



# Community Empowerment for Sustainable Natural Management, and Securing Forest and Land Tenures

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## សង្ខេប

ការស្រាវជ្រាវនេះ មានគោលបំណងបង្ហាញពីការពង្រឹងសិទ្ធិអំណាចសហគមន៍ក្នុងការគ្រប់គ្រងធនធានធម្មជាតិ និងនិរន្តរភាពនៃការគ្រប់គ្រងដីនិងព្រៃឈើរបស់សហគមន៍ជនជាតិដើមភាគតិចក្នុងខេត្តក្រចេះ ដោយផ្ដោតទៅលើ៖ (១) ការអភិវឌ្ឍសេដ្ឋកិច្ច, (២) ការផ្សព្វផ្សាយពីការការពារព្រៃឈើ, (៣) ការផ្សព្វផ្សាយពីការការពារព្រៃឈើ, (៤) ទស្សនៈរបស់សហគមន៍ក្នុងតំបន់នោះលើការអភិវឌ្ឍសហគមន៍។ ជាមួយគ្នានេះ ការស្រាវជ្រាវបានបង្ហាញថា មិនមានទំនាក់ទំនងគ្នារវាងផលប៉ះពាល់អវិជ្ជមាននៃការធ្លាក់ចុះនូវផលិតផលព្រៃឈើ និង ការរួមចំណែករបស់អនុផលព្រៃឈើលើជីវភាពរបស់សហគមន៍ឡើយ។ ជាងនេះទៅទៀត ទាំងជនជាតិដើមភាគតិចក្រោល និងទាំងប្រជាជនខ្មែរបានបង្ហាញការពេញចិត្តកម្រិតមធ្យមទាក់ទងនឹងសិទ្ធិក្នុងការគ្រប់គ្រងដីជនជាតិដើមភាគតិច និងព្រៃឈើ ការពង្រឹងសមត្ថភាព និងយន្តការនៃការគាំទ្រដែលលើកឡើងដោយអាជ្ញាធរពាក់ព័ន្ធជាប្រសិនបើអភិវឌ្ឍន៍ជនបទ, ក្រសួងមហាផ្ទៃ, និងក្រសួងរៀបចំដែនដីនគរូបនីយកម្ម និងសំណង់។ មិនតែប៉ុណ្ណោះ ការពេញ

ចិត្តចំពោះសកម្មភាពដែលផ្តល់ដោយអង្គការក្រៅរដ្ឋាភិបាលត្រូវបានបង្ហាញថាស្ថិតក្នុងកម្រិតមធ្យម។ ចំពោះបម្រែបម្រួលអាកាសធាតុ និងការផ្លាស់ប្តូរសង្គម ទាំងប្រជាជនខ្មែរ និងជនជាតិក្រោលយល់ឃើញថា ការប្រែប្រួលអាកាសធាតុប៉ះពាល់យ៉ាងខ្លាំងលើជីវភាពរស់នៅរបស់ពួកគេ ដោយសារតែភាពរឹងស្មុតមានរយៈពេលយូរ និងកំដៅកើនឡើង។ ការធ្លាក់ចុះនៃធនធានព្រៃឈើ និងការប្រែប្រួលកម្រិតទឹកទន្លេត្រូវបានវាយតម្លៃថាមានផលប៉ះពាល់ខ្ពស់បំផុត។ រីឯ ផលប៉ះពាល់នៃការផ្លាស់ប្តូរសង្គមទៅលើជីវភាពរស់នៅត្រូវបានកំណត់ថាមានកម្រិតខ្ពស់ ក្នុងលក្ខខណ្ឌនៃការចំណាយ ម្ហូបអាហារ តម្លៃថ្លៃ ការធ្លាក់ចុះចំណូលក្នុងគ្រួសារ ការជះឥទ្ធិពលដោយវិបត្តិសកលលោក អសន្តិសុខស្បៀង និងការទទួលបានការអប់រំរបស់កុមារនៅមានកម្រិត។

## ABSTRACT

This action research aims to explore community empowerment for sustainable natural management, and securing forest and land tenures for Indigenous People (IP) in Kratie by focusing on: (a) socio-economic characteristics; (b) engagement of IPs in forest management; (c) awareness of forest management; and, (4) local perceptions of community development. Overall, the household survey reveals there was no relationship between negative effects of a decline in forest products and the contribution of Non-Timber

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Forest Products (NTFPs) to livelihoods. In addition, both Kroul people and Khmer people rated their degree of satisfaction to be moderate regarding rights over Collective Land Titling Community (CLT) Community Forestry, capacity building, and supporting mechanisms carried out by key stakeholders including the Ministry of Rural Development (MoRD), the Ministry of Interior (Mol), and the Ministry of Land Management, Urban Planning and Construction (MLMUPC). Moreover, the degree of satisfaction with activities delivered by NGOs was rated as moderate. In relation to climate change and social change, both Khmer people and Kroul people viewed climate change to have a very significant effect on livelihoods due to unexpected droughts, and increases in temperature. The effect of decline in forest products, and water level were also assessed to have a high impact. At the same time, effects of social changes on livelihoods were rated to have a high impact as well, in terms of high prices for food consumption, declines in household incomes, food insecurity, impacts of global crises, and limited access to education for children.

## 1. Introduction

Due to its high level of dependency on natural resources and low adaptive capacity to the negative impact from climate change, Cambodia has been considered as one of the countries most affected by natural hazards (Yusuf & Fransisco, 2009). Approximately 90% of the country's poor live in rural areas and rely upon agriculture for their food and income activities (MoP, 2013). Today, natural resource-dependent communities are facing increased pressure to obtain the water needed for agricultural production due to climate change (Eastham et al., 2008) and due to hydropower construction in Laos which has decreased mainstream flow causing more extreme droughts (Bakker, 1999).

According to the Mekong River Commission (MRC), the high degree of dependence upon natural resources for villagers' livelihoods and income activities makes for substantial vulnerability to any decline in the resource availability, quality and diversity (MRC, 2010). According to the 2019 Human Development Report for Cambodia, sustaining natural resources is vital for economic growth and social development. Unfortunately, natural resources such as forests have been declining rapidly. For example, Cambodia's forest covers shrunk from 73% to only about 47%; deforestation was mainly caused by rising demand for wood for construction as well as for use as firewood and charcoal (UNDP, 2019).

Indigenous People (IP) have lived in Cambodia for generations and they are mostly found in the northeast and northwest provinces, for example Ratanakiri, Monduliri, Kratie, Stung

Treng, Preah Vihear and Kampong Thom etc. The latest census figures show the number of IP is approximately 1.2% of the country's total population. In the past, IPs practiced shifting to cultivation and collection of non-timber forest products to support their livelihoods. However, from the late 2000s, they have changed to sedentary agriculture and growing strategic crops due to the availability of land and to market demand. With the pressures on their land tenure from land concessions, immigration and land encroachment, some indigenous communities (such as La En, La En Kraen, Pou Trom, among others) have turned to collective land title registration.

The Royal Government of Cambodia (RGC) has recognized IP's rights to their land by enabling them to register collective ownership over this resource through Indigenous Collective Land Titling (CLT). Registering collective ownership of a community's land is generally appealing to IPs. This is because registration is designed to give them secure tenure to most of their traditional land, and therefore to enable them to manage the land in the collective manner that they have followed for a long time. However, because of their vulnerability, attention should be paid to set up appropriate regulatory measures to ensure effective enforcement of indigenous people's land rights as this would contribute substantially to the sustainability of Indigenous Collective Land Titling (CLT). Up to December 2019, there were 30 indigenous communities that received CLT across the country. Collective land title or CLT registration has been recognized and adopted with

the national land law 2001.

