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Study on the Impacts of Private Plantation on Local Communities and Policy Suggestion in Myanmar (A Case Study in Katha Township, Katha District, Sagaing Division)

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Abstract

Forest Department of Myanmar has allowed the private sector investment in private plantations in the forest lands (i.e. Reserved Forests and Protected Public Forests).On the other hand, in rural communities, about 70% of total population, relies on forest land and forest resources for their livelihood. This study was conducted to investigate how private plantation program (PPP) impacted on livelihoods of local communities, stakeholders, perception, and linkage between the private plantation development and local communities' livelihood. This study was conducted in Katha Township, Katha District, Sagaing Region where large scale plantations has been established. Two case study villages were selected, and household questionnaires which were mainly focused on land and natural resources availability, livelihood strategy, household income were carried out. Both quantitative and quantitative analyses were applied in this study. Descriptive statistics and Wilcoxon signed-ranked test were applied for analyzing qualitative data. Stakeholders' feeling, expression and perception obtained from key informant interviews and focus group discussion were qualitatively described in sentence form to attain better understanding of the qualitative results. The study showed that private forest plantations could create employment to local people, but the trend was going down and not represented as an important livelihood strategy. Some households abandoned their agricultural land and average land holding per household before and after the development of private plantation was significantly decreased from 10.4 Ac to 8.7 Ac ($p<0.001$). Availability of NTFPs was decreased and more difficult to collect and far away. Encroachment in the forest area and land conflicts between villagers and private plantation company occurred. There were significantly difference major livelihood strategies before and after the development of private plantation ($p<0.05$). Farming was the most important livelihood strategy and households involved in agriculture declined from 77% to 72%.There was not significantly change in household income between 2008 and 2019 ($p>0.05$). Development of private forest plantation program can limit the availability of farmland and decreasing in NTFPs. Therefore it is needed to formulate policy for proper land use and livelihood development program for local communities in order to reduce land use conflict and encroachment in the forest area as well established private plantations.

Keywords: private plantation program, local communities, forest area, impacts, livelihood, Non Timber Forest Products

မြန်မာနိုင်ငံတွင်ပုဂ္ဂလိက သစ်တောစိုက်ခင်းတည်ထောင်ခြင်းဖြင့် ဒေသခံ ပြည်သူလူထုအပေါ် သက်ရောက်မှုများအား လေ့လာခြင်းနှင့် မူဝါဒပိုင်းဆိုင်ရာအကြံပြုခြင်း

ဒေါ်စိုးစိုးနွယ်၊ လက်ထောက်ညွှန်ကြားရေးမှူး
အပူပိုင်းဒေသစိမ်းလန်းစိုပြည်ရေးဦးစီးဌာန

စာတမ်းအကျဉ်း

မြန်မာနိုင်ငံတွင် သစ်တောဦးစီးဌာနမှတာဝန်ယူကြီးကြပ်၍ ပုဂ္ဂလိကလုပ်ငန်းရှင်များအား ကြိုးပိုင်းတော၊ ကြိုးပိုင်းကာကွယ်တောများကဲ့သို့သော သစ်တောနယ်မြေများအတွင်း ပုဂ္ဂလိက စိုက်ခင်းများတည်ထောင်ခြင်းကို ၂၀၀၆ ခုနှစ်မှစတင်၍ ခွင့်ပြုပေးခဲ့ပါသည်။ အခြားတစ်ဖက် တွင်လည်း မြန်မာနိုင်ငံလူဦးရေ၏ ၇၀% ခန့်ရှိသော ကျေးလက်ပြည်သူများသည် ၎င်းတို့၏ အသက်မွေးဝမ်းကြောင်းအတွက် သစ်တောမြေနှင့်သစ်တောသယံဇာတများကို မှီခိုလျက်ရှိနေပါ သည်။ ပုဂ္ဂလိကသစ်တောစိုက်ခင်းကဏ္ဍအနေဖြင့် ဒေသခံပြည်သူများနှင့်ဆက်စပ်ပတ်သက်သူ များ၏ လူနေမှုဘဝအပေါ်သက်ရောက်မှုများနှင့် ပုဂ္ဂလိကစိုက်ခင်းတည်ထောင်မှုတို့အပေါ် ၎င်းတို့ ၏ သဘောထားအမြင်များကို သိရှိနိုင်ရန်နှင့် ပုဂ္ဂလိကသစ်တောကဏ္ဍဖွံ့ဖြိုးတိုးတက်မှုနှင့် ဒေသခံများ၏ လူနေမှုဘဝဆက်နွယ်မှုများကို လေ့လာသိရှိနိုင် ရန်အတွက် ဤသုတေသနစာတမ်းကို ရေးသားပြုစုရခြင်းဖြစ်ပါသည်။ စစ်ကိုင်းတိုင်းဒေသကြီးအတွင်း ပုဂ္ဂလိကစိုက်ခင်းဧရိယာ အများအပြားတည်ထောင်ထားသည့် ကသာခရိုင်၊ ကသာမြို့နယ်အတွင်းရှိ သုတေသနဆောင်ရွက် သည့်ဧရိယာဖြစ်သောသိမ်အင်းနှင့် သာယာကုန်းကျေးရွာ(၂)ရွာအားရွေးချယ်ခဲ့ပါသည်။ အိမ်ထောင် စု စာရင်း ကောက်ယူခြင်း နမူနာမေးခွန်းပုံစံများကို သစ်တောမြေနှင့် သဘာဝသယံဇာတများအပေါ် မှီခိုမှု၊ အသက်မွေးဝမ်းကြောင်းပုံစံများနှင့် မိသားစုဝင်ငွေများအပေါ် အဓိကအခြေခံ၍ ပြင်ဆင်ခဲ့ပါသည်။ သုတေသန ပြုစုရရှိခဲ့သည့်အချက်အလက်များကို ခွဲခြမ်းစိတ်ဖြာမှုပြုရာတွင် ကိန်းဂဏာန်းအချက် အလက်များအပြင် သဘောထားအမြင်များကိုလည်း စုစည်းဆောင်ရွက်ခဲ့ပါသည်။ ရရှိခဲ့သည့် ကိန်းဂဏာန်းအချက်အလက်များကို စိစစ်ရာတွင် Descriptive statistics နှင့် Wilcoxon signed-ranked တို့ကိုအသုံးပြုခဲ့ပါသည်။ Key informant interviews မှရရှိသည့် ဆက်စပ် ပတ်သက်သူများ၏ ခံယူချက်၊ သဘောထားအမြင်နှင့် ယူဆချက်များနှင့် Focus group discussion မှရရှိသည့် အချက်အလက်များကို နားလည်မှုလွယ်ကူစေရန်စာသားဖြင့် ဖော်ပြထားပါသည်။ သုတေသနလေ့လာမှုအရ ပုဂ္ဂလိကသစ်တောစိုက်ခင်းများ တည်ထောင်ခြင်းဖြင့် စိုက်ခင်းစတင် တည်ထောင်သည့်အချိန်တွင် ဒေသခံများအတွက် အလုပ်အကိုင်အခွင့်အလမ်း ရရှိနိုင်သော်လည်း နောက်ပိုင်းတွင် အလုပ်အကိုင်ရရှိနိုင်မှု အလွန်နည်းပါးပြီး စိုက်ခင်း လုပ်ငန်းများသည် ၎င်းတို့၏အသက်မွေးဝမ်းကြောင်းကိုအထောက်အကူပြုနိုင်မှုလည်းနည်း ပါးလာပါသည်။ ပုဂ္ဂလိကစိုက်ခင်းတည်ထောင်ခြင်းဖြင့် အချို့အိမ်ထောင်စုများသည် စိုက်ပျိုးမြေများဆုံးရှုံးခဲ့ရပြီး စိုက်ခင်းမတည်ထောင်မီ(၂၀၀၈)ခုနှစ် ပျမ်းမျှအားဖြင့် အိမ်ထောင်စု တစ်စုလျှင် မြေဧက (၁၀.၄) ဧက ရှိရာမှ သုတေသနစာရင်းကောက်ယူသည့်ကာလ (၂၀၁၉) ခုနှစ်တွင်

