

学位論文全文に代わる要約  
**Extended Summary in Lieu of Dissertation**

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Name

学位論文題目 :

Title of Dissertation

Study on Rural Livelihood Diversification and Community Forestry Management  
in the Central Dry Zone, Myanmar  
(ミャンマー中央乾燥地農村における生計の多様化とコミュニティフォレスト  
ストーリー管理に関する研究)

学位論文要約 :

Dissertation Summary

### **Introduction**

Community Forest (CF) program in Myanmar has been implemented since 1995 to rehabilitate degraded forests and reduce rural poverty. The Central Dry Zone (CDZ) is the largest CF area, covering over 40% of the total CF area and benefiting 73,929 households. In recent decades, rural livelihood diversification has rapidly increased to adapt to climate change and unstable markets of agricultural products. In addition, strong rural and urban connections in the past 20 years have also led to increased mobility of rural people which led to a diversification of livelihood in CDZ in Myanmar. However, these previous studies of CF did not consider the livelihood diversification aspect of the rural people in CF Implementation. In addition, the weakness in local people participation and stagnant user groups have been observed in the CDZ since 2011, after 15 years of CF implementation. Firstly, the research started with a literature review research through keyword analysis to understand the research trend of CF and its development in Myanmar. Then, the research aims to investigate the impact of CF on the diversification of livelihoods in rural areas. Furthermore, it examines the socioeconomic characteristics of households as determinants of their participation in the CF program. In addition, the study explores the implications of changes in Community Forest User Group (CFUG) livelihoods on the institutional capacity of user groups in the CDZ. The ultimate objective of this dissertation is to provide how rural livelihood diversification is related to CF Management in the CDZ, with the goal of supporting successful CF management and improvement of rural livelihood.

### **Research Methodology**

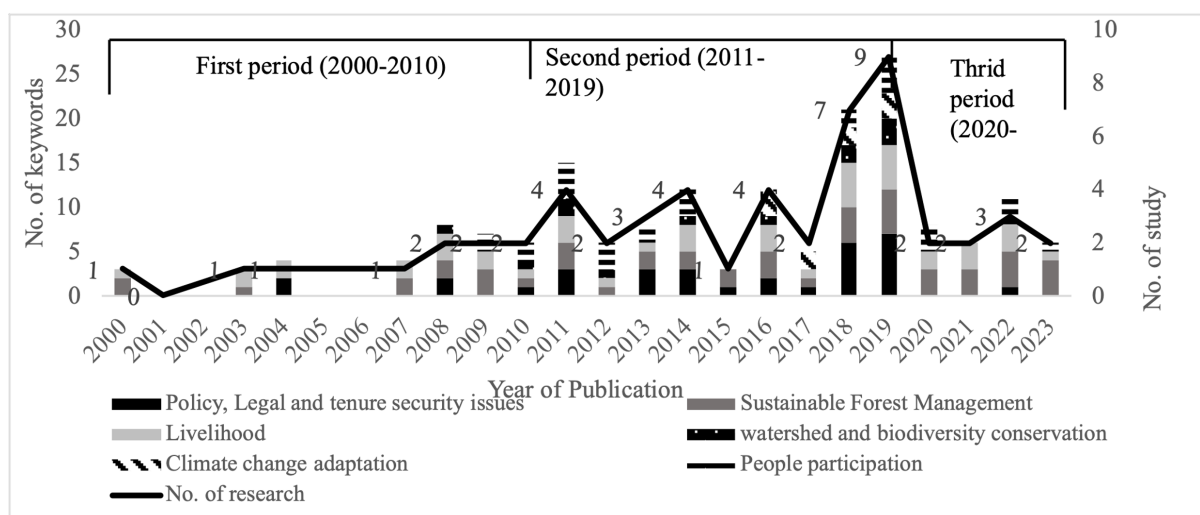
The field survey was conducted from 2021 to 2022 with three times of field surveys. Firstly in October 2021, a pilot survey was conducted to choose the study village. During the pilot survey, in-depth interviews using interview guidelines and semi-structured questionnaires were implemented to get deep information about the current CF implementation situation and the village's history and livelihood. After the pilot survey and literature review, purposively selected one village as a case study in CDZ. Quantitative and qualitative data were collected through a structural household survey, Key Informant Interview (KII), and Focus Group Discussion (FGD) during the full survey conducted from December 2021 to January 2022. Then, a second follow-up survey was conducted in June 2022 for institutional analysis.

