The interaction of Community Forestry with rural livelihoods in Myanmar: Challenges and opportunities

By

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Declaration

I hereby declare that this thesis is my original work. I have duly acknowledged all sources that are used in my thesis. I have not previously submitted it for a degree at any tertiary education institution and for publication in any form.

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Abstract

Since the late 1970s, many countries have taken up Community Forestry (CF) within the rubric of decentralisation and devolved forest management. In Myanmar, CF was adopted in 1995, in response to the rapid depletion of natural forests. Over the 20 years of CF in Myanmar, however, the experiences and impacts of CF on rural livelihoods across Myanmar have not been fully examined. This thesis investigated the interaction of CF with livelihoods in three different ecological zones in Myanmar: the Delta region, the Dry Zone and the Hilly region. Drawing on one year of fieldwork, that combined qualitative and quantitative analyses, I show that, although rural livelihoods are changing, forest resources still play an important role for many rural households in Myanmar.

In relation to the interplay of forest resources and rural livelihoods, this research reveals that community forests have sometimes contributed significantly to local livelihood portfolios. Over the three research sites, communities in the Delta Zone who were participating in CF received financial benefit from the sale of fuelwood and some NTFPs. However, these benefits were inequitably distributed because not all households could become CFUG members. The intervention therefore may not be socially sustainable in the long run. The CFUG members in the Dry Zone and the Hilly Zone also gained benefits from their community forests for household use and they expected to gain valuable timber for building materials in the future. However, financial benefits were limited in these areas. Therefore, CF provided for rural communities in different ways and to different extents.

Based on the three cases, the thesis argues that CF in Myanmar contributes forest products to local livelihoods and has also strengthened access to and control over forest resources. Among the three cases, the case study in the Delta Zone showed the most substantial impacts on forest cover and household livelihoods. However, the case study also found elite capture of benefits because forest land allocation was made to individual households and excluded the poorest households.

The thesis also shows that current livelihood patterns are changing and diversifying, based on the available opportunities at each locality. Within these trends, this thesis reveals that farming is still important and agricultural lands are important role to many household economies. At the same time, forest lands and/or community forest lands, while still important, are becoming less central to livelihoods of rural communities (see below). Yet the landless poor and non-CFUG members rely strongly on CF areas to

improve their livelihoods, as it enables access to daily needs and land. However, they are ultimately constrained in how the lands can be used. Moreover, the growth of migration and off-farm income is changing the significance of and interest in CF. This will likely become more prominent in the future and could undermine the viability of CF in some localities.

Presenting key arguments drawn from the case of Myanmar, this thesis reveals that the impacts of CF are spatially and socially differentiated. While CF provides a platform for people to participate in forest governance, its full potential in supporting rural livelihoods has yet to be realised.

Table of Contents

List of Tables

List of Figures

Abbreviations

AAC	Annual Allowable Cut
ACTMANG	Action for Mangrove Reforestation
ALARM	Advancing Life and Regenerating Motherland
BSS	Brandis Selection System
CBNRM	Community-based Natural Resource Management
CBO	Community-based Organisations
CF	Community Forestry, Community Forest
CFI	Community Forestry Instructions
CFUG	Community Forest User Group
COMFORT	Community Forestry Training and Extension
CSD	Commission on Sustainable Development
DFID	Department for International Development
DOP	Department of Population
DZGD	Dry Zone Greening Department
ECCDI	Ecosystem Conservation and Community Development Initiative
FAO	Food and Agriculture Organisation of the United Nations
FD	Forest Department of Myanmar
FGD	Focus group discussion
FREDA	Forest Resource Environment Development and Conservation Association
GAD	General Administration Department
HDI	Human Development Initiative
IID	The Institute of International Development
IIED	International Institute for Environment and Development
IMF	International Monetary Fund
IMMP	Integrated Mangrove Management Plan
INGO	International Non-Governmental Organisation
IPF	Intergovernmental Panel on Forests
IUCN	International Union for Conservation of Nature

JICA	Japan International Cooperation Agency
LNCF	Lwai Nyeint Community Forestry
MC	Management Committee
MDM	Medecins Du Monde
MMK	Myanmar Kyat
MOAI	Ministry of Agriculture and Irrigation
MOECAF	Ministry of Environmental Conservation and Forestry
MOHT	Ministry of Hotel and Tourism
MONREC	Ministry of Natural Resources and Environmental Conservation
MSN	Mangrove Service Network
MSS	Myanmar Selection System
MTCF	Maing Thauk Community Forestry
NGO	Non-Governmental Organisation
Non-CFUG	Non-Community Forest User Group
NTFP	Non-Timber Forest Product
PA	Protected Areas
PFE	Permanent Forest Estate
PPF	Protected Public Forest
PRA	Participatory Rural Appraisal
RECOFTC	Centre for People and Forests (previously Regional Community Forestry Training Centre)
RF	Reserved Forest
RRI	Rights and Resources Initiative
SFM	Sustainable Forest Management
SLA	Sustainable Livelihood Approach
SPDC	State Peace and Development Council
UNCED	United Nations Conference on Environment and Development
UNDP	United Nations Development Programme
USD	United States dollar
WFP	World Food Programme
WRM	World Rainforest Movement