(၈.၇) ဇကသို့လျော့နည်းလာပါသည်။ သစ်တောမဟုတ်သည့် သစ်တောထွက်ပစ္စည်းများ ရရှိနိုင် မှု လျော့နည်းလာခဲ့ပြီး စုဆောင်းရန်ပိုမိုခက်ခဲလာခြင်းနှင့် ရှာဖွေရရှိသည့်နေရာ လည်းပိုမို ဝေးကွာပါသည်။ သစ်တောမြေအတွင်းလယ်ယာမြေချဲ့ထွင်ခြင်း၊ တရားမဝင်ကျူး ကျော်ဝင် ရောက်ခြင်း၊ ဒေသခံနှင့်ပုဂ္ဂလိကလုပ်ငန်းရှင်များအကြားမြေယာပိုင်ဆိုင်မှုအငြင်းပွားခြင်းများ လည်းဖြစ်ပေါ်ခဲ့ပါသည်။ ပုဂ္ဂလိကစိုက်ခင်းတည်ထောင်ခြင်းဖြင့် ဒေသခံများ၏ အသက်မွေး ဝမ်းကြောင်းပုံစံများလည်းသိသာစွာပြောင်းလဲခဲ့ပါသည်။ အဓိကအသက်မွေးဝမ်းကြောင်း ဖြစ်သည့် လယ်ယာလုပ်ငန်းသည် ၇၇% မှ ၇၂ % သို့ ကျဆင်းခဲ့ပါသည်။ မိသားစု တစ်ဦးချင်း ဝင်ငွေအနေဖြင့်နှိုင်းယှဉ်ပါကသိသာစွာကွာခြားမှုမရှိပါ။ ပုဂ္ဂလိကသစ်တောစိုက်ခင်း လုပ်ငန်း များ တိုးတက်များပြားလာခြင်းသည် ဒေသခံများ အတွက်စိုက်ပျိုးမြေရရှိမှု အပေါ်ကန့် သတ်ချက်များရှိလာခြင်းနှင့် သစ်မဟုတ်သည့် သစ်တောထွက်ပစ္စည်းများ ရရှိမှု လျော့နည်း လာခြင်းများ ဖြစ်ပေါ်လာနိုင်ပါသည်။ သို့ဖြစ်၍ သင့်လျော်သည့် အသုံးချမှုဆိုင်ရာ မူဝါဒများ ချမှတ်ခြင်းနှင့်ဒေသခံပြည်သူများ၏အသက်မွေးဝမ်းကြောင်း တိုးတက်မှုဆိုင်ရာ စီမံချက်များ ချမှတ်အကောင်အထည်ဖော်ခြင်းဖြင့် မြေယာပိုင်ဆိုင်မှုအငြင်း ပွားမှုများနှင့် သစ်တောမြေ အတွင်း ကျူးကျော်ဝင်ရောက်မှုများ လျော့နည်းလာမည့်အပြင် ပုဂ္ဂလိက သစ်တော စိုက်ခင်း များကိုလည်းအောင်မြင်စွာတည်ထောင်နိုင်မည်ဖြစ်ပါသည်။

Study on the Impacts of Private Plantation on Local Communities and Policy Suggestion in Myanmar

(A case study in Katha Township, Katha District, Sagaing Region)

1. Introduction

Myanmar is one of the countries in South-East Asia Region possessing rich forest resources. According to forest resource assessment (2015), about 42.92 percent of the total land area is covered with forest. Forest resources make a substantial contribution to country's economic sector both at subsistence and commercial scale, as well as in a tangible and intangible way. It also contributes to meeting forest product demand of the country for the domestic uses including wood fuel and charcoal, which are the main sources of the bioenergy used in Myanmar. In addition, non-timber forest products (NTFPs) also significantly contribute to the livelihood of local communities.

Moreover, the country's economy had been heavily dependent on earnings from export of timber, especially between 1990 and 2000. Therefore, Myanmar's forest areas reduced from 47% in 2010 to 42.92% in 2015 (FAO, 2010, 2015). The annual rate of deforestation in Myanmar was 1.2% for the period 1990-2015 (FAO, 2015) due to rapid expansion of commercial agriculture, alongside legal and illegal logging, and the clearance of forest areas for infrastructural projects being the main drivers (Forest Trends, 2015).

Plantation forestry plays an important role in combating deforestation and forest degradation and, thus, reduces dependency on natural forests. Massive scale plantation forestry in Myanmar began in the early 1980s. More than 30,000 ha of forest plantations have annually been formed since 1984 (Myanmar Forest Department 2000; Naing, 2014). Myanmar has also launched a Special Teak Plantation Program in 1998 which has an annual plantation target of 8000 ha in addition to the normal plantation scheme (Maung & Yamamoto, 2008).

Although FD emphasized on forest plantations establishment with *Tectona grandis* in particular and commercial hardwood species in general, maintenance, monitoring and evaluation in order to ensure quantity and quality of plantation wood is limited due to insufficient human and financial resources. This suggests a need for more private investment in plantations apart from state-owned with the aim to provide development of private sector and national economy, and also sustainable forest. Therefore, FD encouraged the private sectors to become partners in plantation forestry through profit sharing. In this context, FD has launched the private sector investment in private plantations in the forest lands (i.e. Reserved Forests and Protected Public Forests) since 2006.

As for rule and regulations to establish private plantations, land lease to private companies or entrepreneurs for teak and hardwoods is 30 years while land lease for industrial plantation is 15 years. They have to follow the laws, rules and regulations with relevant to environmental protection. The government will collect the tax with the rate of 25% of either the product or the value of the product. As of September 2019, almost 258,263 hectares of private forest plantations have been established by over 100 private

companies/ entrepreneurs all over the country. Normally, there are 3 main types of private plantation; teak, hardwood (Eucalyptus, *Xylia xylocarpa*) and industrial (bamboo, rubber (*Hevea brasiliensis*), palm) (Natural Forest and Plantation Division, Forest Department, 2019).

Private plantations are allowed in natural forest lands which have been degraded and are no longer possible to maintain as natural forests. However, most of the rural communities living around the forest area mainly depend on the forest for their subsistence. The concession can effect negatively on livelihood of local peoples, especially when they highly depend on the forests land and when these forest lands are confiscated by the companies /entrepreneurs under the concession right. On the other hands, private companies have invested in their plantation projects and successful implementation private plantation and timber market is very important for them. They can also face some difficulties in their planting activities and management.

Thus, it is necessary to ensure the balance between effective forest management and livelihood development of local communities the sustainability of forest utilization and management. Moreover, the effectiveness of the existing policies, rules and regulations prescribed by the Forest Department is up most important for sustainability of plantation management.

In Myanmar, although private plantation program (PPP) was initiated by Forest Department (FD) since 2006, the study of changes in local communities' livelihoods, and social and economic impacts of plantation establishment is still limited. In order to enhance the research based successful implementation of PPP, this study will be a platform for this context.

Large areas of private forest plantation are supposed to be increased in Myanmar. On the other hands, local communities from nearby villages have already encroached into natural forests and are likely to continue encroachment. Since encroachment in the forest area is a common problem in Myanmar, some of encroached areas of the local communities had already included in the private plantation sites. Besides, conflicts between private plantations and local communities are crucial issues to be addressed. These situations are challenging livelihood of local community and plantation development.

Therefore, understanding of previous and current socio-economic impacts before and after private plantation establishment and current situations of this program will be useful for policy makers to revise and formulate an appropriate forest restoration program. It is also needed to assess the effectiveness of the existing policies, rules and regulations prescribed by the Forest Department for sustainability of plantation management.

2. Objectives

The main objective of the research is to explore the socioeconomic impacts of private forest plantation on the local community, stakeholder's perceptions which will assist determination of the promising technical inputs and reviewing policy and regulation for sustainability of private plantations in managing forest areas in harmony with the balance of community's wellbeing.

The specific objectives of this research are:

i. To observe the previous and current livelihood conditions of local communities
ii. To assess the impacts of private forest plantation program on the socioeconomic conditions of local communities
iii. To explore stakeholder's perceptions on private forest plantation program
iv. To highlight the regulatory factors of sustainable private plantations establishment in Myanmar

3. Materials and Methods

3.1 Selection of the study area

The selected study area, Katha Township is situated in Katha district, Sagaing Region. According to the information In Katha Township Forest Department, 2019, forest cover composed of Reserve Forests and Protected Public Forest was estimated 72% of the total land area, whereas the unclassified forest area was about 23% and the agricultural land area was approximately 22%. The main forest type in this study area is the mixed deciduous.

As of August 2019, 11 private investors have been allowed for establishing three types of private forest plantations namely private teak, hard wood and industrial plantations and the total permitted area reaches to 12833.03 acres in the Township. According to the statistical data of Katha Township Forest Department, Yinke Reserve Forest and Aungpon Nattaga Protected Public Forest (PPF) are close enough to the village areas and there is the largest private plantation company in the region so called Honda Myanmar. Honda Myanmar Company possesses 4500 acres of Teak plantation, 1036.69 acres of Eucalyptus plantation and 1274.98 acres of sugar cane plantation in Yinke Reserve Forest. In Aungpon Nattaga Protected Public Forest, Teak/ Hardwood plantation of 263.05 acres are allowed with 7 private investors and, most of the investors are local investors. Thus, this area is suitable to do the research on how the socio-economic condition of local people changed after establishing private plantations and how the sustainability of natural forest management is going on.

In order to select suitable villages, two common elements were identified: (1) the existence of currently established private plantations areas and (2) the existence of rural community near the private plantations especially large private plantations. Two villages were selected as study villages: Tharagone village which is closed to the Honda Myanmar Company's Teak/ Eucalyptus plantations and Thein Inn village which is near the small private plantations. The following Figure shows Location map of private plantation in Katha Township.

