borrowing with no collateral, contributions in funerals, and contributions in *Sangkeaha*, a fund raising system for medical expenses in some part of Cambodia, is being usually and actively practiced in the present times. However, the above mutual help is voluntary and based on personal relations and never develop into a well-organized institution.

There have been many previous studies on norms of mutual help in rural Cambodian society. However, these studies often focus on the role of norms of mutual help in shaping social relations (eg. reciprocity) and how the system has been sustained in rural Cambodia. There have been no systematic efforts to establish how heterogeneous individual household characteristics and relations among households affect the intensity of mutual help. For example, if Mr. A gave something which has value of USD 5 to Mr. B, in reciprocity, Mr. B will reciprocate something around USD 5 or more to Mr. A in the future, but why not USD 10 from an initial giver is left unanswered. There are two possible reasons for this. One is the studies on community norms, traditions, religion, and rituals of Cambodia are mainly the preserve of sociologists and anthropologists. In general, sociologists and anthropologists tend to assume that a community is a bounded object or a closed system analogous to an organism (Leach et al. 1999). The other is that Cambodia and other Southeast Asia political historians and political scientists often focus on power relations and peasant revolutions. Scott (1976) shows the vertical patron-client relations between landlord at the center and homogeneous villagers at the periphery and Hughes (2003) discusses “modified” patron-clients in modern Cambodia. This chapter addresses this issue by using the case study of *Sangkeaha* and funeral contributions.

A number of stylized facts make the study of the determinants of the amount of contributions to *Sangkeaha* and funerals interesting: 1) *Sangkeaha* and funerals represent community collective action because all villagers feel obliged to contribute in whatever amount

although kinship are more important in funerals than in *Sangkeaha*; 2) contributions in *Sangkeaha* and funerals are natural experiments for community collective action because positive amount of contribution is voluntary and the real amount, rather than self-reported, contributions are observed in a list of contributors; 3) the amount of contributions is heterogeneous so that the effects of recipients' and contributors' characteristics and the relations between them can be separately tested;¹ and 4) the study also allows for testing the motives behind the contributions.

We choose four farming villages located along National Road 3 around 100 Km south of Phnom Penh. The reasons we choose these four villages to study *Sangkeaha* and funeral contributions are: 1) these villages are located in the areas which prevalently practice *Sangkeaha*; 2) the data in the lists of contributors can be matched with exiting household survey to trace the identity of households of both recipients and contributors so that isolation of the impact of income level, personal network, and risk-taking behavior is possible;² and 3) the contributions in *Sangkeaha* and funerals, regarded as natural experiments, can be used to check validity of risk-taking behavior in a laboratory experimental game conducted in the household survey in 2010. The study draws on data from 11 lists of funeral contributions from four villages and 13 lists of *Sangkeaha* contributions from two villages. The data used is from a subset of lists of contributions of *Sangkeaha* and funerals that can be found in our study period because some lists kept by villagers were lost. Our empirical results show that relatives contribute more than non-relatives in both *Sangkeaha* and funerals. High social capital and risk-taking behavior of contributors are associated with higher contribution amount in *Sangkeaha* and funerals.

Sangkeaha and funerals are different in the degree of urgency and necessity. *Sangkeaha*

¹With the name of the contributors in a registered notebook which is kept by each recipient of the contribution, we asked a family member of recipients, with the assistance of the village head, to identify their household relation with the contributor (relative or not), location (in the village or outside the village), and self-evaluated comparative income level in comparison to that of recipient households.

²We measured risk-taking behavior by using a laboratory experiment. After completing our household survey, we gave respondents 5,000 riels (USD 1.25) and informed them about the rule and results of the betting game. The respondents were allowed to bet for real any amount of 0, 1,000 riels, 2,000 riels, 3,000 riels, 4,000 riels, or 5,000 riels. A higher amount of betting is considered as higher risk-taking behavior.

mainly assist seriously sick people in need of urgent funds while funeral ceremonies are for religious and traditional reasons so when funerals are compared to *Sangkeaha*, funeral is less urgent. Kinship is more important in funerals than in *Sangkeaha*

By juxtaposing contributions to *Sangkeaha* and funerals among relatives and non-relatives, we further find that high social capital of non-relatives functions as kinship in *Sangkeaha* contributions. Moreover contributions to *Sangkeaha* is more obligatory for relatives while contributions to funerals for non-relatives is more like charity. Put in differently, it is more obligatory for a relative to help other relatives in urgent needs and it is more charitable for a person to help other non-relatives in the same villages in less urgent situation. In a continuum from obligation to charity, it ranges from role of relatives in *Sangkeaha* at the side of obligation, non-relatives in *Sangkeaha*, relatives in funerals, and non-relatives at the side of charity.

We check the robustness of our results which is based on a sample of identified contributors with a sample of unidentified contributors in the same village. The robustness check showed that in a sample of unidentified contributors, the sign of independent variables is not in reverse though significant level is sometimes changed a bit

Our chapter proceeds as follows: Section two describes concepts and measures of social capital, concepts and contributions in *Sangkeaha* and funerals in rural Cambodia. Section three is on the data used and research methodology. Section four shows our estimation results of an empirical analysis and its interpretation. Section five concludes the results.

2.2 Concepts and Measures

2.2.1 Concepts and Measures of Social Capital

The concepts and definition of social capital used in this study focus primarily on cognitive phenomena of social relationship such as trust, helpfulness, and fairness that reflect

a sense of solidarity and mutual trust within a village. The definition of social capital used here stems from the works of Putnam (1993) and Fukuyama (1995). According to Putnam (1993), social capital is the feature of social organization, such as network, norms, and trust, that facilitate coordination and cooperation for mutual benefit. Communities with positive economic development and effective governments are those supported by a "network of civil engagement". This civil network fosters norms of reciprocity that reinforce sentiments of trust within a society and improve the effectiveness of communication and social organization. While Fukuyama (1995), who uses trust as a measure of social capital, describes trust as arising when a community shares a set of moral values in such a way as to create expectations of regular and honest behavior. Reciprocity, civic duty, and moral obligation are essential to a successful and stable society. This concept in the study is also derived from cognitive social capital from Uphoff (2000) who classifies social capital into structural social capital (relationship, networks, and association) and cognitive social capital (norms and values which are behind structural social capital).

The approach to social capital that is most relevant to our study is the *communitarian* approach in Woolcock and Narayan (2000), whose typologies are communitarian, networks, institutional, and synergy. The communitarian view equates social capital with such local organizations as clubs, associations, and civil groups. This perspective has made important contributions to analysis of poverty by putting social ties at the center in helping the poor manage risk and vulnerability. Although there is evidence of it having a dark side such as caste inequality, ethnic exclusion, and gender discrimination. However, this kind of inequality does not exist in the context of community development in Cambodia.

Derived from the definition of social capital by Putnam (1993), Fukuyama (1995), and Uphoff (2000), we define social capital in this chapter by positive attitude of a respondent to interactions among other villagers in terms of trust, helpfulness, and fairness. Measuring social capital by the responses to three yes/no questions: 1) do most people in your village trust each other? (*TRUST*); 2) do most people in your village help each other? (*HELP*);

and 3) do most people in your village are fair by thinking not only about their own interest but also caring about other villagers' interest? (*FAIR*). Optimistic expectation regarding others' inclination toward selfless action create trust on one hand, and trust is reciprocal on the other hand; we trust because we think most of the people in the village are trustworthy.

This measure of social capital indicates village-level characteristics rather than individual attitude. This approach reduces self-bias of tendency to respond virtuously. Household perception of village-level characteristics reflects the household characteristics of a respondent himself.

There are two potential measures of social capital which we have dropped due to less variation. One measure is a response to the question “if your villagers are given an option to choose between 2.5 ha of land but having to work and share output with another villager; and one ha of land but work separately, which one do most people in your village prefer?”. 95% of respondents prefer a smaller size of land. The other measure is density of membership, which is widely used by researchers to measure social capital, is not used in this study for two reasons: 1) there is usually no variation of the number of memberships for each household in groups or associations at village level. Each association tends to cover the whole village; 2) we measure a variation of social capital of each household within each village and we do not compare level of social capital across villages.

2.2.2 Concepts of *Sangkeaha* and Funerals

Unlike other community collective action which are commonplace in rural Cambodia such as community managed forest groups, rural road associations, or water-user groups with involvement from the state through its specialized agencies and development organizations, *Sangkeaha* and funerals are mutual help among community members living in the same villages—collective action that do not involve any support from external agencies. Degree of people participation (contribution amount) is by far the most important determinant of

collective action, the total amount received. It means that the total amount of contributions is an end in itself. Moreover, it is not an informal insurance system which has clear rules of membership, membership fees, or insurance benefits. However, both events function as an informal insurance in the sense that villagers tend to reciprocate the amount they received. The more one contributes, the more one will expect to receive when any member of a household face the similar situation in the future based on norm of reciprocity. One more important difference of *Sangkeaha* and funerals with other forms of collective action is that almost all villagers contribute but the total amount of contributions goes to only one recipient household.

There is a substantial difference between *Sangkeaha* and funerals which makes our study of *Sangkeaha* and funerals together interesting. 1) Contributors of *Sangkeaha* largely involve only villagers regardless of kinship while kinship matters much more in funerals. 2) *Sangkeaha* is more urgent need and funerals are for religious and traditional which is less urgent. In our study, we juxtapose *Sangkeaha* and funeral contributions, in which we further subdivide both contributions in *Sangkeaha* and funerals into contributions from relatives and non-relatives.

2.2.3 Amount of Contributions in *Sangkeaha* and Funerals

Sangkeaha

Sangkeaha (“aid” or “assistance” in Khmer) is a village-level fund raising system practiced in some parts of rural Cambodia mainly for seriously ill patients who are in urgent need of fund for medical treatment (Yagura 2010). It is organized once for a person in their lifetime and practiced mainly in Takeo and Kampong Spue provinces. In some villages, *Sangkeaha* is not necessarily organized for the poor; and in some cases, *Sangkeaha* is organized for a household of those who suddenly passed away so that households of those who did not receive contribution while any affected member is alive are compensated. Al-

though there are some differences in *Sangkeaha*'s rules between villages, the fundamental concept of *Sangkeaha* is to help alleviate medical expenses for seriously ill patients. The total contributions only marginally cover the bill of medical treatments. Yet there is also positive psychological effects from feeling supported by community members though it can not be measured and included in our study. *Sangkeaha* dates back at least to the 1960s and many villages just started *Sangkeaha* in the 2000s according to Yagura (2010). In our study area, all four villages have organized *Sangkeaha* since the early 2000s. Only in two villages, Kol Korm and Prey Changeva, we could find the lists of contributors. The lists in the other two villages—Trapeang Kraloam and Kan Damra—were not found during the study period. Kan Damra used to organize *Sangkeaha* for a household in 2005 but since then *Sangkeaha* has not been organized. The villagers in Kan Damra mentioned that rising income for villagers in general during the last few years made *Sangkeaha* less necessary. On average, a *Sangkeaha* recipient gets 261,992 riels equal to USD 65, in cash and in kind which is mainly rice. Taking a figure from Yagura (2010, p.17), we calculate that the total amount received just covered only around 14% of medical expenses. *Sangkeaha* is usually organized by village heads, deputy village heads, or *achar*, a monk assistant. Contributors of *Sangkeaha* are largely from within the village. In our field site, 94% of contributors are households in the villages and 92% of amount of contribution is from the village. Those who were not identified in the contribution list may have not contributed at the time *Sangkeaha* was organized or their names were inadvertently not included on the contribution list. The rest of contributors are from nearby villages usually mobilized through *achar* or commune chiefs, whose territory covers many villages.

Funerals

Funerals are one of the most important life milestone regardless of social class, caste, political ideology, race, or religion, etc. For religious and traditional reasons, they are necessary. From an economic point of view, in rural developing countries, funerals are a costly event

which sometimes exhaust all household savings, and in some cases, a household even plunges into debt due to a funeral.³ Traditionally, funeral expenses are based on socioeconomic status. A rich family spends more on a funeral than a poor family. In Cambodia, normally funerals are not community events which need coordination from a village head or other leaders to organize. They are just family affairs. The amount of contribution is based on personal relations and the income level of contributors. Each household makes a decision on how much to contribute to each funeral independently and voluntarily. A burden of funeral costs is shouldered by the family of the deceased; and the contributions from relatives are the most important of all outside the family including non-relatives usually living in the same villages. The relatives living outside the village also contribute to funeral which is not so common in *Sangkeaha*. In our study site, funeral expenditure ranges from USD 500 to USD 3,000. On average, the total contribution covers only 52% of funeral expenditure in our studied villages. Therefore the burden on poor households is tremendous. However, the spread is very high ranging from 17% to 80% so there is more elasticity for income although it is not in the linear relationship. In our studied villages, almost all villagers contribute to funerals as in the case of *Sangkeaha*. However, 32% of contributors are villagers, and 30% of contribution amount is from the village because relatives living outside the village contribute with greater amount. This figure shows the importance of relatives in contributions in funerals even though they live far away from the village.

2.3 Data and Research Methodology

2.3.1 Data

We have existing data on risk-taking behavior from a laboratory experimental game in a household survey in 2010 for 44 households in Kol Korm; 40 households in Prey Changeva, 32 households in Trapeang Kroloam, and 42 households in Kan Damra. The households

³See more on Dercon et al. (2006) for an overview of funerals from an economic perspective.

selected in the household survey in 2010 was based on random selection from among the total households of 191 households in Kol Korm, 89 households in Prey Changeva, 102 households in Trapeang Kroloam, and 98 households in Kan Damra respectively. Among the interviewed households, we could find 13 lists of *Sangkeaha* contributions—ten lists from Kol Korm and three lists from Prey Changeva—and 11 lists of funeral contributions—three lists from Kol Korm, two from Prey Changeva, three from Trapeang Kroloam, and three from Kan Damra—which could be found in our supplementary survey in September in 2011. To check the identity of recipients and contributors and the relationship among recipients and contributors, we ask a recipient household member, with the assistance from a village head, to match the household identity of recipients and the household identity of contributors in the lists with the household identity in existing household survey of four villages in 2010.

In the existing household survey in 2010, we use a house index and amount bet in a laboratory experimental game which we will explain later.

Dependent variable (*lnamount*) is natural logarithm form of contribution amount from each contributor—in cash and in kind which is mainly rice converted into monetary units. The independent variables are characteristics of both contributors and recipients including income level, social capital, risk-taking behavior which was conducted in the existing household survey in 2010, a recipient household's evaluated comparative income level between a recipient and a contributor, and their relations. Income level is measured by a house index (*HOUSE*), which includes four house parameters—wall, roof, condition, and size. A house in rural Cambodia is a symbol of the status of a family. So a house index is one good measure of income level. Moreover, (*HOUSE*) is a variable which can be observed without an interview.

(*SC*) is an additive score from binary variable (*TRUST*), (*HELP*), and (*FAIR*). This measure can avoid self-biased evaluation when we ask a respondent about themselves.

(*risk*) is a measure of risk-taking behavior which is experimented in 2010 by using a

Table 2.1: Definition of Variables for Contribution Amount in Funeral and *Sangkeaha*

amount	Amount contribution by a contributor household
lnamount	Logarithm form of amount contribution by contributor household
SC_r	Social capital index of recipient
SC_c	Social capital index of contributor
HOUSE_r	House index of recipient
HOUSE_c	House index of contributor
id_village1	Kol Korm village in Takeo province
id_village2	Prey Changva village in Kampong Spue province
id_village3	Trapeang Kralom village in Takeo province
id_village4	Kan Damra village in Kampong Spue province
relative_dum	Whether a contributor household and a recipient household are within second lineage relatives
income1	A contributor household reported that his/her household is richer than a recipient household
income2	A contributor household reported that his/her household and a recipient household have the same socioeconomic status
income3	A contributor household reported that his/her household is poorer than a recipient household
risk_r	Amount bet by a recipient household in a laboratory
risk_c	Amount bet by a contributor household in a laboratory
village_01	Whether a contributor lives in the same village as the recipient household 1 if yes 0 otherwise
village_dum	Location of contributors 1 if in the same village 2 if in the same commune 3 if in the same district 4 if in the same province 5 if outside the province 6 if abroad
id_vhh_recip	Recipient Dummy variable

lottery game. After the interview, we gave a respondent 5,000 riels which is equal to USD 1.25 and informed them about the rules and the outcomes of the game. A respondent can bet either 0 riel, 1,000 riels, 2,000 riels, 3,000 riels, 4,000 riels, or 5,000 riels for real; and the outcome of the game had six possibilities—1, 2, 3, 4, 5, and 6 in order of receiving more money for a respondent. From an outcome of 1, 2, or 3, a respondent lost an amount depending on how much he bet. If he bet more, he lost more. For an outcome of 4, 5, or 6, he won according to the amount he bet. The amount bet by a respondent is a measure of risk-taking behavior while the outcome of the game is not important to us. The more he bets, the higher risk-taking he is.

We use two types of variables to represent comparative income level between the recipient and a contributor. *income1*, *income2*, and *income3* are a recipient-evaluated comparative income level. *income1* is when a recipient household reported that a contributor is richer; *income2* the same; and *income3* poorer.

However, recipient-reported comparative income level tends to be biased toward (*income1*) since people tend to report to be poorer. So we also use the difference between (*HOUSE*) of a recipient and a contributor and group it into a three-ordered variable in descending order. From this variable, we tabulate (*HOUSE_diff31*), (*HOUSE_diff32*), and (*HOUSE_diff33*) with equal observation. For (*HOUSE_diff31*), a contributor is richer; (*HOUSE_diff32*), relatively the same; and (*HOUSE_diff33*) poorer. However, one advantage of using recipient-reported variables is when the identity of a contributor in a list is not identified either because the identity of a contributor could not be found in the list of contributors or because a contributor lives outside the village. Therefore, to check the robustness of our results in the case that unidentified contributors living in the village or outside the village, we use (*income1*), (*income2*), and (*income3*). We use suffix *c* and *r* to represent a contributor and a recipient respectively.

relative_dum is a variable of kin relation. *relative_dum* equals one if a recipient and a contributor are within second lineage and zero otherwise.