Chapter 1 Introduction

Community Forestry (CF) has been hailed as a mechanism for empowering communities and securing sustainable livelihoods alongside forest protection (Poffenberger, 2006; Tyler, 2006; Pokharel et al., 2007). Although critiques have emerged that question the effectiveness and equity of CF interventions in Asia (Nurse and Malla, 2005), attention normally falls to differentiated benefits (Shackleton et al., 2002; Sikor and Nguyen, 2007), livelihood impacts (Byron, 2001; Chhatre and Agrawal, 2009), and power asymmetries between communities and state actors (Vandergeest and Peluso, 1995; Ribot, 1998; Li, 2007). There has been limited comparative attention to whether and how diverse socio-ecological contexts can shape the outcomes of CF in Myanmar. This is a significant gap, because potential differences in the drivers of forest loss and social organisation may interact in different ways with CF interventions to produce diverse outcomes. This knowledge gap is therefore addressed in this research through a study of Myanmar, where – as in many other parts of Asia – seemingly uniform CF policies and regulations are being rolled out in highly diverse socio-ecological settings. The study finds that contextual differences significantly shape the trajectory of CF and its impacts, and need greater attention in the design of CF institutions.

This introductory chapter provides a brief overview of the location and geography of the Republic of the Union of Myanmar and provides background on the state of forestry and emergence of CF in the country. Reasons for undertaking the current research are elaborated, along with the research objectives and questions.

1.1 Background

The Republic of the Union of Myanmar (henceforth referred to as Myanmar) is located in Southeast Asia (see Figure 1-1). The country is bordered by Bangladesh and India to its west, Laos and Thailand to its east, and China to its north and northeast. Myanmar has a total land area of 676,578 km^2 (67.6 million ha), and a total population of 51.5 million people according to the latest census conducted in 2014 (Department of Population, 2015). The country is divided into seven States, seven Regions and a union territory (Nay Pyi Taw) based on the State Constitution established in 2008. The administrative divisions are further subdivided into districts, townships, wards or village tracts and villages.