Kratie is a province which is mostly covered by dense forests and it is situated in the Prey Lang landscape. Prey Lang is the largest remaining lowland evergreen forest on the Indochinese peninsula and approximately 200,000 members of ethnic minorities reside within it. Some land in Kratie is used for agriculture, though a smaller percentage than elsewhere in Cambodia. Moreover, Prey Lang plays a dominant role in the livelihood of hundreds of thousands of Cambodian people. There are approximately 200,000 people, mostly members of the indigenous Kuy people, living in districts surrounding Prey Lang. Another 700,000 people live within 10 kilometers of Prey Lang, for whom the forest is essential. Kratie province has a total area of 11,094 km<sup>2</sup>, which divides into two specific regions; the northeast and southwest. The Northeast segment of the province is a plateau region consisting mainly of thick forests, a variety of grasses and fertile red soil, which are favorable for rearing livestock and agro-industry plantations for products such as rubber, pepper, and cashew nuts.

The Southwest segment is mostly wet plains that are typical to Cambodia and consist of highly fertile soils, especially along the Mekong River, that are favorable for agricultural crops such as rice, corn, and beans. In addition, it is also a home to many globally significant terrestrial fauna species including mammals such as the iconic Irrawaddy dolphin and gigantic fish like Mekong giant catfish, giant carp and giant freshwater stingray. The dolphins are the main tourist attraction for the province and Kratie City. According to the Forestry Administration in 2018, Kratie had a total forest coverage of 72,993 hectares and 46 CF have been established with a total membership of 9,160. The CFs have played a very important role in engaging government institutions for the purpose of information exchange and sharing experiences in CF practices.

This action research aims to examine community empowerment for sustainable natural resource management, and securing forest and land tenures for Indigenous People by focusing on: (1) socio-economic characteristics; (2) engagement of IPs in forest management; (3) awareness of

forest management; and, (4) local perceptions towards community development.

## 2. Materials and methods

This action research applied both primary and secondary data collection. Information was collected regarding community empowerment for sustainable natural resource management, and securing forest and land tenures for indigenous communities. A comparative analysis was used to investigate well-being and adaptive capacities of indigenous peoples (IPs) and non-indigenous peoples (non-IPs), for coping with the negative impacts of climate change through sustainable forest and land management. The research was conducted in two different communes of Sambour district in Kratie. Due to time and financial constraints, a sample size of 97 households was used, including 47 Kroul people in Sre Chis commune and 50 Khmer people in Koh Khner Commune were selected for interviews. The field work was conducted in Sre Chis Commune, a community of IP residents and in Koh Khner Commune, a community of Khmer residents. The selection helped to investigate the degree of participation and community empowerment by IPs and non-IPs in for sustainable natural resource management, and securing forest and land tenures. For collecting quantitative data, a household survey was used with both Kroul people and Khmer people. Also, a case study was conducted to collect qualitative data.

Household survey. Standardized questionnaires were used to collect quantitative data from Kroul people and Khmer people. The survey was conducted with 97 respondents including 47 Kroul people and 50 Khmer people. This questionnaire included collection of information on demographic and socio-economic characteristics, and respondents' engagement in community development.

In-depth Interviews. A total of four Kroul people (2 females and 2 males) and four Khmer people (2 females and 2 males) were recruited for in-depth interviews. The interviews served to collect information on their experience, knowledge and benefits earned in relation to capacity building, gender empowerment, CF engagement, CLT and legal rights of collective land tenure for customary uses in order to secure their livelihoods.

Key informants. Relevant organizations including NGO officers from Provincial Departments of Rural Development were also contracted for the interview. Unfortunately, two other key organizations, the Forestry Administration Cantonment in Kratie and the Provincial Department of Land Management Urban Planning and Construction, were not available to participate in the interview. In each community, a local actor was also contacted to be a key informant. The interview served to gain insights regarding respondents' understanding of the policies, legal frameworks, and activities to support CLT and legal rights of collective land tenure for customary use to secure livelihoods.

Observation. Field observations were carried out at the two study communities to gain more physical and visible information about livelihood activities, CF engagement and physical infrastructure that are important for the well-being and adaptive capacities of IPs and non-IPs to cope with the negative impacts of climate change.

Focus group discussions. These activities served as tools for researching perceptions of the local decision-makers at community meetings, involving IPs and Khmer people, for improving well-being and adaptive capacity. In each study commune, a group of two males and two females were invited to participate in the group discussion. This technique was used to collect information related to the priority mechanisms and strategies required to improve the current situation faced by the local villages. The technique was also employed to rank problems and constraints regarding capacity building, gender empowerment, CF engagement, CLT, and legal rights of collective land tenure.

The analysis used quantitative and qualitative methods: (1) Desk review was an important part of the research as it served to collect, organize and synthesize available reports and previous assessments (2) Problems and Situational analysis facilitated exploration of the general situation and context in the study area, or of institutions operating within a specific time period. The findings elicited from using this technique provided an understanding of the context of and knowledge about community

development of indigenous and Khmer residents, for improving their well-being and adaptive capacities for managing the impacts of climate change through sustainable forest and land management. (3) A Case study was conducted to develop a description of the support mechanism available for indigenous people and Khmer people related to gender empowerment for improving well-being and adaptive capacities for coping with the negative impacts of climate change. (4) Quantitative analysis utilized the Statistical Package for Social Science (SPSS) software for data processing and analysis. The study employed both descriptive and advanced statistical techniques when permitted by the data collection. Some advanced statistics including Weighted Average Index (WAI), T-test, Chi-square, and correlation were used for analysis of quantitative data collected with the structured questionnaire.

### 3. Results and discussion

#### 3.1 Socio-economic characteristics

Almost all of the respondents were rice farmers especially Kroul people (93.6%). Rice cultivation has remained the key source of their food for consumption and for the sale of surplus in order to earn extra income (Fig. 1). In Koh Khmer commune, Khmer people were also involved in other work, such as wood cutting, fishing, raising chickens and pigs, and growing crops. Migration among the young Khmer population was relatively high, with many community members opting for migrating out of the area. Seven out of ten young Khmer people were already migrating [Per Communication, Group Discussion 2].

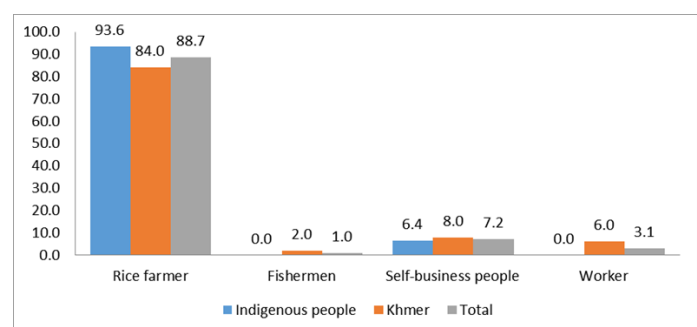


Fig. 1. Type of employments of the Respondents.