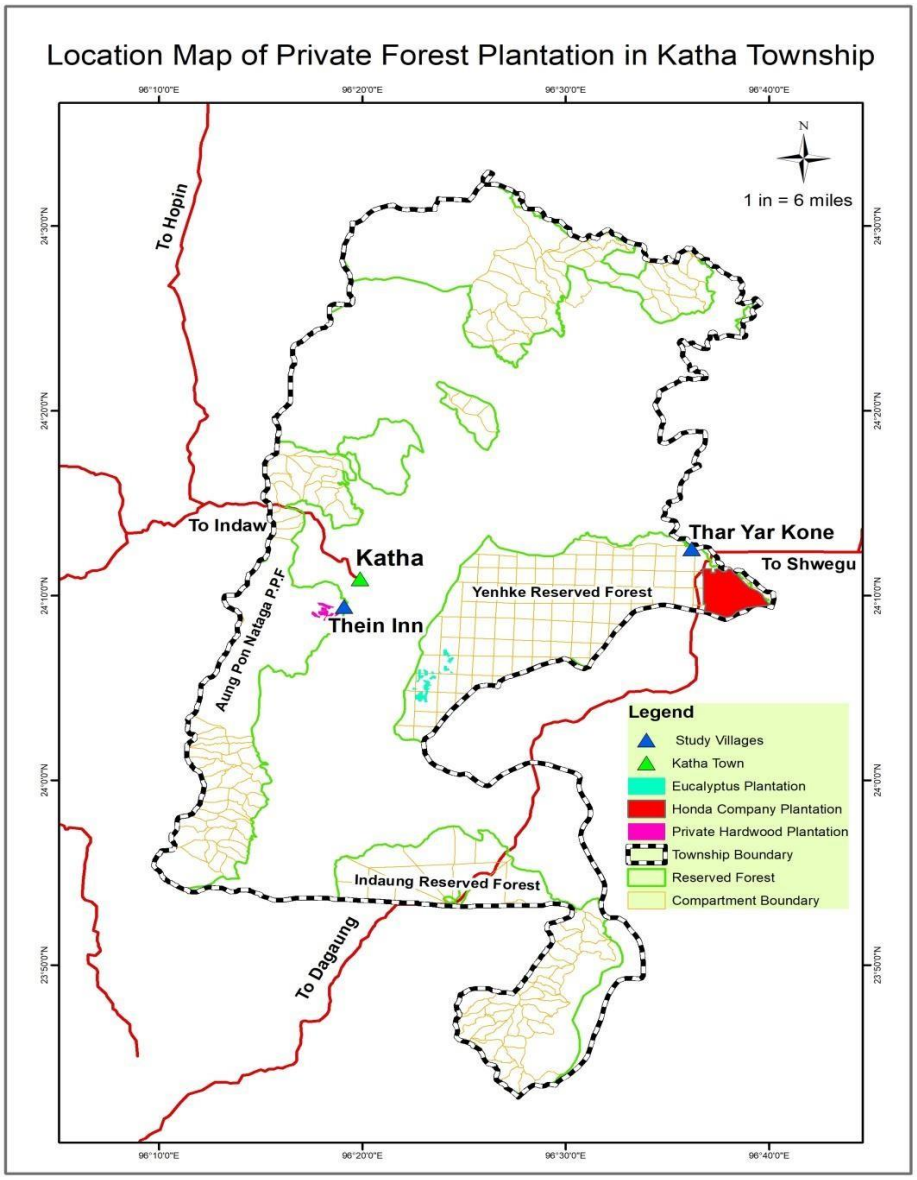


Figure: 3.1 Location map of private plantation in Katha Township

3.2 Sampling and sample size

Simple random sampling was used to choose sample size from total population of two villages. There are altogether 304 households in two target villages: 183 in Tharagone village and 121 in Thein Inn village. Sample size was calculated at 5% precision level by using Taro Yamane formula (Yamane, 1967):

$$n = \frac{N}{1 + Ne^2}$$

Where; n = sample size, N= total population of household, and e = precision level

Thus, the result of sample size calculation was 173. Then, it was proportionately allotted for the each target village: 104 households for Tharagone village and 69 households for Thein Inn village. In the context of private plantation companies, there are 11 private companies/ investors in study areas. Among them, discussions and questionnaire survey were conducted with 6 investors.

3.3 Data collection

Secondary data were mainly collected from Headquarters, Township and Regional Forest Department. Primary data collection was mainly conducted through household survey, key informant interviews, focus group discussion and observation. Social survey was mainly focused on the differences between 2008 and 2019 (before and current situation of private plantation establishment). The survey questionnaires were adjusted by using the concepts of DFID's sustainable livelihood framework.

Observation was also conducted throughout primary data collection in order to know the ground situation of study area. The findings from observation were applied as back up and cross check of the information supported by the villagers and company representatives.

3.4 Data processing and analysis

3.4.1 Quantitative data analysis

Descriptive statistics, Wilcoxon Signed Rank Test, were applied for analyzing quantitative data. Microsoft excel and SPSS 20 version were used when analyzing and processing data. To describe socio-economic condition of before and after introducing private plantation forestry, descriptive statistics and Wilcoxon Signed Rank Test were used to compare the socioeconomic conditions of two villages before and after introducing private plantations in order to express how private plantation program changes livelihoods of local community.

3.4.2 Qualitative data analysis

The information and explanation regarding to the respondents and private investor " feelings, expression and perceptions" obtained from key informant interviews and focus group were summarized so as to support the results from the qualitative data analysis. Moreover, notes taken during key informant interviews were refined after field data collection.

Depending on the secondary data, household survey result, focus group discussion, key informant interview, and observation in the plantation sites and assessment of the forest condition, technical inputs (including planting and maintenance), and market condition were carried out. The effectiveness of existing forest policies, laws and regulations prescribed by the Forest Department related with private plantation were also reviewed based on the questionnaire data and current situations.

4. Results

4.1 Socio-economic characteristic of respondents

In practical, 104 households for Thayagone village and 75 households for Theininn village, totally 179 households were surveyed. In the questionnaires, before the private plantation project was denoted by before 2008 and after entering plantation project was denoted by the time of field survey- year 2019. Socioeconomic characteristics of respondents are as described in **Table 4.1**

Table 4.1 Socio-economic characteristics of respondents, n= 179

Characteristic		**Respondent %**
Household type	Timber	53
	Bamboo	43
	Brick	4
Family Size	Small (1-3) persons	18
	Medium (4-6) persons	62
	Large (7 persons and above)	20
Gender	Male	49
	Female	51
Education	Basic Education	89
	Higher Education	9
	Graduate	3
Major livelihood	Farming	72
	Odd job or casual labor	17
	Service providers (transportation, entertainment, etc.)	7
	Government employee	4
	Small scale trading	1
Annual income level	Low (< 2.5 million kyats)	43
	Medium (2.5 to 5 million kyats)	45
	High (> 5 million kyats)	12
land holding status	Landless	24
	Small (1-10 Ac)	44
	Medium (11-20 Ac)	24
	Big (30 Ac and above)	8
Animal husbandry	Yes	80
	No	20
Income for animal husbandry	Yes	18
	No	82

Characteristic		Respondent %
Collect NTFPs	Yes	25
	No	75
Income from selling NTFPs	Yes	13
	No	87

4.2 Impact on socio-economic conditions of local communities

4.2.1 Status of land abandoned because of the private plantation project

Both study village encroached within the forest reserve and have been cultivating rain- fed agriculture including lowland and upland for a long time. Once Forest Department allowed and approved to establish private plantations, private plantation companies/ entrepreneurs acquired land concession right to establish private forest plantation, some agricultural land legally possessed or encroached land were involved in the plantation area.

According to the household survey, villagers from Thein Inn villages did not receive land compensation. However, some of the villages from Tharagone villages acquired land compensation from Honda Myanmar Company. Most of the farmers accepted the compensation, but some farmers did not agree on the proposal for compensation and caused land use conflict. Thus, land use conflict occurred between the company and local villagers in Thein Inn village.