Stratified random sampling was used for the selection of households. A total of 189 households were interviewed; among them, 78 were CFUG households while 111 were non-CF households, representing 20% of the total households of the study village. The participants were interviewed with structural questionnaires by

face-to-face for 45 minutes to 1 hour. The survey team audio-recorded the interviews with the participants' approval to ensure an accurate transcript. For qualitative data collection, 7 Key Informant Interviews and 5 Focus Group Discussions were conducted to get different opinions from diverse stakeholders and different land holding sizes and livelihoods. For the statistical analysis, binary regression, multiple linear regression, and descriptive statistics were deployed using software 28.0.0.0 (190) version. Qualitative analysis was applied to verify the quantitative data.

## Result and implication of the study

The research trend and number of publications of CF research are presented in Figure 1. Research trends were categorized as belonging to three major periods based on the number of published papers and thematic areas. During the first period (2000–2011) only a few studies were conducted, focusing on thematic areas such as livelihood, sustainable forest management, policy, legal, and tenure security issues, people participation, and watershed and biodiversity conservation. Domestic issues attracted more attention than international aspects, which were much less investigated.



Sources: Primary Data (2023)

Figure 1. Number of studies conducted in each thematic area in each year of the period examined

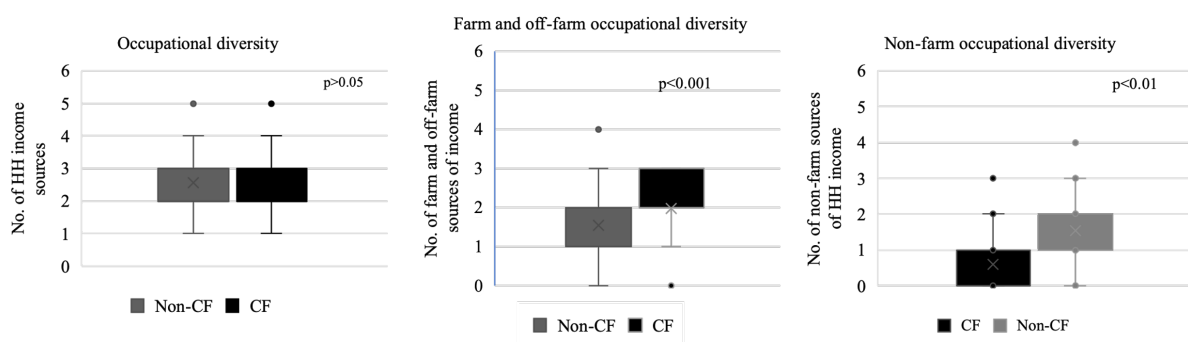
During the second period (2011–2019), there was an increase in the number of published studies. The research content became more diverse, also covering climate change in addition to the same topics of the first period. Under Myanmar's democratic government, the CF program tackled land confiscation, forest governance, human rights, poverty, deforestation, and climate change, and it also received international aid for research and development.

During the third period (2020–2023), there was a relative decrease in the number of published papers. The main thematic areas investigated were livelihood, sustainable forest management, policy, legal and tenure security issues, and people's participation. The COVID pandemic and political turmoil were responsible for the decreased publications, leading to a predicted decline in financial support for the CF program. It has been therefore important for local people to protect forests against unlawful logging and promote sustainable forest management through community involvement and strong customary claims.

CF research trend in Myanmar is predicated on two scenarios: under the non-democratic rule, a strong local forest management system is crucial, with research exploring customary forest management during political turmoil. Under democratic rule, local people's voices would be considered, leading to more research on policy,

legal issues, and sustainable forest management with international support. However, weak institutions and a lack of interest from forest-dependent people in the government-developed CF program hinder the success of the CF in Myanmar.

This study conducted a livelihood analysis to understand the contribution of CF to the livelihood diversification pattern of rural people in the CDZ. First, this study compared the occupational diversity and household income between CFUG and non-CF households. Then, five livelihood asset analysis was used to explore asset impact on the livelihood strategies of the two groups. Finally, the forest dependency of the two groups was analyzed to understand the role of CF in the livelihood of CFUG households. This study found that CFUG households are more diversified in off-farm livelihood, whereas non-CF households are more diversified in non-farm livelihood. CF is important for local people with limited livelihood assets to diversify into alternative livelihoods such as non-farm during their difficult times. Figure 2 presents comparison of the occupational diversity between CFUG and non-CF households.