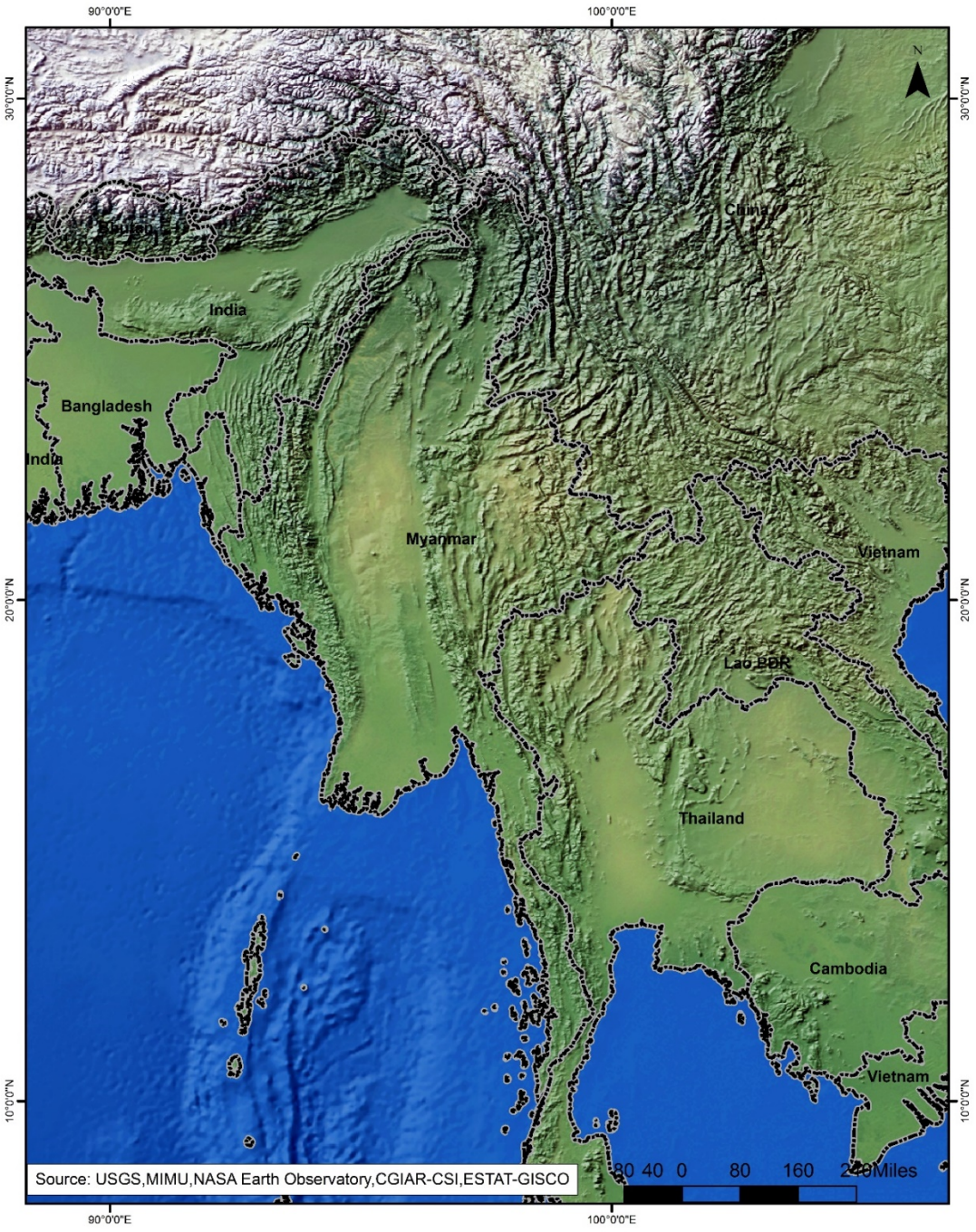

Figure 1-1: Map showing the location of Myanmar

The government of Myanmar has developed CF activities since 1995. This is because forests are seen as a major resource for local livelihoods, and important to regional and national economic policy (Tint et al., 2011). Forest cover consists mainly of natural forests, of which 45 per cent are teak-bearing forests (Kyaw, 2003) with associated valuable tree species, such as Pyinkado (*Xylia xylocarpa*) and Padauk (*Pterocarpus macrocarpus*), which are the most economically important species in Myanmar. Nationally, forestry has been a main source of revenue; in 2000 timber exports generated

as much as 25 per cent of the country's total foreign earnings, of which about 90 per cent has been derived from teak (Htun and Hlaing, 2001). Timber has since decreased to around 10 per cent of Myanmar's total official export earnings, with teak alone contributing 60 to 70 per cent of that total (Woods and Canby, 2011).

Topographically, Myanmar is divided into four main regions: the western mountain ranges, the Shan plateau region, the central region and the Ayeyarwady Delta and coastal region (Tint et al., 2011). Due to a wide range of topography, temperature and rainfall over the whole country vary widely. Temperatures vary from night-time lows of less than 0˚C in the northern highlands to daytime highs of over 40˚C in the central Dry Zone. The average annual rainfall varies from less than 1,000 mm in the Dry Zone in central Myanmar to over 5,000 mm in the coastal regions. As much of the country lies between the Tropic of Cancer and the equator, Myanmar's climate is greatly influenced by the Indian Ocean monsoon, leading to three distinct seasons, namely hot, rainy and cold (Thein, 2004). All these diverse conditions in which CF is being attempted contribute towards a unique opportunity to see how social and environmental differences shape CF trajectories.

Myanmar is endowed with rich natural resources arising largely from its unusual ecological diversity, and about 47 per cent of its total land area is still covered with natural forests (FD, 2016). Great variation in rainfall, temperature, soil and topography favours growing different types of forests in different parts of the country. Myanmar's forests are commonly categorised into seven forest types, namely 1) mangrove forest, 2) tropical evergreen forest, 3) mixed deciduous forest, 4) dry forest, 5) deciduous Indaing (*Dipterocarp*) forest, 6) hill and temperate evergreen forest, and 7) scrub land (FD, 2016). Each forest type provides rich biodiversity, high-value timbers, a range of non-timber forest products and ecosystem services such as water supplies and natural habitats (Tint et al., 2011).

Over the past few decades, there has been a rapid degradation of natural forests occurring mainly through radical demographic, social and economic changes in the country that have placed considerable pressure on forest resources and forest cover (Wang and Myint, 2016). As a result of these changes, the total forest cover decreased from 56 per cent in 1990 to 52 per cent in 2000 (Htun, 2009). This shows that the rate of deforestation within a decade is about 4 per cent of the total land area. The decrease of forest cover continued until 2010 and reached about 47 per cent of the country's total land area (FAO, 2010).

Wang and Myint (2016) point out that the mean annual deforestation rate of Myanmar was 0.81 per cent between 2001 and 2010 in their study. The expansion of commercial agricultural fields, unsustainable rates of logging (both legal and illegal), and the clearing of forests for infrastructure development such as roads and hydropower dams are the major driving forces of deforestation in Myanmar (Woods, 2015). The precise conjuncture of transitions and pressures varies between different regions, and this research explores how that shapes CF and its outcomes.