Among 179 sample households, 128 households did not abandon agricultural lands due to the establishment of private plantation, but the remaining 51 households abandoned their agricultural lands; 9 households from Thein Inn village, 42 households in Tharagone village respectively. **(See in Figure 4.1).**

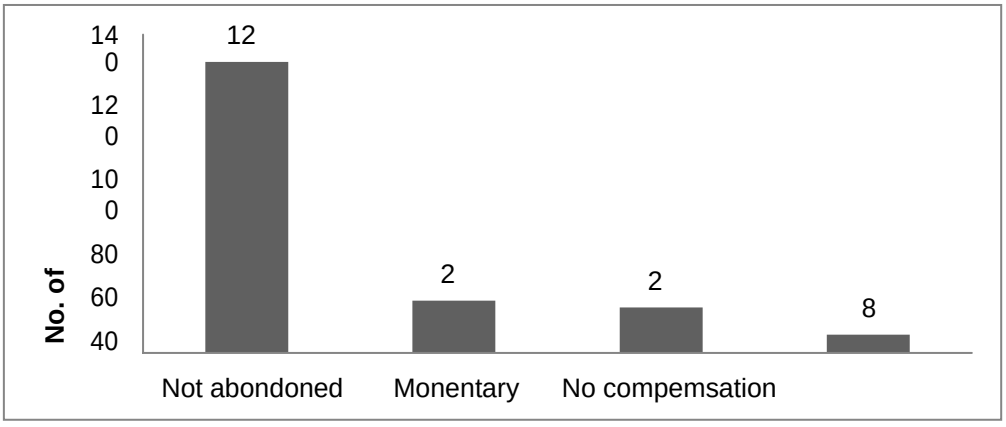


Figure 4.1 Status of land abandoned in study area, n= 179

4.2.2 Change in agricultural land properties

As overall, percentage of "landless" household was declined from 25% to 24% while increasing in small landholding size "1-10 Ac" from 35% to 44%. However, percentage of medium (11- 20Ac) and large land holding size (21 Ac and above) was decreased from 28% to 24% and 11% to 8% respectively as shown in **figure 4.2.**

According to the result of Wilcoxon signed rank test, 148 households remained

"unchanged" or "no decrease" in landholding size. For the remaining 31 households, land holding size of 23 households was decreased, but the other 8 households increased between 2008 and 2019. Of households, 23 household respondents mentioned private forest plantations as reason for reducing their landholding size while the rest 8 households provided theybought new land from others.

In addition, significance value 0.021 was less than 0.05 and this showed that there was significantly different in average land holding size before and after the establishment of private forest plantation. The reason of changed in average land holding size was some villagers' abandoned their agricultural land due to the establishment of private forest plantations.

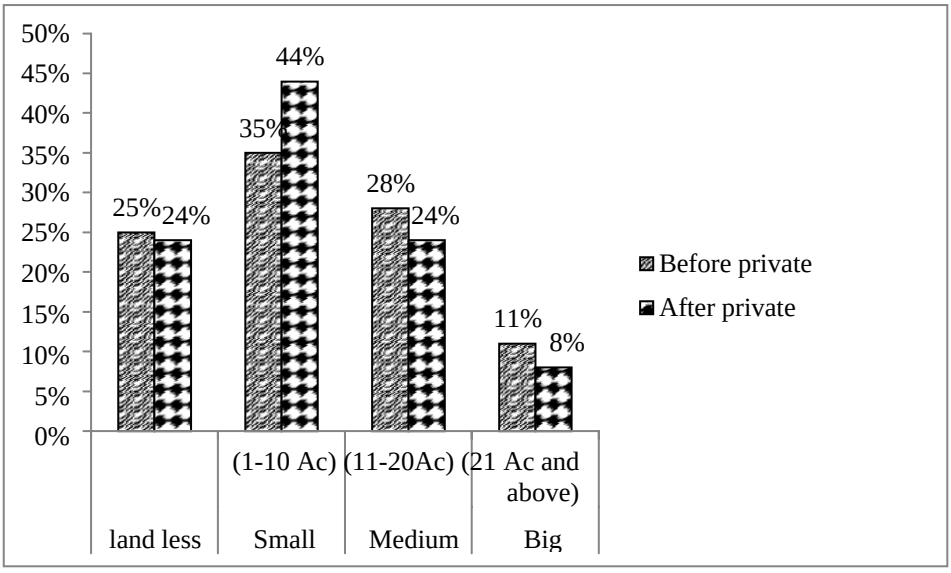


Figure 4.2 Comparison of land properties in study area, n=179

4.2.3 Changes in land holding size

Agricultural land holdings area before and after the development of private plantation, and land loss areas in both study villages are as shown in the following **Table**.

Table 4.2 Status of agricultural land holdings area in 2008, 2019 and land loss area

land condition	Village	Area	Mean	SD
2008	Thein inn	185	2.5	3.8
	Tharagone	1678	16.0	13.0
	Total	**1863**	**10.4**	**16.8**
2019	Thein inn	141	2.0	3.0
	Tharagone	1409	14.0	11.0

land condition	Village	Area	Mean	SD
	Total	**1550**	**8.7**	**14.0**
land loss	Thein inn	55	1.0	3.0
	Tharagone	457	4.0	8.0
	Total	**512**	**2.9**	**7.0**

It was found that total holding size before the plantation project was 1863 acres, after the establishment of private plantation is 1550 acres. Average landholding size was 10.4 acres per household (SD=16.8) before starting the private plantation, i.e. in 2008. After developing private forest plantation, this however decreased to 8.7 acres per household (SD=14) in 2019.

In village level, average land holding size in Thein Inn village was 2.5 to 1.9 Ac, while, Tharagone village was 61.1 Ac to 13.5 Ac. According to the Wilcoxon signed rank test, significance value 0.000 was less than p value 0.001. Thus, there was significantly difference in land holding size before and after the development of private plantation.

Average land loss area in Thein Inn village was 1 Ac; Tharagone village was 4 Ac and overall 2.9 Ac. However, land holding area before the plantation project was 1863 acres, land loss was area 512 acres, and after the establishment of private plantation was 1550 acres as mentioned in **Figure 4.3.** Besides, land holding after the establishment of private plantation was 199 acres larger than abandoned area. Therefore, it could be assumed that some villagers encroached again in the forest areas after abandoning their agricultural land.

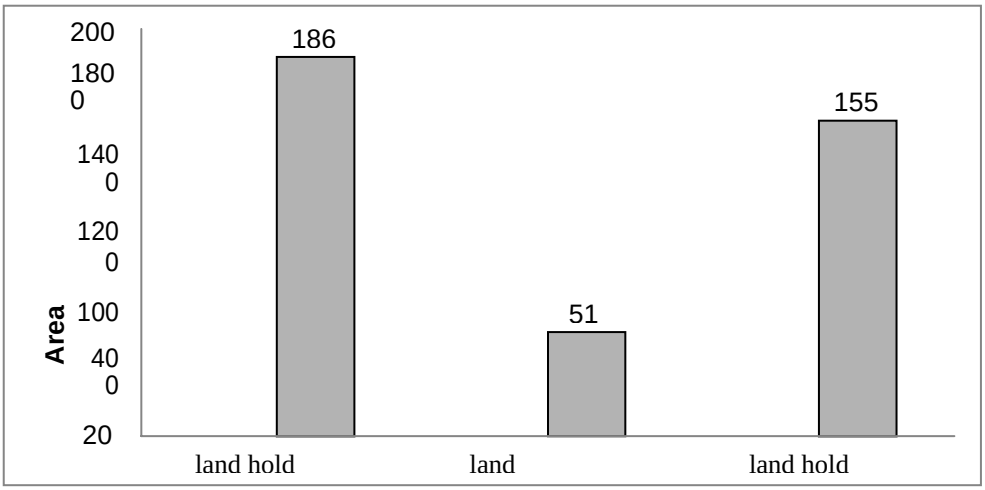


Figure 4.3 Comparison of land holds size before and after the plantation, n= 179

4.2.4 Impact on occurrence of land conflict

Overall, 4% of respondents had experienced land conflicts in regard with land tenure among local owners or government organizations. However, a total of 96% of the respondents did not cause any land conflict during the study period. After the private plantation come in, 14% of respondents occurred land conflict whereas 86 % did not occurred, as shown in **Figure4.4**. The process of private plantation had negative impact on experiences land conflicts for the community. Increase in conflicts was mainly because of establishing private plantations near the village area.

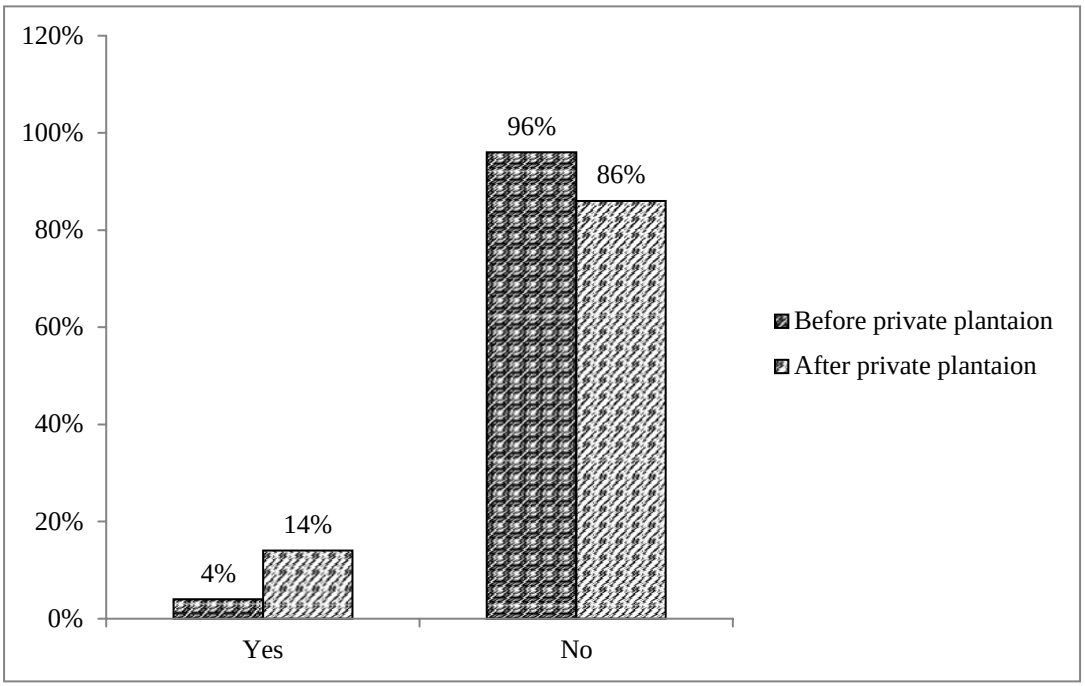


Figure 4.4 Occurrence of land conflicts before and after the private plantation, n=179