In Sre Chis commune, all the villagers had primary jobs as rice farmers. Kroul people cultivated rice for their own consumption because

the yield was as low as 3 tons per ha. When there was a surplus, the rice was sold, but only to members of the same community. Some Kroul people were engaged in cultivating crops such as maize for their own consumption, and cashew apples for sale. Middlemen come to the community to buy cashew apples directly. The farmers could sell cashew apples at a price between 4,000 and 5,000 Khmer Riel per kilogram [Per Communication, Group Discussion 1]. There is no doubt that households could not be sustained with one job by a household head or member. On average, the respondents worked two different jobs, and a few of them worked five different jobs in the same year.

Fig. 2 show that both Kroul (2.3 jobs) and Khmer (1.7 jobs) respondents had similar number of jobs ( $P$ -value= 0.135). During the rainy season, they cultivated rice, harvested non-timber forest products from jungle areas, raised livestock, cultivated other crops. In the dry season, they may work as woodcutters, work in construction, and cultivate crops. In the past 10 years, many villagers spent only a few months, during the rainy season, to grow rice for consumption. The rest of the year was spent fishing occasionally, picking up wild aquatics, raising livestock, and growing vegetables. Today, villagers earn income from selling agricultural products, non-timber forest products, and involvement in wage labor.

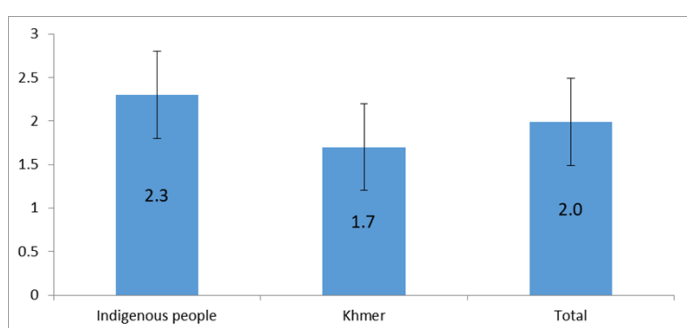


Fig. 2. Number of jobs employed by the respondents.

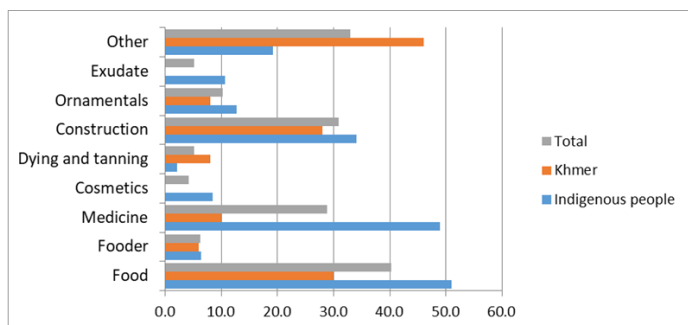
Fig. 3 illustrates the types of Non-Timber Forest Products which were collected by those in the study communities (including both Kroul people and Khmer people). They collected such forest products for the purposes of: food (40.2%), construction (30.9%), medicine (28.9%), ornaments (10.3%), fodder (6.2%), dying and tanning (2.1%),

exudate (5.2%), and cosmetics (4.1%). Overall, one third of the respondents were still dependent on non-timber forest products for their food, medicine, and home construction, especially Kroul people. Unfortunately, both Kroul people and Khmer people tended to not be well aware of all the uses of the non-timber forest products (such as Bay Dam Neb, a kind of wild fruit). Survey results showed that many respondents did not have clear knowledge of the purposes or uses of the different types of non-timber products. The villagers had a vague conception that the non-timber forest products are used for medical purposes. Each type of non-timber forest product collected by the respondents was harvested following demand set by middlemen from outside. As a result, both Kroul people and Khmer people were not able to bargain on pricing with the middlemen. Comparatively, Kroul people were more highly dependent on non-timber forest products than Khmer people were. Moreover, Kroul people could also sell those products at a better price than Khmer people.

In Sre Chis commune, cash incomes were mainly derived from raising livestock such as cows, buffalos, chickens, ducks and pigs. Kroul people also collected non-timber forest products such as orchids, Bay Dam Neb (a kind of wild fruit), bees (honey), and raisins. Kroul people could sell orchids for between 55,000 and 60,000 Cambodian Riels and Bay Dam Neb for 13,000 Cambodia Riels. Some Kroul people spent several days in the forest for collecting non-timber forest products and their children were also involved in collecting non-timber forest products [Per Communication, Group Discussion 1]. The villagers in Koh Khner commune also went into the jungle for the purpose of collecting Bay Dam Neb, orchids, mushrooms, and strychnine.

Khmer respondents indicated that they could collect between 15 and 20 kg of fishes per morning and sell it at a price of 5,000 Cambodian Riel per kg; and, that they could collect two to three kg of Bay Dam Neb and sell it at a price of 5,000 Cambodian Riel per kg. Only small number of the Khmer people indicated that they collected bee honey, but they noted that they could collect between 5 or 6 liters per day. For some other types of NTFPs, the villagers collected them for

their own use. More mushrooms are available during the rainy season, and after periods of rains mushrooms became abundantly available. Some children even dropped out of school during the rainy season in order to be able to pick mushrooms. Bay Dam Neb is available during the whole year, and middlemen come to buy it directly from the villagers [Per Communication, Group Discussion 1].



**Fig. 3.** Types of non-timber forest products collected.

The analysis of Pearson Chi-Square test, illustrated in **Table 1**, confirms that there was no significant association between the negative effects of decline in forest products and the contribution of non-timber products to the livelihoods of the respondents. This follows from the fact that the availability of non-timber forest products remained sufficient to support the livelihoods of both the Kroul people and the Khmer people. In contrast, according to the group discussion, the livelihoods of the villagers are likely to be increasingly endangered in the future because of a gradual decline in natural resources. Deforestation has accelerated and forests are not able to regrow sufficiently fast [Per Communication, Group Discussion 1]. The villagers in Koh Khner Commune were not worried about the decline in forests, and instead raised concerns regarding Economic Land Concession (ELCs). The villagers claimed that the ELC has supposedly been granted for creating job opportunities, but the result that villagers have seen so far is deforestation [Per Communication, Group Discussion 2]. Land is a very important resource for rural residents especially for those who depend on the agricultural sector. **Fig. 4** demonstrates the findings that all of the respondents owned land for settlement between 0.1 ha. and 1.0 ha. Out of the total respondents, 5.2% were landless (6.4% of the Kroul people and 4.0% of the Khmer people).

**Table 1.** Association between decline in forest products and the contribution of NTFPs to livelihoods.

Variable		Contribution of NTFPs		X <sup>2</sup>	P-value	
		N	Yes			No
Effect of decline in forest product on livelihoods	Yes	79	6	73	0.091	0.763
	No	18	1	17		
	Total	97	7	90		



**Fig. 4.** Land sizes for settlement and for agriculture. Note: *P*-value=0.0001 for land size for settlement; *P*-value= 0.116 for land size for agriculture.

On average, the respondents owned 0.18 ha. of land for settlement and 1.56 ha. of land for agriculture. Khmer people were found to own larger sized land for settlement (*P*-value=0.0001), but the land owned by Kroul and Khmer people were similar in size (*P*-value=0.116). In Sre Chis commune, a newly-married couple was able to apply for agricultural land in the reserve (for Shiuing Cultivation). The Kroul traditional committee is responsible for decisions on giving land to Kroul people to start up a new family. In this commune, all residents are Kroul people and no people from outside the ethnic group were allowed to settle. Many Kroul people are long-term residents and have never moved somewhere else [Per Communication, Group Discussion 2].