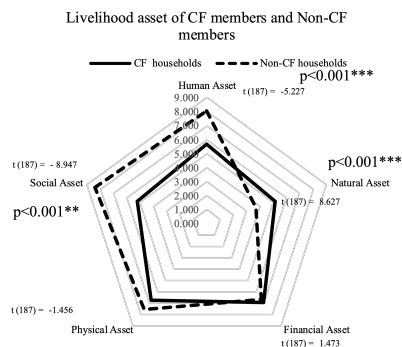


Sources: Field survey (2021)

Figure 2. Comparison of income sources between CFUG and non-CF households

The livelihood asset represents stocks of directly or indirectly productive factors that generate income for individual households in cash or kind. Hence, this study used comparative asset analysis of the CFUG and non-CF households (Figure 3.). It found that CFUG households possessed better natural assets and human assets than those of their counterparts. However, the survey showed that non-CF member households had a better social asset index than that of CFUG households.

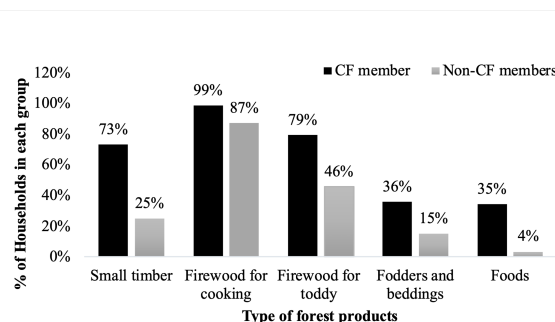
The CF program significantly increased the natural assets of CFUG households. The CF program provided secure user rights of agroforestry land to its members, allowing for regular cash income from agricultural products. The survey found that each CFUG household received an average of 1.7 ha of agroforestry land for agricultural production from the CF program, which contributed to 40% of farm income in average. In addition, they owned more toddy palm trees, which is also a source of off-farm income. This natural asset assists the members in obtaining the required working capital of the CFUG households, who worked more in farm and off-farm occupations. Limited social networking and lack of access to official channels with outsiders limited them to expand their product business and technology, hindering the development of Community Forestry Enterprise (CFE) in the study village. As a human asset, education is determining factor in pursuing high-earning nonfarm income. Education is long-term investment for the rural family. Hence, children of the poor toddy palm climbers leave after primary school as child labor, which is important for jaggery making. Therefore, poor education is found among CFUG households. Figure 3 presented the livelihood asset comparison of CFUGs and non-CF households. This analysis showed that the community forest user group households wishing to establish a business approach to the community forest encounter entry barriers such as weakness in social networking, high mobility of its members, and an insecure financial support system.



Sources: Field survey (2021)

Figure 3. Comparison of five livelihood assets between the CFUG and non-CF households

In terms of forest dependency, CF in the CDZ provides various subsistence needs of the local people, including firewood, small timber, and food requirements. With the combined impact of a degraded forest and limited value-added options, significant cash income from the CF is not found. Less than 5% of the CFUG households said that they received cash income from the forest by selling firewood to toddy palm climbers and bushmeat from the forest seasonally. Figure 4 presents the comparison of forest dependency by the CFUGs and non-CF households.



Sources: Field survey (2021)

Figure 4. Use of forest products by CFUG and non-CF households

This study explores the determinants of the socioeconomic characteristics of households to become CF members and further participation in the collective activities of the CFUGs. Among 10 independent factors referred to the literature review in different country's CF programs, 7 factors determine local people's decision to become CF members: gender of household head, customary forest area, livestock-holding unit, education, agricultural land-holding size, family labor, and nonfarm income. Among 10 independent characteristics among CF member households, the nonfarm income of the household, working outside of the township, and availability of family labor determine CF member participation in collective activities.

Changes in rural livelihood from forest-dependent to non-forest-dependent livelihood determine people's willingness to join the CF program and to participate in the collective activities of the CFUGs. This study found that the rural transition setting will have a negative effect on CF implementation due to reduced interest by local people in the forestry sector with limited labor availability. Local people cope with farm labor scarcity using mechanization in the agricultural sector because agricultural income is essential for their livelihood. However, in community forestry in the dry zone, where local people did not receive immediate income from CF, the less participation of CF members in CF management activities is the result of rural livelihood transformation.

