

The Republic of the Union of Myanmar
Ministry of Natural Resources and Environmental Conservation
Forest Department



**Evaluation of Sparsely Settled Households' Perception on Resettlement
Plan of Reserved Forests: A Case Study of Tharyarwady District in
Myanmar**



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December, 2019

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သုံးသပ်ခြင်း

ဒေါက်တာအိအိဆွေလှိုင်၊ လက်ထောက်ညွှန်ကြားရေးမှူး
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စာတမ်းအကျဉ်း

မြန်မာနိုင်ငံတွင် ကြိုးဝိုင်းတောများ အပါအဝင် သစ်တောနယ်မြေများအတွင်း အခြေချ နေထိုင်မှုများသည် သစ်တောများ စဉ်ဆက်မပြတ်ရေရှည်တည်တံ့ရေးအား ထိခိုက်နိုင်သည့် အဓိက အကြောင်းအရာများအနက်မှ တစ်ခုဖြစ်ပါသည်။ ၂၀၁၃ ခုနှစ်မှ စတင်၍ နိုင်ငံတော် အစိုးရက သစ်တောနယ်မြေများအတွင်း အခြေချ နေထိုင်မှုများအား အဓိက အလေးထားခဲ့ပြီး ကြိုးဝိုင်းနှင့် ကြိုးပြင်ကာကွယ်တောများအတွင်း အခြေချ နေထိုင်သူများအား ပြန်လည်နေရာချ ထားသည့် စီမံချက်ကို ရေးဆွဲခဲ့ပါသည်။ စာတမ်း၏ ရည်ရွယ်ချက်မှာ သစ်တောနယ်မြေများတွင် အခြေချ နေထိုင်သူများအနက်မှ ကြိုးဝိုင်းအတွင်း နေထိုင်လျက်ရှိသော ပြန့်ကျဲအိမ်ထောင်စု များ၏ နေထိုင်ရခြင်း အကြောင်းရင်းများနှင့် စီမံချက်အပေါ် အမြင်များကို လေ့လာခြင်းဖြင့် စီမံချက် အကောင်အထည်ဖော်ရာတွင် အထောက်အပံ့ ဖြစ်စေရန်အတွက် ဖြစ်ပါသည်။ ဤသုတေသနကို ဒေသတစ်ခုအား အသေးစိတ် လေ့လာခြင်း (case study) နည်းစနစ်အရ ပြန့်ကျဲ အိမ်ထောင်စု များစွာတည်ရှိသည့် သာယာဝတီခရိုင်မှ ကြိုးဝိုင်းတော နှစ်ခုအား ရွေးချယ်၍ qualitative နှင့် quantitative နည်းလမ်းများအား အသုံးပြုကာ ဆောင်ရွက်ခဲ့ ပါသည်။ အချက်အလက် ကောက်ယူရာတွင် စုစုပေါင်း အိမ်ထောင်စု ၄၉ စုအား snowball sampling နည်းစနစ်ဖြင့် ရွေးချယ် မေးမြန်းခဲ့ပါသည်။ ရလဒ်များကို ကြိုးဝိုင်းတွင်းရှိ လယ်ယာများတွင် အစုအဖွဲ့ပိုင် သစ်တောများ တည်ထောင်ပြီးသည့် အိမ်ထောင်စုများနှင့် တည်ထောင်မှု မရှိသေးသည့် အိမ်ထောင်စု များအဖြစ် အုပ်စုနှစ်စုခွဲ၍ ဆွေးနွေးပါသည်။ DPSIR Frameworkကို အသုံးပြု၍ အုပ်စု တစ်စုစီမှ အိမ်ထောင်စုများ၏ ကြိုးဝိုင်းအတွင်းနေထိုင်ရသည့် အကြောင်းအရင်းများအား ဖိအားပေးသည့် တွန်းအားများအနေဖြင့် သုံးသပ်ခြင်း၊ လက်ရှိ လူမှုစီးပွားရေး အခြေအနေများ၊ မြေပိုင်ဆိုင်မှုများနှင့် အသက်မွေးဝမ်းကျောင်း လုပ်ငန်းများအား လေ့လာ၍ လက်ရှိ အခြေအနေကို သုံးသပ်ခြင်းနှင့် စီမံချက် အကောင်အထည်ဖော်ရာတွင်

ပူးပေါင်းပါဝင်မှု မြှင့်တင်နိုင်ရန် အိမ်ထောင်စုများ၏ သဘောထားအမြင်များအား တုံ့ပြန်မှု အနေဖြင့် ဆန်းစစ်ခြင်းဟူ၍ ခွဲခြား သုံးသပ်ထားပါသည်။ သုတေသန ရလဒ်များအရ အိမ်ထောင်စုများ၏ အသက်မွေးဝမ်းကျောင်းနှင့် ဝင်ငွေ အရင်းအမြစ်များအတွက် အဓိက လိုအပ်ချက်နှင့် အဓိက စိတ်ဝင်စားမှုသည် နေထိုင်လုပ်ကိုင် စားသောက်ရန် မြေနေရာ ဖြစ်ကြောင်းနှင့် မြေအသုံးပြု ခြင်းဆိုင်ရာ ရပိုင်ခွင့်ကို လွှဲပြောင်းရရှိနိုင်ခြင်းသည် စီမံချက် အကောင်အထည်ဖော်ရာတွင် အိမ်ထောင်စုများ ပူးပေါင်းပါဝင်မှုအား မြှင့်တင်နိုင်ကြောင်း တွေ့ရှိရပါသည်။ သုတေသန စာတမ်းသည် သစ်တောဌာန အနေဖြင့် စီမံကိန်း အကောင် အထည်ဖော်ခြင်း ဆောင်ရွက်ရာတွင် မြေအသုံးချခြင်းဆိုင်ရာ ရပိုင်ခွင့်များကို အိမ်ထောင်စု များအား သေချာစွာ နားလည် သဘောပေါက်ရန် ရှင်းလင်း သတင်းပေးရန်နှင့် အစုအဖွဲ့ ပိုင်သစ်တောများ တည်ထောင်ရာတွင် ချမ်းသာသော အိမ်ထောင်စုများမှ လက်ဝါးကြီးအုပ်မှု များအား ကာကွယ်ရန် အထူးဂရုပြု သင့်ကြောင်း အကြံပြုထားပါသည်။