### 3.2 Engagement of IPs in forest management

A Chi-square test was employed to assess the association between ethnicity and engagement in CF in terms of: (1) establishing CF'; (2) becoming a member of CF; (3) becoming a volunteer to support CF; and, (4) using CF for income generation (**Table 2**). The analysis confirms that there was a significant association among ethnicity and (1) becoming a member of CF (*P*-value=0.000), (2)

becoming a volunteer to support CF ( $P$ -value=0.000); and (3) using CF for income generation ( $P$ -value=0.006) (Table 2). However, there was no significant association between ethnicity and establishing CF. In the two communes, CF was established because the main sources of cash income were derived from non-timber forest products. Interestingly, Kroul people tended to be more active in becoming a member, being volunteers, and using CF for income generation. There were many reasons for Khmer people to be reluctant to get involved in the operation of the Community Forestry, but one of the obvious causes was likely the effect on their illegal activities, as those involved in illegal logging and hunting may not wish to be associated with the CF.

In Sre Chis commune, NGOs have supported the community to establish a CF, and to register collective land titling. With support from NGOs, Kroul people were able to protect forests through patrolling to deter illegal logging. Both CF and CLT did not register with the Ministry of Environment (MoE) or the Ministry of Agriculture Forestry and Fishery (MAFF), but they have been registered at the Ministry of Land Management, Urban Planning and Construction (MLMUPC) as Community Forestry and Collective Land Title, and the spiritual forest is part of the CLT. To date, there were approximately 400 members registered in this CF [Per Communication, Group Discussion 1]. As for Koh Khner commune, the villagers started to operate the CF in 2005, but it was not officially recognized by the MAFF until 2012.

Non-governmental Organizations have helped the community to mobilize resources, including financial and technical support for establishing the CF. Presently, NGOs provide budget resources including financial and technical support of 80 US dollars per month for patrolling. The CF can use the budget to conduct patrols for 5 to 12 times. Each patrol involved between 7 and 12 participants and lasted for a few days in the jungle. The patrols were conducted regularly, and ad hoc patrols were undertaken as well. There were six committee members of the community, and 235 households were the members of the CF. Before the members were required to pay for 1,000

**Table 2.** Association between ethnicity and engagement in CF.

Variable	Ethnicity				$\chi^2$	P-value
	N	IP	Khmer			
Establishing CF	Yes	60	33	27	2.699	0.100
	No	37	14	23		
	Total	97	47	50		
Becoming a member of CF	Yes	50	33	17	12.720	0.000***
	No	47	14	33		
	Total	97	47	50		
Becoming a volunteer to support CF	Yes	53	32	21	6.651	0.010**
	No	44	15	29		
	Total	97	47	50		
Using CF for income generation	Yes	40	26	14	7.462	0.006**
	No	57	21	36		
	Total	97	47	50		

Cambodian Riel per year, but the fee ended in 2012/2013. The committee stopped collecting money from its members because they were poor. The establishment of the CF helped to reduce deforestation and the hunting of wild pigs, mouse deer and turtles [Per Communication, Group Discussion 1].

The association between ethnicity and engagement in collective land tenures was also explored by using Chi-square analysis (Table 3 & 4). The analysis confirms that there is a significant association between ethnicity, seeking legal rights for collective land tenures for customary use ( $P$ -value=0.000), using collective land tenures for customary use, becoming a volunteer to support collective land tenures for their customary uses ( $P$ -value=0.000), and using the CF for income generation ( $P$ -value=0.000) (Table 3).

Comparatively, Kroul people perceived more benefits from collective land titling and were more involved in activities to support collective land tenures than Khmer people were. While Kroul people applied for state-owned land for spiritual forests, Khmer people requested land for CF for collective land use. According the Provincial Department of Rural Development, it has worked to support the registration of indigenous people. The central Ministry conducted the evaluation for identifying indigenous people. Furthermore, the communities worked with the Ministry of Interior (Mol) in order to apply for recognition as a

legal entity. Finally, the approval for a collective land registration must be preceded by a request to the Provincial Office of Land Management, Urban Planning and Construction [Office Head, Provincial Department of Rural Development [PDRD]. The indigenous people in Cambodia still maintain and practice their traditions. They still speak their language and believe in spiritual events. The evaluation of IPs is based on survey data collected in the village by the Ministry of Rural Development (MoRD). The Ministry has a set of 6 or 7 questions in order to identify IPs. The Provincial Department of Rural Development has worked with the Provincial Administration and NGOs to identify for IPs for registration. It takes a very long time to get collective land titling. For example, IPs of Kroul in Sre Chis commune attempted to obtain collective land titling in 2010 and only obtained it in 2018. It takes a long time to request collective land registration from the MLMUPC (Office Head, Provincial Department of Rural Development). In Koh Khner Commune, residential land has only been registered at the commune level and was not officially registered by the Ministry of Land Management Urban Planning and Construction (MLMUPC).

The villagers had raised the issue in meetings with local authorities about official registration, but the Commune Councils instructed them to wait for systematic registration. If a villager wishes to register individually, the cost is very high. The cost was around 1 million Cambodia Riel per ha. [Per Communication, Group Discussion 2]. The establishment of CF in Koh Khner commune has been crucial for natural resource conservation and livelihood development. CFMC organized monthly meetings with its members for a period of 15 months. The gatherings entailed discussion of issues and problems faced. The committee received training and technical support from NGOs. Yet, the CF in this commune was still hard-pressed to manage illegal activities because there is only one CF for the whole commune. In other communes, such as Ou Kreang, there was one CF per village, so better regulation and management was attained [CF in Koh Khner Commune].

NGOs have worked in the two communes in order to improve local livelihoods of the villagers. NGOS delivered activities to raise awareness of

**Table 3.** Association between ethnicity and engagement in collective land tenures.

Variable		Ethnicity			$\chi^2$	P-value
		N	IP	Khmer		
Seeking legal rights of collective land tenures for customary use	Yes	47	33	14	17.285	0.000***
	No	50	14	36		
	Total	97	47	50		
Using collective land tenures for customary use	Yes	43	31	12	17.282	0.000***
	No	54	16	38		
	Total	97	47	50		
Becoming a volunteer to support collective land tenures for customary use	Yes	43	32	11	20.850	0.000***
	No	54	15	39		
	Total	97	47	50		
Using CF for income generation	Yes	40	29	11	15.759	0.000***
	No	57	18	39		
	Total	97	47	50		

both the Indigenous people and the Khmer people for improving their well-being and sustainable development. Activities included: forest law, land law, indigenous law, Information Communication Technology (ICT), gender, and CF management. Almost all the respondents gained increased knowledge of the land laws (93.8%), forestry laws (87.6), gender issues (28.9%), indigenous laws (25.8%), and CF management (12.4%). The respondents also received awareness regarding sub-decrees related to CF and indigenous peoples. Interestingly, almost one-third of the respondents (especially indigenous people) (42.6%) gained a better understanding of social development issues, such as climate change, natural resource management and community organization.