Data of *Sangkeaha* contribution

Table 2.2: Summary Statistics of Variables for *Sangkeaha* Contributions

Variable	Obs	Mean	Std. Dev.	Min	Max
amount	379	2449.87	970.53	1000.00	8000.00
lnamount	379	7.74	0.34	6.91	8.99
SC_r	380	1.81	0.63	1.00	3.00
SC_c	380	2.28	0.64	1.00	3.00
risk_r	324	1.60	1.06	1.00	5.00
risk_c	380	1.47	0.95	0.00	5.00
HOUSE_r	380	8.46	3.39	4.00	14.00
HOUSE_c	380	9.75	2.70	4.00	15.00
relative_dum	379	0.17	0.38	0.00	1.00
income1	379	0.54	0.50	0.00	1.00
income2	379	0.21	0.41	0.00	1.00
income3	379	0.25	0.43	0.00	1.00
HOUSE_diff31	380	0.42	0.49	0.00	1.00
HOUSE_diff32	380	0.31	0.46	0.00	1.00
HOUSE_diff33	380	0.27	0.45	0.00	1.00
id_village1	380	0.77	0.42	0.00	1.00
id_village2	380	0.23	0.42	0.00	1.00

In Table 2.2, each contributor contributes 2,450 riels (USD 0.62) on average in *Sangkeaha* in the village. In Table 2.3, each recipient receives an average of 262,000 (USD 67) riels from all contributors and 2,500 riels on average. Average contribution amount from all contributors and average contribution amount from contributors in the same village are not different. 92% of the total contributions comes from within the village with an average contribution of 2,495, which is not so much different from all contributors (2,524 riels and 2,495 riels respectively). In Table 2.4, average contributions from relatives living in the same village is 3,000 riels, while the contributions from non-relatives is 2,300 riels, which is not substantially different.

Table 2.3: Amount of Contributions by each Recipient in *Sangkeaha*

HOUSE_r	All contributors			Contributors in the village		
	Amount	Contributors	Average	Amount	Contributors	Average
10	241,500	89	2,713	197,500	84	2,351
11	213,500	90	2,372	205,000	86	2,384
12	259,500	115	2,257	257,000	114	2,254
5	263,500	104	2,534	253,500	100	2,535
12	374,500	134	2,795	366,500	130	2,819
14	400,000	142	2,817	382,000	136	2,809
5	227,000	93	2,441	217,000	90	2,411
5	193,000	87	2,218	169,500	77	2,201
9	248,000	116	2,138	244,500	114	2,145
9	226,500	95	2,384	222,500	93	2,392
12	242,500	87	2,787	227,500	83	2,741
14	297,000	105	2,829	234,000	77	3,039
9	219,400	87	2,522	183,500	78	2,353
10	261,992	103	2,524	243,077	97	2495

Data of funeral contributions

Table 2.4: Amount of Contributions by each Recipient by Relatives and Non-relatives in *Sangkeaha*

HOUSE_r	Relatives in the village			Non-relatives in the village		
	Amount	Contributors	Average	Amount	Contributors	Average
10	13,000	6	2,167	184,500	78	2,365
11	20,000	8	2,500	185,000	78	2,372
12	20,000	9	2,222	237,000	105	2,257
5	31,000	12	2,583	222,500	88	2,528
12	90,500	23	3,935	276,000	107	2,579
14	97,000	25	3,880	285,000	111	2,568
5	56,000	18	3,111	161,000	72	2,236
5	27,000	14	1,929	142,500	63	2,262
9	4,500	2	2,250	240,000	112	2,143
9	6,500	3	2,167	216,000	90	2,400
12	52,500	16	3,281	165,000	66	2,500
14	113,500	21	5,405	120,500	56	2,152
9	31,000	7	4,429	152,500	71	2,148
10	43,269		3,066	199,038		2,347

Table 2.5: Summary Statistics of Variables for Funeral Contributions

Variable	Obs	Mean	Std. Dev.	Min	Max
amount	297	8599.33	7523.23	1500.00	60000.00
lnamount	297	8.81	0.65	7.31	11.00
SC_r	297	2.36	0.67	1.00	3.00
SC_c	297	2.14	0.63	1.00	3.00
risk_r	243	1711.93	1402.24	0.00	5000.00
risk_c	297	1410.77	896.47	0.00	5000.00
HOUSE_r	297	10.27	2.86	4.00	14.00
HOUSE_c	297	10.31	2.47	4.00	15.00
relative_dum	297	0.36	0.48	0.00	1.00
income1	297	0.34	0.47	0.00	1.00
income2	297	0.25	0.44	0.00	1.00
income3	297	0.41	0.49	0.00	1.00
HOUSE_diff31	297	0.24	0.43	0.00	1.00
HOUSE_diff32	297	0.46	0.50	0.00	1.00
HOUSE_diff33	297	0.30	0.46	0.00	1.00
id_village1	297	0.27	0.44	0.00	1.00
id_village2	297	0.21	0.41	0.00	1.00
id_village3	297	0.23	0.42	0.00	1.00
id_village4	297	0.29	0.45	0.00	1.00

Table 2.6: Amount of Contributions by each Recipient in Funerals

HOUSE_r	All contributors			Contributors in the village		
	Amount	Contributors	Average	Amount	Contributors	Average
7	1,193,500	107	11,154	1,035,000	95	10895
4	5,229,500	194	26,956	1,758,500	129	13632
4	1,305,000	103	12,670	894,000	74	12081
8	1,703,500	343	4,966	558,000	97	5753
4	1,902,500	409	4,652	560,000	120	4667
9	1,699,000	396	4,290	489,000	80	6113
10	1,459,000	278	5,248	434,000	77	5636
13	3,264,500	480	6,801	418,000	64	6531
13	6,468,000	333	19,423	933,000	81	11519
10	1,250,700	151	8,283	584,200	90	6491
12	2,853,000	271	10,528	709,500	71	9993
Average	2,575,291	279	10,452	761,200	89	8483

Table 2.7: Amount of Contributions by each Recipient by Relatives and Non-relatives in Funerals

HOUSE_r	Relatives in the village			Non-relatives in the village		
	Amount	Contributors	Average	Amount	Contributors	Average
7	82,000	6	13,667	953,000	89	10,708
4	517,500	26	19,904	1,228,500	102	12,044
4	249,000	12	20,750	645,000	62	10,403
8	199,500	22	9,068	352,500	74	4,764
4	545,000	116	4,698	15,000	4	3,750
9	212,000	24	8,833	277,000	56	4,946
10	72,500	7	10,357	361,500	70	5,164
13	240,000	35	6,857	178,000	29	6,138
13	556,000	28	19,857	377,000	53	7,113
10	162,000	14	11,571	369,000	75	4,920
12	368,000	20	18,400	331,500	50	6,630
Average	291,227		13,088	462,545		6,962

In Table 2.5, each contributor contributes 8,600 riels (USD 2.15) on average in funerals in the village. In Table 2.6, each recipient receives an average of 2,575,000 riels (USD 650) from all contributors and 10,500 riels (USD 2.60) on average in funerals. Average contribution amount from all contributors is 19,425 riels while average contribution amount is only 8,483 riels. 30% of the total contribution comes from within the village. That is because people living outside the village, mainly relatives, contribute with greater amount. In Table 2.7, within the same village, average contributions from relatives is 13,000 riels while the contributions from non-relatives is 7,000 riels in funerals, which is substantially different compared to the difference in *Sangkeaha*. These above two comparative figures show the importance of relatives at the expense of importance of households living in the same village. What is more, the number of contributors in the village accounts for only 32% of all contributors because contributions from relatives living outside the villages dilute the share of contributions from households living in the same village. However, that does not mean that villagers are not helpful in funerals. It is 90% of households in the same village contribute to funerals which is comparable to the number of contributors in *Sangkeaha*.

2.3.2 Research Methodology

We first regress an amount of contribution of each contributor (*amount*) on *id_village*, characteristics of contributors, characteristics of recipients, kin relationship between a contributor and the recipient, relative income level between the recipient and contributors, and identity of each recipient.

Our estimation specification is

$$\begin{aligned} amount_i = & id_village_i * \beta_{i1} \\ & + contributor's\ character_i * \beta_{i2} \\ & + recipient's\ character_i * \beta_{i3} \\ & + relative\ income\ level_i * \beta_{i4} \\ & + relative_dum_i * \beta_{i5} \\ & + id_vhh_recip_i * \beta_{i6} \\ & + u_i \end{aligned}$$

while i equals 1 if it is *Sangkeaha*, and 2 if funeral.

Then we subdivide the sample into the subsample of relatives and the sub-sample of non-relatives for *Sangkeaha* and funerals since funerals are more involved with relatives than *Sangkeaha* does. In Table 2.8, the average amount of contributions for *Sangkeaha* is not different between Kol Korm and Prey Changeva. However, in Table 2.9, the average amount of contributions from relatives in Prey Changva is higher than in Kol Korm while the average contribution amount from non-relatives is more or less the same between Kol Korm and Prey Changva. This makes it worth including *id_village* in the estimation for *Sangkeaha*.

Tables 2.10 shows that the total and average contribution amount for funerals in each

Table 2.8: Amount of Contributions by each Village in *Sangkeaha*

Village	All contributors			Contributors in the village		
	Amount	Contributors	Average	Amount	Contributors	Average
Kol Korm	264700	107	2467	251500	102	2430
Prey Chagva	252967	93	2713	215000	79	2711
Average	258,833	100	2,590	233,250	91	2,571

Table 2.9: Amount of Contributions by each Village by Relatives and Non-relatives in *Sangkeaha*

Village	Relatives in the village			Non-relatives in the village		
	Amount	Contributors	Average	Amount	Contributors	Average
Kol Korm	36550	12	2674	214950	90	2371
Prey Changva	65667	15	4372	146000	64	2267
Average	51,108	13	3,523	180,475	77	2,319

village is substantially different, so *id_village* is also included in the estimation for funerals. Table 2.11 also reveals that the average contribution amount in funerals between the four villages are substantially different for both the sub-sample of relatives and the sub-sample of non-relatives. For *Sangkeaha* in Table 2.3 and Table 2.4 and funerals in Table 2.6 and Table 2.7, each recipient also receives a very different total amount of contributions, so (*id_vhh_recip*) is also included in the estimations to control for other different characteristics of each recipient, which is not captured in the estimations. We also intended to include months and years when *Sangkeaha* and funerals occur to capture the effects of timing on the amount of contributions. Because household's availability of cash at hand in rice-producing villages tends to depend on rice-harvesting season. When an event occurs immediately after harvesting, villagers have more cash and rice at hand to contribute than the time long after harvesting season since 2007 the price of rice which directly affect livelihood of those villagers tends to fluctuate largely. However, since the number of recipients is small (only 13 for *Sangkeaha* and 11 for funerals), timing when the event occur tend to correlated with individual recipient (*id_vhh_recip*). Therefore, timing was dropped in the estimations.

We also considered controlling for whether a contributor household experienced receiv-

ing the contributions before in the estimations. However, dummy variable which indicate experience was also dropped due to the number of recipients is too small.

Table 2.10: Amount of Contributions by each Village in Funerals

Village	All contributors			Contributors in the village		
	Amount	Contributors	Average	Amount	Contributors	Average
Kol Korm	2,576,000	135	16,927	1,229,167	99	12,203
Prey Cha	1,803,000	376	4,809	559,000	109	5,210
Trapeang	2,140,833	385	5,447	447,000	74	6,093
Kan Damra	3,523,900	252	1,2745	742,233	81	9,334
Average	2,510,933	287	9,982	744,350	91	8,210

Table 2.11: Amount of Contributions by each Village by Relatives and Non-relatives in Funerals

Village	Relatives in the village			Non-relatives in the village		
	Amount	Contributors	Average	Amount	Contributors	Average
Kol Korm	282,833	15	18,107	942,167	84	11,052
Prey Changva	372,250	69	6,883	183,750	39	4,257
Trapeang	174,833	22	8,683	272,167	52	5,416
Kan Damra	362,000	21	16,610	359,167	59	6,221
Average	297,979	32	12,571	439,313	59	6,736

2.4 Econometric Results

2.4.1 Econometric Results for *Sangkeaha* contributions

Structure of econometric results in Table 2.12 are that we first simply pool all identified contributors (relatives and non-relatives) living in the same village and then we subdivide the sample into a subsample of relatives and a subsample of non-relatives to see how the estimation results for both subsamples differ.

In Table 2.12, Columns (1)-(3) use (*HOUSE_diff31*) and (*HOUSE_diff32*) for relative income while columns (4)-(6) use (*income1*) and (*income2*) for relative income level. For the sample of identified contributors in the same village in columns (1) and (3), contributors' social capital, risk taking behavior, and kinship show positive significant

Table 2.12: The Determinants of *Sangkeaha* Contributions

	(1)	(2)	(3)	(4)	(5)	(6)
	S1	S2	S3	S4	S5	S6
SC_c	0.0591** (2.34)	-0.0245 (-0.23)	0.0890*** (3.57)	0.0635** (2.52)	-0.0183 (-0.17)	0.0921*** (3.71)
risk_c	0.0524*** (3.03)	0.0410 (0.85)	0.0512*** (2.77)	0.0515*** (3.00)	0.0385 (0.84)	0.0487*** (2.65)
SC_r	-0.00375 (-0.08)	-0.128 (-0.52)	-0.0414 (-0.98)	-0.0876* (-1.94)	-0.0963 (-0.45)	0.0197 (0.40)
HOUSE_c	0.0351*** (3.61)	0.0833** (2.15)	0.0195 (1.47)	0.0166** (2.34)	0.0401* (1.75)	0.00301 (0.40)
HOUSE_diff31	-0.129 (-1.30)	-0.399 (-0.96)	-0.102 (-1.04)			
HOUSE_diff32	0.00693 (0.11)	-0.101 (-0.41)	0.0278 (0.44)			
relative_dum	0.232*** (5.18)			0.225*** (5.04)		
income1				0.185*** (2.81)	0.560** (2.39)	0.180*** (2.72)
income2				0.169*** (2.77)	0.367 (1.52)	0.168*** (2.78)
_cons	7.137*** (54.24)	7.651*** (10.55)	7.333*** (57.25)	7.291*** (56.60)	7.776*** (11.39)	7.299*** (55.77)
<i>N</i>	379	65	314	379	65	314
R2_a	0.175	0.225	0.100	0.183	0.288	0.111

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

(1)-(6) Estimation results with controlling for the identity of the villages and the recipients

(1)-(3) Income difference is the difference of house index between recipients and contributors

(4)-(6) Income difference is recipients's reported relative incomes between recipients and contributors

(1) & (4) All households in the village with identified contributors

(2) & (5) Relatives in the village with identified contributors

(3) & (6) Non-relatives in the village with identified contributors

effects on the amount of contributions to *Sangkeaha*.

By juxtaposing contributions from relatives and non-relatives in *Sangkeaha*, we further learn that for contributions from relatives in columns (2) and (5), only income level of contributor, not (*SC_c*) and (*risk_c*), is positively associated with amount of contributions while income level of contributors become significant. In the case of non-relative contributors in columns (3) and (6), the characteristics of the contributor such as (*SC_c*) and (*risk_c*) have significant effects on the amount of contributions while income level of contributors (*HOUSE_c*) is not significant. It is a form of obligation for relatives to help their own relatives in urgent need based on their income level. Under the situation that contributions are more of an obligation, and the amount of contribution is voluntary, the positive coefficients of (*risk_c*) can be explained that any contribution involved risk because a contributor are not able to bind a recipient to return the same amount when they face such a similar situation in the future. This condition is to restrict another contradictory argument that high risk-takers may prefer to self-assure rather than contribute to *Sangkeaha*. *id_village* is not significant in Table 2.12. Recipient dummy variables are jointly significant but are not reported in Table 2.12.

Robustness Check of a Sample of Unidentified Contributors

Table 2.13 compares the sample of identified contributors and the sample of unidentified contributors. Column (1) and column (2) compare the estimation results for identified relatives and unidentified relatives in the village; column (3) column (4) for identified non-relatives and unidentified non-relatives in the villages; and column (5) and column (6) for all identified households and all unidentified households in the village. The estimation results are not so much different when we compare between the sample of identified contributors and unidentified contributors.

(*HOUSE_r*) is positively correlated with the amount of contribution in the sample of identified relatives in column (1) while it is not in the sample of unidentified relatives

in column (2). Yet the sign of coefficient does not differ. For relatives, *income1* is a bit different between the sample of identified relatives and the sample of unidentified relatives. (*income1*) in column (1) is positively significant; however, in column (2) is negative but insignificant. Relative income itself is not important when the income level is not significant.

(*HOUSE_r*) is not significant in the sample of identified non-relatives in column (3) while it is positively significant in the sample of unidentified non-relatives in column (4). However, the sign is not changed. Therefore from Table 2.13, we conclude that estimation results between identified households and unidentified households (if they have been identified) are not so much differed.

Table 2.13: Robustness Check of the Determinants of *Sangkeaha* Contributions

	(1)	(2)	(3)	(4)	(5)	(6)
	S10	S11	S12	S13	S14	S15
SC_r	-0.162 (-0.77)	-0.0484 (-0.17)	0.0144 (0.33)	0.0375 (1.33)	0.0130 (0.30)	0.0415 (1.37)
HOUSE_r	0.0758* (1.78)	0.00827 (0.16)	0.0213 (1.33)	0.0195** (2.16)	0.0381** (2.55)	0.0238** (2.53)
income1	0.649*** (2.77)	-0.159 (-0.77)	0.202*** (3.46)	0.160*** (4.05)	0.270*** (4.63)	0.162*** (3.98)
income2	0.288 (1.25)	0.0287 (0.16)	0.171*** (2.82)	0.138*** (3.34)	0.190*** (3.11)	0.145*** (3.39)
relative_dum					0.239*** (5.31)	0.184*** (4.92)
_cons	7.304*** (10.40)	7.575*** (7.86)	7.348*** (30.79)	7.321*** (49.46)	7.115*** (30.60)	7.243*** (46.98)
N	65	99	314	780	379	879
r2_a	0.259	0.0416	0.0505	0.0600	0.134	0.0761

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

(1) Relatives in the village with identified contributors

(2) Relatives in the village with unidentified contributors

(3) Non-relatives in the village with identified contributors

(4) Non-relatives in the village with unidentified contributors

(5) All households in the village with identified contributors

(6) All households in the village with unidentified contributors

2.4.2 Econometric Results for Funeral Contributions

Structure of econometric results in Table are that we first simply pool all identified contributors (relatives and non-relatives) living in the same village and then we subdivide the sample into a subsample of relatives and a subsample of non-relatives to see how the estimation results for both subsamples differ.

In Table 2.14, Columns (1)-(3) use (*HOUSE_diff31*) and (*HOUSE_diff32*) for relative income while columns (4)-(6) use (*income1*) and (*income2*) for relative income level. For the sample of identified contributors in the same village in columns (1) and (3), contributors' social capital, risk taking behavior, and kinship show positive significant effects on the amount of contributions to funerals.

By juxtaposing contributions from relatives and non-relatives in funerals, we further learn that (*risk_c*) is not significant for contributions from relatives in columns (2) and (5) while (*risk_c*) has a positive significant effect on the amount of contributions in funerals in the subsample of non-relatives in column (3) and column (6) which is the same as in the case of *Sangkeaha*. However, (*SC_c*) is always positively significant while (*HOUSE_c*) is always insignificant. Therefore, contributions in funerals, whether in the subsample of relatives or the subsample of non-relatives, is a form of charity. The difference between the subsample of relatives and the subsample of non-relatives is only in the degree of charity. Contributions from non-relatives is more charitable than the contributions from relatives because (*risk_c*) have positively significant effect on the amount of contribution in funerals in the subsample of non-relatives but not in the subsample of relatives.