Evaluation of Sparsely Settled Households' Perception on Resettlement Plan of Reserved Forests: A Case Study of Tharyarwady District in Myanmar

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Abstract

In Myanmar, settlements in Permanent Forest Estates, including Reserved Forests, became one of major threats for the sustainability of the forests. Government has paid special attention to the issue and developed a resettlement plan for communities and households settled in forests after conducting nation-wide assessment in 2013. The objective of the study is to support the implementation of the resettlement plan by understanding reasons of settlements of sparsely settled households in Reserved Forests (RFs) and their perceptions on the resettlement plan. The study was carried out in two RFs in Tharyarwaddy District which a high number of sparsely settled households using case study approach by applying both qualitative and quantitative methods for data collection and analysis. We studied 49 households and snowball sampling method is used for collecting data. It is discussed in the paper by dividing into two cases based on the nature of communities and households, which are 'case I: Households as Community Forest User Group members' and 'case II: Households with no knowledge of Community Forestry'. Using modified DPSIR framework, in each case, we identified the driving forces/pressures to settle from the origin into forest area; state/impact on RFs; and response to policy action in terms of perception on resettlement plan and increased participation of households towards implementation of the resettlement plan. The study concluded that land is the major interest of the interviewed households for their income source and livelihoods. Handing over the land tenure rights from the Forest Department to households has increased participation of households towards implementation of the resettlement plan. The study recommends that FD or respective stakeholders should inform well about land tenure rights of CF to the households. The study also highlighted preventing elite capture in Community Forest establishment.

Key Words: Resettlement Plan, Participation, Sparsely Settled Households, Land Tenure, Perception.

Evaluation of Sparsely Settled Households' Perception on Resettlement Plan of Reserved Forests: A Case Study of Tharyarwady District in Myanmar

1. Introduction

RF constitution is one of the major forest operations in Myanmar. Forest Department (FD) has focused on expansion of Permanent Forest Estates including RFs up to 30% of the country total areas by the end of 2030 by setting it up as a target in the Forestry Master Plan and Nationally Determined Contribution (INDC 2015). To meet the target in time, not only expansion of RFs but also maintenance of existing RFs is important. In 2013, FD has carried out an assessment on encroachment in Permanent Forest Estates. FD reported that around 1,648,000 acres has been encroached and changed into different land use within the Permanent Forest Estate boundaries (MOECA 2013). Hence, FD developed a resettlement plan with two implementation stages (ibid). The first stage is to take actions on the settlement of the communities with more than 50 households (ibid). In that case, paddy fields, religious areas, housings, communal areas such as school compounds are abrogated from the RF areas and granted under village land titles (ibid). The upland farm areas which are adjacent to the village are planned to establish CFs in order to balance between maintaining communities land tenure rights and reforestation goals (ibid).

The second implementation stage is focused on managing the communities with less than 50 households including households which spread individually throughout RFs (ibid). Sparsely settled households which means “Pyan Kyae” households in Myanmar language, are mainly focused in that stage. According the resettlement plan (2013), FD initially planned to put sparsely settled households together as villages by providing lands for practicing agroforestry in degraded areas and fallow lands through Community Forestry. Currently, FD put effort in establishment of CFs in upland farm areas in RFs using agroforestry practices including upland farms of communities with less than 50 households and sparsely settled households. In October 2019, 319260 acres of upland farms has been transformed into CFs. In order to meet the target and to ensure long term sustainability, active participation of the communities is crucial. Le et al. (2012) pointed out that the acceptance and participation of communities is an important factor for the long term

sustainability of reforestation programs. Tuan (2007), Thomson (1980) and Hlaing (2013) highlighted that perception of communities and understanding their livelihoods are fundamental factors to increase their participation. In addition, understanding underlying factors of the current settlement is also essential to provide the proper incentives to increase participation in the implementation the plan (Thomson and Freunderberger 2000). Up until now, there are limited studies on how to incentivize the households to increase participation in the implementation of the resettlement plan. Hence, the study intends to contribute the knowledge gap in order to support the implementation of resettlement plan specifically focusing on sparsely households in RFs.

2. Objectives

The main objective of the study is to develop options to incentivize sparsely settled households in RFs by assessing the reasons of encroachments and their perceptions.

The specific objectives are

- i) To assess the causes of encroachment of sparsely settled households in RFs
- ii) To understand the perception of sparsely settled households in RFs regarding implementation of the resettlement plan
- iii) To recommend on how to incentivize sparsely settled households in RFs to increase their participation

3. Literature review

Previous studies reveal that there are several factors identified causing encroachment of state land and its magnitude. Factors leading to encroachment on forest lands include population and poverty (Pulhin, 2005; Khalyani et al 2014) and high rate of migration from the mountains to the plains in Nepal (Acharya 2009). In Bangladesh, the average landholding per encroacher household was 1.38 ha and major causes of forest encroachment is lack of land for cultivating crops along with growing population pressure followed by lack of employment (Iftekha, 2005). On the other hand, FD of Bangladesh reported that encroachment of forest land is partly due to insufficient demarcation of

boundaries and improper land records (Bangladesh FD , 2017). Tshering (2018) focuses on the push and pull factors of migration in state land of Bhutan as major causes accelerating encroachment. Push factors includes land fragmentation practice, lack of economic opportunities and fundamental services while pull factors covers economic viability, good market and access to public services and infrastructure.

The attitude of the public authorities towards the people living in the encroachment areas and strategic interventions to address the issue of encroachment also varies from country to country. Likewise in urban settlement noted by Tshering (2018) referring to Fekade (2000), the attitude towards forest occupants in the settlement had changed at the beginning of 1970s and they were considered as indispensable stakeholders of forest management rather than punishing by strict laws. For instance, forest occupants in the Philippines were punished strictly by law before 1970s. However, it has been reported that forest occupants are allowed to develop the lands they were occupying or cultivating as long as it does not exceed 7 ha per occupant under forest occupancy management program in 1976. Later on, this program was promoted into community based forest management with 25 years renewable tenure instrument (Pulhin 2005). In the case of Bangladesh, participatory forestry project started in the early 1980s with the support of external Donors, e.g. Asia Development Bank, and forest occupants were settled phase by phase in specific villages in a district rather than implementing throughout the whole country (Nath and Inoue 2009) and the project was successful.