4.3 Impact on access of forest resources

4.3.1 Access of NTFPs in 2008 and 2019

It was observed that, 39% of the households collected NTFPs in 2008, but 61% did not collected in the study area. However, only 25% are collecting NTFPs after the development of private plantation especially for household use. Moreover, according to the test results of Wilcoxon signed rank, significance value, 0.000 is less than 0.01 and, there was significantly different availability of NTFPs before and after the development of private plantation. Thus, it could be generally assumed that availability of NTFPs is more difficult after the private plantation. The decreasing natural asset in both study villages was as private plantation program acquired some areas of agricultural land and destroyed NTFPs by clear cutting the existing vegetation or over exploitation. **Figure 4.5** indicates comparison of NTFPs collections in 2008 and 2019 in study area.

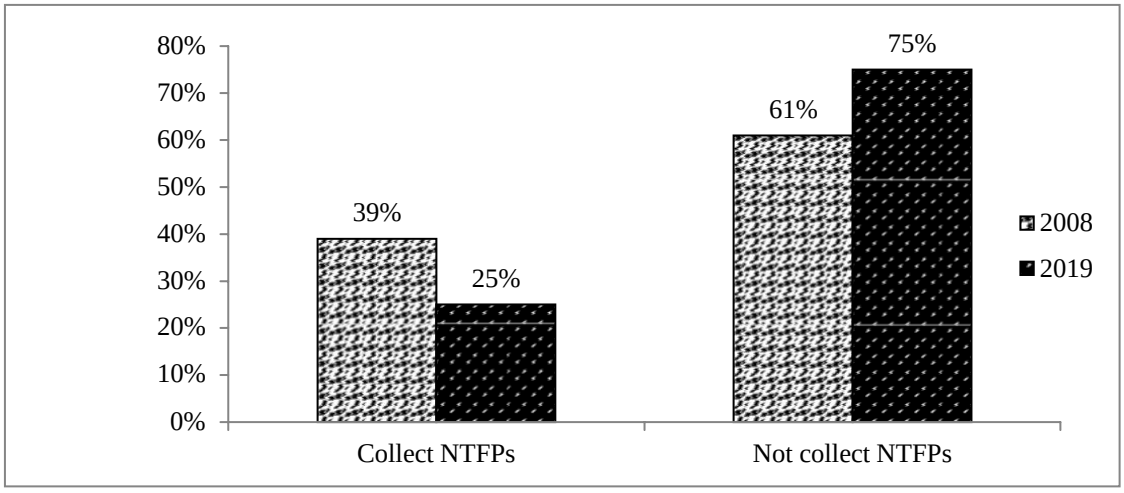


Figure 4.5 Comparison of NTFPs collection in 2008 and 2019, n= 179

4.3.2 Current status of NTFPs collection

Among the sample households 179, 11 % of households collected fuelwood while 8% collected bamboo. It was also observed that 2.8 % of households collected both fuel wood and charcoal, and 3 % collected bamboo shoot. But, the remaining 75% did not collected NTFPs in the forest area and their fuelwood supply could depend on other sources such as electricity, agricultural residues, trees from farm land, orchards, home garden, and banks of the streams and creeks. The following **figure** shows current status of NTFPs collection in study area.

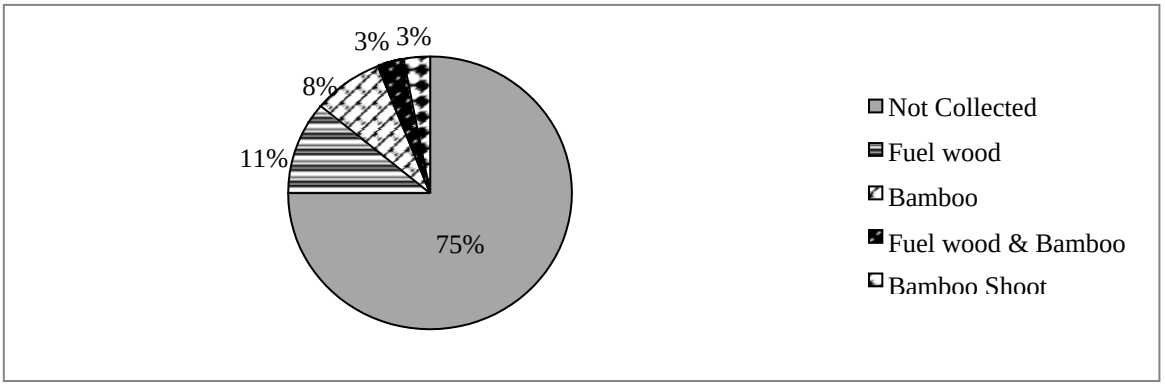


Figure 4.6 Current status of NTFPs collection in study area

Among 179 respondents in study area, 64% of the respondents replied that collection of NTFPs was more difficult since the private company came in, while, 12% of the respondents did not provide their experiences or opinions. However, the rest 14% of the respondents stated that, "There is no change the availability of NTFPs before and after the establishment of private forest plantations". Besides, about 25% of the respondents explained that NTFPs near the village were decreasing day by day before the establishment of private forest plantations as the consequences of over exploitation. Therefore, it could be generally concluded that decreasing of NTFPs was not only the impact of private plantation establishment but also the consequences of over exploitation.Source of energy for daily cooking

Figure 4.7 indicates status of energy sources for daily cooking in study area. This figure shows that most of the households in the study are still using fuelwood for their daily cooking.

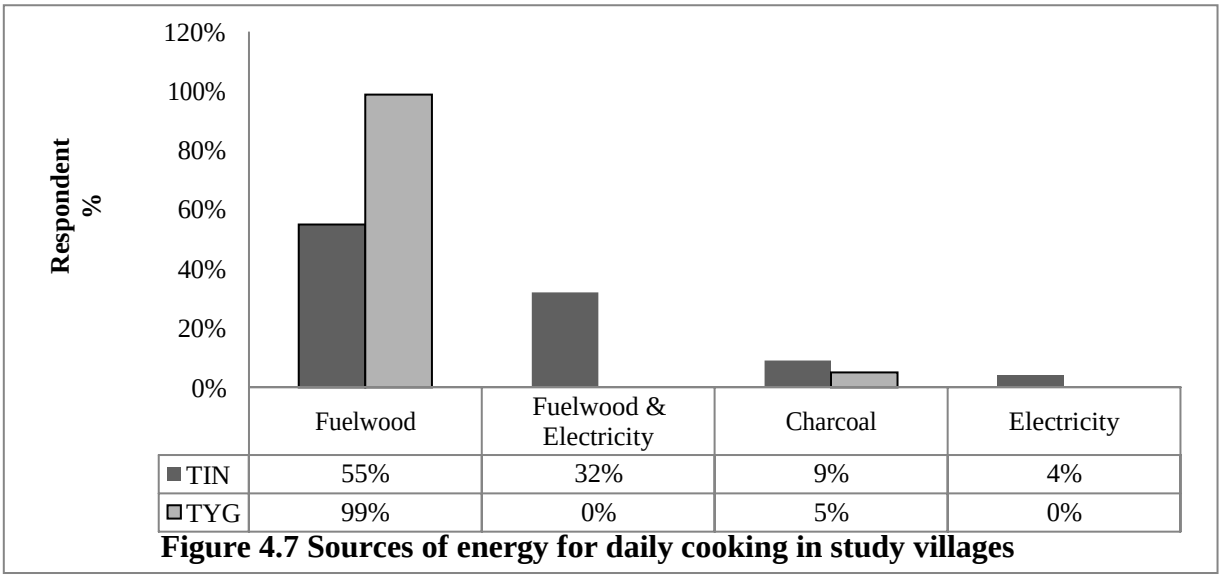


Figure 4.7 Sources of energy for daily cooking in study villages

According to the household survey and observations, most of the villagers were using fuel wood for their daily cooking. In addition, most of the landless or small land holders explained that they normally collected fuelwood near the forest area since they were young; however, it was more and more difficult to collect due to over exploitation, conversion of forest land to agricultural land. Besides, some of the respondents said that fuelwood was decreasing as the establishment of large-scale plantation near the village area. But some respondents supposed that fuelwood availability was not change as they collected fuelwood from the forest areas since they were young, and decreasing was the consequences of over exploitation. Therefore, it could be generally assumed that developing private plantation was one of the factors of fuel wood scarcity, but not a major cause.