### 3.3 Awareness of forest management

Comparatively, Khmer people experienced a much greater increase in awareness of forest laws, land laws, and gender issues. In addition, NGOs provided technical support and material resources to establish a savings group in Koh Khner Commune. The savings group included a president, an administrator, and an accountant. In the savings group, there were 15 members. Between 2017 and 2019, the group saved five million Cambodian Riels. The members deposited between 5,000 Cambodian Riels and 100,000 Cambodian Riels per month. If a member borrowed, 3% interest was charged. If a member saved 100,000 Cambodian Riels, she/she



could borrow up to 200,000 Cambodian Riels. The borrower was required to return the funds within three to six months. So far, the group has not received any capital from NGOs. NGOs only provided the group with capacity-building, and materials such as books, pens and boxes.

Previously, NGOs conducted follow-up with the group every month, but such engagement has been suspended since 2018. Perhaps the savings group had been established and effective to the point where further follow-up was not necessary. On the other hand, the savings group did not have an opportunity to participate in any higher-level meetings or capacity-building provided by NGOs. NGOs had promised to provide some capital, but by the time of this study, the group had not yet received any funds. In this commune, NGOs helped to establish another saving group and provided funding in the amount of 500 US dollar as initial capital.

However, that savings group was not successful because one of the group members borrowed money and migrated. During group discussions with member of the Koh Khner commune, the villagers asserted that: 'Our group does not receive any fund from NGOs and we also do not have sufficient opportunity to participate in meetings or capacity building events. We would like to request 1,000 US dollars from NGOs as capital to support the savings group. We want to have more reserve funds so our members can borrow to buy chickens and water pipes for agriculture. We have the capacity to manage the group, but we need more capacity to be more sustainable. Moreover, we request NGOs provide skill-building for our group members, for skills related to raising livestock and growing vegetables, which are useful for our livelihoods.'

By increasing social participation, NGOs have worked in the communities to create opportunities for villagers to get involved in their livelihood development. Fig. 5 illustrates types of activities the villagers participated in. NGOs carried out various events and activities including trainings (21.6%), community meetings (7.2%), information sharing (6.2%), advocacy (5.2%), volunteer work (5.2%), and public forums (4.1%). Although it is likely that Khmer people had more

opportunity to participate in training than Kroul people did, the Kroul reported higher rates of participation in meetings (8.5%), information sharing (8.5%), advocacy (6.4%), and public forums (6.4%) (Fig. 6). It was very crucial for Kroul people to participate in those social events because they were struggling for their rights and collective land titling.

The Office of the Provincial Department of Rural Development reveals that the government of Cambodia has a strong policy for improving the livelihoods of indigenous people by ensuring their community identity.

Even if the government does not have sufficient budget resources for implementing development activities for indigenous people, the provincial governments are working with NGOs to improve their well-being and sustain their identity.

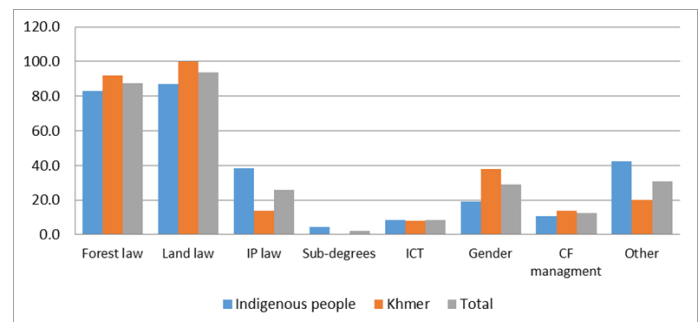


Fig. 5. Awareness raising by NGOs and learning of the respondents.

The analysis obtained from using Weighted Average Index, illustrated in Fig. 7, demonstrates that both Kroul people and Khmer people obtained a moderate awareness regarding rights to land and forestry.

Furthermore, T-test analysis confirms that Kroul people had higher awareness of the right to own and use traditional lands ( $P$ -value=0.003) and the right to legal protection of traditional land ownership ( $P$ -value = 0.001).

The majority of indigenous people were rice farmers, crop farmers, livestock raisers, hunters, bee collectors, and undertook shift cultivation. Their livelihoods are dependent on nature, especially the forest. The lands of indigenous people are not allowed to be sold to people from outside the community.

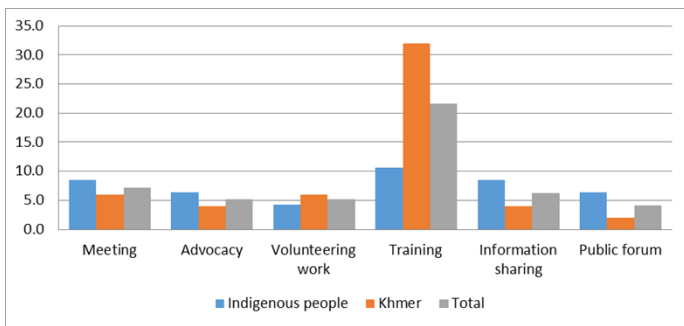


Fig. 6. Types of activities respondents participated in.

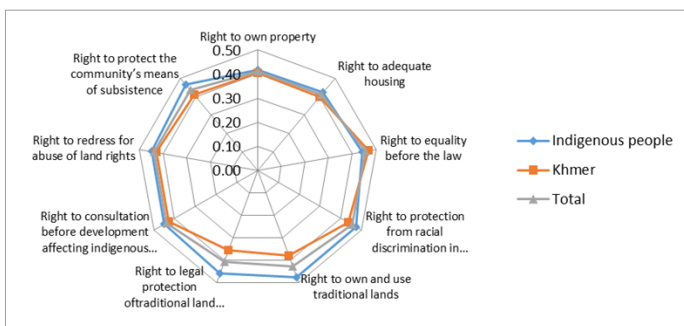


Fig. 7. Degree of awareness obtained regarding rights to land and forestry. Notes: WAI = Weight Average Index measured on a five-point scale [Very Low (VL) = 0.00- 0.20, Low (L) = 0.21-0.40, Moderate (M) = 0.41-0.60, High (H) = 0.61-0.80, Very High (VH) = 0.81- 1.00]; OA = Overall Assessment; \*Significance at the 0.05 level; \*\*Significance at the 0.01 level.

The villager can sell land only to other member of their community. Indigenous people rarely sell their land and leave their communities. Only those who have higher education were found to leave their communities. Also, there are very few indigenous people returning to their communities and working for their communities after having obtained higher education. Before indigenous people earned substantial income from logging, but their income from that has gradually reduced. Under their motor seat, there was, previously, at least 4 to 5 million Cambodian Riel (Office Head, Provincial Department of Rural Development).

Chi-square analysis confirms that Kroul people participated to a greater extent in patrolling to find and deter illegal logging and informing authorities about illegal logging (Table 4). Yet, both Kroul people and Khmer people had shared a sense of unease and being unsafe when

getting involved in patrols and informing on illegal logging. According to the CF head in Koh Khner commune, the patrol team was not able to do anything other than stopping the illegal activities and confiscating the equipment. The CF used to confiscate the chainsaws used to cut trees and send them to the Forestry Administration (FA). One month later, the saw machine with the same barcode was found being used again by illegal loggers.