In addressing strategic interventions through various forms of participatory forest management, farmers/forest occupants were encouraged to include tree planting in their agricultural systems or to establish plantations for livelihood improvement as well as for environmental conservation (Smith1994; Enters et al. 2016). Although factors influence successful outcome of participatory forest management vary depending on the context, incentives are among the major factors that shape the effectiveness of the interventions and to motivate participation (Pagdee et al ,2006; Hlaing & Inoue, 2012; Enters et al, 2016). Incentives refer to the “incitement and inducement of action’ cited in Enters 2016 referring to Enters 2001 and it can be direct and indirect incentives. Direct incentives include inputs

such as seedlings and fertilizers, specific provision of local infrastructure, grants, tax concessions, subsidized loans, food-aid and cost-sharing arrangement. Examples of indirect incentives include tenure security, high timber prices, development of infrastructure, private sectors, efforts in research, development and extension and policies need to consistent.

Incentives either a help or a hindrance are a big controversial issues among the scholars particularly for directive incentives because it may have both positive and negative effects. Based on the assessment in the Asia-Pacific Region, Enters et al (2016) reveals that 'direct incentives are most likely to be important in the initial state to raise awareness and to increase the pace and scale of plantation establishment to augment supplies for a developing processing sector. These should be replaced by variable incentives and social services such as research and extension during the acceleration stage'. Then, outcome of providing incentives will achieve in the maturation stage.

4. Materials and Methods

4.1 Study areas

In selecting the case study unit, the area with the most numbers of sparsely settled households were firstly investigated at regional level, followed up by district level according to the data from FD (2013). After selecting a district, the RFs with highest number of sparsely households are selected as case study areas. There were 32904 households which were sparsely found in RFs throughout the country, of which, Bago region is the one with the highest number with sparsely households in RF as shown in the Figure 1(a). After selecting Bago region as the first step, numbers of sparsely settled households in different districts in the region were observed as illustrated in Figure 1 (b). Tharyarwaddy district with total sparsely settled households of 3363 households was selected at the district level as it has the most occurrences of sparsely households.

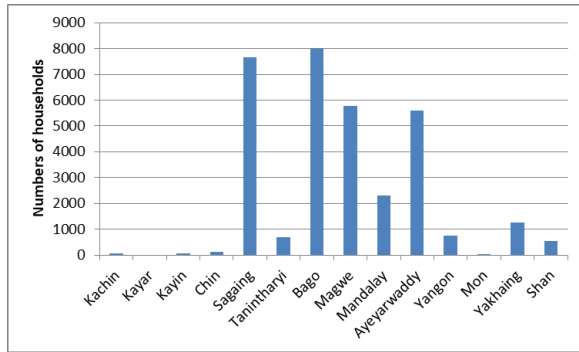


Figure 11 (a) Number of sparsely settled households in states and regions

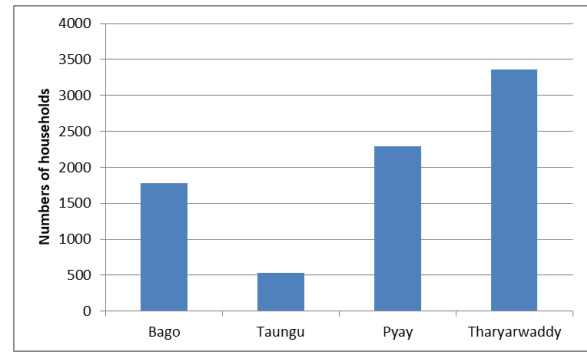


Figure 1 (b) Number of sparsely settled households in Bago regions

In Tharyarwaddy district, we selected the case study RF based on the preference of different settling options assessment conducted by the FD in 2013. The assessment includes the options: i) living as a village, ii) will go back to origin, iii) continue settling in RFs. Hence, we selected Konbeelin and Nyaungpinzin RFs because households in those RFs have a mixture on the preferences of different settling options (Figure 3). The Konbeelin RF can be found in Tharyarwaddy Township and Letpandan Township. The total area of the RF is 16186 Acres, which occupies 934 Acres in Tharyarwaddy Township and 15252 Acres in Letpandan Township. According to the data from the FD, 153 households were settling sparsely in the RF during the survey in 2013 (FD 2013). The total areas of 165.93 acres were reported as upland farm areas in the RF which is supposed to be implemented according to the resettlement plan. The total Area of Nyaungpinzin RF is 7537 acres and exists in Letpandan Township. It was observed during the survey that 44 households are sparsely settled in the RF. During the survey in 2013, only six acres were reported as encroached upland farms in the RF at that time.

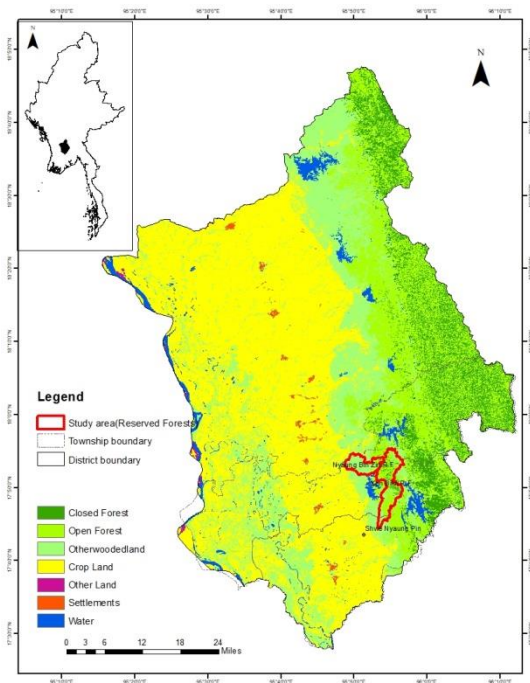


Figure 12. Map of Tharyarwaddy District showing study areas

4.2 Data collection and analysis

As targeted households have nature of scattering and moving around in the RF, data collection was conducted using snowball sampling method. Snowball sampling method is a method often used for collecting data of hidden population (Atkinson & Flint 2001). First samples referred the researchers to new households according to their knowledge. When the researchers found them, they informed about other new households to the researchers and the process repeats until there were no more new households in the area. A total of 26 households in Case I and 23 households in Case II were interviewed using open questions to gather qualitative data as much as possible. Socio-economic data are analyzed using Lorenz curve in order to illustrate the inequality of wealth among households, which also shows level of differences in wealth status between a majority group and a minority group. GINI Coefficient is calculated using the following formula in order to explain the level of inequality of wealth status among households.