4.4 Impacts on livelihood strategies

Four major livelihood strategies (farming, service providers, and government employee) were found in study site. Very small amount of the respondents were doing small scale trading such as small super market, green grocer and small food shop in the village area. Some of the villagers were conducting small home garden in their household compounds and sold a minor part of their harvest to generate additional income for the household. Livelihood strategies of study areas are as shown in **figure 4.8.**

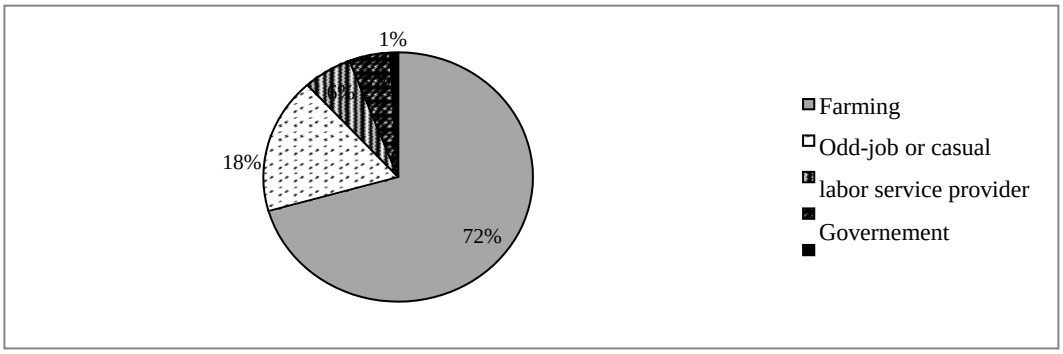


Figure 4.8 Proportion of households participating in different livelihood activities n=179

Figure 4.8 indicates percentage of households which were involved in different livelihood strategies in 2008 and 2019, before and after launching private forest plantation program. The finding of the household survey showed that percentage of households involved in agriculture declined from 77% to 72%. However, odd-job or casual labor, service provider and government employee increased from 15% to 18%, 5% to 6% and 3% to 5 % respectively. There was no change in small scale trading represented by 1% as both of the villages are located in the remote area. According to Wilcoxon signed ranged test (a non-parametric test) result, significance value, 0.010 is less than p vale 0.05. Therefore, it could be supposed that major livelihood strategies after the private plantation establishment strategies were significantly different than before establishing private plantation.

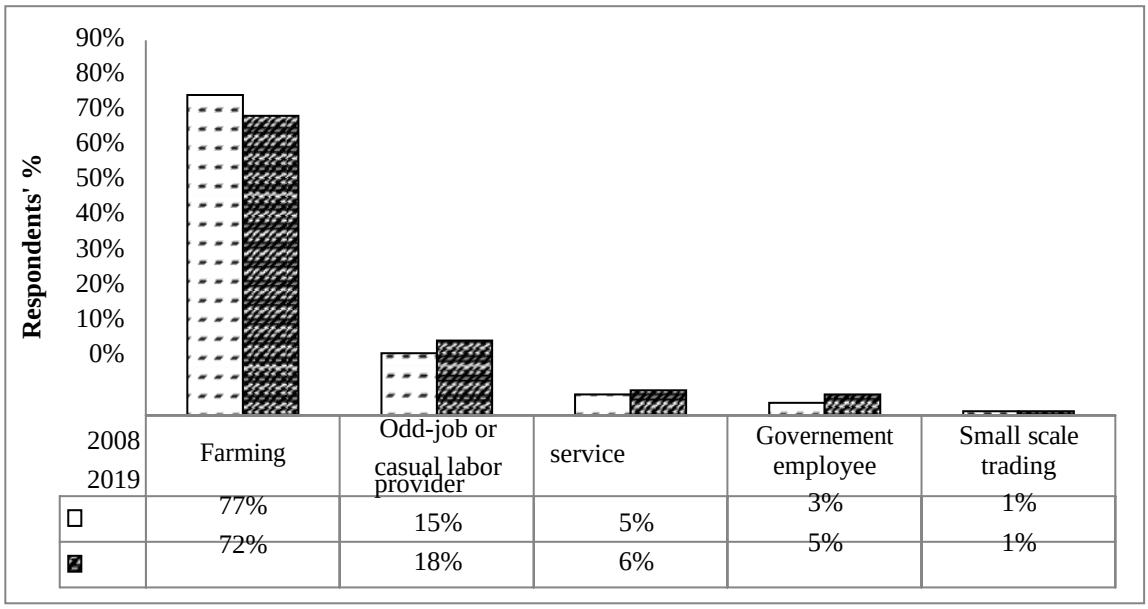
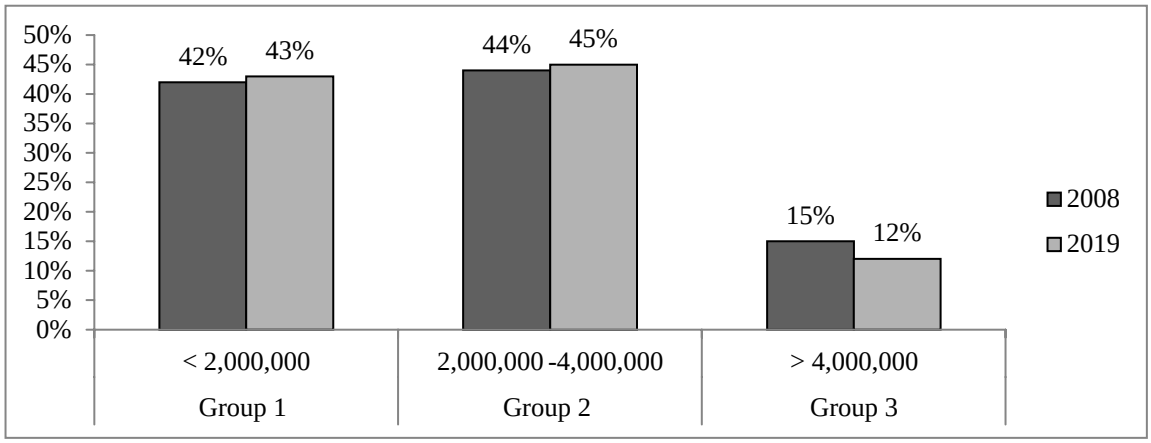


Figure 4.9 Comparison of different livelihood strategies in 2008 and 2019, n= 179

4.5 Impact on the household income

As overall household income from 2008 to 2019, it was found that percentage of households income were increased to Group 1 (<2,000,000 Kyats) and Group 2(2,000,000 to 4, 000,000 Kyats); 42% to 43% and 44% to 45% respectively, while, went down at Group 3(>4,000,000 Kyats) from 15% to 12 %.(See in **Figure 4.10**).



4.10 Comparison of overall household's income in 2008 and 2019

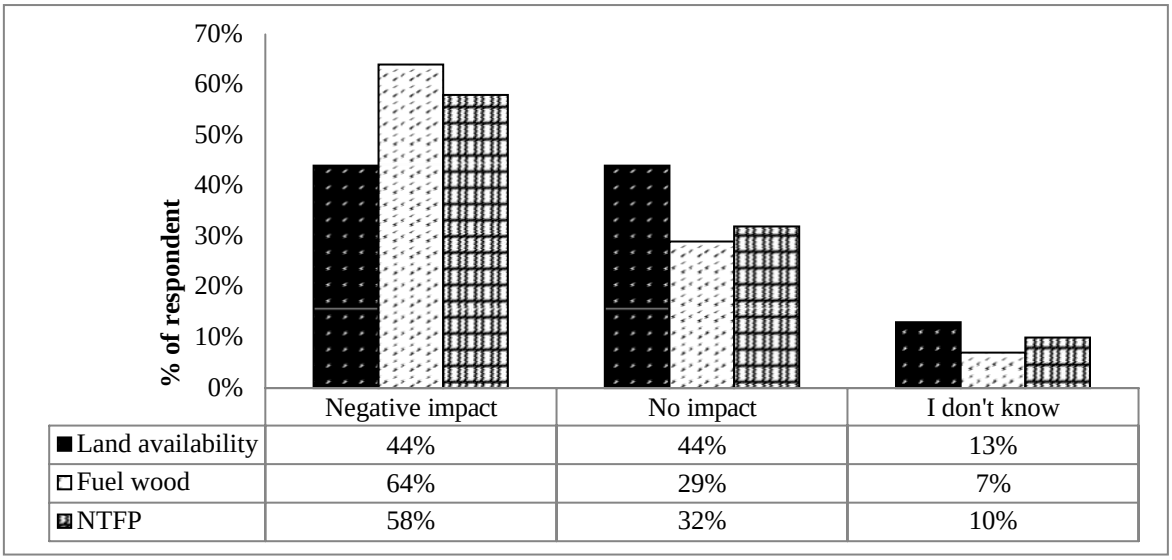
According to the Wilcoxon signed ranged test result, among 149 households in the study area, 128 households were "no change" in household income. For the remaining 56 households, 25 households increased, while, the other 31 households decreased between 2008 and 2019. It was found that significance value, 0.423 is greater than 0.05 and it could be supposed that household income after establishing private plantations was not significantly different than before establishing private plantation.