The patrol team only had the right to confiscate equipment and are not allow to destroy it. Every month, NGOs fund CF to go for patrols four to five times, but in reality, the members of CF conducted patrols six to seven times. The patrol team prepared a report of their patrols for the CoCs and NGOs. NGOs provided 80 US dollars per month for patrols, but previously it was only 50 US dollars. Each patrol may take 3 days, if the patrol goes into dense jungle. In Sre Chis, the patrol was made between four and eight times per month, and seven to ten people participated in the patrol. Every month, NGOs provided 240,000 Cambodia Riels for funding the patrols. If the cost of the patrols exceeded this amount, the patrol team paid for the costs (CF Head in Sre Chis Commune). The respondents, as illustrated in Figure 8 reported on illegal logging to various key authorities in charge. The main entities included CoCs (66.0%), CF (58.8%), police (27.8%), and NGOs (20.6%). While the majority of Kroul people (70.2%) reported to the CF, the Khmer people preferred to report to CoCs (72.0%). There was only a small amount reporting to MoE officers, FA officers, and MAFF officers. The head of CF in Koh Khner commune described that ‘The members of the CF who go to collect non-timber forest products provided information about illegal logging, but actions against offenders are not effective or timely.

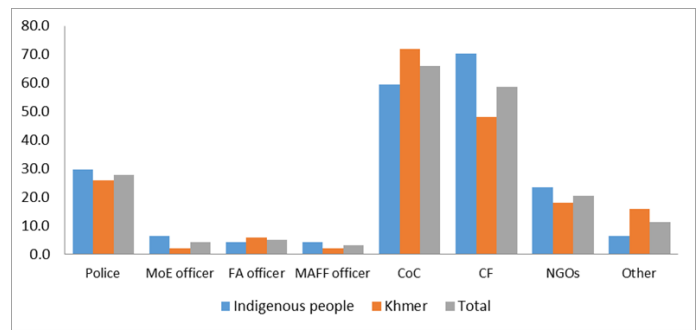
Before our team asked for a mission letter from the local authority for each patrol, but we do not ask for it any more. When we ask for a mission letter, we cannot find any illegal activity. Therefore, we decided not to ask for it any more. We trust CoCs more than the police.’ The satisfaction of the respondents regarding activities implemented by NGOs was, generally, moderate (Fig. 9). T-test analysis confirms that Kroul people had higher degree of satisfaction regarding

**Table 4.** Association between ethnicity and engagement in social development.

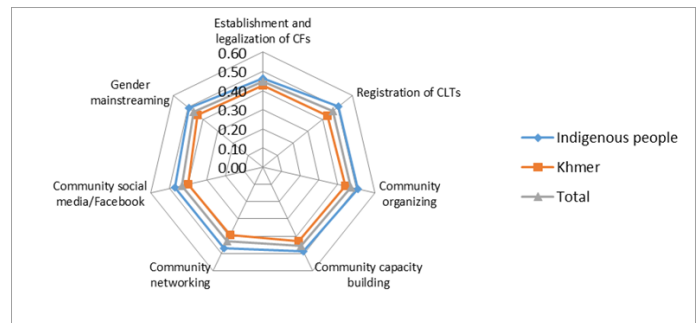
Variable		Ethnicity			$\chi^2$	P-value
		N	Kroul	Khmer		
Participate in patrols to stop illegal logging	Yes	59	37	22	12.259	0.000***
	No	38	10	28		
	Total	97	47	50		
Feel safe to get involved in patrols	Yes	34	18	16	0.422	0.516
	No	63	29	34		
	Total	97	47	50		
Inform on illegal logging	Yes	53	31	22	4.713	0.030*
	No	44	16	28		
	Total	97	47	50		
Feel safe to inform on illegal logging	Yes	34	18	16	0.422	0.516*
	No	63	29	34		
	Total	97	47	50		

registration of collective land titling ( $P$ -value=0.036), community networking ( $P$ -value=0.023), and community social media/Facebook ( $P$ -value=0.028). Kroul people were more highly involved in the activities implemented by NGOs for livelihood development than Khmer people were. In Sre Chis commune, Kroul people participated in all the activities implemented by NGOs. They were keen to conserve their identity and manage collective land tenure more effectively. However, although CF, collective land titling and identity of indigenous people were important for community development, they were not priorities in the Commune Investment Plan (CIP). If there were any concerns raised and communicated to the local authorities, the CoCs took action. Only NGOs had budget resources to implement development activities to support indigenous people and the establishment of CF (IP Head in Sre Chis Commune).

Land eligible for collective land titling is state-owned land. While state private land (susceptible to being granted as an ELC) includes residential land, and cultivated land, state public land consists of spiritual forests, burial grounds and reserve lands (for shifting cultivation). Before getting a collective land title, indigenous people are required obtain support from three main government agencies: MoRD, Mol and MLMUPC. The assessments show that Kroul people had a moderate degree of satisfaction with their support. At the same time, NGOs supported



**Fig. 8.** Preferred institution for informing on illegal logging.

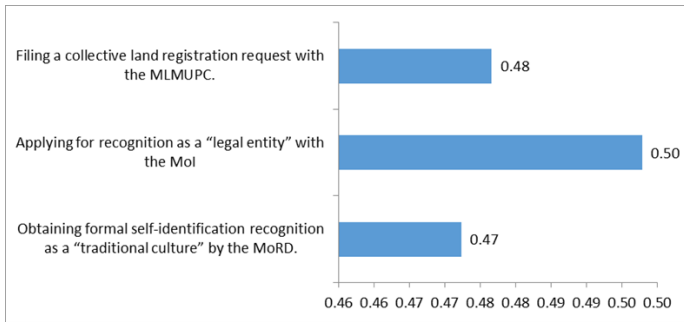


**Fig. 9.** Satisfaction with activities implemented by NGOs contributing to livelihoods. Notes: WAI = Weighted Average Index measured on a five-point scale [Very Lo (VL) = 0.00- 0.20, Low (L) = 0.21- 0.40, Moderate (M) = 0.41-0.60, High (H) = 0.61- 0.80, Very High (VH) = 0.81- 1.00]; OA = Overall Assessment; \*Significance at the 0.05 level; \*\*Significance at the 0.01 level.

indigenous people to build capacity and to develop an understanding of the legal framework in order to work with all the three Ministries to be categorized as an indigenous community as well as to apply for collective land titles.

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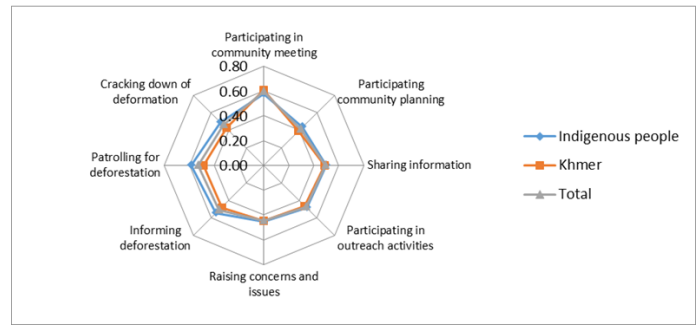
as an indigenous community as well as to apply for collective land titles.



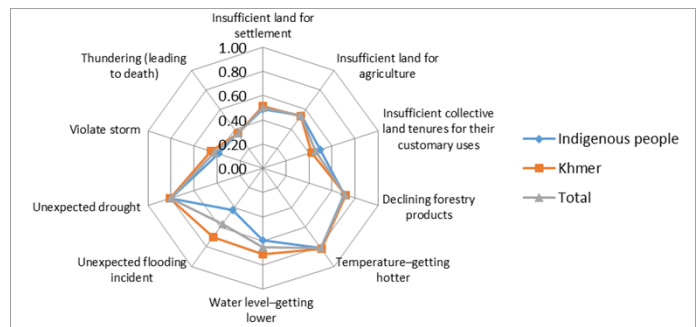
**Fig. 10.** Satisfaction with support provided by key government agencies for land registration. Notes: WAI = Weighted Average Index measured on a five-point scale [Very Lo (VL) = 0.00- 0.20, Low (L) = 0.21-0.40, Moderate (M) = 0.41-0.60, High (H) = 0.61-0.80, Very High (VH) = 0.81- 1.00]; OA = Overall Assessment; \*Significance at the 0.05 level; \*\*Significance at the 0.01 level.