Robustness check of a sample of unidentified contributors

Table 2.15 compares the sample of identified contributors and the sample of unidentified contributors. Column (1) and column (2) compare the estimation results for identified relatives and unidentified relatives in the village; column (3) column (4) for identified non-

Table 2.14: The Determinants of Funeral Contributions

	(1)	(2)	(3)	(4)	(5)	(6)
	F1	F2	F3	F4	F5	F6
SC_c	0.234*** (4.21)	0.296** (2.55)	0.188*** (3.07)	0.226*** (4.05)	0.299** (2.55)	0.174*** (2.78)
risk_c	0.0698* (1.83)	0.0374 (0.42)	0.0821** (2.03)	0.0698* (1.83)	0.0332 (0.35)	0.0899** (2.24)
SC_r	0.120 (1.35)	0.0982 (0.61)	0.0947 (0.33)	0.136* (1.68)	0.132 (0.88)	0.170 (0.62)
HOUSE_c	0.0243 (1.04)	0.0249 (0.62)	0.00738 (0.26)	0.00274 (0.17)	0.0161 (0.52)	-0.0160 (-0.83)
HOUSE_diff31	-0.222 (-1.07)	-0.195 (-0.49)	-0.151 (-0.62)			
HOUSE_diff32	-0.136 (-1.10)	0.0238 (0.10)	-0.178 (-1.26)			
relative_dum	0.477*** (5.64)			0.477*** (5.61)		
income1				0.00660 (0.05)	-0.0680 (-0.24)	0.0521 (0.37)
income2				0.0862 (0.89)	0.0808 (0.38)	0.132 (1.24)
_cons	7.791*** (23.53)	8.610*** (14.44)	7.648*** (8.64)	8.135*** (28.73)	8.675*** (13.46)	7.431*** (8.57)
<i>N</i>	297	107	190	297	107	190
r ² _a	0.235	0.244	0.218	0.234	0.241	0.216

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

(1)-(6) Estimation results with controlling for the identity of the villages and the recipients

(1)-(3) Income difference is the difference of house index between recipients and contributors

(4)-(6) Income difference is recipients' reported relative incomes between recipients and contributors

(1) & (4) All households in the village with identified contributors

(2) & (5) Relatives in the village with identified contributors

(3) & (6) Non-relatives in the village with identified contributors

relatives and unidentified non-relatives in the villages; and column (5) and column (6) for all identified households and all unidentified households in the village. The estimation results are not so much different when comparing between the sample of identified contributors and the sample of unidentified contributors.

$(HOUSE_r)$ is positively correlated with the amount of contribution in the sample of identified relatives in column (1) and in the sample of unidentified relatives in column (2). The difference is only $(income1)$ and $(income2)$ which have significantly positive impact in the sample of unidentified relatives but not in the sample of identified relatives. However, the sign is not changed. (SC_r) is negatively significant in column (4) but not in column (3); however, the sign is not changed between column (3) and column (4). $(income1)$ has significantly positive impact in column (4) but not in column (3). In column (5) and column (6), $(income1)$ and $(income2)$ have significantly positive impact in column (6) but not in column (5).

Table 2.15 shows a tendency that $(income1)$ and $(income2)$ have positively significant effect on the amount of contribution in funerals in column (2), column (4), and column (6) while not in column (1), column (3), and column (5). However, the sign is not changed for $(income1)$ and $(income2)$. Therefore from Table 2.15, we conclude that estimation results between identified households and unidentified households (if they have been identified) are not so much differed.

Table 2.15: Robustness Check of the Determinants of Funeral Contributions

	(1)	(2)	(3)	(4)	(5)	(6)
	F10	F11	F12	F13	F14	F15
SC_r	-0.0785 (-0.42)	0.0594 (0.65)	-0.208 (-1.14)	-0.269*** (-2.72)	-0.0735 (-0.83)	-0.0435 (-0.90)
HOUSE_r	0.0950** (2.13)	0.180*** (8.12)	0.0786** (2.26)	0.171*** (9.24)	0.102*** (4.74)	0.203*** (18.50)
income1	0.0154 (0.06)	0.347** (2.42)	0.0574 (0.44)	0.356*** (4.80)	0.0729 (0.61)	0.394*** (5.91)
income2	0.0902 (0.46)	0.308** (2.34)	0.176* (1.72)	0.245*** (3.87)	0.154 (1.63)	0.281*** (4.83)
relative_dum					0.482*** (5.54)	0.553*** (10.67)
_cons	8.240*** (20.08)	7.062*** (31.76)	8.274*** (11.11)	7.434*** (18.84)	7.667*** (29.63)	6.501*** (45.07)
<i>N</i>	107	197	190	474	297	672
r2_a	0.201	0.629	0.171	0.449	0.189	0.502

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

(1) Relatives in the village with identified contributors

(2) Relatives in the village with unidentified contributors

(3) Non-relatives in the village with identified contributors

(4) Non-relatives in the village with unidentified contributors

(5) All households in the village with identified contributors

(6) All households in the village with unidentified contributors

Table 2.16: Robustness Check of the Determinants of Funeral Contributions within and outside the Villages

	(1)	(2)	(3)
	F22	F23	F24
SC_r	-0.0592 (-1.37)	-0.116*** (-3.08)	-0.0785** (-2.23)
HOUSE_r	0.179*** (18.20)	0.208*** (21.65)	0.163*** (17.01)
income1	0.314*** (5.35)	0.510*** (13.27)	0.407*** (11.27)
income2	0.255*** (5.17)	0.222*** (5.52)	0.204*** (5.52)
relative_dum	0.530*** (11.84)	0.609*** (13.96)	0.507*** (12.35)
_cons	6.810*** (53.56)	6.481*** (68.29)	6.820*** (75.65)
<i>N</i>	969	1565	1533
r2_a	0.406	0.475	0.438

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

(1) All households within the village

(2) All households outside the village

(3) All households outside the village excluding those living in Phnom Penh and abroad

Table 2.16 and Table 2.17 compare a sample of contributors living in the village, outside the village, and outside the village excluding Phnom Penh and abroad (from the same province). Columns (1)-(3) in Table 2.16 compare the sample of all contributors living in the same village, outside the village, and outside the village excluding contributors living in Phnom Penh and abroad. In Table 2.17, columns (1)-(3) compare a sample of relatives living in the same village, outside the village, and outside the village excluding relatives living in Phnom Penh and abroad while columns (4)-(6) compare a sample of non-relatives living in the same village, outside the village, and outside the village excluding relatives living in Phnom Penh and abroad.

In Table 2.16, (*SC_r*) is negative but not significant in column (1) but (*SC_r*) is

Table 2.17: The Determinants of Funeral Contributions within and outside the Villages

	(1)	(2)	(3)	(4)	(5)	(6)
	F16	F17	F18	F19	F20	F21
SC_r	0.00800 (0.09)	-0.160* (-1.65)	-0.0593 (-0.70)	-0.233** (-2.33)	-0.431*** (-3.69)	-0.407*** (-3.53)
HOUSE_r	0.162*** (7.74)	0.239*** (13.42)	0.161*** (9.14)	0.154*** (8.43)	0.117*** (5.29)	0.105*** (4.77)
income1	0.287** (2.21)	0.864*** (7.29)	0.418*** (3.71)	0.280*** (4.38)	0.377*** (11.28)	0.358*** (10.72)
income2	0.228** (2.08)	0.359*** (3.06)	0.149 (1.41)	0.248*** (4.66)	0.230*** (6.49)	0.228*** (6.50)
_cons	7.354*** (36.17)	6.690*** (39.29)	7.318*** (45.44)	7.543*** (18.50)	8.267*** (16.86)	8.301*** (17.13)
<i>N</i>	304	500	481	664	1062	1049
r2_a	0.477	0.463	0.403	0.373	0.498	0.480

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

(1) Relatives within the village

(2) Relatives outside the village

(3) Relatives outside the village excluding those living in Phnom Penh and abroad

(4) Non-relatives within the village

(5) Non-relatives outside the village

(6) Non-relatives outside the village excluding those living in Phnom Penh and abroad

negative and significant in column (1) and (2). In Table 2.17, (SC_r) is negative and significant at 10% significant level in column (2) but not in column (1) and column (3). Results in columns (4) and (6) in Table 2.17 are parallel. The funeral contributions from outside the village is much higher than the contributions from the same village. When limiting contributors from outside the village to contributors from outside the village excluding contributors living in Phnom Penh and abroad, $income1$ becomes lower because those living in Phnom Penh and abroad tend to have higher levels of income. For relatives, the contributions from outside the village follow the same direction as in the sample of relatives, but are lower than relatives in terms of magnitude. In this table, one interesting point to note is that for non-relatives living in the same village, socioeconomic status of recipient $HOUSE_r$ is significant for the amount of contributions in the same village while not for the amount from outside the village because people in the same village might expect more contributions from richer households in the future.

Table 2.18: Average Amount of Funeral Contributions by Location of Contributors

Location	Relative contributors			Non-relative contributors		
	Mean	Std. Dev.	Freq.	Mean	Std. Dev.	Freq.
Village	10,333.87	10,749.31	310	7,662.65	6,398.40	664
Commune	8,856.85	13,433.91	241	4,237.09	2,892.14	736
District	10,595.75	8,125.13	47	6,661.13	8,014.10	247
Province	7,471.83	12,383.67	213	9,962.03	16,144.73	79
Other provinces	68,636.36	113,094.89	11	18,423.08	18,332.40	13
Abroad	352,857.14	368,542.82	7			0
Total	12,849.82	48,067.55	829	6,255.49	6,819.13	1,739

Table 2.18 compare amount of contribution from relatives and non-relatives living in the same village, in the same commune, in the same district, in the same province, in other province (mainly living in Phnom Penh), and abroad.

Table 2.18 clearly shows that relatives living in other provinces and abroad contribute on average 6 times and 35 times more than relatives living in the same village. Non-relatives living in other provinces contribute about 2.5 times more than non-relatives living in the same village. More interestingly, non-relatives living in other provinces contribute about 18,423 riels more than relatives living in the same village about 10,334 riels. So in general, a recipient tends to depend on contributions from relatives living in other provinces because villagers are still poor.

2.4.3 Comparison of Econometric Results between Contributions in *Sangkeaha* and Funerals

Table 2.19: Summary of Results of Contributions in *Sangkeaha* and Funerals

	<i>Sangkeaha</i>		Funerals	
	Urgency		Tradition and religion	
	Relatives	Non-relatives	Relatives	Non-relatives
SC_c	0	+	+	+
risk_c	0	+	0	+
HOUSE_c	+	0	0	0

Table 2.19 summarizes the results of the main determinants of contributions in *Sangkeaha*

and funerals by dividing the whole sample in the subsample of relatives and the subsample of non-relatives. In Table 2.19, the results for *Sangkeaha* is taken from Table 2.12 while the results for funerals can be seen in Table 2.14. More importantly, Table 2.19 show the similarity and the contrast of the role of SC_c , $risk_c$, and $HOUSE_c$ play in each category. There are two interesting results which we can be drawn from comparing between contributions in *Sangkeaha* and funerals for both relatives and non-relatives.

First, by juxtaposing *Sangkeaha* (with more urgency) and funeral contributions (with less urgency), we find that, except ($risk_c$) which is positively significant for non-relatives in *Sangkeaha*, contributions in *Sangkeaha* by non-relatives are parallel to the contributions in funerals by relatives. This shows that high social capital of contributors for non-relatives in the case of more urgency can substitute for the function of kinship. This finding is against the dichotomy whether a community is just a cluster of unrelated different kin groups or community members help each other regardless of kinship prevails. Second, the results in *Sangkeaha* contributions by relatives and the results in funeral contributions by non-relatives are in stark contrast. The coefficients of contributors' characteristics (SC_c) and ($risk_c$) are not significant but income level of contributors ($HOUSE_c$) are positively significant in the former while in the latter the result is exactly opposite. We conclude that the relatives feel obliged to help other relatives in the case of urgency proportionally to their income level. While it is not obligatory at all for non-relatives in less urgent cases, each contribution depends totally on (SC_c) and ($risk_c$), not on income level of contributors.

2.5 Concluding Remarks

The study of mutual help—contributions in *Sangkeaha* and funerals which are based on volunteer, reciprocity, and personal relations—is interesting in itself. Indeed, it appears to us that contributions in *Sangkeaha* and funerals are understudied in the literature of collective action. More important issue which can be learned is that rural Cambodia's

villages are not fragmented by cluster of kinship to the degree suggested by some pessimists. Social capital links community members across kin groups. In funerals, however, villagers depend more on contributions from relatives living outside the village than contributions from households living in the same village because the income level of villagers is still low.

The finding will contribute to the study of the community norm of reciprocity notably by anthropologists and sociologists which tend to observe and evaluate reciprocity by ignoring intensity of reciprocity. For experimental game, we use the data in a natural experiment (contributions in *Sangkeaha* and funerals) to validate the measure of risk-taking behavior in a laboratory. For community collective action, community members in rural Cambodia assist each other when necessary. This norm of mutual help is evolving from the necessity for interdependency among community members who can hardly afford the expense of health treatment and funerals by one household alone.

Chapter 3

Determinants of People Participation in Community Managed Forests in Cambodia

This chapter studies the role of social capital in people participation of 590 households from 59 villages involved with community managed forests (CMFs) in Cambodia. Social capital measure is a total score of a respondent's opinion on other villagers' trust, helpfulness, and fairness. Another measure of social capital is a behavior which describes whether a household has any member who participated in a CMF in the year of its establishment. From year becoming a member in a CMF, we create duration of waiting time to be a member of a CMF as another measure of social capital. Three measures of social capital have a positive impact on people participation with added effects from the externalities of social capital in a village. Duration of waiting time for those who were not a member from the year of its establishment has no added impact, so social capital is more of characteristics than social pressure.

Keywords: Community Managed Forest, people participation, social capital, Cambodia.

3.1 Introduction

Due to the failure attributed to the central government and market-oriented policy in managing local common property resources in developing countries, community-based natural resource management, based on self-governance and volunteer community participation, has been widely adopted (Baland and Platteau 1997, Leach, Mearns and Scoones 1999, Agrawal 2003, Agrawal and Gupta 2005, Nygren 2005, Maskey, Gebremedhin and Dalton 2006, Antinori and Rausser 2007, Araral 2009).^{1, 2}

Moreover, local resources devoted to communities in developing countries in general are of low quality and limited scale. The argument of comparative advantage holds that small-scale local commons are better managed by local users for motivational and informational reasons (Araral 2009).

There has also been sufficient empirical evidence to justify the community-based management of local common-property resources in spite of theoretical and analytical pessimism among theorists.³ The extensive case studies by Wade (1987, 1988) and Ostrom (1990, 1998) on local common property resource management suggest that under certain circumstances communities can organize collective action without external force—state enforcement or private ownership—as an alternative to the theories of Hardin’s “tragedy of the commons” and Olson’s “private production of public goods.”

The structure of these two latter theories is similar to a Prisoners’ Dilemma game.

¹Forest management policy in the developing world has traditionally been centralized because of a general distrust of local people’s abilities to manage (Heltberg 2001), the legacy of past practices and prescriptions from neoclassical economists (Kant 2000), and the perceived role of foresters in defending forests against their inhabitants (Cleary 2005). North (1990) takes state and formal institutions as the central role in delivery of public goods though he does not rule out the role of communities and civil society. Baland and Platteau (1996) explained in detail the tendency of colonial governments whether under British and French and post-independence governments in developing countries to centralize local commons, notably forests, and failure as a consequence.

²Southeast Asia’s primary rain forests shrank from over 250 million hectares in 1900 to less than 60 million hectares in 1989. Failure of state forest agencies was a major reason (Poffenberger, Soriaga and Walpole 2006).

³See more on theoretical issues in incentive design (Seabright 1993), evolution of social norms in common property resource use (Sethi and Somanathan 1996), collective action and evolution of social norms (Ostrom 2000). Lise (2000), Heltberg (2001), Adhikari and Lovett (2006), and Maskey et al. (2006) have contributed particularly to the issue of forest resource management.

These differences between these two latter theories and others related to the commons are mainly from the assumptions that community members are not be able to create, devise and enforce the rules for adapting to local commons environments (Wade 1988, p. 204).

According to Hardin's theory (1968), each herder does not or cannot communicate with other herders who operate on the same grazing land to make a contract or change the rules for sustainable use. This lack of rule enforcement compels each herder to add animals to the point of the exhaustion of the grazing land (Ostrom 1990, p. 2). That is generally not the situation in communities where community members can communicate to modify and enforce the rules with minimal cost.

Likewise, Olson's theory states that consumers' rationality and firms' profit-seeking do not lead to efficient provisions of public goods. Therefore, voluntary collective action will not produce public goods. "Positive" or "negative" punishment is necessary to produce the efficient level of public goods. This situation is applied to large interest groups in his three-fold classification of groups according to their size of the group. In addition, in a large group, the contribution of other members is not noticeable and no single individual receives a share of benefits large enough to give him an incentive to provide public goods. This situation in the large group of Olson is different from the situation applied to communities in developing countries where the contributions by other members are easy to observe. This condition can restrain free riding and provide incentives that are large enough for the contributors.

The community-based paradigm places people participation at the core for planning, implementing, and managing local commons (clean water supply, irrigation, fish, forest, etc). By recognizing its importance, we study determinants of people participation in community managed forests (CMF) management in Cambodia with special emphasis on the role of social capital, which have been widely recognized to facilitate collective action in general.

We use our two round-household survey data on CMF management which we conducted

separately in 2007 and 2011 in rice-producing villages in the Northern Tonlé Sap region of Kampong Thom and Siem Reap provinces. There were 590 households from 59 villages in our data set. A village is chosen as a unit of community collective action because the operational level of CMF management is mainly at the village level although some CMFs cover a cluster of nearby villages. Moreover a village is relatively free from higher local government administration so there would be a better isolation of impacts of people participation, and, last but not least, the psychological boundary of a community is at the village level, which is agreed by many of Cambodia's anthropologists. The reasons for the field site selection are: 1) socioeconomic landscape in the region is typical of rice-producing Cambodia's villages; 2) years of establishment are relatively long and variable and topography is diverse ranging from high mountainous areas with a low density of population to low areas in Tonlé Sap rivers with a high density of population.