Since rapid deforestation in Myanmar has attracted national and worldwide attention, the government has been applying different strategies or policies to conserve and utilise its natural resources. Therefore, the main remedial measure for deforestation in the country has been oriented towards the establishment of forest plantations through reforestation and rehabilitation. Various types of forest plantations such as commercial plantations, industrial plantations, watershed conservation plantations and local supply fuelwood plantations have been established all over the country (FAO, 2009). However, the forest plantations have been unsuccessful, in terms of both survival rate and growth rate due to limited government funds for silvicultural operations, protection and long-term management of plantations, and illegal felling by local people (Kaung and Cho, 2001). Poorly performing plantations and limitations in the state reforestation budget have led decision-makers towards the potential for CF. Therefore, CF was developed to address problems with the development of government plantations.

CF has been taken up in Myanmar to address some of these challenges, based on the belief that it has been a successful policy around the world for communities to protect and manage their forests sustainably and derive livelihood benefits (Tint et al., 2011). CF came into practice internationally in the late 1970s, as experts recognised that the development strategies of the 1950s and 1960s, which focused on industrial development, were not meeting the basic needs of the rural poor and were being criticised for overlooking rural development (Warner et al., 1997). CF advocates encouraged the uptake of CF to facilitate active and meaningful involvement of local people in managing forest resources, within people-centred forest management schemes. Egan et al. (2002) stated that the key characteristics of CF are meaningful involvement of the local community in, or control of decision-making about, forest management and retention of benefits of forest use and management within the community. In fact, CF is an evolving concept and it has two distinct features in Asia:

(1) A recognition of the rights of rural communities living adjacent to forests to extract resources and manage forests for their basic livelihood needs. A complementary recognition that indigenous management institutions exist and that there is significant local knowledge about the management of trees and forests.

(2) A recognition of the classical role of foresters in the protection and management of the national forest estate, that this has needed to change, from foresters as being agents of enforcement and protection to their new role as advisers and extensionists (Nurse and Malla, 2005).

In many countries, CF has moved well beyond the pilot stage to become a mainstream and well-accepted form of forestry in its own right (Nurse and Malla, 2005). It has been embraced in countries such as Nepal (Bhatta et al., 2007) where virtually 100 per cent of mid-hill forests are now under community management, and in Mexico (Bray et al., 2005). In many cases, CF is leading to forest regeneration, and benefits to local communities, albeit with some questions about equity in access to these, as well as land tenure and property rights (Tint et al., 2011).

As in other countries, CF in Myanmar started in the late 1990s. The adoption of CF was seen as a means to regain environmental stability and address basic needs of local people. Active participation by the rural communities was urgently needed to plant trees in barren lands and to reforest degraded areas (CFI, 2005). To achieve these goals, Community Forestry Instructions (CFI) were issued by the Forest Department (FD) in December 1995 prior to the formal enactment of the CF Rules (FD, 1995). It also marked a significant opportunity for state-community partnership, local participation and decentralisation in managing Myanmar's forests. Under the CFI, local communities gain trees and forest land tenure rights for an initial 30-year period, which is extendable. The FD then provides technical assistance and plays a leadership role in the exercise of CF (FD, 2016).

Since the issuance of CFI, more attention has been given to participatory forest management – both in policy and in practice in Myanmar. In this context, CF was promoted by international donor projects such as the United Nations Development Programme (UNDP) and the Japan International Cooperation Agency (JICA) as well as through local non-government organisations (e.g. Forest Resource Environment Development and Conservation Association and Ecosystem Conservation and Community Development Initiative) and in some cases self-organisation by communities in cooperation with the FD (Tint et al., 2011). Implementation of CF received a major

boost through the government Forestry Master Plan (2001) which mandated that about 918,000 ha (1.36 per cent of the country) be handed over to community forest user groups by 2030 (ibid).

As of December 2015, there are 2023 community forest user groups (CFUGs) with legal community forest certificates, managing a total of 113,016 ha (FD, 2016) under formal community forest management. However, many more are awaiting formal certificates to recognise existing CF (Woods and Canby, 2011). Annual progress of community forest establishment since 1995 had averaged 2,810 ha (Macqueen, 2012) and implementation progress to date has been highest in Shan (234 CFUGs, managing an average of 24,000 ha of CFs), Ayeyarwady (139 CFUGs, managing an average of 4,000 ha of CFs), Rakhine (102 CFUGs, managing an average of 3,000 ha of CFs), Mandalay (95 CFUGs, managing an average of 2,500 ha of CFs) and Magway (65 CFUGs, managing an average of 2,600 ha of CFs) (FD, 2014). However, CF coverage is far below the Forestry Master Plan's 30-year target (Tint et al., 2011) and only 12.3 per cent of targeted community forest areas have so far been established. Therefore, community forest implementation is at a critical stage in Myanmar and there is a need to review experience and opportunity to understand how CF interfaces with the country's highly diverse landscapes and communities.