Three recommendations are suggested to boost the participation of local people in the CF program in the CDZ. First, the Forest Department should consider a fair ground for non-customary forest owners, particularly landless vulnerable households with a limited option to diversify their livelihood to join the CF program as an equal opportunity, and should then provide a shared pool CF area for them to manage. Second, rural livelihood development programs should be considered in cooperation with the CF program, such as the introduction of community-owned livestock farms and skill development programs for women CF members to produce handicrafts from nontimber forest products or toddy palms. Lastly, the institutional analysis should be conducted before the establishment of CFUGs to better understand the local collective action system to cooperate in the CF for strengthening of CFUGs.

Institutional analysis was conducted as a case study to explore the impact of livelihood changes on the institutional capacity of CFUGs. To analyze the institutional capacity of CFUG, this study used the Ostrom design principle as a theoretical and evaluation framework. This helped to determine the relevance of each principle for the situation of eight CFUGs. Table 2 presents the evaluation of eight CFUGs' institutional capacity by using Ostrom Design Principle.

The study found that every user group in the study village has the authority to create and enforce their own rules. However, the village administration helps organize collective activities when there is a labor shortage or conflicts arise. The FD does not interfere with CF management and governance as long as the community follows the laws and Community Forest Management Plan (CFMCs). The village-level CF program implementation is explained in Figure 5. It has been identified that there are six types of livelihood changes, but most local people still keep on their traditional income sources. Out of the eight user groups, only three groups have significant changes in their livelihoods, each with different patterns. The livelihood changes of CFUG households are presented in Table 1.

Table 1. Livelihood changes of CFUGs in the study village

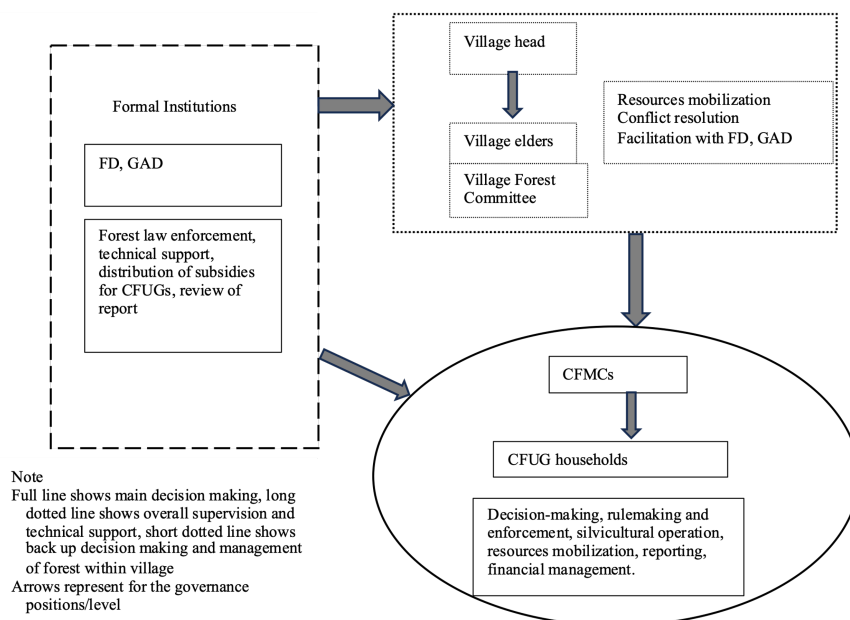
| CFUG | % of HH in type 1<br>(Fam to Fam) | % of HH in type 2<br>(Fam to<br>non-fam) | % of HH in type 3<br>(fam to off fam) | % of HH in type 4<br>(off-fam to fam) | % of HH in type 5<br>(off fam to<br>non-fam) | % of HH in type 6<br>(off-fam to<br>off-fam) |
|------|-----------------------------------|--|---------------------------------------|---------------------------------------|--|--|
| I    | 50%                               | 14%                                      | 0%                                    | 0%                                    | 0%   | 36%  |
| II   | 42%                               | 0%                                       | 0%                                    | 17%                                   | 42%  | 0%   |
| III  | 43%                               | 0%                                       | 0%                                    | 0%                                    | 0%   | 57%  |
| IV   | 57%                               | 0%                                       | 0%                                    | 0%                                    | 0%   | 43%  |
| V    | 10%                               | 10%                                      | 22%                                   | 13%                                   | 25%  | 33%  |
| VI   | 10%                               | 34%                                      | 22%                                   | 0%                                    | 33%  | 0%   |
| VII  | 13%                               | 0%                                       | 0%                                    | 0%                                    | 0%   | 88%  |
| VIII | 30%                               | 13%                                      | 0%                                    | 0%                                    | 0%   | 57%  |