People participation (*PARTI*), as a dependent variable, is an household-level additive variable of whether a respondent participated during the current year in five main CMF activities such as attending a meeting, contributing money, attending forest fire prevention road making, planting trees, and patrolling CMFs. This ordered variable (*PARTI*) ranges from value zero to value five. Due to the small number of value zero and one in (*PARTI*), we recode values zero and one into the same category as value two. This reduces (*PARTI*) to four-ordered variable (*PARTI1234*). Furthermore, in most model specifications, the cut point between first and second order is not significant. Therefore, we recode the first value of (*PARTI1234*) into the second value. This further reduces (*PARTI*) to three-ordered variable (*PARTI123*). To account for different weight given to each CMF activity because an activity is more costly and time-consuming than another activity, we combine these five binary variables of CMF activities to create an index of people participation (*par*) by using the method of Principle Component Analysis. We also cluster our regression by village because households from the same village tend to be highly correlated.

For social capital variable which is our main independent variable, we use (*SC*), an

additive score of a respondent's evaluation of interactions among other villagers such as trust, helpfulness, and fairness. To check the robustness, we use (*ENTHU*), a binary variable which describes whether a respondent were a member of a CMF in the year the CMF was established in his village. From the year becoming a member in a CMF, we also create (*DELAY*), a duration of waiting time for those who were not a member from the year of its establishment as another measure of social capital but its value is in reverse. It means that the longer the duration of waiting time, the lower the level of social capital. (*DELAY*) counts duration in year while (*ENTHU*) only consider whether or not a household was a member from the year a CMF was established in the village.

For all measures of social capital, we collapse the household level score from these measures of social capital in a village to create social capital at village level to check whether there is any positive externalities effects of social capital in the village. Our estimation results show that all measures of social capital variables has positive significant effects on all specifications of people participation whether it is (*PARTI*), (*PARTI1234*), (*PARTI123*), or (*par*). The variables of the collapsed village score also have positive significant effects on people participation. The three-ordered variable of people participation (*PARTI123*) has the highest Pseudo *R*² among the three specifications of the dependent variable, and the threshold cut points are significant.

(*SC*) explains people participation the most among the measures of social capital. However, (*SC*) is more subjective because we ask a respondent about their evaluation on other villagers's interaction. The other two measures of social capital validate the former because they are more objective than the former. To further check whether the duration of waiting time in joining a CMF has any additional significant effects on people participation we limit a sample to those members who were not a member in a CMF from the year the CMF was established. The result indicates that duration of waiting time has no impact so social capital is more of characteristics rather than social pressure.

Control variables such as education of household head, distance to collect firewood, size

of home garden in a house compound, and main source of loan have significant effect on people participation.

This chapter proceeds as follows. Section two describes concepts and measures of people participation, social capital, community managed forest management, and Cambodia's villages. Section three is about data and field site selection. Section four is on research methodology and estimation strategy. Section five empirically tests the model and shows the econometric results. Section six concludes the results.

3.2 Concepts and Measurements

3.2.1 Concepts and Measures of People Participation in Collective Action

Community-based natural resource management place community members at the center of management. This approach is based on self-governance and volunteer participation in management activities. Community members are supposed to be voluntarily contribute labor, time, and money for those activities. Some studies measure people participation by the self-reported degree of participation. Because self-reporting tends to exaggerate the contribution, we rather use the additive score of whether any member of a household participates in CMF activities. Therefore, rather than asking people to rate their degree of participation from one to five, questions such as in the current year, did you attend any meetings (*MEET*), contribute money to CMF committee (*MONEY*), plant trees (*PLANT*), make fire prevention roads (*FIRE*), and/or go on patrol (*PATROL*)? were asked. These five binary variables of CMF activities are added up to create an index for the ordered variable of the degree of participation in CMF management activities (*PARTI*).

This ordered variable ranges from value zero to value of five. Due to the small number of value zero and one in (*PARTI*), we recode values zero and one into value two. This reduces

the dependent variable to four-ordered variable (*PARTI1234*). Furthermore, in most model specifications, the cut point between first and second order is not significant. Therefore, we recode the first value into the second value. This further reduces the dependent variable to three-ordered variable (*PARTI123*).

The method of Principle Component Analysis is used to combine these five different activities into an index of people participation (*par*) by giving different weights to each activity according to the score of each activity in Component One. This method is used because an activity in CMF is likely to be more time-consuming and costly than another activity. The weight of (*MONEY*) is the least, followed in order by (*MEET*), (*PLANT*), (*PATROL*), and (*FIRE*).⁴ We also cluster our regression by village because households from the same village tend to be highly correlated.

3.2.2 Concepts and Measures of Social Capital

The concepts and definition of social capital used in this study focus primarily on cognitive phenomena of social relationship such as trust, helpfulness, and fairness that reflect a sense of solidarity and mutual trust within a village. The definition of social capital used here stems from the works of Putnam (1993) and Fukuyama (1995). According to Putnam (1993), social capital is the feature of social organization, such as network, norms, and trust, that facilitate coordination and cooperation for mutual benefit. Communities with positive economic development and effective governments are those supported by a "network of civil engagement". This civil network fosters norms of reciprocity that reinforce sentiments of trust within a society and improve the effectiveness of communication and social organization. While Fukuyama (1995), who uses trust as a measure of social capital, describes trust as arising when a community shares a set of moral values in such a way as to create expectations of regular and honest behavior. Reciprocity, civic duty, and

⁴The weight of (*MONEY*) in Component One is 0.1792; (*MEET*) 0.4397; (*PLANT*) 0.4629; (*PATROL*) 0.4784; and (*FIRE*) 0.5757.

moral obligation are essential to a successful and stable society. This concept in the study is also derived from cognitive social capital from Uphoff (2000) who classifies social capital into structural social capital (relationship, networks, and association) and cognitive social capital (norms and values which are behind structural social capital).

The approach to social capital that is most relevant to our study is the *communitarian* approach in Woolcock and Narayan (2000), whose typologies are communitarian, networks, institutional, and synergy. The communitarian view equates social capital with such local organizations as clubs, associations, and civil groups. This perspective has made important contributions to analysis of poverty by putting social ties at the center in helping the poor manage risk and vulnerability. Although there is evidence of it having a dark side such as caste inequality, ethnic exclusion, and gender discrimination. However, this kind of inequality does not exist in the context of community development in Cambodia.

Derived from the definition of social capital by Putnam (1993), Fukuyama (1995), and Uphoff (2000), we define social capital in this chapter by positive attitude of a respondent to interactions among other villagers in terms of trust, helpfulness, and fairness. Measuring social capital by the responses to three yes/no questions: 1) do most people in your village trust each other? (*TRUST*); 2) do most people in your village help each other? (*HELP*); and 3) do most people in your village are fair by thinking not only about their own interest but also caring about other villagers' interest? (*FAIR*). Optimistic expectation regarding others' inclination toward selfless action create trust on one hand, and trust is reciprocal on the other hand; we trust because we think most of the people in the village are trustworthy. This measure of social capital indicates village-level characteristics rather than individual attitude. This approach reduces self-bias of tendency to respond virtuously. It also reflects back to the characteristic of a respondent himself. We sum up (*TRUST*), (*HELP*), and (*FAIR*) to create an index of social capital (*SC*). However, (*SC*) is "subjective".

Economists' skepticism of subjective survey questions have been demonstrated by many researchers in the experimental literature because measurement errors tend to correlate with

a large set of characteristics and behavior (Bertrand and Mullainathan 2001). Therefore, we use variables determining the behavior to check the validity of (*SC*).

From (*YEAR*), the duration a household became a member in a CMF, (*ENTHU*) and (*DELAY*) are derived to create “objective” measures of social capital. (*ENTHU*), a binary variable which indicates the behavior of participation in CMF from the year the CMF was established in the village, is used to measure the original level of social capital which is inherent in individuals without taking incentive into account. This is because the outcome of the success of a CMF will be determined by participation of other villagers in the future. Therefore, (*ENTHU*) is a good indicator of social capital which is more objective than (*SC*). (*DELAY*), the period of waiting time from the year when a CMF was established and the year a household became a member of the CMF to further check whether binary (*ENTHU*) or continuous (*DELAY*) is more appropriate. We limit the sample to those members who were not a member of a CMF from the year the CMF was established in the village ($((\textit{DELAY}) > 0)$) to test whether different period of waiting time has any additional impact on the dependent variable besides a household participated in a CMF from the year of its establishment. If there is any additional impact, nature of social capital in the study is more of social pressure rather than characteristics and vice versa.

There are two more measures of social capital but they were dropped because of less variation. One measure of social capital is the trade-off between access to 2.5 hectares of land for two households but with the requirement of working with and sharing output with the other, instead of one hectare for each. 95% of respondents prefer a smaller land area in order not to depend on cooperative relations with others.

Another measure of social capital is density of household membership in various groups, which was used by Maluccio et al (2000) and Carter (2003). However, it is not a good measure of within-village difference of level of social capital. Because in Cambodia’s village context, each group or association tends to have membership from all households in each village. These include fertilizer groups, rice bank groups, cow bank groups, water user

groups, pond groups, and community managed forest groups, etc.

3.2.3 Community Managed Forest Management in Cambodia

There are three types of community managed forests in Cambodia—community forests, administered by the Forest Administration, community fisheries by the Fishery Administration, and community protected forests by the Protected Area General Department.⁵

Although under the government's different specialized agencies, their management involves volunteer participation of community members; and these specialized agencies and development organizations, which are jointly called external agencies, limit their roles to the enforcement of rules from any encroachment on CMFs and technical support respectively.

There has been an increasing number of CMFs and households involved with CMF management in the last ten years due to the government's commitment to reverse the trend of rapid depletion of forest resources by empowering local communities to maintain ownership on their communities' natural resources, from which they depend on for their livelihood, which can be seen in fashion throughout the developing world. In Carson and Hou (2009), there are 570 CMFs in Cambodia covering 366,000 ha of forest land involved with 724,700 households from 784 villages in 2005; and the number of CMFs increased to 872 in 2009.⁶ Although those CMFs are under the jurisdiction of the Cantonments of those specialized agencies, communities are encouraged to design their own rule of CMF management with technical support from external agencies.

In our field site, all five CMFs in Kampong Thom province were technically supported by Mlop Baitong, a local NGO. In Siem Reap province, Food and Agriculture Organization

⁵The Forest Administration was established in 2004 to replace the Department of Forestry and Wildlife Protection. It has staff and offices through the countries in a four-tiered structure: 4 Inspectorates, 17 Cantonments, 55 Division, and 170 Triages. Most Cantonments are parallel to Provincial Administrative Level, although some Cantonments may cover one province with less forest or small province (Bampton et al. 2010).

⁶According to Community Forestry Office's Report in June 2009 cited in (FA 2010, p. 19), the community forests were first established in Cambodia in 1991. There are 377 community forests covering 347,740 ha and 13 potential area with 20,203 ha to be established. There are 37 community forests in Siem Reap province covering 18,122 ha where 67 community forests located in Kampong Thom with 66,065 ha.

(FAO) commissioned the CMF technical supporting projects to staff from the Cantonments of specialized agencies. Staff from the Cantonment of Forestry support CMFs under the jurisdiction of the Cantonment of Forestry and the Protected Area. Staff from the Cantonment of Fisheries support CMFs under their jurisdiction. So there are only two institutions that supported the CMFs in Siem Reap. Since a sample in Kampong Thom is only five villages supported by Mlop Baitong, and those villages are also under the jurisdiction of the Cantonment of the Forest Administration in Kampong Thom province, these five CMFs were merged into the same classification under the administrative authorities of the Cantonment of Forest Administration in Siem Reap province.

3.2.4 Cambodia's Villages and their Leadership

A village in rural Cambodia is a cluster of around 40 households for small villages to more than 300 households for large villages. A village is not an administrative unit. It is one level lower than a commune which is comprised of many villages and is the lowest democratically elected administrative units in Cambodia's administrative hierarchy. There are slightly more than 13,046 villages in Cambodia according to the results of the population census in 2008 (NIS 2009b).

Typical caste, class, religious, or ethnic-linguistic heterogeneity which is mainly prevalent in South Asian societies is nearly absent in rural Cambodia. Villagers are generally composed of Khmer Buddhists from low socio-economic class and low educational levels. In our surveyed villages, on average the poverty rate is 35% ranging from 16% to 74% (NIS 2010) and the years in education of the average villager is only three.

Village heads socioeconomically and educationally are not quite different from the rest of the villagers in their own village. The years in education of village heads is just four, only one year higher than the year in education of an average villager. The administrative capacity of Cambodian village heads is low, and villages are also small in scale. Village

heads informally serve as secretaries to a commune chief to channel information to other villagers and collect village basic demographic data to a commune chief. Although their educational capacity is low and role is minimal, village heads function as gatekeepers and can not be ignored. Effective and efficient communication between villagers to other higher administrative units have to go through village heads. Relatively better educated and active village heads are more likely to contribute positively to community development activities by reducing the communication cost between villagers and development agents or administrators.

Historically, until recently village heads had been responsible for security affairs. They usually regarded themselves as administrators rather than development agents. This conventionally assigned role makes village heads less likely to initiate their own village development program which involves villagers' participation. Since 2006, village heads have been officially elected by members of a commune council. This change was just a formality and legitimization of the power of elected commune councils.⁷ The position of village heads has not changed as evident in our study of villages. On average, village heads have 10 years of experience in service.

3.3 Data and Field Site Selection

3.3.1 Data

We use data from two rounds of household-level surveys of household participation in CMF activities which are conducted in villages in the Northern Tonlé Sap Region of Kampong Thom and Siem Riep provinces in 2007 and 2011 respectively. One round of surveys was conducted in September-October in 2007 in 41 villages involved with CMFs on 410 households in the provinces of Siem Riep and Kampong Thom. The other round was conducted

⁷The description of the role of villages head is mainly based on informal discussion with Dr. Kimchoeun Pak.

in 18 more CMFs on 180 households in August-September 2011. This data set consists of household and village leadership level. We first interviewed village heads and CMF management committee members about village characteristics, leaders' characteristics, forest resource conditions, and CMF management. Then ten households from each village were randomly selected by the order of households in a village's household list, and these households were interviewed in detail on demography, socioeconomic condition, social capital, and the participation in CMF activities. Our main data is household level data of 590 households from 59 villages.

3.3.2 Field Site Selection

Cambodian society is relatively homogeneous in terms of socio-economic class, caste, religion, ethnicity, and political economic power. Therefore Cambodia was chosen as our country case study mainly for a methodological reason which can disentangle our main variable impacts from any heterogeneity effects on social capital and people participation.

Under Cambodia's political, administrative, and fiscal decentralization policies, natural resource management is delegated to communities. Forest management is one of the main natural resource decentralizations because it covers large land areas and directly affects the livelihood of communities near the forest. 366,000 ha of forest land area was under the CMF program in 2005 (Carson and Hou 2009). Moreover, forests' physical characteristics covering large areas makes it costly to exclude other community members from exploitation. So collective action is necessary to manage resources successfully and in a sustainable way. Safeguarding a CMF is necessary since it has become scarce in the last two decades. By the government's regulations, community members are aware that they will benefit from protecting a CMF and it is their responsibility to manage a CMF although there are some regulations imposed by the government and technical support from the external agencies.

The Northern Tonlé Sap region is chosen because this region well represents Cambo-

dia in CMF management. This is because 1) the Northern Tonlé Sap region has all three types of CMF institutions. As a result, this property allows for testing impacts of different institutions of CMFs on people participation; 2) a landscape of rice fields is commonplace. Siem Reap and Kampong Thom provinces mainly subsist on rain-fed rice cultivation which is typical of the Cambodian rural socio-economy; 3) topological and population density are diverse stretching from high mountainous areas and low population density to low river and high population areas; 4) the region has a comparatively wide range of years in experience with CMF management ranging from 1997 to 2006. While Cambodia's experience with CMF management is relatively new, the ten year period is relatively large which in some extent can mitigate the shortcomings of the data set to test learning effect on CMF management.

Table 3.1: Definitions of Variables of Household Participation in Community Collective Action

Variable label	Variable definition
PARTI	Six-ordered degree of participation in CMF
PARTI1234	Four-ordered degree of participation in CMF
PARTI123	Three-ordered degree of participation in CMF
par	An index of participation in CMF by using method of Principle Component Analysis
SC	Social capital index from TRUST, HELP and FAIR
TRUST	A respondent's evaluation of trust among villagers 1 yes 0 no
HELP	A respondent's evaluation of helpfulness among villagers 1 yes 0 no
FAIR	A respondent's evaluation of fairness among villagers 1 yes 0 no
SC_v	Village aggregate score of SC in the village
ENTHU	Membership from the year of CMF establishment 1 yes 0 no
ENTHU_v	Village aggregate score of ENTHU in the village
DELAY	Duration of period between year becoming a member and year of CMF establishment
DELAY_v	Village aggregate score of DELAY in the village
EDUC	Education of household head (in years)
DISTANCE_d1	Distance to collect firewood less than 2 Km
DISTANCE_d2	Distance to collect firewood 2.1-9.9 Km
DISTANCE_d3	Distance to collect firewood more than 10 Km
GARDEN_d1	Garden size less than 10m ²
GARDEN_d2	Garden of size of 10-99 m ²
GARDEN_d3	Garden size larger than 100m ²
LOAN1	Source of loan from institutional lender
LOAN2	Source of loan from relatives
LOAN3	Source of loan from neighbor
LOAN4	Source of loan from local money lender
LOAN5	Source of loan from savings groups

3.4 Research Methodology and Estimation Strategy

3.4.1 Research Methodology

In this empirical part, we test the determinants of people participation in CMF management by using (*PARTI*), (*PARTI1234*), (*PARTI123*), and (*par*) as dependent variables. (*PARTI*) and (*PARTI1234*) are not shown because (*PARTI123*) is more appropriate. The nature of (*PARTI*), (*PARTI1234*), and (*PARTI123*) are ordered variables so the Ordered Probit method is used. (*par*) is an index weighted by the score from method of Principle Component Analysis, Ordinary Least Square is used because its value varies

Table 3.2: Summary Statistics of Variables of Household Participation in Community Collective Action

Variable label	Observation	Mean	Std. Dev.	Min	Max
PARTI	589	2.34	1.25	0.00	5.00
PARTI1234	587	2.37	1.11	1.00	4.00
PARTI123	587	1.67	0.80	1.00	3.00
par	589	0	1.26	-2.26	2.56
SC	590	2.00	0.98	0.00	3.00
TRUST	590	0.68	0.47	0.00	1.00
HELP	590	0.74	0.44	0.00	1.00
FAIR	590	0.58	0.49	0.00	1.00
SC_v	590	20.03	4.21	10.00	29.00
ENTHU	585	0.63	0.48	0.00	1.00
ENTHU_v	590	6.25	1.90	2.00	10.00
DELAY	590	1.07	1.74	0.00	10.00
DELAY_v	590	10.69	7.98	0.00	37.00
EDUC	587	2.99	2.74	0.00	12.00
DISTANCE_d1	576	0.38	0.49	0.00	1.00
DISTANCE_d2	576	0.44	0.50	0.00	1.00
DISTANCE_d3	576	0.18	0.39	0.00	1.00
GARDEN_d1	588	0.41	0.49	0.00	1.00
GARDEN_d2	588	0.51	0.50	0.00	1.00
GARDEN_d3	588	0.08	0.28	0.00	1.00
LOAN1	564	0.20	0.40	0.00	1.00
LOAN2	564	0.14	0.35	0.00	1.00
LOAN3	564	0.18	0.38	0.00	1.00
LOAN4	564	0.19	0.39	0.00	1.00
LOAN5	564	0.29	0.46	0.00	1.00

widely.