### 3.4 Local perceptions towards community development

Weighted Average Index (WAI) analysis found a moderate degree of local participation in events organized by NGOs (Fig. 11). Perceptions of Kroul people and Khmer people were similar in all the aspects measured except for patrolling for deforestation ( $P$ -value=0.044); Kroul people tended to be more active. The respondents rated climate change as having a very high effect on livelihood due to unexpected droughts and increases in temperature. In addition, the respondent rated the decline in forest products and water level decreases as having a high impact (Fig. 12). The perceptions of Kroul people and Khmer people were significantly different with regards to water level decreases, unexpected flooding incidents and violent storms. In Sre Chis commune, the villagers were dependent on natural resources; therefore, floods and drought were also problem issues. While floods had destroyed infrastructure, drought caused shortages of water for agriculture. In recent years, for example 2019, drought has become the worst problem for people’s livelihoods (CoC in Sre Chis Commune). According to NGO officers, the villagers in both communes were dependent on rain-fed agriculture and they could only cultivate once a year. Quite often, either floods or droughts hit the commune. The villagers only engaged in



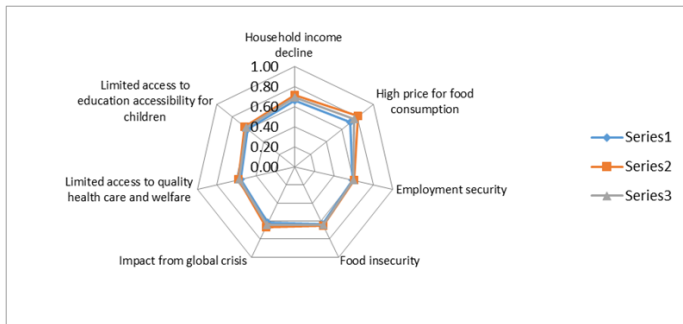
**Fig. 11.** Local perceptions towards participation in events conducted by NGOs. Notes: WAI = Weighted Average Index measured on a five-point scale [Very Lo (VL) = 0.00- 0.20, Low (L) = 0.21-0.40, Moderate (M) = 0.41-0.60, High (H) = 0.61-0.80, Very High (VH) = 0.81- 1.00]; OA = Overall Assessment; \*Significance at the 0.05 level; \*\*Significance at the 0.01 level.



**Fig. 12.** Perceptions on the effects of climate change on livelihoods. Notes: WAI = Weighted Average Index measured on a five-point scale [Very Lo (VL) = 0.00- 0.20, Low (L) = 0.21-0.40, Moderate (M) = 0.41-0.60, High (H) = 0.61-0.80, Very High (VH) = 0.81- 1.00]; OA = Overall Assessment; \*Significance at the 0.05 level; \*\*Significance at the 0.01 level.

agriculture for their own consumption, but were unable to cultivate enough for their food requirements. This year there has been a long drought and no water. As a result, the villagers already started buying rice for personal consumption (NGO staff). The effects of social change were rated as having a high impact on livelihoods, due to factors such as increasing prices for food consumption, declines in household incomes, food insecurity, impact from global crisis, and limited access to education for children (Fig. 13). T-test analysis confirms similar perceptions among Kroul people and Khmer people, except in relation to the high prices for food

consumption. Comparatively, Khmer people rated the higher prices as having more impact than Kroul people did ( $P$ -value=0.002). In fact, food consumed by Kroul people was mainly produced in the community. They cultivated rice, vegetables, and crops for their own consumption. In addition, they also used non-timber forest products for medicinal and other purposes.



**Fig. 13.** Perceptions of the effects of social changes on livelihoods. Notes: WAI = Weighted Average Index measured on a five-point scale [Very Low (VL) = 0.00- 0.20, Low (L) = 0.21-0.40, Moderate (M) = 0.41-0.60, High (H) = 0.61-0.80, Very High (VH) = 0.81- 1.00]; OA = Overall Assessment; \*Significance at the 0.05 level; \*\*Significance at the 0.01 level.

In Sre Chis commune, the committee provides residential land and agricultural land for indigenous people. Each household received 20 meters in width and 50 meters in length for their residence and two hectares of land for agriculture. Moreover, the committee deals with land allocation. Some of 10% of people violated the internal regulation, and they occupied land without permission. The offenders were not members of community. Almost all cases were already resolved with only two households that did not come to deal with the issue with the traditional community committee. The two cases have now been sent to the courts for a solution (IP Head in Sre Chis Commune). Moreover, the commune had an issue with a lack of clarity on boundaries with other communes in Mondulkiri province. Originally, the relevant residences were in Sre Chis commune, but under the new administrative map they are situated in Mondulkiri province. With no clear boundary, it was hard for local authorities to carry out activities, especially those related to forestry. (CoC in Sre Chis Commune).

In addition, the commune was difficult to access. Transportation was dependent on boats which are expensive. Transport boats only operate between 8am and 5pm, which posed a substantial challenge to residents in the event that they needed transport during the night time, especially for emergencies such as pregnant women going into labor. If pregnant women needed to go to hospital at night time it was very challenging and risky, given that there was no health center located in the commune. The nearest health center is located eight kilometers away from the community. As well, it was even harder to make the trip in the rainy season. For children, it was difficult to go to school.

To do so they needed to travel by boat to other side of the river. In the dry season, however, people can walk. Migration was found to be only an option for a small number of people. Out of ten, three young people migrate. Currently, there are two people that have migrated to South Korea and 5 people that have migrated to Malaysia [Per Communication, Group Discussion 1]. In Koh Khner Commune, deforestation was still a serious problem, mostly caused by people from outside the community. Moreover, illegal fishing was one of the biggest issues in this community. Between 2018 and 2019, there were at least 10 incidents of illegal fishing with a total catch between 2 and 4 tons. Law enforcement was weak, and illegal fishermen were using drugs as well [Per Communication, Group Discussion 2].

### 3.5 Policy Implications

The Ministry of Rural Development (MoRD), Ministry of Interior (Mol), and Ministry of Land Management Urban Planning and Construction (MLMUPC) should continue to work with the community to maintain cultural traditions and to manage collective land titling for the sake of maintaining the identity of indigenous peoples and supporting their sustainable livelihood development. The application of collective land titling is very useful to help in the maintenance of the cultural and traditional identity of indigenous people because it makes it so they are not able to sell the land to people from outside the community (i.e., members of the dominant ethnic group, Khmers). Both MoRD and Mol should work to

improve the status and maintain the identity of indigenous people, and MLMUP should work to provide for a good enabling environment for land use and management. In the meantime, NGOs should continue to work with the MoRD, the Mol, and the MLMUPC to ensure that indigenous people are granted full rights to manage collective land titling, and Khmer people are empowered to register CFs for the purposes of conservation and sustainable livelihood development. In addition, all the three Ministries should provide more space for NGOs to participate in planning and policy development which is useful for natural resource management, land management, and ensuring ethnic identity survival.