Equation 1. Calculation of GINI Coefficient (Gini 1912)

$$G = \frac{\sum_{i=1}^n \sum_{j=1}^n |x_i - x_j|}{2n^2 \bar{x}}$$

Where x is an observed value, n is the number of values observed and x bar is the mean value.

Descriptive analysis is used in the study to compare the occurrence level of data between different groups. Qualitative data are analyzed using coding, categorizing and summarizing. Microsoft Office Excel 2010 and SPSS software were used during analysis.

4.3 Analytical Framework

As noted, this study investigated sparsely settled households in two RFs to assess the causes of encroachment and perception on the resettlement plan of the FD. For this purpose, we used DPSIR framework in this study that enabled systematic assessment and classification of findings (Vacik 2006). DPSIR stands for Driving forces, Pressures, Status, Impact and Responses. Regarding driving forces of causes of encroachment, we assessed push and pull factors of from the origin to settle in Konbeelin and Nyaungpinzin RFs. Following Kristense (2004), we modified the assessment framework to be in line with our research context and issues. In this study, lack of farm lands and knowledge on RF boundary and basic rules are selected as push factors whereas availability of resources (land and food), weak law enforcement on encroachments are selected as pull factors from the origins to settle in RFs. Due to causes of encroachment, forest areas has been changed into farm land and we assessed number of encroached farm land area (acre), socio-economic characteristics and livelihood strategies as a state/impact to forest areas. To address these issues, FD has being implemented settlement plan for the communities with less than 50 households including households which spread individually throughout RFs. Hence, respondents' perceptions on (a) settlement programs; (b) CF establishment and its difficulties and (c) incentive programs to increase participation are assessed as responses.

5. Results and Discussions

5.1. Case I: Households as CF User Groups (CFUGs)

The first case study was conducted in Konbeelin RF, Tharyarwaddy Township. The encroached area is situated around six kilometers far from Shwe Nyaung Pin village. There is no permanent infrastructure for accessibility between the village and households. It can only be accessed with motorcycle during rainy seasons. A total of 26 households were interviewed. Households in the study area already have knowledge of CF establishment and already started implementation of CFs. In this case, three CF User Groups can be found among the interviewed households.

5.1.1. Causes of encroachment

This section describes the causes of encroachment in the study area. The major causes accelerating encroachment are categorized as push factors from the origin to settle in RFs and pull factors from the origin to settle in RFs.

5.1.1.1. Push factors from the origin to settle in RFs

a. Landless for farm land

Among the interviewed households, a total of 15 households, which represent 56.7% of samples, are seasonal settlers. They practice farming in the RF while their house and families permanently settle in the nearby village. They stay in the forest only in growing seasons of agricultural crops and stay back to their origin during the rest of the years. The rest 53.3% of households stayed in the RF for all the year round. **When they start settling, 80% of households were landless as results of land grabbing and high taxation of agricultural farms during the military regimes.** Shift from labor intensive farming to mechanized farming were found as one of major factors that worsened socio-economic situation of landless. The other 20 % have their property in their origin and expand farm lands in the RF for better income. It is found out that 84.6 percent of interviewed households are from Shwe Nyaung Pin village and they started encroaching after losing their property due to village fire and poor socio-economic situations resulted from unfavor agricultural taxations around 1960. The others started settling as Taung-ya plantation workers and shifting cultivators.



Picture1. A temporary house of a seasonal settler

b. Knowledge on RF Boundary and Rules

The majority of the households, 80% of interviewed households are aware of the fact that they are settling in the RF. They have knowledge on where the RF boundaries are. This may be related to extension activities of FD staffs in organizing communities for CF establishment. Among them, 32% of total interviewed households do not know what the basic rules relating to settlement in the RF while 48% of households are fully aware of both the RF boundaries and rules. The rest 20% of total interviewed households showed no knowledge relating to RF boundaries and rules.

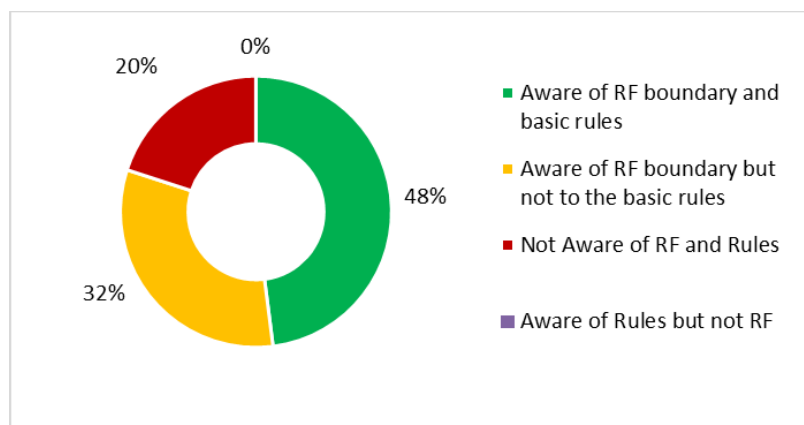


Figure 13. Knowledge of households on RF boundary and rules

5.1.1.2. Pull factors to RF

As the external factors of political and socio-economical pressured households, they looked for an alternative livelihood to survive. **Availability of land and forest resources** in

the forest was the major attraction for landless and poor to do upland farming and settle in the RFs. **Taung-ya plantation workers and shifting cultivators** also settled in the RF. Initial settlements **encouraged settlers' relatives and others** to settle more in RF. After getting land tenure through the CFs, it was found that settlers have more adhesion on their plantation areas. One household reported that, “I stayed in the RF only during farming at the start, but now I must take care of my trees after the CF establishment, so that I must live here year round” (own translation from Myanmar).