Since within-correlation in each village is high, each village can be systematically different from other villages. Therefore, the clustered robust standard error is used to control for the dependence of error terms within the same villages. We also collapse each measure of social capital at household level into village level to check whether there is any externalities among households in the same village.

We create a house index (*HOUSE*) from house parameters such as wall, roof, condition, and size. Each parameter has a score from one to four. (*HOUSE*) represents household income level because a house is a symbol of family status in the context of rural Cambodia and it is easily observed without interviewing villagers of the earned income.

We tabulate size of home garden (*GARDEN*) into three dummy variables, household distance to collect firewood (*DISTANCE*) into three dummy variables, and main sources of loan into five dummy variables respectively. For (*GARDEN*), the size less than $10m^2$ is considered as a small-sized home garden (*dGARDEN1*), the size of $10 - 99m^2$ a medium-sized home garden (*dGARDEN2*), and the size over $100m^2$ a large sized home garden (*dGARDEN3*). The size of home garden is not related to household wealth and compound size so it is independent of household socioeconomic condition. A medium size of home garden is chosen as a proxy for the reciprocity among villagers in the same village. Reciprocity is quite common in Cambodian rural villages because each household needs a variety of vegetables to cook which is beyond the vegetable self-sufficiency of one household with a home garden of size around $10 - 99m^2$. By observation, reciprocity tends to be balanced which is also supported by Platteau (1997). Unlike households with a medium sized home gardens, households with small sized home gardens have nothing to share and households with large sized home gardens do not need to share. The quadratic form of (*GARDEN*), (*GARDEN_squ*), is also included in the estimate to check whether there is any non-linear effect of (*GARDEN*) on the people participation.

For (*DISTANCE*), the distance below 2 Km is considered as a short distance

(*dDISTANCE1*), the distance between 2.1 Km and 9.9 Km a medium distance (*dDISTANCE2*), and the distance over 10 Km a far distance (*dDISTANCE3*). According to the theory of relative need, cooperative behavior is determined by the extent to which people benefit from working cooperatively with others. The distance to collect firewood is also related to incentive to participate in CMF activities. When the distance to collect firewood is short, and it is easy to find firewood, a household does not depend on firewood from nearby CMFs. So they do not have incentive to participate in CMF activities. Likewise when the distance is far, a household does not have incentive to participate either because they can collect firewood in large quantity from quasi-open access forests which are usually located at a far distance from the village. Any household who can afford the time, energy, and a drought animal go to collect firewood in large quantities, which is well above the sufficiency rate of household firewood consumption. A household with a medium distance tends to participate because they need to depend on CMFs for firewood collection, which is allowed under the benefit sharing rule in a sustainable way. The quadratic form of (*DISTANCE*), (*DISTANCE_squ*), is also included in the estimate to check whether there is any non-linear effect of (*DISTANCE*) on the people participation.

For source of loan (*LOAN*), we categorize main sources of loan into five categories: (*LOAN1*) is a household with main source of loan from institutional lenders such as commercial banks and micro-finance institution; (*LOAN2*) from Relatives; (*LOAN3*) from neighbors; (*LOAN4*) from local money lenders; and (*LOAN5*) from savings groups of usually five to seven households rather than village-wise savings groups. We hypothesize that a household with a main source of loan from institutional lenders, from relatives, and from local money lender, is less likely to participate in a CMF comparing to a household with a main source of loan from savings groups. We also consider the possibility of any endogeneity of savings groups because a village which can manage a CMF well tends to successfully manage savings groups. However, it is not the case in our study area for two reasons: one is that a savings group in Cambodia comprises of only five to seven households, not most

households in a village. The other is that (*YEAR*) is included to control for learning effect from people participation on successfully organizing savings groups.

The level of education of household head (*EDUC*) help smooth collective action through effective communication, mutual understanding, and social preference which education is basically about. (*EDUC*) is also used as an independent variable and we expect positive significant effects on people participation.

3.4.2 Estimation Strategy

Derived from Cameron and Trivedi (2009, p. 512), the ordered dependent variables of the degree of participation in CMF activities which arise orderly as a latent variable, y^* , across progressively higher thresholds. y^* is an unobserved measure of the degree of participation. For household i , we specify

$$y_i^* = X_i' \beta + u_i$$

For very low y^* , the degree of participation is one ; for $y^* > \alpha_1$, the degree of participation is two; and so on until the degree of participation increases to m . For m ordered model, we define

$$y_i = j \text{ if } \alpha_{j-1} < y_i^* \leq \alpha_j, j = 1, \dots, m$$

where $\alpha_0 = -\infty$ and $\alpha_m = \infty$. Then

$$\begin{aligned} Pr(y_i = j) &= Pr(\alpha_{j-1} < y_i^* \leq \alpha_j) \\ &= Pr(\alpha_{j-1} < X_i' \beta + u_i \leq \alpha_j) \\ &= Pr(\alpha_{j-1} - X_i' \beta < u_i \leq \alpha_j - X_i' \beta) \\ &= F(\alpha_j - X_i' \beta) - F(\alpha_{j-1} - X_i' \beta) \end{aligned}$$

where F is the cumulative distribution function (c.d.f) of u_i . The regression parameters, β , and the $m - 1$ threshold parameters, $\alpha_1, \dots, \alpha_{m-1}$ are obtained by maximizing the log likelihood with $P_{ij} = Pr(y_i = j)$ as defined above. Stata excludes an intercept from the regressors. For the ordered Probit model, u is standard normally distributed with $F(\cdot) = \Phi(\cdot)$, the standard normal c.d.f.

The sign of the regression parameters, β , can be immediately interpreted as determining whether the latent variable, y^* , increases with the regressor. If the $\beta > 0$, an increase in x_{ij} necessarily decreases the probability of being in the lowest category ($y_i = 1$) and increases the probability of being in the highest category ($y_i = m$).

The three specifications of the ordered dependent variable are:

$$\begin{aligned} PARTI &= social\ capital\beta_1 + Control\ variables\beta_2 + u_i \\ PARTI1234 &= social\ capital\beta_1 + Control\ variables\beta_2 + u_i \\ PARTI123 &= social\ capital\beta_1 + Control\ variables\beta_2 + u_i \end{aligned}$$

Another specification for (*par*) is

$$par = social\ capital\beta_1 + Control\ variables\beta_2 + u_i$$

3.5 Econometric Results

Based on our estimation results in Table 3.3 and Table 3.4, any measure of social capital and its collapsed village score have positive significant effects on the degree of participation in a CMF. When limiting the sample to $(DELAY) > 0$, $(DELAY)$ becomes insignificant, so

measures of social capital variable are more of characteristics than social pressure. To simply put, active community members are intrinsically active in community activities regardless of any involvement of external agencies and group behavior of other members. We use result from (*par*) to interpret because it accounts for the different weight attached to each CMF activity. A measure of social capital (*SC*) has the highest Pseudo *R*² among the measures of social capital so we use column (2) in Table 3.4 to interpret the result. Bootstrap estimation of standard error is also used but sign and significant level of each independent variable are not changed. The education level of household head (*EDUC*) has positively significant effects on the degree of participation in all specifications as expected. A short distance to collect firewood has no negative impact on the participation in community forest activities. However, a long distance to collect firewood (farther than ten kilometers) has a moderate negative impact on the degree of participation in community forest activities.

While the size of home garden less than $10m^2$ is negatively related to the degree of participation in CMF activities as expected, the size of home garden more than $100m^2$ is not negatively correlated with the participation in CMF activities compared with the base group of size of home garden of $10 - 99m^2$. While households with main source of loan from institutional lenders, from relatives, and local money lenders are less likely to have its members actively participating in CMF activities compared to households with main source of loan from savings groups, households with main source of loan from neighbors are not less likely to participate in CMF activities compared to the base group.

3.6 Concluding Remarks

Social capital plays important role in people participation in community managed forest activities after controlling users' household characteristics and the users' interaction with forest resources. Social capital also has positive externalities within a village. We also find that measuring social capital by positive evaluation of their community members'

Table 3.3: The Determinants of *PARTI123*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	PS1	PS2	PE1	PE2	PD1	PD2	PD3
Social capital	0.367*** (7.24)	0.347*** (6.02)	0.637*** (5.13)	0.570*** (4.34)	-0.184*** (-3.18)	-0.137** (-2.20)	-0.0636 (-0.66)
Social capital at village level	0.0430* (1.89)	0.0530** (2.38)	0.111** (2.34)	0.127*** (2.65)	-0.00899 (-0.90)	-0.0165* (-1.67)	0.00252 (0.12)
EDUC		0.0600*** (3.22)		0.0721*** (3.89)		0.0705*** (3.79)	0.0661* (1.68)
DISTANCE_d1		-0.134 (-0.89)		-0.264* (-1.81)		-0.212 (-1.50)	-0.325 (-1.18)
DISTANCE_d3		-0.422*** (-2.63)		-0.577*** (-3.61)		-0.557*** (-3.37)	-0.648** (-2.55)
GARDEN_d1		-0.381*** (-3.08)		-0.237* (-1.79)		-0.357*** (-2.81)	-0.443** (-2.01)
GARDEN_d3		-0.0793 (-0.39)		0.0380 (0.19)		0.0134 (0.07)	0.0973 (0.30)
LOAN1		-0.784*** (-4.30)		-0.631*** (-3.41)		-0.626*** (-3.33)	-0.422 (-1.61)
LOAN2		-0.714*** (-3.73)		-0.640*** (-3.44)		-0.642*** (-3.43)	-0.598 (-1.57)
LOAN3		-0.179 (-1.07)		-0.151 (-1.02)		-0.140 (-0.97)	0.0282 (0.10)
LOAN4		-0.394** (-2.33)		-0.425*** (-2.73)		-0.416*** (-2.68)	-0.462 (-1.56)
cut1							
_cons	1.723*** (4.00)	1.417*** (3.14)	1.219*** (4.45)	0.892*** (2.78)	-0.169 (-1.05)	-0.633*** (-3.07)	-0.0142 (-0.04)
cut2							
_cons	2.501*** (5.88)	2.257*** (5.14)	1.987*** (7.06)	1.708*** (5.29)	0.577*** (3.43)	0.166 (0.79)	0.642 (1.61)
<i>N</i>	589	552	584	548	589	552	194
Pseudo R2							

t statistics in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

(1) & (2) (*SC*) is a measurement of social capital; (3) & (4) (*ENTHU*); (5) & (6) & (7) (*DELAY*)

(7) Sample limited to (*DELAY*) > 0

Table 3.4: The Determinants of *par*

	(1) PS1	(2) PS2	(3) PE1	(4) PE2	(5) PD1	(6) PD2	(7) PD3
Social capital	0.343*** (7.90)	0.305*** (6.44)	0.616*** (5.31)	0.509*** (3.93)	-0.164*** (-4.36)	-0.118*** (-2.78)	-0.0334 (-0.44)
Social capital at village level	0.0369 (1.52)	0.0391* (1.75)	0.0980* (1.95)	0.0970* (1.98)	-0.00861 (-0.87)	-0.0143 (-1.47)	-0.00635 (-0.35)
EDUC		0.0394** (2.19)		0.0469** (2.55)		0.0491*** (2.67)	0.0206 (0.55)
DISTANCE_d1		-0.197 (-1.29)		-0.313** (-2.02)		-0.290* (-1.90)	-0.357 (-1.44)
DISTANCE_d3		-0.489*** (-3.34)		-0.593*** (-3.86)		-0.613*** (-3.90)	-0.668*** (-2.82)
GARDEN_d1		-0.322*** (-3.16)		-0.226** (-2.01)		-0.331*** (-2.83)	-0.324** (-2.04)
GARDEN_d3		-0.109 (-0.55)		0.0198 (0.10)		-0.0197 (-0.11)	-0.0493 (-0.15)
LOAN1		-0.538*** (-3.07)		-0.416** (-2.33)		-0.450** (-2.41)	-0.320 (-1.37)
LOAN2		-0.428** (-2.11)		-0.367* (-1.88)		-0.378* (-1.89)	-0.0106 (-0.03)
LOAN3		-0.0654 (-0.38)		-0.0361 (-0.22)		-0.0168 (-0.10)	0.138 (0.47)
LOAN4		-0.261 (-1.65)		-0.291* (-1.93)		-0.296* (-1.92)	-0.119 (-0.43)
_cons	-1.425*** (-3.24)	-0.949** (-2.16)	-0.996*** (-3.69)	-0.535* (-1.79)	0.268 (1.57)	0.719*** (3.45)	0.200 (0.59)
<i>N</i>	589	552	584	548	589	552	194
r2_a	0.111	0.195	0.0988	0.165	0.0625	0.147	0.0460

t statistics in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

(1) & (2) (*SC*) is a measurement of social capital; (3) & (4) (*ENTHU*); (5) & (6) & (7) (*DELAY*)

(7) Sample limited to (*DELAY*) > 0

interactions in terms of trust, helpfulness, and fair is validated by more objective measures of social capital, and social capital itself is more of characteristics than social pressure.

The policy implication in this chapter is both exploiting existing social capital and building social capital, if it is lacking, are strategies for the successful management of community collective action because social capital has a positive impact on people participation, and social capital has positive externalities within the village.

Chapter 4

Determinants of Successful Management of Community Managed Forests in Cambodia

This chapter studies the determinants of successful management of community managed forests (CMFs) in Cambodia by using CMF-level data in 66 CMFs and household-level data in 590 households from 59 villages. Support from development organization or specialized government agencies' staff, proxied by frequency of visits to a CMF, is endogenous; and when instrumented with distance from the provincial city to a village and the percentage of the poor in the village, the impact increases. However, people participation is still significant though with less extent. The impact is underestimated because the staff tends to pay more visits to a CMF negatively correlated with the successful management. So support from the staff is even more important for physically remote and poor villages whose capacity is still weak.

Keywords: Community Managed Forest, Community, Village, Cambodia.

4.1 Introduction

By recognizing that collective action is not an ultimate goal of local resource management as mentioned in Tachibana and Adhikari (2009), this chapter goes beyond the study of factors that facilitate people participation in collective action. The successful management of community managed forests (CMFs) is not only people participation but also resource condition, capacity of village leadership, technical support from development organization, rule enforcement and recognition from government departments, and many other factors.

The survey of literature on community collective action in Cambodia shares one common observation that villagers are *individualistic*, although the main reasons for this vary among ethnographic studies (see Peang-Meth (1991); Colletta and Cullen (2000, p.27)), ideological schools (Hou (1955) and Hu (1965)), and structuralism which mentioned the lack of specialization and division of labor in rural economies (Kiernan and Boua 1982). Chronic civil war (1970-1998) and failed experiments of forced collectivization in two consecutive regimes, communist (1975-1979) and socialist (1979-1989) made Cambodian people even distrustful of *collectivized* action, and have made it difficult to involve villagers in community collective action (see Colletta and Cullen 2000, Hughes 2003, Gottesman 2003). Furthermore, since the late 1980s, the donor development activities and practice of *modified* patron-client relations by Cambodian party politics (Hughes 2003, pp.61—61) have substituted the role of horizontal cooperation among community members for provision of local public goods.¹ Although the literature is pessimistic on Cambodia's community collective action, the authors do not equate community members' *individualistic* behavior as fragmented or conflictual. The literature ignores to some extent the low capacity of community members and leaders in terms of income and education, perception of a community

¹The modified patron-client in Cambodia in Hughes (2003) differs from the patron-client in Southeast Asia by Scott (1976) in that the patron (central leaderships) provides opportunities for clients (local civil public officials and armed forces) to enrich themselves, but at the expense of a third party (local villagers) rather than the exchange between legitimation of hierarchy and privilege to extract resources by virtue of his landholdings for a patron and protection and provision of a social safety net for clients.

on provision of local public goods such as building and maintaining all roads and ponds to be the responsibility of the state and donors, not community itself, and less necessity for community members' survival. Maintaining pagodas, contributing money to pagodas for seasonally traditional and religious ceremonies, and contributing money for funerals and *Sangkeaha*, which are perceived to be their responsibilities, are practiced without fail by villagers. Relative land and resource abundance to the population in Paul Collard (2002)², rural farmers' livelihood based on subsistent rain-fed cultivation, and a more predictable climate (Danida 2008) might be main factors which make collective action less necessary for survival. When it is necessary, villagers cooperate as in the case of labor sharing activity arrangements which are commonly observed in Africa and other Asian countries (Krishna and Sciubba 2009), and are commonplace in Cambodia when household labor is insufficient due to the seasonal nature of some activities such as rice transplanting and harvesting.

Forest resources in Cambodia have been depleted rapidly during the last two decades. The community managed forest program, which delegates management to its beneficiaries, is one of the forest rehabilitation policies which puts people participation at the central stage. All CMFs in Cambodia belong to the state; however, managers and beneficiaries of CMFs are community members. A community agrees on its own rules of management, contribution, and benefit sharing among its members. CMF members vote to select their own CMF leadership. Their participation is important for operational and managerial works of CMF activities. With their participation, violation from its members themselves such as clandestine firewood cutting and land clearance for cultivation can be reduced; forest fires prevented; and forest growth stimulated. However, with the recognition that communities' experience with collective action is new and their capacity is low, development organizations provide technical support, coordinate, and sometimes initiate the establishment of CMFs until the CMFs obtain recognition from specialized government agencies. So the roles of de-

²Cited in Slocomb (2010, p.49) that the considerably high infant mortality rate in Cambodia is one reason why there are so few inhabitants in the kingdom which could easily feed ten times more people

velopment organizations and specialized government agencies, which are collectively called external agencies, are also substantial in the successful management of CMFs at least in that early stage. In the case of Cambodia, Forest Administration, Fisheries Administration, and the General Department of Protected Areas are involved with legal enforcement of CMFs under their respective jurisdiction. The Provincial Offices and Cantonments of the Government's specialized agencies act as a rule enforcer for those who illegally encroach on CMFs under their jurisdiction. In some cases, technical support projects are staffed by officials from the specialized agencies.

To safeguard forests now is more necessary for Cambodian people than when resources were still abundant. The government's policy that empowers and involves communities to manage CMFs also make community members perceive that it is their responsibilities to contribute to CMF management. In this sense, our study of the successful management of CMFs addresses two questions at the same time. First, competing theories of the cause of lack of community collective action in Cambodia can be tested as whether the lack of collective action is intrinsic in Cambodia's communities (community members are not willing to work together or communities have low level of social capital) or low capacity of a community in terms of income and education. The latter goal is to study what the role of external agencies, along with the role of people participation, play in CMF management when the experience of community collective action is new and the capacity of the community is low.