4.6 Respondents' perceptions on private plantation program

Forest plantations are perceived to impact the main livelihood; availability of agricultural land and NTFPs were reducing after plantation companies entered. Respondents

in the study area also perceived that private plantation have negative impacts on their cultivations and land availability. According to the result, about 44% the household survey respondents assessed that plantation have negative impact on land availability while the other 44% perceived that private plantation have no impact on the land availability.

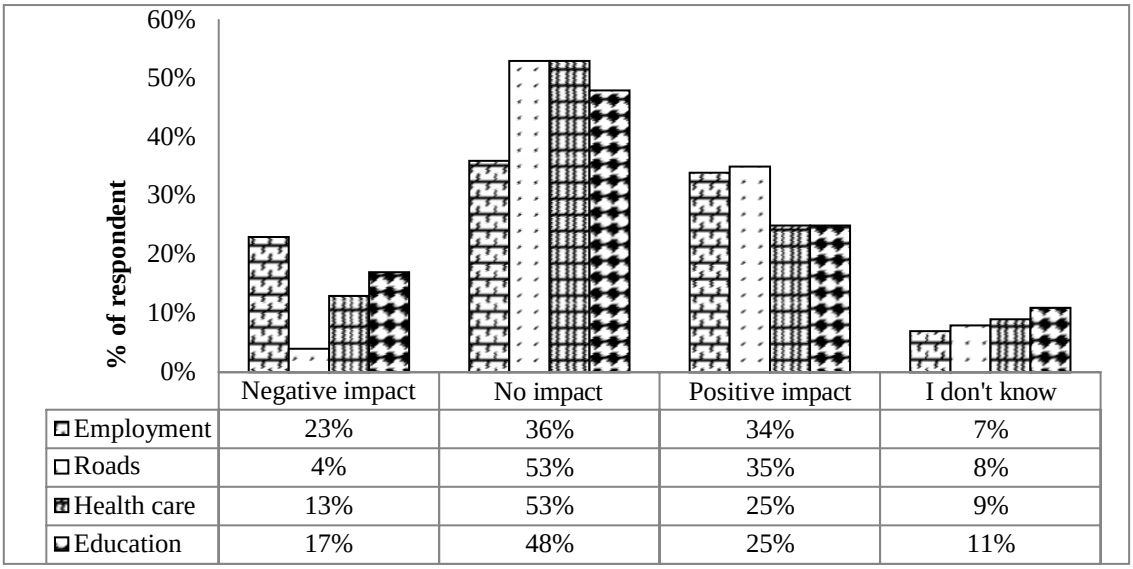
Regarding their livelihoods, most of the respondents perceived that private forest plantation program also negatively impact the availability of resources from natural forests. Most of the landless and small land holders in the study site collect NTFPs especially firewood from the natural forest areas. Perceptions of respondents on the impacts of plantations on natural resource and land availability are as shown in **Figure 4.11.**



	Negative impact	No impact	I don't know
Land availability	44%	44%	13%
Fuel wood	64%	29%	7%
NTFP	58%	32%	10%

Figure 4.11 Respondents' perception on the impacts of plantations on land and natural resources availability

Infrastructure development was possible for increased alternative livelihood strategies. Most of the respondents perceived that privation plantation program created both positive and negative impacts. Some private plantation investors/ companies additionally implemented social activities in the villages, e.g. roads and education and health care facilities have been improved with the support of the plantation companies. More than 30% of the respondents thought employment opportunities have increased because of private forest plantations, while 23% thought there was no impact. About 30% of the respondent expected infrastructure, health and education will improve with the aids of private companies/ investors in the near future. Respondents' perception on the impacts of plantations on employment, trading and infrastructure are as shown in **Figure 4.12.**



	Negative impact	No impact	Positive impact	I don't know
Employment	23%	36%	34%	7%
Roads	4%	53%	35%	8%
Health care	13%	53%	25%	9%
Education	17%	48%	25%	11%

Figure 4.12 Respondents' perception on the impacts of plantations on employment, trading and infrastructure

Overall, among 179 households, about half of the respondents thought that development of private plantations have no impact at all on the overall well-being of their household. However, 30% of the respondents have perceived that development of positive impact on their overall well-being, and 12% have supposed that private plantation program have negative impact on the overall welfare, as mentioned in **Table 4.3.**

Table 4.3 Respondents' perceptions on overall impacts of plantations in study villages

Village	Negative impact	No impact	Positive impact	I don't know
Thein Inn	3	26	17	5
Tharagone	9	23	13	4
Overall	12	49	30	9

4.7 Respondents' knowledge on the private plantation program

As private companies has allowed establishing private forest plantation in RF or PPF area, some local communities living around the forest might have misconceptions or, doubt on this program whether the private owner got special opportunity to establishment plantation without any permission or land lease fee. Therefore, the questionnaire survey was conducted their knowledge about this program, land concession right, procedure, rule and regulation formulated by FD.

According to the household survey, most of the respondents had lack of knowledge about the private plantation program. Among 179 respondents, 4% of the respondents knew how to get permission to establish private plantations and detailed procedures while 25% just know about it. However, 71% of the respondents did not any knowledge to get permission for private plantation establishment.

Regarding rule and regulation for private plantation, 11% of the respondents just knew that private companies have been allowed to establish private plantation under the permission of FD and land lease period of 30 years. The rest 85% did not understand rule and regulations.

Besides, 16% of the respondents knew how the private companies established private plantations and what kind of plantation they have established in forest area.

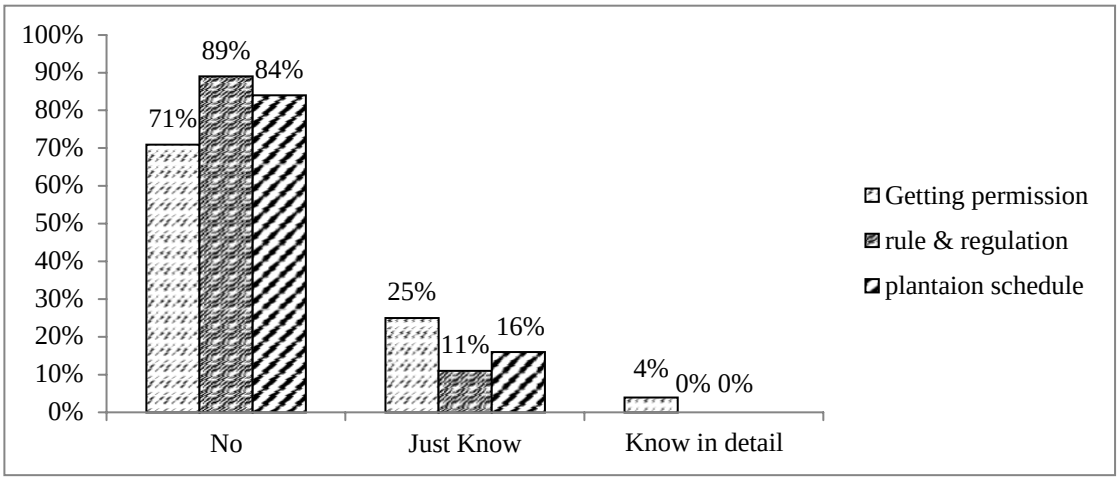


Figure 4.13 Respondents' knowledge on private plantation program

4.8 Focus group discussion (FGD)

With regard to NTFPs, most of the households are still using fuelwood and charcoal for daily cooking although electricity can assess. Some land less and small land holders used to collect fuelwood and bamboo in the RF for income generation. Nowadays, fuelwood and bamboos are getting rare in good access area as private plantations are closed to the village and over exploitation. They needed to spend more days to collect fuelwood, and bamboo for domestic use.

The current livelihood condition is neither so good nor so bad for the majority of people except rich or big land holders. In additions, farming and odd job labors met with seasonal unemployment for several years and some residents are working outside of village to get extra income. Most of the villagers are not willing to introduce private plantation program near their village if possible.

Every participant has some concerns regarding availability of fuel wood and other NTFPs for their domestic uses. Most of the villagers didn't know procedures and rule establishing private plantation. The willingness of every participant in FGD was that they want to manage some degraded forest areas as village use forests or community forestry approved by FD to secure the availability of fuel wood and other NTFPs for their domestic uses, to main water sources and good climate. Most of the participants didn't understand the procedure and regulations of private plantation, and differences between CF and PPP. However, some participants were willing to establish CF in the degraded forest areas.

4.9 Key informant interview

4.9.1 Key results of FD staff

Most of the rural communities living around the forest area are still depending on the forest land and resources for their livelihood. Expansions of upland fields in the forest area were found to be a very common issue. Although, FD is setting efforts to convert upland fields as CF land use to increase socio-economic situation of the local community to reduce encroachment in forest area, more or less encroachment are still occurring. On the other hands,

private plantations are allowed in the degraded reserve forest and PPF to private companies or investors. In this situation, land use conflict occurs very often between the villagers and private companies. Some of the villagers did not know clearly the differences between CF and PPP. Besides, some villagers were misunderstanding that if they encroached in the forest area, they will possess this land legally in the future.