5.1.2. State of encroachment farm land area per household

All interviewed households in the area have encroached farm lands. The encroached land area per household ranged from 2 to 20 acres as illustrated in the Figure 5. Two extreme cases of encroached land ownership which are 19 and 20 acres per household are found while the average encroached farm land per household is 7.36 acres. Unequal land distribution is observed in the case.

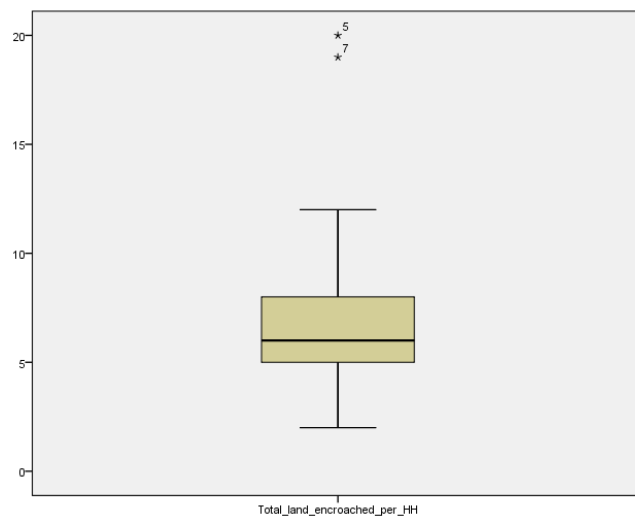


Figure 14. Area of encroached farm land per household

5.1.3. State of Socio-economic conditions and livelihood strategies

The major livelihood strategy of the settlers is upland and lowland farming. 92% of interviewed households receive their main income from farms. They grow sesame and groundnuts as major crops. In addition to farming, 20.8% of interviewed households earn

their household income as daily workers in other farms. Among them, there are two households living in the outside of the Reserved Forest who are traders with high income. They have established Community Forests in the farm areas and become CF user group members. The income of the households ranged from 36000 to 1,200,000 MMK (kyats) per year. The income distributions are illustrated in Figure.4 using the Lorenz Curve. According to the graph, it can be clearly seen that household incomes are quite unequal with GINI coefficient of 0.44. When we compare income levels of interviewed households, 80% of total households earn only less than 50% of total income of all households while the other 20% of households receive income more than 50% of the cumulative income of all households. The major 80% of households earn annual income not more than 3,000,000 MMK (kyats) per household which means 250,000 MMK per month. It means that there is a handful better off households among the majority of poor households group.

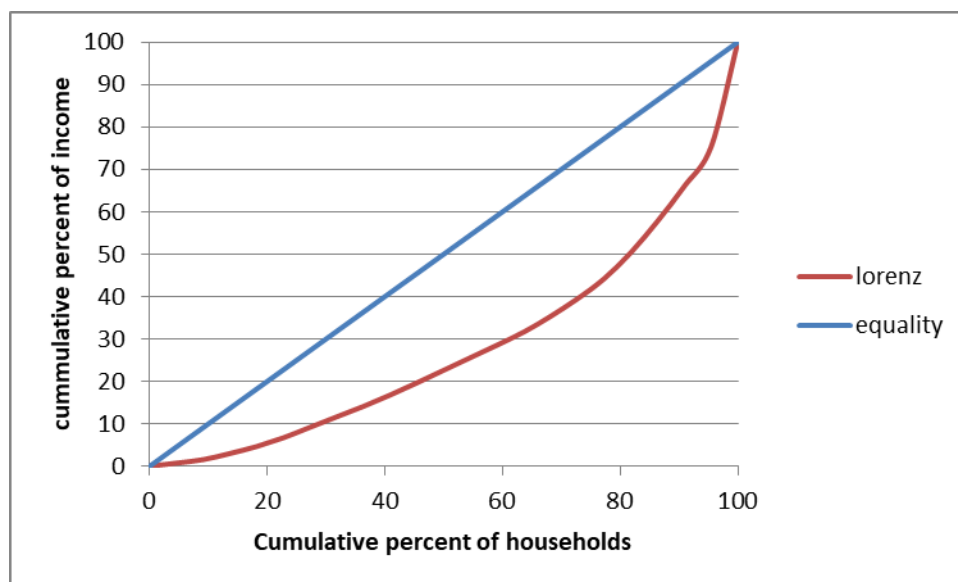


Figure 15. Income distributions among the interviewed households using Lorenz curve

5.1.4. Perception on different Settlement Options

The perceptions of sample households on settling options were assessed in order to understand their future plan in accordance to government law enforcement in RF. Based on FD's previous survey, three possible options were proposed. The option 1 is that

perception on resettling households to a specific area as a cluster or village. The option 2 is that moving back to the origin place and the option 3 is that they continue living in the current place.

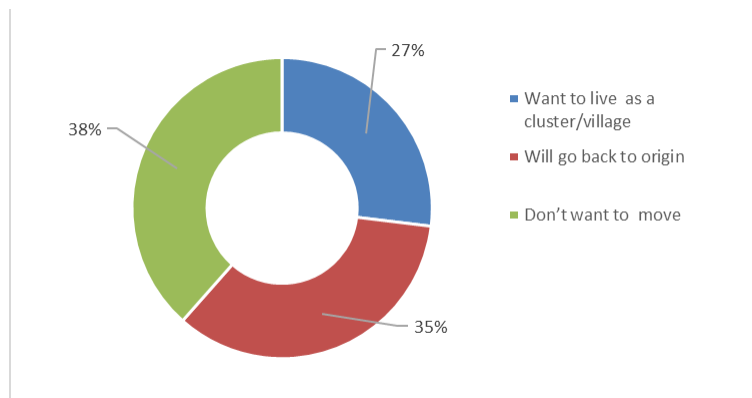


Figure 16. Perception on different settling options

Preference of households on different given settling conditions can be seen in Figure. 7. According to their prioritization of the households, 35% of sample households are willing to go back to their origin if they are allowed to build a temporary guarding tent in their farm and plantation areas. Similarly, 27% of sample households said that they are willing to live in another place as a village in case if they can have a temporary guarding place in their farm and plantation. They mentioned that they prefer setting in a village with good accessibility, electricity and better infrastructure. However, 38% of households strongly stated their determination to continue living in their farm and plantations in the RF.