We use a CMF-level data set from Kampong Thom and Siem Reap provinces on demography, size of a CMF per household, distance from the provincial city to a village involved with a CMF, distance from a village to a CMF; and their staff's evaluation of degree of successful management of CMFs (forest growth and performance of CMF management committee), frequency of staff visits of a CMF, current people participation, people participation and problems they encountered from the year of CMF establishment, a forest's initial condition, and income inequality. We also use village-level data on the percentage of poor people in villages from the Identification of Poor Household Program under the Min-

istry of Planning and the Commune Database from the Ministry of Interior which generally describe village conditions in terms of demography, education, health care, land use, and infrastructure.

Our dependent variables are an ordered variable of staff-evaluated forest growth from one to four in 66 CMFs and the sum of technical staff-assessed performance of CMF management committees with respect to committee practical management, legal awareness, technical knowledge of forests, their relations and communication with local governments, NGOs, and specialized agencies' staff in 57 CMFs. The latter is used for a robustness check because both variables are highly correlated. We also use an aggregate village level variable of people participation in CMFs by collapsing each household participation in CMF activities in a village from our household survey on people participation in CMF activities of 590 households in 59 villages.

We use staff-evaluated frequency of visits to a CMF as a measure of external agencies' support, because data on motivation, activeness, and capacity of those external agencies' staff is difficult to measure. The frequency of visits is instrumented by the distance from the provincial city to a village involved with a CMF weighted by road stretch condition and the percentage of poor in each village. Both instrument variables are highly correlated; physically remote areas tend to have a high incidence of poverty. Both instrumental variables not directly impact the degree of successful management of CMFs because most villages involved with CMFs tend to be located far a way from a provincial city and more than 90% of cooking energy in Cambodia is from firewood and charcoal.

Our results shows that both measures of people participation in CMF, whether staff evaluated people participation at the village level or people participation at household-level collapsed at village level, have positive significant effects on successful management of CMFs. Frequency of visits by these external agencies' staff is endogenous when instrumented by these two above instrumental variables, and have positive impacts on degree of successful management of CMFs when it is the staff-evaluated forest growth or the sum of

staff-assessed performance of CMF management committee. The magnitude of the coefficient of frequency of visits when instrumented is larger than the case in which we treated it as an exogenous variable. It is meant that we would underestimate the impacts of the frequency of visits if we ignore its endogeneity because staffs tend to pay more visits to CMFs negatively correlated with successful management of CMFs. This result amplifies the importance of support from external agencies; however, impact of people participation is still high though with less extent. So support from external agencies is even more important for communities whose capacity is weak. The policy implication is that external agencies should locate their staff at district level (one administrative level below provincial level) because a district center tend to have a short and equal distance to each village in the district.

This chapter proceeds as follows. Section two describes concepts and measures of CMFs, successful management of CMFs, people participation, support from external agencies, and collective action in Cambodia's villages with focusing on competing theories about the causes of the lack of collective action. Section three is on data description and field site selection. Section four is on research methodology and estimation strategy. Section five empirically tests the model and shows the econometric results. Section six concludes and provides policy implications.

4.2 Concepts and Measurements

4.2.1 Community Managed Forest Management in Cambodia

There are three types of CMFs in Cambodia—community forests, administered by the Forest Administration, community fisheries by the Fishery Administration, and community protected forests by the General Department of Protected Areas.³ Although under the

³The Forest Administration was established in 2004 to replace the Department of Forestry and Wildlife Protection. It has staff and offices throughout the countries in a four-tiered structure: 4 Inspectorates, 17 Cantonments, 55 Division, and 170 Triages. Most Cantonments are parallel to Provincial Administrative

government's different specialized agencies, their management involves volunteer participation of community members; and these specialized agencies and development organizations, which are jointly called external agencies, limit their roles to the enforcement of rules from any encroachment on CMFs and technical support respectively.

There has been an increasing number of CMFs and households involved with CMF management in the last ten years due to the government's commitment to reverse the trend of rapid depletion of forest resources and the government's policy to empower local communities to maintain ownership on their livelihood, which can be seen in fashion throughout the developing world. In Carson and Hou (2009), there are 570 CMFs in Cambodia covering 366,000 ha of forest land involved with 724,700 households from 784 villages in 2005; and the number of CMFs increased to 872 in 2009.⁴ Although these CMFs are under the jurisdiction of the Cantonments of these specialized agencies, communities are encouraged to design their own rule of CMF management with technical support from a development organization. In Table 4.1, 22 CMFs are under the Cantonment of Fisheries Administration and the rest of the CMFs are clustered under the Cantonment of Forest Administration. To check the robustness whether five CMFs in Kampong province can be grouped under the Cantonment of Forest Administration, we estimate our econometric model without the five CMFs from Kampong Thom provinces alongside the estimation with the full sample.

A CMF usually consists of a village. One village per CMF is also a preference by supporting staff and villagers alike because of the psychological boundary of community members is at the village level. However, physically inseparable and interdependent ecological systems of some CMFs make management by a cluster of nearby villages more rational. In our study areas, a multi-village CMF consists of up to 14 villages. The multi-village

Level, although some Cantonments may cover one province with less forest or small province (Bampton et al. 2010).

⁴According to Community Forestry Office's Report in June 2009 cited in (FA 2010, p. 19), the community forests were first established in Cambodia in 1991. There are 377 community forests covering 347,740 ha and 13 potential area with 20,203 ha to be established. There are 37 community forests in Siem Reap province covering 18,122 ha where 67 community forests located in Kampong Thom with 66,065 ha.

Table 4.1: Rule Enforcers and Technical Supporters of CMFs in the Study Area

Province	No of CMFs	Rule Enforcers (Types of CMFs)	Technical Supporters
Kampong Thom	5	Forest Administration	Mlop Baitong
Siem Reap	6	General Department of Protected Areas	Food and Agricultural Organization
Siem Reap	33	Forest Administration	Food and Agricultural Organization
Siem Reap	22	Fisheries Administration	Food and Agricultural Organization
Total	66		

CMFs are usually inundated forests located in the territory of the Cantonment of Fisheries. The structure of a multi-village CMF is like a federal system with the committee elected to be the head, the deputy head, and the secretary of the multi-village CMF but operations are at the village level and village heads also serve as deputies of the CMF in charge of their respective villages.

4.2.2 Measures of Successful Management of CMFs

Since we do not have data on forest inventory for CMFs, we ask the staff who were assigned to support communities in CMF management to evaluate the ranking of forest growth in a CMF from one (the least growth) to four (the fastest growth). To reduce the bias from staff's subjective evaluation, we also used the index of performance of CMF management committee regarding overall management capacity of the committee members from around 80 questions which are assessed by supporting staff. These variables range from committee practical management, legal awareness, technical knowledge of forests, their relations and communication with development organizations' and specialized agencies' staff. Although the index does not automatically determining forest growth, it is one of the main determinants of forest growth and the correlation between forest growth and performance of CMF management committee is very high. Therefore we use both four-ordered variable of staff-evaluated forest growth (*success_forest123*) in 66 CMFs and performance of CMF

management committee (*mana_fao*) in 57 CMFs as dependent variables in the study.

4.2.3 Concepts and Measures of People Participation in Collective Action

Community-based natural resource management places community members at the center of management. This approach is based on self-governance and volunteer participation in management activities. Community members are supposed to voluntarily contribute labor, time, and money for those activities. Some studies measure people participation by the self-reported degree of participation. Because people self-reporting tends to exaggerate their contribution, we use the additive score of people participation in an important CMF activity. Therefore, rather than asking people to rate their degree of participation from one to five, questions such as in the current year, did you attend any meetings (*MEET*), contribute money to CMF committee (*MONEY*), plant trees (*PLANT*), make fire prevention roads (*FIRE*), and/or go on patrol (*PATROL*)? were asked. However, each CMF activity tends to be more costly and time-consuming than another activity, we use Method of Principle Component Analysis to combine these five variables into an index of people participation at household level (*par*).

The source of data for (*par*) is two rounds of household-level surveys of the participation in CMF management which were conducted in the same field site. One round of survey was conducted in September-October in 2007 in 41 villages involved with CMFs on 410 households in the provinces of Siem Riep and Kampong Thom. The other round was conducted in Siem Reap in 18 villages involved with CMFs on 180 households in August-September 2011. So the data set covers 590 households from 59 villages. We collapsed (*par*) into village-level aggregate data of people participation (*par_v*). (*par_v*) is a link between survey data at the household level in 59 villages and staff-evaluated people participation in a CMF (*parti_fao*), which is ranked by a supporting staff for each village.

Therefore (*par_v*) is used as a measure of people participation to check the consistency of the estimation of the impact of (*parti_fao*) on degree of successful management of a CMF—(*success_forest123*) or (*mana_fao*).

4.2.4 Support from External Agencies

Baland and Platteau (1996) concluded that rural communities with the most prospect for cooperation are probably those that met relatively easy collective challenges at some point in history (they cite Japanese villages as an example) hence the communities could build trust required for more complex situations. On the contrary, those with the the worst prospects are communities which do not benefit from such a coincidence of historical events and become suddenly confronted with hard challenges without any preparation for collective action (they cite Indian villages as an example). The latter rural communities well represent Cambodian villages which had not experienced such village collective action in the past except for contributing to sustain pagoda (only one example of village collective action which left from the Angkorean Period (early 9th century to mid-14th century) where the cluster of villages are charged with maintaining the functioning of temples). Now these communities have to confront the hard current situation with rapid declining of surrounding forest resources and rapid changing of rice ecology and relatively unpredictable agro-climatic condition. However, the success of collective action of the latter communities is possible even though it was not rooted in a long tradition of cooperation. They also emphasized that the success of latter communities will crucially depend on external assistance.

With this recognition, the government, donors, and NGOs provided assistance to communities when necessary from the outset, but in a way to balance the necessity of intervention and not to be seen by communities as unsatisfactorily involved in communities' affairs. In the early stage of CMF development, support from external agencies such as government specialized agencies' staff working through their provincial level staff and donors are piv-

total in the performance of CMFs. Therefore the difference in motivation, competence, and activeness of the staff who is assigned to assist CMF management, partly accountable for the difference in CMF performance. However, since these variables of the extent of support from external agencies are difficult to measure directly, we use staff-evaluated frequency of visits to CMFs as a measure of the degree of their support to CMFs. However, rather than asking community members to evaluate the frequency of staff visits as used by Krishna and Uphoff (2002), we use a top-down approach to ask the staff to evaluate the frequency of their visits to reduce different subjective evaluations by each CMF head and households in the village. We believe that even though they may exaggerate their frequency of visits, the exaggeration is consistent. Molinas (1998) used the number of training courses provided to peasant committees during the last twelve months as a measure of external assistance in his study in rural Paraguay. This variable might be absurd in our study because the committees may not distinguish different NGOs which provide the training courses and the training courses may not be necessarily related to the management of CMFs. We also believe that the frequency of visits is endogenous because the staff may have a tendency to visit a CMF with characteristics which is not conducive to the successful management because of the staff's mission to help all communities to be successful. They may put more efforts to help those communities with less prospect for successful collective action.

4.2.5 Community Collective Action in Cambodia's Villages

A village in rural Cambodia is a cluster of around 40 households for small villages to more than 300 households for large villages. A village is not an administrative unit. It is one level lower than the commune level which is composed of many villages and is the lowest administrative units in Cambodia's administrative hierarchy. There are 13,046 villages in Cambodia according to the result of a population census in 2008 (NIS 2009b). The psychological boundary of a community is limited to a village and many Cambodian

anthropologists also use a village to represent a community. Kim (2011) argues that Cambodia's rural economic integration emerges most visually only at the intra-village level and that the integration does not link to outside the village. Typical caste, class, religious, or ethnic-linguistic heterogeneity, which is mainly prevalent in South Asian societies, is nearly absent in rural Cambodia. Villagers are generally composed of Khmer Buddhists from low socio-economic class and low educational levels. In our surveyed villages, on average the poverty rate is 35% ranging from 16% to 74% (NIS 2010) and the years in education of the average villager is only three in our survey.

Competing Theories of about the Causes of the Lack of Collection Action in Cambodia's Villages

The survey of literature on communities in Cambodia shares one common observation that there is lack of community collective action in Cambodia although the main reason for this vary among ethnographic studies (eg. focus on religion), ideological schools (eg. focus on Marxism), and structuralism (eg. focus on structure of production). Scholars, who analyze Cambodian society from a religious perspective, for example, tend to agree that individualism is intrinsic to Theravada Buddhism which is practiced by more than 90% of the population (Peang-Meth 1991, Colletta and Cullen 2000, p.27). Hu (1965), influenced by the Marxist school of colonial theory, argues that individualism in the Cambodian peasantry is due to the Napoleonic code of private property and inheritance system of equal sharing among all the children without consideration of order and gender. Hou (1955), another Cambodian socialist, cites capitalism as the main culprit. Both Hu and Hou reject the commonly held view that individualism is internal to Cambodian society.

However, Kiernan and Boua (1982) explain individualism among Cambodian peasants based on structuralism and attribute the individualism to the fragmented nature of the rural economy. In other words, because there was a low level of agricultural technology, there was little of the specialization and division of labor, which involves community organization

to solve problems of commodity exchange and other social conflicts. Jean Delvert even described Cambodian villages as groupings of houses in particular geographical conditions, without an *organized* community (Kiernan and Boua 1982).

Chronic civil war (1970-1998) and failed experiments of forced collectivization in two consecutive regimes, communist (1975-1979) and socialist (1979-19889) made Cambodian people even distrustful of *collectivized action*, and have made it difficult to involve villagers in community collective action (see Colletta and Cullen 2000, Hughes 2003, Gottesman 2003). Furthermore, since the late 1980s, the donor development activities and practice of *modified* patron-client relations by Cambodian party politics (Hughes 2003, pp.61—61) have substituted the role of horizontal cooperation among community members for provision of local public goods.

Taking inter-village roads in a commune and community ponds as an example, the roads and the community ponds have been built with commune funds. Until recently, the roads in a commune and the ponds were built with main contributions from politicians, donors through NGOs, and in some cases from private companies which use the roads for their own transportation. NGOs have mainly used work-for-food programs to involve villagers to contribute their labor to work on a project which directly benefits their own communities. In both of the cases, villagers rarely organize among themselves to build or repair the roads or to dig ponds they mainly use on a daily basis.

Another example includes common water wells. The wells were built in rural areas by local NGOs during the last ten years for a cluster of nearby households and in some cases for the whole villages to help villages with serious shortages of water. After the wells broke, they were abandoned and villagers did not initiate to repair them. This common wells situation was encountered while we visited our surveyed villages. This hard evidence clearly shows how low the collective action in rural Cambodia is.

Although the literature is pessimistic on Cambodia's community collective action, they do not equate community members' *individualistic* behavior as fragmented or conflictual.

Typical conflicts from caste, class, religious, or ethnic-linguistic heterogeneity, which is mainly prevalent in South Asian societies, is nearly absent in rural Cambodia's villages.

The literature also ignores to some extent the low capacity of community members and leaders in terms of income and education, the perception of a community that the provision of local public goods such as building and maintaining all roads and ponds are the responsibility of the state and more recently donors, and less necessity for community members' survival. Maintaining pagodas, contributing money to pagodas for traditional and religious ceremonies, and contributing money for funerals and *Sangkeaha*, which are perceived to be their responsibilities, are practiced without fail by villagers. Relative land and resource abundance to the population in Paul Collard (2002), rural farmers' livelihood based on subsistent rain-fed cultivation, and a more predictable climate might be main factors which make a community less necessary for survival. When it is necessary, villagers cooperate in labor sharing arrangements which are commonly observed in Africa and other Asian countries (Krishna and Sciubba 2009), and are commonplace in Cambodia when household labor is insufficient due to the seasonal nature of some activities such as rice transplanting and harvesting. Moreover, the legacy of chronic civil war and forced collectivization of *solidarity groups* have gradually disappeared. Studies by many anthropologists show that trust among people has been restored to the prewar level (before 1970).

Community Leadership

Village heads socioeconomically and educationally are not quite different from the rest of the villagers in their own village. The years in education of village heads are just four, only one year higher than the year in education of an average villager in our studied villages. The administrative capacity of Cambodian village heads is low, and villages are also small in scale. A village head informally serves as a secretary to a commune chief to channel information to other villagers and collects village basic demographic data to a commune chief. Although their educational capacity is low and role is minimal, a village head functions

as a gatekeeper. Effective and efficient communication between villagers to other higher administrative units normally go through a village head. Relatively better educated and active village heads are more likely to contribute positively to community development activities by reducing the communication cost between villagers and external agencies such as development agents or administrators. Historically, until recently village heads have been responsible for security affairs. They usually regard themselves as administrators rather than development agents. This conventionally assigned role makes village heads less likely to initiate their own village development program which involves villagers' participation. Since 2006, village heads have been officially elected by members of a commune council. This change was just a formality and legitimization of the power of elected commune councils.⁵ The position of village heads has not changed as evident in our study of villages. On average, a village head has 10 years of experience in service.

4.3 Data and Field Site Selection

4.3.1 Data

We use a CMF-level data set in 66 CMFs from Kampong Thom and Siem Reap provinces, which is shown in Table 4.1 on demography, size of a CMF, distance from the provincial city to a village involved with a CMF per household, distance from a village to a CMF; and their staff's evaluation of successful management of CMFs, frequency of their visits to a CMF, degree of people participation and problems they encountered from the year of CMF establishment, a forest's initial condition, and income inequality. We also use village-level data on the percentage of poor people in villages from data of the Program of Poor Identification under the Ministry of Planning and the Commune Database from the Ministry of Interior which generally describes village condition in terms of demography,

⁵The description of the role of village heads are based on an informal discussion with Dr. Kimchoeun Pak.

education, health care, land use, and infrastructure.

In measuring successful management of CMFs, the indicators of successful management are the four ordered variable of staff-evaluated forest growth rate (*success_forest1_4*) in 66 CMFs and the sum of staff-assessed 80 indicators of performance of CMF management committees (*mana_fao*) in 57 CMFs. (*mana_fao*) is the total score of CMF committee practical management, legal awareness, technical knowledge on forests, and their relations and communication with local governments, NGOs, and forest officers. (*success_forest1_4*) is recoded into a three ordered variable (*success_forest123*) by grouping observations in the first order with the observations in the second order due to the number of observations in the first order being too small. (*success_forest123*) or (*mana_fao*) are used alternatively for a consistency check of these two dependent variables.

(*par_v*) is an aggregate village level variable of people participation in CMFs by collapsing each household participation in CMF activities (*par_v*) in the village.