A recent survey of CF in Myanmar notes a wide range of livelihood benefits that have emerged from established CFUGs and in general finds a strong track record of improved forest protection and sustainable management (Tint et al., 2011). Yet little is known about whether these apparent benefits vary across different CF localities and any contributing factors. The study by Tint et al. sought to understand the status of community-managed plantations from a standing biomass aspect only. The authors did not assess the livelihoods of non-CFUG members and the question of how non-CFUG members perceived CF remained outside the scope of the study. It would be useful to better understand the differences in livelihoods of CFUG and non-CFUG members impacted by CF, in order to realise the reasons why local people engage or do not engage in CF, and what outcomes are derived from it.

1.2 Importance of the study and research problem

It is widely accepted that CF is a forest management system practised around the world that encourages local people to engage in sustainable forestry, under their own management scheme, in order to achieve the twin goals of sustainable forest management and poverty reduction. However, there remains a number of practical and management

uncertainties regarding implementation of CF programs and projects, which relate to the most appropriate and effective governance frameworks. Although the social impacts of CF have been well-studied in other countries, there have been few comparative case studies focusing on the role of differing socio-ecological conditions in shaping livelihood impacts and outcomes in Myanmar.

The impacts of CF have been reviewed in many aspects in many countries. For example, in Nepal, the literature on CF shows that forest and tree resources are vital for rural livelihoods (Nurse and Malla, 2005; Arnold, 2001). Forest resources are inputs for livestock and agriculture, and supply timber and non-timber forest products to the local people. Hence, forestry, agriculture and livestock husbandry are intimately related in the farming system, such as agroforestry system, and are central for rural livelihoods in Nepal. Yadav et al. (2015) review the institutions of CF with a focus on the environment and economic outcomes of local people. They recognise that community forests have proved to be successful in terms of environmental achievement but solid evidence for economic improvements for marginalised and poor groups proved elusive.

It is important for Myanmar to understand the role of CF, whether or not it encourages reforestation and improves rural livelihoods. Tint et al. (2011) conducted a survey to understand how CF had developed in Myanmar by assessing 16 community forests from two States (Kachin and Shan) and two Regions (Mandalay and Ayeyarwady) of Myanmar. However, their study did not include the livelihoods of non-CFUG members to compare, and therefore they could not assess the experience of non-CFUG households, that is, whether they were enduring hardship due to CF. In addition, their study sought to understand the status of community-managed plantations from a biomass aspect only. There has been a lack of comparative case study approaches documenting the outcomes of CF across different sites and how these outcomes relate back to underlying ecological conditions.

Some important aspects, which might benefit from analytical exploration of CF adopted by local people, are still lacking in Myanmar. There is thus an opportunity to add to this knowledge in relation to diverse ecological conditions and the changing rural political-economy in Myanmar. This study attempts to address some of the knowledge gaps by investigating the interaction of CF with livelihoods of rural people, through a comparative case approach. By understanding the benefits and drawbacks of initiation of CF, potential revisions and improvements to the CF rules and procedures could be identified, in order

to support local people's participation in CF activities to enhance their livelihoods. This study explores differences in livelihoods impacted by CF between CFUG members and non-CFUG members in three ecological zones in Myanmar. It is also hoped that the qualitative analysis will complement existing empirical knowledge on management of community forests in different localities of the country.

1.3 Objectives and research questions

In light of the issues outlined above, this study assesses the implementation of CF and its interactions with livelihoods of rural communities in three different ecological zones in Myanmar. Through this, the study aims to offer insights on how socio-ecological contexts can shape the implementation of natural resource management interventions, as well as informing the development of CF in Myanmar and internationally.

In order to achieve the above objectives, this study addresses the following research question and specific sub-questions:

How does CF impact rural communities in different areas of Myanmar?

1. Are there differences between the livelihood changes experienced by community forest user group members compared with non-community forest user group members?
2. How does CF interact with the livelihood strategies pursued by community forest user group members and non-community forest user group members?
3. How do underlying ecological conditions shape CF outcomes?
4. What are the implications for CF in Myanmar and internationally?

1.4 Overview of the thesis

This thesis has been structured into eight chapters including this introductory chapter, which has presented an overview of the background regarding CF in the focal country, Myanmar, discussed the significance of the study, and listed its research questions.

Chapter 2 reviews the literature on CF, to understand why CF has been adopted so widely in many other developing countries. It discusses issues that have emerged so far. The chapter also examines the relevance of the sustainable livelihoods framework to understanding local impacts of CF. The review then discusses how the potential for CF is shaped by forest governance frameworks more broadly and what is known about the significance of CF in rural livelihoods.