Although sample households have different opinion on settling options, they all share the same perception to have a small living infrastructure in the plantation area in order to take care and patrol their own plantations effectively.

5.1.5. Perception on CF establishment and its difficulties

The acceptance towards CF plantation establishment of the encroached households was interviewed to the sampled households. It is found out that 96.15 % of the interviewed households have a high willingness to implement the plan and 76.9% of the household already applied CF and planted trees (mainly *Acacia mangium*) in their farm land area.

The highly accepted households answered that the main reason to establish CF was to keep the land use rights of the farm land as well as to get more benefits by planting trees. A successful CF near the border of the RF which grows *Acacia mangium* was observed in the neighborhood of the interviewed area. It was mentioned that the success of the neighboring CF was one of the strong factors that convinced the households to invest more in growing plants in the farm land. It strengthened the trust of the households on CF establishment regarding land and forest use rights. It is also observed that the encouragement and active leadership of CF leaders was also another factor which increased participation of nearby households to establish CF in the farm land.

As the settlers have already started establishment of CFs, the perceived difficulties on CF establishment were interviewed based on their experiences. The summarized difficulties are as follows:

- **Initial investment:** In the study area, *Acacia mangium* is very popular due to its fast growing behavior and economic profitability in a short time compared to hard wood species. As they prefer to grow *Acacia mangium* than the hardwood species distributed from FD, households perceived initial investment for CF Establishment mainly for buying seedlings as a difficulty.
- **Tenure insecurity:** Households hesitate to invest in plantations or forest trees in agroforestry as they do not feel completely secure on their tenure.
- **Technical assistance for agroforestry practices:** Households requested more technical assistance related to plantation techniques such as how to manage light and resource competition between crops and forest trees.
- **Fire protection:** Households see fire protection as a challenge because they have limited knowledge and resources to protect and control fire.
- **Destruction by others:** Established CF has experiences from destruction by outsiders.
- **Communication barrier:** Due to education limits of settlers, they are hesitant to report or ask assistance to the local FD.
- **Insecure market for planted trees:** Although forest trees have been planted in their upland farms, they are concerned about future market of those species.
- **Limited knowledge on species availability and tree rights:** Settlers do not have enough knowledge on which species are distributed by local FD, which tree species

are allowed to grow and harvest or how to harvest. For instance, households have interests on growing Teak (*Tectona grandis*) and Pyinkado (*Xylia xylocarpa*) species, however, they misunderstood that they do have the harvesting rights of Teaks and Pyinkado.

5.1.6. Perceived Ways to increase participation in CFs

Based on previous experiences, the sample households perceived the following facts are important to increase the active participation and interest of settlers in the implementation of CFs.

- Deep understanding on potential benefits, security of tenure and benefits, and land use rights
- ‘Seeing in reality’ which means demonstration of successful CF was also a strong encouraging factor
- Availability of informer who can distribute the information related to CFs soundly and truthfully.
- Convincing by neighboring settlers. Sharing information and encouraging among communities is also important to increase trust and participation.
- Good leadership that can persuade other settlers
- Technical support on species selection and plantation maintenance
- Strong interest and support from local FDs
- Understanding on current settlement and land use rights in the RFs

In addition to the above mentioned facts, the interviewed households emphasized on initial investment of the plantation as a major constraint for the poor households to implement CFs. Hence, it was also suggested that support for initial investment in a form of loan or seedlings will be a promising way to increase interest and participation of poor households.

5.2. Case II: Households with no knowledge of “Community Forestry”

Households in the second case study are situated in Nyaungpinzin RF and adjacent boarder area of Konbeelin RF, Letpandan Township. The households are not aware of the

resettlement plan and CF establishment. A total of 23 households were interviewed during the research. Household settlements are found very scattered in the RF compared to case I.

5.2.1. Causes of encroachment

As indicated in case I, the major causes accelerating encroachment are categorized as push factors from the origin to settle in RFs and pull factors from the origin to settle in RFs.

5.2.1.1. Push factors from the origin to settle in RFs

a. Landless for farm land

The majority of households in the area are year round settlers; 86% of interviewed households stay permanently in the RF while the others settle only seasonally. It is found out that 91% of households do not have land or houses in their origin or other area. Similar to the Case I, the indirect push factors that pressure settlers to move into the forests are found in the area. They include: the past political instability, high taxation around 1960 and dam construction led the settlers to become landless and change of labor-based agriculture to machine-based agriculture affected the income source of landless agricultural workers.

b. Knowledge of Households on RF Boundary and Rules

The majority, which represents 70% of total interviewed households, are not aware of basic rules related to settlement in the RF. In addition, 57% of total interviewed households shows no knowledge on where RFs boundaries and do not realize that they are settling in RF. Only 26 % of interviewed households are aware of RF boundary and have basic understanding of RF rules such as settling in the RF is illegal.