Four ordered variable (*visit1_4*), a staff evaluated variable of frequency of their visits to a CMF, is a measure of support of external agencies because data on motivation, activeness, and capacity of those external agencies' staff is difficult to measure. We reduce the number of ranking of (*visit1_4*) from four to three to create (*visit123*) because the number of observations in the first ranking is too small. So we recode observations in the first ranking into observations in the second ranking. The frequency of visits (*visit123*) is instrumented by the distance from the provincial city to a village involved with a CMF weighted by road stretch condition (*length_weight*) and the percentage of poor in each village (*poor_per*). These variables are believed to indirectly impact (*success_forest123*) or (*mana_fao*) through the frequency of visits.

Because offices of external agencies are located in each provincial city, the distance from the provincial city to a village where a CMF exists is positively correlated with the frequency of visits (*visit123*). With the still undeveloped infrastructure of some remote areas in Cambodia, we weight each stretch of the distance by road condition. When a

stretch of road is paved, we multiply that stretch by one. If a stretch of road is a bit difficult to drive, we multiply it by two. And we multiply by three when a stretch of road is very difficult to access. Given the remoteness of villages involved with CMF management, poorly served rural infrastructure, and no premium for assignment of staff to work according to the difficulty of their visits, we believe (*length_weight*) strongly determines the frequency of visits.

(*poor_per*) is the percentage of people whose livelihood condition is below the threshold set by the government. The data is collected by the Ministry of Planning to identify those eligible to access free medical services at a designated health care center. (*poor_per*) tends to positively correlate with (*length_weight*) as more remote villages in terms of accessibility tend to be poor.

(*cf_v*) is the number of villages in a CMF. In some cases, a CMF is composed of a cluster of nearby villages, up to 14 villages, in which the boundary of the CMF can not be physically demarcated. Since the coordination involved with more villages is more difficult and more time-consuming, we expect (*cf_v*) to have negative impact on successful management of CMFs. (*problem_initial_c*) is staff-evaluated problems they initially encountered when a CMF was established in a village. Overlapping the designed boundary of state forest land and private farmland claimed by people living in a village and sometimes outside the village was reported by supporting staff to be the main problem they encountered. (*problem_initial_c*) is also expected to negatively associate with successful management of CMFs.

Dummy variable for institution (*cmf_fa10*) equals one if a CMF is under the jurisdiction of the Cantonment of Forestry and zero if under the authority of the Cantonment of Fisheries. Characteristics of resources and users who depend on it are systematically different between CMFs under Forest Administration and CMFs under the Fisheries Administration in terms of the distance from a village to a CMF, degree of dependency of community members on a CMF, physical appearance of a CMF, etc.

(cf_per_hh) is the size of a CMF weighted by the number of households which are members of a CMF. The impact of (cf_per_hh) on the successful management of CMFs is expected to be non-linear. A large size of (cf_per_hh) will bring more benefits but is difficult to manage at the same time.

(vh_educ) is the years in education of village heads. Village heads, although their role is small, are gatekeepers for a village. Communication between higher administrative authorities or other external agencies and villagers normally go through a village head. We believe a higher level of education of village heads leads to more effective communication between external agencies and villagers. We choose (vh_educ) rather than the education of a CMF head which is believed to more directly impact the management of CMFs because 1) the impact of education level of a multi-village CMF head on people participation in a village is not clear; and 2) operation of a multi-level CMF is at the village level due to the federal structure of the multi-village CMF.

$(cf_distance)$ is the distance from a village to a CMF. We checked the accuracy of the estimate of $(cf_distance)$ with supporting staff and village heads. A greater distance to a CMF makes it costly for people to patrol or attend any other CMF activities and the frequency of forest encroachments is high. This variable is expected to negatively affect the successful management of CMFs.

(pop_growth) is a measure of the growth rate of the population in each village from 2007 to 2011 by using the Commune Database. A high population growth rate tends to be highly correlated with overuse of forests and the difficulty of community coordination for collective action, which negatively affects the forest growth and performance of CMF management committee respectively.

Binary variable $(inequality)$ is the staff evaluation of whether income level in a village is high or low.

Table 4.2 shows the availability of observations in our estimations. Village data usually has more observations than CMF level data because a multi-village CMF covers more than

Table 4.2: The Number of Observations in Samples of Village Level and CMF Level Data

Data type	Province	par_v	parti_fao
Village level			
success_forest123	Kampong Thom	5	5
	Siem Reap	54	83
Total		59	88
mana_fao	Kampong Thom	0	0
	Siem Reap	50	79
Total		50	79
CMF level			
success_forest123	Kampong Thom	5	5
	Siem Reap	42	61
Total		47	66
mana_fao	Kampong Thom	0	0
	Siem Reap	38	57
Total		38	57

one village. In the case of multi-village CMFs, it is inevitable for coefficients of villages in the same multi-village CMF to be highly correlated. So only one village from a multi-village CMF, which is suggested by the staff to represent all the villages in a CMF, is selected. We use a village from a CMF as a unit of analysis. In Table 4.2, observations of (*mana_fao*) cover only Siem Reap provinces.

4.3.2 Field Site Selection

Cambodian society is relatively homogeneous in terms of socio-economic class, caste, religion, ethnicity, and political economic power, but is generally observed to lack of collective action. Therefore Cambodia was chosen as our country case study for a methodological reason which can disentangle our main variable impacts from any heterogeneity effects on people participation and successful management of CMFs, and for testing competing hypotheses whether the lack of collective action is attributed to being intrinsic in a community, whose members are not willing to work together, or low community capacity. This situation is common in many developing countries where the agro-climatic condition is more

favorable and predictable.

Under Cambodia's political, administrative, and fiscal decentralization policies, natural resource management is delegated to communities. Forest management is one of the main natural resource decentralizations because it covers large land areas and directly affects the livelihood of communities near the forest. 366,000 ha of forest land area was under the CMF program in 2005 (Carson and Hou 2009). Moreover, forests' physical characteristics covering large areas makes it costly to exclude other community members from exploitation. So collective action is necessary to manage resources successfully and in a sustainable way. There are five reasons which we choose CMF management to study collective action in Cambodia.

First, although a CMF is managed by a community, it needs technical support from development organizations; and recognition and legal enforcement on any violation of a CMF from a specialized government agency. So we can study the relative role of people participation and support from external agencies in successful management of a CMF. Second, unlike savings groups in Cambodia's villages, whose memberships average five to ten households, membership of a CMF usually covers all community members in a village and the degree of participation from each member is voluntary and various, which causes the free-rider problem in any commons. Third, CMFs have large impacts on people living nearby CMFs, especially in rural developing countries, who depend on forest resources for their livelihood. Fourth, the situation of forest resources in Cambodia has changed from abundance to scarcity in the last two decades. Fifth, because the government empowers communities to take ownership of CMF management, community members become managers, contributors, and beneficiaries of CMFs. Therefore, they feel that it is their responsibility to safeguard CMFs for their own community benefits. The last two reasons—scarcity of resources and perception of community responsibility—allows for testing the competing hypotheses of reasons for lacking collective action in Cambodia whether its lack is intrinsic in a community itself, or due to the low capacity of a community.

The Northern Tonlé Sap region, which includes Siem Reap and Kampong Thom provinces, is chosen because this region well represents Cambodia in CMF management. This is because 1) the Northern Tonlé Sap region has all three institutions of CMFs. As a result, this property allows for controlling the impact of institutions of CMFs; 2) a landscape of rice fields is commonplace in rural Cambodia. Siem Reap and Kampong Thom provinces mainly subsist on rain-fed rice cultivation, which is typical of the Cambodian rural socio-economy; 3) topology and population density are diverse stretching from high mountainous and low population density areas to low river and high population areas; 4) the region has a comparatively wide range of years in experience with CMF management ranging from 1997 to 2006. While Cambodia's experience with CMF management is relatively new, the ten year period is relatively large, which in some extent can mitigate the shortcomings of the data set to test learning effect on CMF management.

Village level is chosen to study, although some CMFs cover more than one village because the operational level of a CMF is at the village level due to its federal structure, a village is free from administrative structure, and the psychological boundary of a community is a village.

Table 4.3: Definition of Variables of Successful Determinants of CMFs

Variable label	Variable Definition
<i>success_forest123</i>	Staff-evaluated forest growth rate 3 the fastest 1 the slowest
<i>mana_fao</i>	Staff-evaluated management index of performance of CMF management committee
<i>visit123</i>	Staff-evaluated frequency of visits by supporting staff 3 most frequent 1 least frequent
<i>parti_fao</i>	Staff-evaluated degree of people participation in a CMF
<i>par_v</i>	Total <i>par</i> in the village by collapsing (<i>par</i>) in each village
<i>length_weight</i>	Total distance from a provincial city to a village involved with a CMF weighted by road stretch condition
<i>poor_per</i>	Percentage of poor people in the village
<i>cmf_fa10</i>	Institution manages CMFs 1 if managed by FA 0 if by Fia
<i>problem_initial_c</i>	Initial degree of problem facing CMF establishment 3 much 2 medium 1 little
<i>cf_v</i>	No of villages in a CMF
<i>vh_educ</i>	Village head education (in years)
<i>cf_per_hh</i>	Size of a CMF per household
<i>forest_initial</i>	Initial quality of forest 1 quite good 0 not so good
<i>cf_dist</i>	Distance from a village to a CMF (in Km)
<i>pop_growth</i>	Population growth from 2007 to 2011
<i>inequality</i>	Village inequality 1 high 0 low

4.4 Research Methodology and Estimation Strategy

4.4.1 Research Methodology

We test determinants of successful management of CMFs, forest growth (*success_forest123*) and the performance of CMF management committees (*mana_fao*). (*success_forest123*) is an ordered variable, so we use the ordered probit estimation. But we use simple regression to estimate (*mana_fao*), which has large variation across CMFs from 71 to 182 covering a wide range of scores. (*visit123*), one of our main independent variables, is expected to be highly correlated with other unexplained factors which are also correlated with (*success_forest123*) or (*mana_fao*), are instrumented with two instrumental variables such as (*length_weight*) and (*poor_per*). One would expect both instrumental variables to be associated with (*visit123*), but they do not have any independent effect on (*success_forest123*) or (*mana_fao*).

Table 4.4: Summary Statistics of Variables of Successful Determinants of CMFs

Variable label	Obs	Mean	Std. Dev.	Min	Max
success_forest123	66	1.79	0.67	1.00	3.00
mana_fao	57	111.10	26.42	71.25	182.00
visit123	66	1.53	0.68	1.00	3.00
parti_fao	66	2.11	0.68	1.00	3.00
par_v	47	0.02	0.70	-1.33	1.97
length_weight	66	69.87	46.03	8.00	180.00
poor_per	66	0.33	0.15	0.09	0.74
cmf_fa10	66	0.67	0.48	0.00	1.00
problem_initial_c	66	1.66	0.73	1.00	3.00
cf_v	66	2.95	3.21	1.00	14.00
vh_educ	66	4.38	2.22	0.00	10.00
cf_per_hh	66	3.61	6.77	0.05	52.00
forest_initial	66	1.39	0.49	1.00	2.00
cf_dist	66	2.46	2.56	0.00	15.00
pop_growth	66	0.08	0.15	-0.47	0.46
inequality	66	1.26	0.44	1.00	2.00

At first glance, (*length_weight*) and (*poor_per*) directly impact (*success_forest123*) or (*mana_foa*) because physically remote areas and poor villages (which tend to overlap) tend to depend on forests for their energy consumption and livelihood more than near distant and richer villages. However, the mean of (*length_weight*) is about 70 Km from the provincial city and almost all villages only can be accessed by secondary roads. In our study villages, only four villages of CMFs located in a territory under Fia jurisdiction are located around 10 Km from the provincial city. However, the four villages are also remote and the pattern of energy consumption is not different from other villages. According to NIS (2009a), firewood and charcoal consumption for cooking in Siem Reap province accounts for 86.43% and 4.95% respectively while the consumption in Kampong Thom province is 94.25% and 4.01% respectively. The firewood and charcoal consumption in Cambodia is 83.61% and 7.47% respectively, which is less variation. Moreover, people in our study are mainly subsistent rain-fed rice producers and all forests in theses area are degraded forests. So we argue that dependency on forest resources is not systematically different between rich and near distant villages and poor and far distant villages.

4.4.2 Estimation Strategy

We use the framework in Cameron and Trivedi (2009, p. 512). The ordered dependent variables of (*success_forest123*) which arise orderly as a latent variable, y^* , across progressively higher thresholds. y^* is an unobserved measure of (*success_forest123*). For village i , we specify

$$y_i^* = X_i' \beta + u_i$$

For very low (*success_forest123*), (*success_forest123*) is one ; for $y^* > \alpha_1$, (*success_forest123*) is two; and $y^* > \alpha_2$, (*success_forest123*) increases to three. For the m ordered model, we define

$$y_i = j \text{ if } \alpha_{j-1} < y_i^* \leq \alpha_j, j = 1, \dots, m$$

where $\alpha_0 = -\infty$ and $\alpha_m = \infty$. Then

$$\begin{aligned} Pr(y_i = j) &= Pr(\alpha_{j-1} < y_i^* \leq \alpha_j) \\ &= Pr(\alpha_{j-1} < X_i' \beta + u_i \leq \alpha_j) \\ &= Pr(\alpha_{j-1} - X_i' \beta < u_i \leq \alpha_j - X_i' \beta) \\ &= F(\alpha_j - X_i' \beta) - F(\alpha_{j-1} - X_i' \beta) \end{aligned}$$

where F is the cumulative distribution function (c.d.f) of u_i . The regression parameters, β , and the $m - 1$ thresholds parameters, $\alpha_1, \dots, \alpha_{m-1}$ are obtained by maximizing the log likelihood with $P_{ij} = Pr(y_i = j)$ as defined above. Stata excludes an intercept from the regressors. For the ordered probit model, u is standard normally distributed with $F(\cdot) = \Phi(\cdot)$, the standard normal c.d.f. The sign of the regression parameters, β , can be immediately interpreted as determining whether the latent variable, y^* , increases with the

regressor. If $\beta > 0$, an increase in x_{ij} necessarily decreases the probability of being in the lowest category ($y_i = 1$) and increases the probability of being in the highest category ($y_i = m$).

The four specifications of our estimations for two dependent variables ((*success_forest123*) and (*mana_fao*)) with two types of people participation ((*parti_fao*) and (*par_v*)) are:

$$success_forest123_i = visit123_i\beta_1 + parti_fao_i\beta_2 + control\ variables_i\beta_3 + u_i \quad (4.1)$$

$$success_forest123_i = visit123_i\beta_1 + par_v_i\beta_2 + control\ variables_i\beta_3 + u_i \quad (4.2)$$

$$mana_fao_i = visit123_i\beta_1 + parti_fao_i\beta_2 + control\ variables_i\beta_3 + u_i \quad (4.3)$$

$$mana_fao_i = visit123_i\beta_1 + par_v_i\beta_2 + control\ variables_i\beta_3 + u_i \quad (4.4)$$

Equation (4.1) has 66 observations; (4.2) 47 observations; (4.3) 57 observations; and (4.4) 38 observations.

When there is correlation between (*visit123_i*) and residue u_i , $corr(visit123_i, u_i) \neq 0$. (*visit123*) is expected to be endogenous. So (*visit123_i*) is instrumented with two instrumental variables X_{IV_i} .

$$visit123 = X_{IV_i} \pi_1 + control\ variables \pi_2 + v_i$$

where $corr(X_{IV_i}, v_i) = 0$

4.5 Econometric Results

Table 4.5 to Table 4.7 show the results of (*success_forest123*); and Table 4.8 to Table 4.9 show the results of the determinants of (*mana_fao*). In Table 4.5, we test the endogeneity of (*visit123*) by using Durbin-Wu-Hausman (DWH) test (see Cameron and Trivedi 2009,

p. 182-4). Table 4.6 reports that first stage results by regressing (*visit123*) on instrumental variables and all independent variables. Table 4.7 shows the determinants of forest growth using the predicted value of (*visit123*) when (*visit123*) is endogenous, and comparing to the results that treat (*visit123*) as an exogenous variable.

We also test the determinants of forest growth by excluding the sample of five CMFs in Kampong Thom province and the results are largely unchanged from the results with full sample from both Siem Reap and Kampong Thom provinces. So the results which exclude 5 CMFs from Kampong Thom province were not reported, and we use Table 4.7 to interpret the results since it has more observations.

In all estimations, (*visit123*) is endogenous when instrumented with instrumental variables (*length_weight*) and (*poor_per*). Therefore we use column (1) and column (3) in Table 4.7 to interpret our results and compare them to column (2) and column (4) which treat (*visit123*) as exogenous respectively. This shows that we underestimate the effect of (*visit123*) on forest growth due to the endogeneity of (*visit123*). Our interpretation is that a staff tends to pay more visits to CMFs with characteristics that negatively affect forest growth. At the same time, the coefficient of (*parti_fao*) in column (1) in Table 4.7 declined a bit to 1.59 in column (2) from 2.54, but were still at the 1% significant level, and (*par_v*) in column (3) in Table 4.7 declined to 0.18 in column (4) from 0.21 and were less significant respectively. This confirms that even in the collective action with involvement from external agencies people participation still plays an important role in the successful determinants of CMFs. Comparing column (1) with column (2) and column (3) with column (4), the magnitude and significant level of (*visit123*) increase in column (1) and column (3). The magnitude of (*visit123*) in column (1) and column (3) increases to 2.47 and 3.36 at the 1% significant level from 1.87 at 1% significant level, and 1.07 at 10% significant level respectively.

This finding will also contribute to the study of collective action, which is usually focused on how community members interact with one another without any intervention by

external agencies. According to Molinas (1998), this approach, which is influenced by non-cooperative game theory, may obscure the possible contributions by external agencies. In his study of impacts of external agencies on peasant committees in Paraguay, the impact of external assistance is non-linear with an inverted U-shaped form which is caused by the net results between positive effects of external assistance in providing training courses and its negative effects that the training courses do not address the local community interest. He further explains that the negative effects rest on the assumption that there are different priorities between local communities and the external agencies. Our result may not be contradictory with his findings because external agencies only assist a community in the establishment of a CMF without crowding out the advantages which community members had such as information on community preference, resources and endowments, and informal networks among community members.

In Table 4.8 and Table 4.9, the dependent variable is (*mana_foa*) which is highly correlated with (*success_forest123*). This variable can be used to check the consistency of (*success_forest123*), a variable evaluated by a supporting staff. There is very consistent between measures of successful management of CMFs on main independent variables, (*visit123*) and people participation.

Table 4.8 shows the first stage results for testing endogeneity of (*visit123*) by using DWH test and Table 4.9 reports the estimation results of determinants of performance of CMF management committee in column (1) and column (3) by comparing to the estimate results which ignore the endogeneity of (*visit123*) in column (2) and column (4).