Chapter 3 presents the research methodology for this study, as well as the rationale for selecting research sites, my data collection and analysis methods, questions of positionality and research limitations. It explains how a multiple case study approach (3 case study sites, located in the Dry Zone, the Delta Zone and the Hilly Zone respectively) is used to assess the interplay of CF and rural livelihoods across case studies in three different socio-ecological sites where CF is being implemented. The research primarily draws on qualitative data, with some quantitative analysis of household survey data.

The next three chapters present the findings from the three different agro-ecological zones, discussing how the cases provide a window to investigate various livelihoods activities and CF outcomes. In each of these chapters, I not only discuss findings from my case studies but also provide the implications of the findings, generating key insights.

In Chapter 4, I address my research questions in a village-level case study in the Dry Zone, by comparing two villages: one which is implementing CF and one which is not. In this chapter, I present a portfolio of livelihood activities and livelihood strategies pursued by rural households in both study villages. I then discuss the perceptions of rural people on how CF impacts (positive and negative) their livelihoods with respect to benefit flow from CF and their community forest management regime at village level. In this case study, I argue that under the existing policy settings in Myanmar, CF makes a negligible contribution to the overall economy of the village and to households across all wealth strata. Although the community forest has started to provide forest products to the villagers, it is a very tiny portion and insufficient to provide direct household-level benefits. This is because the community forest in this case is relatively small compared to the village size and local demand for forest products. On the other hand, villagers without community forestry claim an interest in becoming involved in CF, in order to acquire household property rights over this resource. I argue that CF in this case does not support households in diversifying their livelihood options because most households are highly dependent on agricultural-based livelihoods. They could not rely much on forestry-based livelihoods because their community forest plantation is still immature, although there are indirect ecosystem benefits from CF in this case.

Chapter 5 discusses CF in the Delta Zone. In this case study, I mainly focus on differences between community forest user group members versus non-community forest user group members regarding their livelihoods according to their involvement in CF. I argue in this chapter that CF supports local well-being and has improved the livelihoods of the

community forest user group in comparison with those of the non-community forest user group. I document how community forest user group members obtain monetary benefits from their community forest to improve their livings. I also present the distinctions between wealth strata in response to the benefits of CF that generate households' income. This case study recognises the extraordinary community role in forest management, and also describes the interest level of non-community forest user group members to become involved in CF schemes. Further, as mangrove is one of the critical forest ecosystems in Myanmar providing several goods and ecosystem services to local people, community forestry is of great importance to explore in this case study.

In Chapter 6, I examine the effects of CF in two communities in the Hilly Zone, focusing on positive and negative impacts of the CF program on livelihoods of people in different communities. In this chapter, I find that community forests are integral to rural livelihoods, but migration for non-farm work opportunities and processes of agrarian change are changing the importance of CF in local livelihoods. I also argue, in this case study, that the broader ecosystem services generated through the protection of watershed forests have a significant positive impact on local livelihoods.

In Chapter 7, a cross-case comparative analysis is conducted to synthesis key findings from the three case studies. In this chapter, I argue that CF has contributed to rural livelihoods in each case, but in diverging ways across the different localities. However, CF is affected by changing agrarian conditions, for example, the nexus with migration and farming. Migration has triggered profound changes in agriculture through remittances and other indirect effects, making CF less significant as a livelihood source. I also argue that the effects of migration on agriculture and CF are contingent on labour shortages in some areas. Further, I found that, based on villagers' accounts, ecosystem services were increasing in the CF program in each case.

Chapter 8 provides the implications of this study's findings for CF and rural livelihoods. I argue that CF provides a platform for local people's participation in forest governance in Myanmar, but its full potential in supporting rural livelihoods has yet to be realised. I therefore conclude that more attention should be given to specific transitions and socio-ecological conditions at different CF sites across Myanmar, rather than adopting a blanket approach to CF implementation.

Chapter 2 Community Forestry and rural livelihoods

This chapter reviews the factors that led to the development of Community Forestry (CF) and its adoption in Asia and the Pacific, including Myanmar, and current knowledge on advances in and challenges of CF. I discuss a series of critical issues including the challenges of establishing inclusive systems of governance and achieving equitable and sustainable livelihoods in participating communities. The chapter starts by establishing how CF emerged as a strategy to address forest loss, within the rubric of sustainable forest governance and decentralisation. The next section establishes how and why sustainable rural livelihoods have become a central aim of CF. The challenges experienced in each of this spheres are discussed, as well as current gaps in knowledge regarding the implementation of CF and its outcomes.