The Ministry of Agriculture Forestry and Fisheries (MAFF) and Ministry of Environment should work to improve natural resource management through the operations of CFs. In Koh Khner Commune, Sam Pong CF should be officially registered under the MAFF or MoE and funds should be provided annually by the central government for operations. Without an annual budget from the government, CF is not able to function well because funding from NGOs is both small and not certain. The approval as CF is necessary, in part, to clearly delineate the boundary of some villages with Mondulhiri province to avoid conflicts over administrative jurisdiction. In order to establish and maintain CBOs in both communes, NGOs should continue to provide capacity building, and should provide legal support needed for advocacy in relations with the MoE or MAFF to obtain official registration of the CF.

The Provincial Department of Rural Development, Provincial Department of Environment and Provincial Forestry Administration Cantonment should consider compiling information on non-timber forest products such as types, uses, and prices. According to the results of the field work in both Koh Khner Commune and Sre Chis commune, both Khmer people and Kroul people did not know what the different types of non-timber forest products were used for. The villagers tended to collect any type of non-timber forest products based on market demand. As a result, middlemen can control the price. In this regard, an inventory of non-timber forest products would contribute to improving sustainable livelihood development of

both Khmer people and Kroul people that are dependent on natural resources. At the same time, NGOs should provide technical support to compile and publish the types of non-timber forest products. Moreover, NGOs should disseminate the documentation on non-timber forest products among the local people. By doing so, the work of NGOs can contribute to improving the income of the local people.

The Provincial Department of Land Management Urban Planning and Construction should work with indigenous traditional committees to improve law enforcement in reserve lands (for Shifting Cultivation). There were some cases of violation in Reserve lands (for Shifting Cultivation) by Kroul people and some cases are beyond the capacity of traditional committees which were established to manage collective land titling. In this regard, the Provincial Department of Land Management Urban Planning and Construction should conduct regular meetings, and disseminate laws and regulations regarding collective land titling. In particular, violations should be strictly enforced to punish the offenders who violate the laws and regulations pertaining to collective lands. In order to support the community, NGOs should work closely with the Provincial Department of Land Management Urban Planning and Construction to empower them and to protect their right to access collective land titles. NGOs should cooperate with the Provincial Department of Land Management Urban Planning and Construction and work with the community to follow up and organize monthly community meetings for monitoring the use of collective land titling.

NGOs should continue to support indigenous communities, CF management, and land use and management. There is no doubt that CFs will not function well if there is no technical and financial support from NGOs. While CFs do not produce their own revenue and do not get any support from the government, NGOs remain the most important actor in supporting their operation. The livelihoods of Kroul people and Khmer people in both communes addressed by NGO development projects are highly dependent upon natural resources, especially forests. Therefore, capacity building, small-grants for community operations, and close follow-up by NGOs are still required. In particular,

NGOs should work with the Provincial Department of Rural Development and the Provincial Department of Environment, and the Provincial Forestry Administration Cantonment should consider compiling information about non-timber forest products related to types, uses, and prices.

Local communities should contribute effort and time to implement CF and identification as indigenous communities. Since funds for patrols and community meetings from NGOs are not sustainable, local communities should learn how to mobilize resources at the local level for those activities. Regular meetings and patrolling are very useful for reducing deforestation and the decline in natural resources. Since the external support from NGOs is gradually being reduced, CBOs should increase their own local resource collection and improve their capacity for self-management.

#### 4. Conclusion

Household surveys were conducted in the two study communes: Sre Chis and Koh Khner of Sambo District, including 47 Kroul people and 50 Khmer people. The findings help to provide knowledge of their perceptions and the degree of their satisfaction with the key stakeholders (i.e., the Provincial Department of Rural Development, Provincial Department of Environment and Provincial Forestry Administration Cantonment, Provincial Administration and Provincial Department of Land Management Urban Planning and Construction). Survey respondents had an average age of 42.7 years and 89.4% were married. One third of the respondents were illiterate, of both the Kroul people and Khmer people. The majority of the respondents were born in the surveyed communes, especially the Kroul people (87.4%).

In terms of their primary occupation, almost all of the respondents were rice farmers. Kroul people mainly cultivated rice for their own consumption. However Khmer people in Koh Khner commune had other work as well, such as wood cutting, fishing, raising chickens and pigs, and growing crops. Non-timber forest products (NTFPs) were the main source of cash income. On average, the respondents had two jobs. The study confirms that both Khmer people and Kroul people collect NTFPs for food (40.2%), construction (30.9%), medicine (28.9%), ornaments (10.3%), fodder

(6.2%), dying and tanning (2.1%), exudate (5.2%) and cosmetics (4.1%). However, qualitative analysis reveals that both Kroul people and Khmer people did not really know what are those products were used for. They collected them on the basis of market demand as communicated to them by middlemen.

Chi-Square analysis found no relationship between the negative effects of the decline in forest products and the contribution of non-timber products to livelihoods. Therefore, the access to non-timber forest products was still sufficient for contributing to the livelihoods of both Kroul people and Khmer people. All of the respondents owned land, but 5.2% of them did not own agricultural lands. On average, both Khmer people and Kroul people owned 1.56 ha. of land for agriculture.

The study found that there is an association between ethnicity and becoming a member of CF, becoming a volunteer to support CF, and using CF for income generation. In addition, Chi-square analysis reveals a relationship among ethnicity, seeking legal rights of collective land tenures for customary uses, using collective land tenures for customary uses, becoming a volunteer to support collective land tenures for customary uses, and using CF for income generation. In both communes, the respondents were raised with awareness in relation to land law (93.8%), forest law (87.6%), gender (28.9%), policy on registration and right to use of land of indigenous communities in Cambodia (25.8%) and CF management (12.4%). Moreover, NGOs implemented activities, including trainings (21.6%), community meetings (7.2%), information sharing (6.2%), advocacy (5.2%), volunteer work (5.2%) and public forums (4.1%). Comparing Kroul and Khmer communities, the Kroul people tended to be more active participants in their community development, with more involvement in activities and more knowledge of land law and community forest management. What is more, a higher proportion of Kroul people participated in patrolling to find illegal logging and informing on illegal logging. When they found offenders who cut down the trees, they reported to CoCs (66.0%), CF (58.8%), police (27.8%) and NGOs (20.6%). In relation to the awareness obtained from NGOs, the responses showed Kroul people shared a higher degree of awareness of the rights to own and use

traditional lands, and the right to legal protection of traditional land ownership.

Furthermore, the respondents indicated a moderate degree of satisfaction regarding activities implemented by NGOs. Kroul people reported a higher degree of satisfaction regarding registration of collective land titles, community networking, and community social media (Facebook). The assessments of the support by key government agencies, including the MoRD, the Mol, and the MLMUPC, indicated that the respondents were moderately satisfied. The respondents also assessed local participation in events organized by NGOs, and the perception of Kroul people and Khmer people were found to be similar in all the aspects except patrolling for deforestation. Unfortunately, the respondents rated climate change as having a very large effect on livelihoods as a result of unexpected droughts, and high increases in temperature. Moreover, the respondents rated declines in forest products, and declines in water level to both be high. Respondents rated the high cost of food consumption, declines in household income, food insecurity, impacts from global crisis, and limited access to education for children, to all be social changes that have had a high impact on livelihoods.

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None.

## **Declaration of competing interest**

The authors declare that they have no competing interests.

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