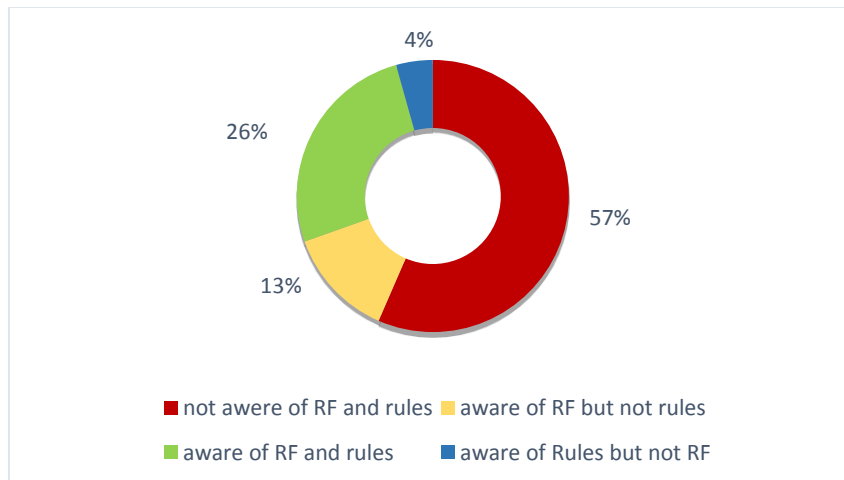


Figure 17. Knowledge of households on RF boundary and rules

5.2.1.2. Pull factors of settlement in RF

While push factors pressure households to look for alternative solutions in order to liberate from the **difficult livelihood situation**, RFs become an option attracting them from different aspects. The major groups of the settlers were plantation workers and they started settling temporarily due to job opportunities. Another type of settlers is under the category of shifting cultivators and they have been living in RFs up to three generations and bamboo harvesters who settle only seasonally in the RF. **Availability of resources** especially forest resources for livelihood, land for settling and agricultural production become the main pull factor of settlement in RF. One bamboo harvester reported that “We can earn as much as we want by bamboo harvesting from natural forests” while another reported “We rely on bamboo cutting as main income”(own translation from Myanmar). **Weak law enforcement on encroachments** in RFs created favorable conditions for making decisions of settling in the RF. In addition, RFs attracts households with low household expenses as they can rely on variety of forest products for fuel and food. The main benefits of settling in RF were reported as **land availability and main income source for their livelihood** for both seasonal and year round settlers.

5.2.2. State of encroached farm land area per household

The nine interviewed households in the case are bamboo cutters and do not have upland farm. Although they settle in the forest for all year round due to landlessness, they do not practice any type of agricultural farming. Hence, when we calculate the average encroached farm land of the households, the bamboo cutters are not included in calculation to minimize the standard deviation. Only the households with encroached farm lands are taken into account in calculation. As shown in Figure 9, the farmland areas per household are ranged from 1 to 18 acres. The mean area of encroached farm land per household is found to be 6.67 acres. However, the majority were observed with the ownership of farm land which is between 3.5 to 8 acres.

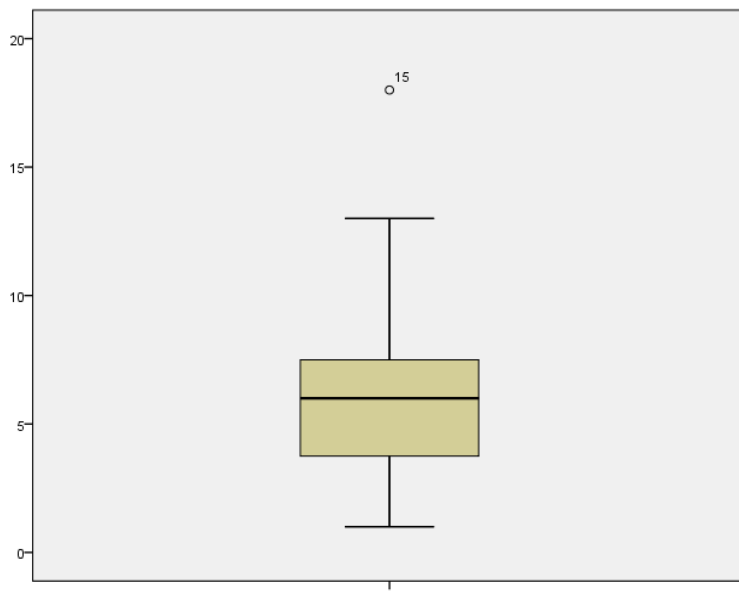


Figure 18. Area of encroached farm land per household

5.2.3 State of Socio-economic conditions and livelihood strategies

The main livelihood strategies of households are farmers, daily labors and non-timber forest products harvesters such as bamboo cutters and elephant yam collectors. Unlike in the case I, around 37 percent of households are heavily depending on forest for their

livelihood and income. The income ranges from 318,700 MMK to 2,700,000MMK per household per year. As we can see in the income distribution in Lorenz curve in the following Figure 8, the income differences among households are not as high as in case I. It results in a GINI coefficient of 0.295 which has more equality in terms of income among households compare to case I.

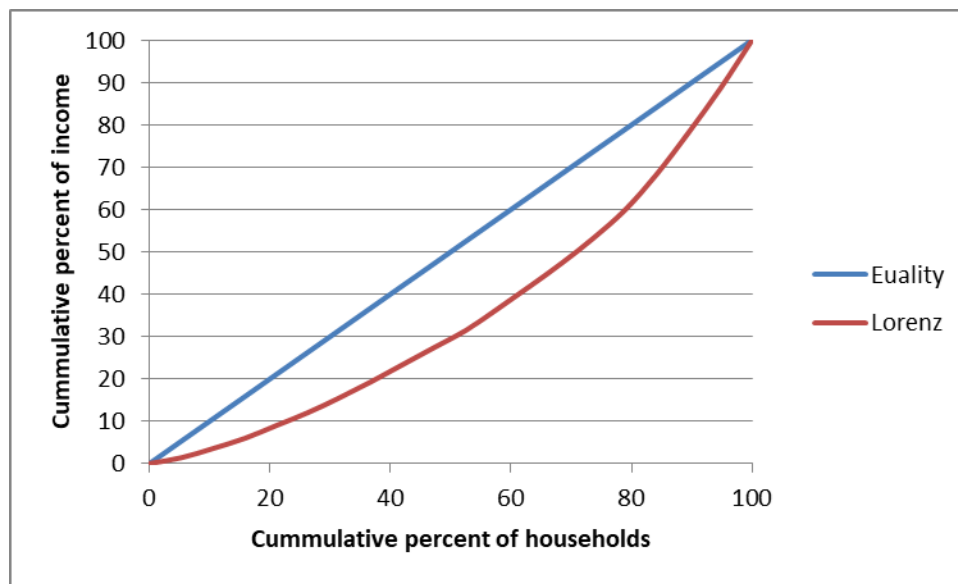


Figure 19. Income distributions among the interviewed households using Lorenz curve

5.2.4. Perception on Different Settling Options

The perceptions of sample households on settling options were asked similar to case I. Preference of households on different given settling conditions can be seen in the figure. A total 48% of interviewed households responded that they prefer staying back to the origin if the FD enforces not to settle in the forest. As bamboo and non timber forest products harvesting is major reasons of settling in RF, they have less attachment to settle in the RF compared to upland farmers. Meanwhile, the other households, which represents 44% of total interviewed households do not have an alternative place to live. Hence, they showed

their willingness to continue settling in the RFs because of their heavy dependency on forests for their subsistence needs and income by harvesting a range of non-timber forest products such as elephant yam, grasses for sweeps and bamboo. Only 8% of the respondents select the option of resettlement in a village if the government arranges for them.