2.1 Global forest loss and the impetus for sustainable forest governance

Over the past 25 years, global forest area has declined dramatically and rapidly[1]. The FAO (2016) estimates a decrease in global forest area from 4.1 billion ha in 1990 to 3.7 billion ha in 2015. Changes in forest area often bring about changes in the ability of forests to provide important goods and services, such as employment, wood products, non-wood forest products and environmental services. An understanding of these changes provides a sound basis for policy, investment and management decision-making at the national and international levels. Forests hold 80 per cent of the world's terrestrial biodiversity, and approximately 1.6 billion people around the world depend to varying degrees on forests for their livelihoods, not just for food but also for fuelwood, livestock grazing areas and medicine (World Bank, 2008).

The drivers of loss and degradation of tropical forests are multiple and complex, and vary between countries (Pauli, 2010). The most common direct causes of deforestation are agricultural expansion, infrastructure development and timber extraction (Geist and Lambin, 2002). These factors play out differently in different geographic regions. For example, deforestation is frequently caused by the expansion of large-scale soybean and beef production in Latin America, while forest degradation is more closely associated

[1] The FAO defines forests as "land spanning more than 0.5 ha with trees higher than 5 meters and a canopy cover of more than 10 per cent, or trees able to reach these thresholds in situ. It does not include land that is predominantly under agricultural or urban land use." In practice, the definition of forest areas can be ambiguous in some areas, as the national statistics used in FAO assessments have varying levels of accuracy regarding actual forest cover versus land "classified" as forests. Note that one could log out 90 per cent of an intact high quality forest and if there is still just 10 per cent crown cover left, there is no "deforestation" according to this standard!

with consumption of fuelwood and expansion of small-scale shifting agriculture in Africa. In Southeast Asia, deforestation often is an outcome of small and large-scale land acquisitions, for instance for smallholder farming and industrial agriculture (oil-palm, rubber) respectively (Lambin and Geist, 2003). In many tropical countries, deforestation results from underlying drivers such as cultural and demographic change, economic development, technological change, and governance weaknesses, for example, unclear land tenure and poor enforcement of environmental laws (Kanninen et al., 2007). Furthermore, these drivers are highly interactive.

In response, international efforts under the rubric of sustainable forest management (SFM) have trialled various approaches to address forest loss and degradation. SFM means different things to different people (for example, in the tropics whether it should include monoculture tree plantations of exotic species), but there is general agreement that it should involve a balance between social, economic and environmental objectives. The United Nations Food and Agriculture Organization describes SFM as "a dynamic and evolving concept, that is intended to maintain and enhance the social, economic and environmental value of all types of forests, for the benefit of present and future generations" (FAO, 2016). It is widely recognised that achieving these outcomes requires substantive improvements in current systems of forest governance (Pauli, 2010; World Bank, 2006; Kanninen et al., 2007; Eliasch, 2008; Saunders et al., 2008). The key governance barriers that have been identified include state corruption, weak accountability, non-transparent decision-making, poorly defined property rights, inappropriate and contradictory forest laws, and weak law enforcement (Kanninen et al., 2007). Remote frontier areas have been particularly prone to illegal logging and illegal conversion of forests for agriculture (Saunders and Nussbaum, 2008).

Forest governance reforms have accordingly aimed to address such barriers through a broad suite of interventions. These include the development of more effective institutions with clearly defined roles and responsibilities; clearer and more appropriate legislation together with better enforcement and accountability; strengthening of national verification and monitoring systems; clear land tenure; greater participation in decision-making processes including by stakeholders from civil society; and the removal of economic incentives to deforest (World Bank, 2006; Eliasch, 2008; Saunders et al., 2008). These have been taken up by key donor agencies, for instance about 60 per cent of all World Bank programs in the forestry sector have included governance components since 2001 (Contreras-Hermosilla et al., 2007).

Many of these interventions for forest governance have, ostensibly, involved a shift from the centrally administered, top-down regulatory policies that characterised 19th and 20th century forest governance towards more decentralised approaches (Agrawal et al., 2008). Agrawal notes that in the 21st century decentralisation has been one of three important forest governance trends, often targeting forests with low commercial value, but that nonetheless play an important role in the livelihoods of hundreds of millions of rural people in developing countries. The other two, not considered in this research, are the changing management of forest concessions and the growth of market-oriented systems of forest governance.

The effects of centralised colonial forest governance are well documented. Under "scientific forestry" regimes, governments assumed all rights over forest management and access and attempted to manage forests to maximise timber production for the benefit of the colonising power and/or the State (Odera, 2004; Barr, Barney and Laird, 2014, p. 201–236). Generally, these rights were embedded in new laws, which alienated land and forests from local communities, although subsistence was sometimes permitted. Such regimes continued well into the twentieth century, until a prominent transition commenced during and beyond the 1970s, based on the premise that forest governance initiatives are more likely to be successful if local forest users are active participants (Gilmour, 2016).