Columns (1) and (2) in Table 4.9 compare the coefficients when (*visit123*) is instrumented in (1) and when (*visit123*) is not instrumented in (2) by using (*parti_fao*) as a measure of people participation. Similarly, (3) and (4) in Table 4.9 compare the coefficients when (*visit123*) is instrumented in column (3) and when (*visit123*) is not instrumented in column (4) by using (*par_v*) as a measure of people participation at village level.

There are similar patterns of coefficients of main independent variables and (*visit123*)

is also endogenous. Both measures of people participation (*parti_fao*) and (*par_v*) are positively correlated with (*success_forest123*) or (*mana_foa*) as expected. This confirms role of people participation in collective action and shows the consistency between household response (*par_v*) and supporting staff evaluation (*parti_fao*).

In Table 4.7, (*inequality*) negatively affects (*success_forest123*) whether we use (*parti_fao*) or (*par_v*) as people participation. Higher inequality in a village makes co-operation more difficult. Education level of village head positively contributes to (*success_forest123*) when we use (*par_v*) as people participation while it is not significant when using (*parti_fao*) as people participation. (*cf_v*) and (*cmf_fa10*) negatively affect (*success_forest123*) as expected while (*problem_initial_c*), (*forest_initial_fao*), (*cf_distance*), (*pop_growth*), and (*cf_per_hh*) are not significant.

4.6 Concluding Remarks

The frequency of visits by a supporting staff has highly significant effects on both measures of successful management of CMFs. When the frequency of visits is instrumented by distance from a provincial city to a village involved with a CMF, weighted by the difficulty of road accessibility and the percentage of poor people in a village, the impact of the frequency of visits increases. This reflects that the staff tends to pay more visits to CMFs with characteristics which negatively affect forest growth and performance of a management committee. So the role of a supporting staff is even more important in the case where the capacity of a community is still weak which tend to locate in physically remote and poor villages as in the case of Cambodia's communities.

In this chapter, we also show that both measures of people participation, whether evaluated by a supporting staff or by responded by households, play a critical role in both forest growth and performance of CMF management committees. This measure of people participation contributes positively to successful management of CMFs even with the pres-

Table 4.5: Endogeneity Test of Visit123 in the Determinants of *success_forest123*

	(1)	(2)	(3)	(4)
	ENDO1	ENDO2	ENDO3	ENDO4
visit123	4.592*** (3.10)	4.981*** (3.02)	3.452** (2.51)	3.727** (2.40)
res	-2.131** (-2.03)	-2.605** (-2.10)	-3.521** (-2.12)	-4.169** (-2.19)
problem_initial_c	-0.100 (-0.21)	-0.181 (-0.35)	-0.317 (-0.70)	-0.332 (-0.64)
cf_v	-0.547** (-2.05)	-0.561* (-1.96)	-0.000319 (-0.00)	-0.0328 (-0.21)
cmf_fa10	-3.817** (-2.16)	-3.392* (-1.91)		
parti_fao	2.991** (2.56)	2.858** (2.53)		
par_v			1.786** (2.29)	1.487* (1.87)
vh_educ	0.142 (0.92)	0.191 (1.16)	0.387** (2.23)	0.453** (2.12)
forest_initial_fao	-0.654 (-0.96)	-0.818 (-1.08)	-0.262 (-0.35)	-0.233 (-0.26)
cf_dist	-0.342* (-1.68)	-0.336 (-1.59)	-0.403* (-1.91)	-0.344 (-1.63)
pop_growth	-0.0586 (-0.03)	-0.264 (-0.13)	2.366 (0.80)	2.382 (0.77)
inequality	-3.443** (-2.49)	-3.966** (-2.38)	-3.650** (-2.51)	-3.671** (-2.49)
cf_per_hh	0.0358 (0.63)	0.0521 (0.89)	0.0632 (0.38)	0.0341 (0.20)
cut1				
_cons	1.548 (0.60)	1.293 (0.47)	-0.794 (-0.38)	-0.208 (-0.08)
cut2				
_cons	8.636** (2.40)	8.536** (2.39)	4.432* (1.81)	5.089* (1.67)
<i>N</i>	66	61	47	42
Pseudo R2	0.7163	0.7133	0.6978	0.6933

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

(1)-(4) Instrumented: visit123 ; IVs: length_weight and poor_per

Table 4.6: First Stage Results of Endogeneity Test of *visit123*

	(1)	(2)	(3)	(4)
	first1	first2	first3	first4
length_weight	-0.00715*** (-3.35)	-0.00668*** (-2.98)	-0.00243 (-1.10)	-0.00272 (-1.20)
poor_per	-1.020* (-1.77)	-0.847 (-1.41)	-2.266*** (-3.82)	-2.030*** (-3.30)
problem_initial_c	0.0949 (0.84)	0.0524 (0.42)	0.140 (1.29)	0.0655 (0.55)
cf_v	-0.0184 (-0.54)	-0.0220 (-0.63)	-0.00818 (-0.18)	0.00582 (0.13)
cmf_fa10	0.0937 (0.34)	-0.0384 (-0.13)		
parti_fao	0.365*** (2.84)	0.358** (2.59)		
par_v			0.368*** (3.15)	0.357*** (2.88)
vh_educ	0.00664 (0.15)	-0.0215 (-0.42)	-0.00790 (-0.21)	-0.0501 (-1.11)
forest_initial_fao	0.405** (2.09)	0.303 (1.40)	0.216 (1.06)	0.0710 (0.31)
cf_dist	-0.0242 (-0.70)	-0.0188 (-0.52)	-0.0811** (-2.26)	-0.0764** (-2.07)
pop_growth	-0.406 (-0.76)	-0.311 (-0.56)	-0.295 (-0.57)	-0.215 (-0.41)
inequality	0.206 (1.00)	0.290 (1.25)	-0.0305 (-0.15)	-0.0313 (-0.15)
cf_per_hh	-0.00410 (-0.31)	-0.00445 (-0.33)	-0.0514 (-1.13)	-0.0353 (-0.73)
_cons	0.682 (1.12)	0.917 (1.35)	2.427*** (4.43)	2.742*** (4.50)
<i>N</i>	66	61	47	42
r2	0.413	0.379	0.549	0.537

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

(1)-(4) First stage equation for *visit123* as a dependent variable

Table 4.7: The Determinants of *success_forest123* in Siem Reap and Kampong Thom

	(1) IV1	(2) oprobit1	(3) IV2	(4) oprobit2
visit123hat	2.645*** (3.43)		6.713** (2.00)	
visit123		2.461*** (3.16)		2.074* (1.90)
cf_v	-0.211* (-1.79)	-0.577** (-2.08)	-0.837** (-2.09)	-0.518* (-1.69)
cmf_fa10	-1.488* (-1.75)	-3.906** (-2.33)	-9.401** (-2.11)	-5.993** (-2.12)
parti_fao	1.643*** (2.82)	3.336*** (3.01)		
par_v			0.226** (2.19)	0.219*** (2.84)
vh_educ	0.102 (0.85)	0.112 (0.79)	0.588** (2.27)	0.391** (2.20)
inequality	-1.995*** (-2.69)	-1.924** (-2.23)	-4.145* (-1.67)	-1.913** (-2.09)
cut1				
_cons	1.660 (1.02)	1.306 (0.56)	-2.848 (-0.61)	-2.808 (-0.79)
cut2				
_cons	5.523*** (2.97)	7.430** (2.35)	7.273* (1.77)	3.001 (0.95)
<i>N</i>	66	66	47	47
Pseudo R2	0.5850	0.6798	0.7786	0.7000

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

(1) & (3) Instrumented: visit123 ; IVs: length_weight and poor_per

(2) & (4) visit123 is treated as exogenous

ence and the necessity to work with supporting staff. This contributes to prove that the lack of collective action is attributed to low capacity of a community rather than low social capital of a community. So people participation and assistance from external agencies are complementary rather than exclusive. One policy implication here is that locating staff at a district center, which is always at a near and equal distance to any village in a district rather than at the provincial city makes the probability of successful management of a CMF much higher. The policy of the external agencies' staff do not disturb or intend to lead communities, they try to utilize the existing strength of a community but simultaneously help improve the weak point of communities. So the synergy approach of Woolcock and Narayan (2000) which recognizes the synergy between community participation and assistance from external agencies is appropriate for collective action and general development issues. It does not necessarily contradict the communitarianism of Woolcock and Narayan (2000) either. In addition, communities, due to their low capacity, may not be able to afford building a link with the higher administrative authorities, therefore external agencies have to go to build a link with and assist communities to successfully organize collective action.

Table 4.8: First Stage Results of Endogeneity Test of *visit123*

	(1) first1	(2) first2
length_weight	-0.00715*** (-3.35)	-0.00243 (-1.10)
poor_per	-1.020* (-1.77)	-2.266*** (-3.82)
problem_initial_c	0.0949 (0.84)	0.140 (1.29)
cf_v	-0.0184 (-0.54)	-0.00818 (-0.18)
cmf_fa10	0.0937 (0.34)	
parti_fao	0.365*** (2.84)	
par_v		0.368*** (3.15)
vh_educ	0.00664 (0.15)	-0.00790 (-0.21)
forest_initial_fao	0.405** (2.09)	0.216 (1.06)
cf_dist	-0.0242 (-0.70)	-0.0811** (-2.26)
pop_growth	-0.406 (-0.76)	-0.295 (-0.57)
inequality	0.206 (1.00)	-0.0305 (-0.15)
cf_per_hh	-0.00410 (-0.31)	-0.0514 (-1.13)
_cons	0.682 (1.12)	2.427*** (4.43)
<i>N</i>	66	47
r2	0.413	0.549

t statistics in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

(1) First stage equation for *visit123* with *parti_fao* as a measure of people participation

(2) First stage equation for *visit123* with *par_v* as a measure of people participation

(1)-(2) Instrumented: *visit123* ; IVs: *length_weight* and *poor_per*

Table 4.9: The Determinants of *mana_fao*

	(1)	(2)	(3)	(4)
	IV3	reg3	IV4	reg4
visit123	25.22*** (2.59)	11.48*** (2.92)	26.48*** (2.67)	7.569 (1.40)
problem_initial_c	2.341 (0.61)	3.093 (0.82)		-4.067 (-0.94)
cf_v	0.0685 (0.07)	0.187 (0.18)		3.800** (2.27)
cmf_fa10	3.943 (0.39)	-2.366 (-0.26)		
parti_fao	20.92*** (3.35)	27.67*** (6.22)		
par_v			11.77* (1.81)	20.21*** (4.11)
vh_educ	-1.351 (-0.81)	-2.098 (-1.32)	1.646 (1.00)	0.284 (0.17)
forest_initial_fao	-0.746 (-0.13)	-0.464 (-0.08)	0.165 (0.02)	-0.368 (-0.05)
cf_dist	-0.132 (-0.13)	0.0369 (0.04)	0.0454 (0.04)	-0.748 (-0.63)
pop_growth	-18.58 (-1.12)	-16.66 (-1.01)	-23.49 (-1.20)	-20.34 (-1.07)
inequality	-7.296 (-0.84)	0.220 (0.03)	-6.004 (-0.69)	-4.204 (-0.52)
cf_per_hh	-0.335 (-0.77)	-0.587 (-1.47)	0.943 (0.55)	0.0109 (0.01)
_cons	34.23* (1.78)	36.67* (1.92)	72.02*** (2.96)	106.4*** (5.04)
<i>N</i>	57	57	38	38
r2_a	0.5100	0.6256	0.4600	0.5532

t statistics in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

(1) & (3) Instrumented: visit123 ; IVs: length_weight and poor_per

(2) & (4) *visit123* is treated as exogenous

DWH test of endogeneity: (1) $F(1, 46) = 3.33494$, $p = 0.0678$

DWH test of endogeneity: (3) $F(1, 26) = 4.13571$, $p = 0.0420$

Chapter 5

Conclusions

It is a common perception of development practitioners and policy makers that Cambodian villages lack collective action; villagers are not willing to cooperate and prefer to make decisions independently. The practitioners and policy makers tend to ascribe the lack of collective action to a lack of social capital, which resonates well with many perspectives based on supporting theories, especially when referring to the more recent Civil War (1970-1998) in Cambodia, without paying due attention to other causes such as low capacity of a community in terms of education and income, the necessity of collective action for community members to survive, and perception of community members about the responsibilities of the state and donors for providing local public goods.

Indeed, community knowledge of institutional building, leadership, and ecological processes of community resources and community responsibilities for environmental destruction and protection are inadequate. The evolutionary hypothesis of having a less critical need for collective action (the necessity for collective action) is indeed relevant to the situation of community collective action in Cambodia. Based on this hypothesis, however, the prospects for successful collective action are not promising for communities in Cambodia. Without having experience in collective action, the sudden challenges under rapidly changing agro-climatic and natural resource endowments prevent community members from gradually

learning to find adequate institutional responses to the sudden change of environment. In such circumstances, technical support in terms of institutional building, more sophisticated knowledge on resource conditions, conflict resolution, and law enforcement to protect communities from internal and external encroachment on their resources are absolutely needed.

Cambodia's decentralization policy to empower community members to take ownership of local natural resources and local physical infrastructure would affect perception of community members that it is their responsibility to safeguard local natural resources and contribute labor and money to build and maintain local physical infrastructure. Under government policy, communities are responsible for managing these local collective action.

In addition, due to the mission of development practitioners and policy makers to assist communities to build collective action with a high level of coordination (maintaining roads and irrigation systems and natural resource management), they tend to ignore mutual help, which continues to survive without any involvement from external agencies. Obviously, the bias from ignoring mutual help as a kind of community collective action forms their pessimistic perception on community collective action in Cambodia that low social capital accounts for the lack of community collective action.

This dissertation is systematically done to empirically test the hypothesis of the cause of a lack of collective action in rural Cambodia by using community mutual help (contributions in *Sangkeaha* and funerals) and local management of commons (forests). Mutual help is community collective action without any involvement from external agencies while local management of commons is community collective action with involvement from external agencies. However, external intervention is as minimal as possible to leave space for communities to learn from working with less support and to utilize their comparative advantage in some local knowledge on community resource conditions, preference, and perceived equitable benefit sharing rule. This approach of minimal external involvement is consistent with the synergy view in the typology of Woolcock and Narayan (2000), in which a community acts as implementers with external agencies as technical assistants and policy advisors.

In this overall conclusion, we would like to bring into focus the role of social capital in these forms of collective action, where it is necessary for community members' survival, and the perception of community members that contribution to these forms of collective action is their responsibility. The results of these empirical studies reveal that lack of collective action in Cambodia is attributed to low capacity of communities rather than low social capital, which is intrinsic in a community itself. Social capital is one of the main determinants of people participation in community collective action, and in turn, people participation plays a very important role in the successful management of community collective action, whether with or without the presence of external agencies. Moreover, the support of external agencies is even more important when the capacity of a community is still weak and are located in remote and poor villages.

The findings in this doctoral dissertation provide many lessons learned which can be drawn for policy implications. Therefore, the contribution of the doctoral dissertation for policy implications can be summarized in order of the chapters as follows:

In chapter two, the study of mutual help—contributions in *Sangkeaha* and funerals which are based on volunteer, reciprocity, and personal relations—is interesting in itself. Indeed, it appears to us that contributions in *Sangkeaha* and funerals are understudied in the literature of collective action. It survives the chronic Civil War in Cambodia and transformation of communities to more modernity and marketization of exchange in communities. More importantly, the study reveals that rural Cambodia's villages are not fragmented by a cluster of kin groups to the degree suggested by some pessimists of community collective action in Cambodia. In deed, social capital functions as a link to socially connect community members across kin groups. For community collective action, community members assist each other when necessary. This norm of mutual help is evolving from the necessity for interdependency among community members who can hardly afford the expense of health treatments and funerals by one household alone.

In funerals, however, villagers depend more on contributions from relatives living outside

the village than contributions from households living in the same village because the income level of villagers is still low. Heavy dependency of community members on relatives living outside the village (usually in Phnom Penh, the capital city) supports the argument that community capacity to cope with its own problems is still weak. The findings in the study of mutual help also contribute to the study of the community norm of reciprocity, notably by anthropologists and sociologists which tend to take into account whether community members reciprocate rather than at what intensity they reciprocate. For experimental game, we use the data in a natural experiment of contributions in *Sangkeaha* and funerals, rather than self-reporting of a respondent's contributions, to validate the measure of risk-taking behavior in a laboratory.

The policy implication in this chapter is that group setup in a village should be built along personal relations in which they trust and are willing to assist each other. Therefore, development practitioners should propose to villagers to initiate potential group members whom they are willing to be with, rather than arrange a group for them, to take advantage of their personal attachments, rather than clustering villagers along neighborhood even though neighbors tend to have good personal relations, and sometimes are relatives.

In chapter three, the study of people participation in CMF activities shows that social capital plays an important role in people participation in CMF activities after controlling users' household characteristics and the users' interaction with forest resources. Social capital also has positive externalities within a village. We also find that measuring social capital by positive evaluation of their community members' interactions in terms of trust, helpfulness, and fairness is validated by more objective measures of social capital, and social capital itself is more of characteristics than social pressure. The policy implication in this chapter is that both exploiting existing social capital and building social capital, if it is lacking, are strategies for the successful management of community collective action because social capital has a positive impact on people participation, and social capital has positive externalities within the village. Development practitioners must not crowd out

existing social capital because it takes a very long time to build social capital with a nature of characteristics.

In chapter four, the study of determinants of successful management of community-managed forests in Cambodia reveals that the frequency of visits by a supporting staff has highly significant effects on successful management of CMFs. When the frequency of visits is instrumented by distance from a provincial city to a village involved with a CMF, weighted by the difficulty of road accessibility and the percentage of poor people in a village, the impact of the frequency of visits increases. This reflects that the staff tends to pay more visits to CMFs with characteristics which negatively affect successful management of CMFs. So the role of a supporting staff is even more important in the case where the capacity of a community is still weak as in the case of communities in rural Cambodia.

In this chapter, people participation plays a critical role in successful management of CMFs. People participation contributes positively to successful management of CMFs even with the presence and the necessity to work with supporting staff. So people participation and assistance from external agencies are complementary rather than exclusive. One policy implication in this chapter is that locating staff at a district center, which is always at a near and equal distance to any village in a district rather than at the provincial city makes the probability of successful management of a CMF much higher.

The synergy approach of Woolcock and Narayan (2000) which recognizes the synergy between community participation and assistance from external agencies is appropriate for community collective action and general development issues in Cambodia when external agencies try to utilize the existing strength of a community and simultaneously help improve the weak point of communities. It does not necessarily contradict the communitarianism of Woolcock and Narayan (2000) which places much more importance on communities themselves for the role of development. In addition, communities, due to their low capacity, may not be able afford building a link with external agencies, therefore external agencies should go to assist communities and at the same time help communities to build a link with

the higher administrative authorities and development practitioners.

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