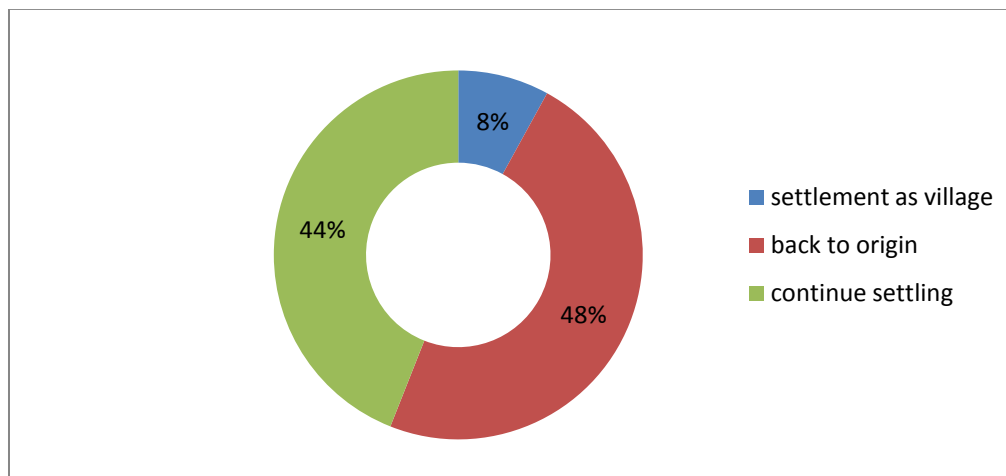


Figure 20. Perception on different settling options

5.2.5. Perception on CF Establishment

As households are not aware of CF establishment, we provide brief information on CF establishment opportunities. After explaining, around 62% of the sampled households highly accepted and showed interests in CF establishment in their farm lands or in other RF areas. The other 21% did not give a precise answer. However, 17% of households answered that they prefer to move out of the RFs and settle back in their origins even if they get rights to land for establishing CF.

6. Conclusion

The push factors are directly related to landless for farm land and knowledge on RF boundary and rules. The direct push factors of the settlement is based on household level while indirect factors from a wider context such as high taxation around 1960 which lead to land grabbing; change of labor-based agriculture to machine-based agriculture; and dam

construction led the settlers to become landless affect the decisions of each households. Availability of land and forest resources was the major attraction for landless and poor households to practice upland farming and settle in the RFs. Additionally, the initial settlers of shifting cultivators and Taung-ya plantation workers and their settlements also attracted the others to settle in the area. It was found that increasing awareness on RF boundaries and rules are also necessary to protect encroachment because a 57 % of settlers in Case II do not realize that they are settling in the RF.

In the current situation, land is found as the main interest for those who want to continue settling in the RF. Hence, land tenure right is the strongest incentives for those settlers. As the majority of households in Case II reported that they would implement as FD requests to them as long as they can continue their settlement. Hence, when FD implement CF establishment, it is important to explain or emphasize how CF secure land tenure rights for each households and their responsibilities for long term sustainability. Agrawal and Ostrom (1999) also discussed that transferring and securing land tenure rights of communities increase willingness to increase investment in their property. Therefore, to maintain their willingness to participate and put effort in maintenance activity, they need to be well informed that their land tenure rights are secured through CFs.

When we compare socio-economic conditions of both cases, it can clearly be seen that among communities as CFUG members have higher wealth difference than the case II. In addition, a high inequality of land distribution among user group members can be found in CF user group case compared to the case II. The followed up qualitative information proved that there are settlers who encroach only for earning more income not for subsistence. Hence, it is important to control that Community Forestry does not allow spaces for elites. Persha and Andersson (2014) pointed out the risk of elite capture in decentralized forest governance regimes based on empirical data of 174 communities from India, Kenya, Nepal and Uganda. The study emphasized that the longer the time of decentralization, the higher the risk of elite capture without proper local institutions. In reality, local institution development in CFs in Myanmar is totally based on management plan development (CFI 2016). As local communities often have limited knowledge and

capacity as in the study cases, local FD should be aware of and protect elite capture during user group formations and management plan development. The findings of Dasgupta and Beard (2007) in Indonesia also highlighted that capacity to develop proper local institutions is a key factor to protect elite captures when management authority is decentralized to the communities. Therefore, FD should pay attention on the potential of elite capture to protect the rights of marginal groups, especially for whom with limited knowledge and capacities.

7. Limitations

In the study area, seasonal settlers can only be found in certain period of the year depending on their activities in upland farms or forests. It affected the number of households that can be found during the study period and became limited. During data collection, the sparsely scattered nature of settlements created time constraints. In addition, it was nearly impossible to estimate the total number of households in the two RFs.

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Appendix 1. Encroached farm land area in Tharyarwaddy Case

Percentiles

		Percentiles						
		5	10	25	50	75	90	95
Weighted Average (Definition 1)	Total_land_encroached_per_HH	2.00	2.60	5.00	6.00	9.00	14.80	19.70
Tukey's Hinges	Total_land_encroached_per_HH			5.00	6.00	8.00		

Descriptives

		Statistic	Std. Error
Total_land_encroached	Mean	7.36	.892
_per_HH	95% Confidence Interval for Mean	Lower Bound 5.52 Upper Bound 9.20	
	5% Trimmed Mean	6.97	
	Median	6.00	
	Variance	19.907	

Std. Deviation	4.462	
Minimum	2	
Maximum	20	
Range	18	
Interquartile Range	4	
Skewness	1.632	.464
Kurtosis	2.927	.902

Appendix 2. Encroached farmed land area in Case II

Descriptive Statistics of Encroached farmed area in Nyaung Pin zin RF

N	Valid	15
	Missing	0
Mean		6.67
Median		6.00
Mode		6
Std. Deviation		4.447
Variance		19.774
Range		17
Minimum		1
Maximum		18
Percentiles	10	2.20
	25	3.50
	50	6.00
	75	8.00