Source: Field Survey (2021)

One issue that affects the participation of the user group in collective activities is the unclear identification of the user group list. This can also impact the user group's strength in resolving conflicts. The study discovered that the strength of the user group is connected to the diverse interests of user households based on their primary livelihood. It also found that CFUGs have a clear graduated sanction system to punish for breaking the rule, however; the enforcement of the rule largely depends on the leadership of each user group and the CF chairman's availability. In addition, in terms of monitoring systems, Group V and VI lacked an adequate monitoring system

and failed to meet the criteria for the long-enduring institution of Ostrom.

Finally, the institutional capacity of CFUGs cannot be explained solely by the livelihood changes of local people. However, the adaptation capacity of CFUGs household is key to endure the local institution alive according to the changes in socio-economic conditions. This chapter demonstrates how small local user groups manage community forests at the village level according to the resources they can mobilize. The CF program in the CDZ is not just for the CFUGs households provision; it is village-wide activities at the end.



Sources: Field survey (2021, 2022)

Figure 5. CF program management at the village level

The framework for increasing local participation can apply to other areas within the CDZ, where over 40% of the CF area is located. The study discovered that the credit system's failure in the study area, particularly among CFUG households, led them to work more in non-forestry-related jobs. Hence, increasing the non-farm income of rural people have a negative impact on the participation of local people in CF. It is recommended to include a section in CFI that mentions institutional linkages and technical/financial support from other departments, such as the Cooperative Bank and Myanmar Agricultural Development Bank, to provide a secure credit system to households involved in CFUGs to have start-up funds for small-scale forest-based businesses (CFE). This will provide clear guidelines for CFUG households to apply for credits and subsidies or partner with outsiders. By doing so, the livelihood approach incorporated into Community Forest Based enterprises or small businesses will be enhanced in Myanmar, allowing local people to improve their livelihood and move out of poverty rather than just meeting their basic needs through CF.

Table 2. Institutional capacity of eight CFUGs, as per Ostrom Design Principle for managing the Common Pool Resources

| Ostrom Principles   | Design | Definition adapted to Local CFUGs   | G-I | G-I I | G-I II | G-I V | G-V V | G-VI VI | G-VII VII | G-VII I |
|---|--------|---|-----|-------|--------|-------|-------|---------|-----------|---------|
| Clearly defined boundaries  |        | Together with the Community Forest boundaries, the identity and rights of the CFUG are precisely defined.   | 2   | 3     | 3      | 3     | 2     | 2       | 3         | 3       |
| Congruence between appropriation and provision rules and local conditions |        | Benefit sharing should be based on the local system, and it should be based on the contribution of each member to the development of the Community Forest (labor, materials, and money).                          | 3   | 3     | 3      | 3     | 2     | 2       | 3         | 3       |
| Collective choice arrangement   |        | CFUG members who are affected by the operational rules have right to participate in creating the group rules, and make their own decisions with full consensus.   | 3   | 3     | 3      | 3     | 2     | 2       | 3         | 3       |
| Monitoring  |        | Active monitoring system is in place, the monitors are fully accountable to the appropriators or the monitors are CFUG members themselves.  | 3   | 3     | 3      | 3     | 1     | 1       | 3         | 3       |
| Graduated sanction  |        | CFUG member who violate rule of benefit sharing and operational rules are punished by CFUG members or FD or both. The system is based on local punishment system.   | 3   | 3     | 3      | 3     | 3     | 3       | 3         | 3       |
| Conflict resolution mechanism   |        | CFUG members and FD have a good communication system to resolve the problem of community forestry management at a low cost. The resolution mechanism is fair to the members of the group.                         | 3   | 3     | 3      | 3     | 2     | 2       | 3         | 3       |
| Minimal recognition of rights to organize                                 |        | The CFUG members have full rights to manage and conduct the CF activities, and other government agencies have no intervention in resources management system, and not challenged for the local management system. | 2   | 2     | 2      | 2     | 2     | 2       | 2         | 2       |

Note-1= Poor, 2= Fair, 3= Good

Sources : Field Survey (2022)

(注) 要約は、学位論文全文の約10分の1としてください。図表や写真を含めても構いません。

(Note) The Summary should be about 10% of the entire dissertation and may include illustrations