4.9.2 Key results of private company

Some land use conflicts occurred with villagers who already encroached in the permitted planation area. Although they have got permission to manage forest land legally, they consulted with villagers and paid land compensation to give up their agricultural land. Thus, they have to spend additional cost in their investment. However, a few land use conflicts are still happening as a few villagers re-entered and cultivated in the established plantation area.

At present, their plantations are about 11 years old plantations, and they have not received any profit form the plantation as forest plantation is long term enterprise (30/40years rotation). The company personnel were willing to connect local and foreign market with the aid of FD in the near future. Overall, all the private plantation owners were willing to get more helps from the FD in conducting tending operations such as thinning and pest and disease control, connecting local and foreign market.

5. Discussion

According to the research findings, private plantation program has both positive and negative impact on the livelihood of the local communities. Local community could create jobs opportunities with the implementation of private plantation program and would terminated at 3 years old age. Thus, job created by plantation is not stable or long term in order to secure the livelihood of local people.

It was founded that PPP has negative impact on agricultural land availability of local community. Average agricultural land holding area in the study area was significantly decreased after the development of private plantations. Regarding impact on collection of NTFPs by local communities, the findings of this study has already showed that development of private forest plantation caused one of the main reasons of decreasing NTFPs by the villagers, both in terms of quantity and distance to go to collect. In addition, unstainable utilization and clearing of forest vegetation for cultivation was also the drivers for decreasing NTFPs in both study villages.

Relating to livelihood strategies, it is very obvious that development of private forest plantation could make livelihood strategies of the local communities more diversified. Farming was the major livelihood strategy in both study villages. Some villagers abandoned their agricultural land when the private plantation came in and the main coping strategy to cover land loss was to survive as wage labor either in farming, construction or transportation. Farmingand odd job labors met with seasonal unemployment and driving force to work outside of village or cities.

Collecting NTFPs, animal husbandry and wage labor are other important livelihoods after farming. Fuelwood collection for cooking is the major use of forest products by the

local people. Alternative energy sources such as establishing village-owned fuelwood plantations, introducing solar power and firewood substitutes and providing the people with firewood efficient stoves can reduce pressure on the forest land.

Although some farmers abandoned their land due to the establishment of private plantation landless was not significantly decreased. It was also found that the difference of land holding size before and after the establishment of private plantation was greater than the lost area. In addition, a few land use conflict was occurred between private company and villagers. According to the results of stakeholders' perception, local communities have different perception on private plantation. Most of the local people perceived that private plantation have negatively impact on their agricultural land availability, decreasing NTPFs and grazing land while some perceived that it has no impacts. At present they have not received any assistance in local infrastructure, health care and educations. However, some of the villages expected that employment, infrastructure, health and education will improve with the supports of private companies in the future. Therefore, it can be concluded that negative impact not seriously on the socio-economic conditions of local community.

Expansion of upland fields in the forest area was found as a very common issue. Although, FD is setting efforts to convert upland fields as CF land use, encroachment in forest area is occurring. On the other hands, private companies or investors have been allowed to establish private plantation in the degraded reserve forest and PPF. Some land use conflicts occurred with villagers who already encroached in the permitted planation area especially in the Honda- Myanmar Company's plantations. Therefore, it is needed to formulate policy for proper land used and livelihoods development program for local communities in order to reduce land use conflict and encroachment in the forest area as well established private plantations.

All the private plantation owners have established their plantation according to the plantation schedules prescribed by FD. Jobs created by plantations would not be stable or long term in order to secure the livelihood of local people. As the PPP is long- term enterprise they have cost from the initial stage of plantation establishment to final felling as well as monthly land lease fee. Thus, successful implementation of plantations and market for final product is utmost important for private owner as well as FD. Therefore, regular inspection of the plantation should be carried out and giving suggestion in order to operate tending operation (weeding, thinning, fire protection, control of pest and disease) in time, and supporting to connect local and foreign and foreign markets.

6. Conclusion

Forest Department has been encouraging private investment by national companies and entrepreneurs in commercial forest plantations with a view to supplying increasing demand of teak and other hardwoods of the country, contributing to the national economic development, and conserving environmental stability since 2006. This study explored both positive and negative impacts of private forest plantation on livelihoods of local communities, with an emphasis on land and resource utilization, livelihood strategies and livelihood outcomes. Through the understanding of this evidence, the promising policy implications, rule and regulations can be added. In addition, the study of stakeholders' perception on the process gives

information to be helpful to mitigate potential outcomes, revising and further policy implementation and decision making processes. Finally, it can enhance collaboration between forest conservation and stakeholder's engagement to implement development programs. Based on the findings of the research, conclusions can be drawn as follows:

1) Private forest plantation program can enhance job opportunities of local community, but the trend is not stable or long term in order to secure the livelihood of local people.
2) Development of private forest plantation program can limit the availability of farmland by farmers, consequently reduce in land holding size and decline farm income.
3) Implementation of PPP near forest dwellers can occur decreasing in NTFPs as clearing of the existing vegetation and burning. Therefore it is needed to formulate policy for proper land used and livelihoods development program for local communities in order to reduce land use conflict and encroachment in the forest area as well established private plantations.
4) Firewood collection for cooking is the major use of forest products by the local people. Alternative energy sources such as establishing village-owned firewood plantations, introducing solar power and firewood substitutes and providing the people with firewood efficient stoves can reduce pressure on the forest land.
5) Regular inspection of the plantation should be carried out and giving suggestion in order to operate tending operation (weeding, thinning, fire protection, pest and disease control) in time, and supporting to connect local and foreign and foreign markets.

7. Recommendations

The pressure on land and forest resources has increased due to implementation of development projects. As rural communities in the study area are still predominantly dependent on forest land and resources for their livelihoods, reduced agricultural land, occurred land use conflict, and decreased availability of firewood and NTFPs have negatively impacted the majority of local people. Based on the provided baseline information, government or authorized institutions should consider programs that can be synergy between stakeholders' welfare and existence of forest in the long term. To be synergy between forest conservation and livelihood development by PPP, the following policy implications are considerable.

1) Secured access to land and resources

The results based on information collected from two study villages near the private plantation sites indicate that the socio-economic conditions of local people were not noticeable changed after establishing private plantation. However, most of the villagers perceived that private plantation have negative impact on land and natural resources

availability. Thus, private plantation should not be allowed near the village area and the forest land which has been already changed into agricultural land use at large scale.

2) **Formulating joint forest management**

The main reason why some state-owned plantations were not successful is the weakness of proper maintenance and stakeholders' participation. Based on this lesson learned, FD should introduced joint management system such as joint implementation and management of private plantation program by the cooperation of private company and interested local villagers with the facilitating of FD.

3) **Avoiding land use conflict**

To avoid land conflicts, private forest companies need to improve their negotiation process with local communities and make certain that all population groups in the villages have the possibility to express their concerns. The risk of land conflicts could be decreased by the actions of national governments to improve the implementation of land use rights. Sufficient personal, technical and financial capacity is currently missing to fully implement land use right in all the regions. Necessary capacity on the national as well as the local level needs to be provided to assure that local livelihoods are not compromised.

4) **Secured field inspection for permission of PPP**

Field inspection of proposed private plantation sites should be carefully carried out both current forest condition and other environmental information. The inspection report should cover status of existing forest and land use condition, forest resources application by local communities and possible impacts on the livelihood of the local community in order to make decision reasonably in managerial level.

5) **Regular inspection and consultation with stakeholders**

Regular inspection and consultation should be carried in order to know the growth and health of the plantation, what kind of tending operation should be carried out in time and give technical support for plantation development and to mitigate possible conflict with local communities and private owners.

6) **Policy implications**

Private plantation may create pressure on forest land and resources without adding further policies that aim at sustainable land use together with sustainable livelihood of local communities. Therefore, establishing a monitoring program should indicate positive and negative impacts of private plantation, needs for additional considerations in future policy making. Policy makers and should also consider improving awareness of local communities about sustainable use of forest resources and the importance of biodiversity.

7) **Extension and awareness raising**

Extension and awareness raisings on the rights and prohibitions of land use, sustainable utilization of NTFPs should be given because most of the local communities have misconception on the land and resource. Extension services on sustainable farming practices such as CF establishment and joint management of PPP should be promoted as policy implications that aim at enhancing local livelihood through effective and sustainable land use practice.

8) Reducing pressure on forest land

Collecting of NTFPs, especially fuelwood collection for cooking is the major use of forest products by the local people. New alternative energy sources, establishing village- owned firewood plantations, introducing solar power and firewood substitutes and providing the people with firewood efficient stoves can reduce pressure on the forest land. Moreover, providing alternate source of income for the livelihood either through employment opportunities or by a source of income from cultivation will help reduce the pressure on land.

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