According to recent estimates, forest land administered by governments comprises 73 per cent of global forest area (i.e. 2,406 million ha), and forest land owned by indigenous peoples and local communities comprises 12.6 per cent of global forest area (i.e. 415 million ha) (RRI, 2014a). This data indicates that the proportion of community-managed forests is quite low at the international level. As in pre-industrial Europe, rural people in developing countries have long depended on their adjacent forest commons for livelihood support and as an integral part of their traditional agricultural systems. Local management systems often governed how these communal forests were used (Gilmour and Fisher, 1991; Wiersum et al., 2004), but centralised modes of forest governance often eroded such customary laws and institutions (Gilmour, 2016). Communal forest lands were enclosed and customary rights extinguished, to the detriment of poor farmers, when colonial rulers annexed forests that had previously been managed under various customary regimes (e.g. Poffenberger, 2000 for South Asia, and Peluso and Vandergeest, 2001). These developments explain why many contemporary forest governance interventions aim to move from centrally administered, top-down regulatory policies

(Agrawal et al., 2008). In this sense, tenure is an important facet of decentralised forest governance.

Although governments still considered state and private sector actors to be best placed to manage natural forests, greater space was created for community engagement, especially on degraded lands. This shift may have occurred for a mix of reasons. Coercive policies and laws had often led to conflicts between government agencies and local communities, and also negative impacts on natural forest resources. In the late 1980s, governments and donor agencies saw the importance of active cooperation and support by local residents, leading to various experiments in community-based natural resource management (CBNRM) (Shivakoti, 2013). The main challenges at the time were how to facilitate devolution of government authority to forest-based communities while minimising conflicts, how to support new partnerships between communities, government and the private sector, and how to simultaneously secure community needs, forest conservation and sustainable use. It was argued that creating adaptive policies and programs and clarifying forest use rights and responsibilities could support more sustainable forest management (Poffenberger, 1996). Decentralisation of control over degraded forest was made easier after private and state actors had organised the full extraction of any valuable timber from those areas, hence the state rather cynically handed back some of these areas to local communities, in order to gain their "participation" in regeneration activities.

International bodies played an important part in this transition, including the United Nations Conference on Environment and Development (UNCED) in 1992, and the Commission on Sustainable Development (CSD) in 1992. CSD initiated the Intergovernmental Panel on Forests (IPF) in 1995, to build a global consensus towards participatory and sustainable forest management (Gilmour, 2016). The International Union for Conservation of Nature (IUCN) also played an encouraging role, with its 1996 Working Group on Community Involvement in Forest Management, which advocated for community-based forest management in international discussions on forests. The overall purpose of these efforts was to promote decentralisation in forest governance, while emphasising the potential of community-based forest management to contribute to SFM (ibid). Currently, policies and programs that support community involvement and decentralisation in forest management are found worldwide. Community-based forest management in its various forms has become an integral part of the programs of most international organisations concerned with forest conservation and management (Gilmour, 2016).

As outlined above, forest governance has been steadily moving towards more participatory and inclusive approaches, with a gradual transformation from "top-down" initiatives towards a focus on "grass roots" action and active participation of civil society and the private sector (Agrawal et al., 2008). This shift has stalled in Southeast Asia in the past decade with the consolidation of authoritarian state politics. There have been few improvements in participation in natural forest governance in Laos, Thailand, Vietnam, Cambodia, and Sarawak over the past 15 years. Civil society has faced many setbacks, and it seems Myanmar, the Philippines and Indonesia are only partial exceptions.

Thus, the decentralisation of forest management that began in the mid- to late 1980s had become a prominent feature of changing governance of forests by the mid-1990s (Andersson and Gibson, 2007; Ribot et al., 2006). An emerging body of scholarly work on resource institutions, governance, local peoples' participation, and accountability also provided justification for decentralisation reforms (Dietz et al., 2003; Ostrom, 1990). This pattern is expected to continue although there are some concerns that large-scale initiatives that promote payments for forest carbon and ecosystem services may result in grabbing of forest land, corruption, and exclusion of forest-dependent communities and powerless stakeholders (CPF, 2008; Agrawal and Chhatre, 2009).

In short, over about three decades, there has been a realisation that forest governance is more likely to be effective if forest-dependent communities, managers and policy-makers can collaborate. Devolution of forest management has therefore taken place in many developing countries, for example in Nepal, as a primary means to involve local people in decision-making and the management of forest resources (Meinzen-Dick and Knox, 1999; Edmunds and Wollenberg, 2001 and 2003). Such regimes are also expected to improve socio-economic equity by enabling communities to access a more equitable share of benefits of forest resources (Agrawal and Ostrom, 2001; Kirk and Ngaido, 2001; Ribot, 2002).

Experimentation and research has raised various lessons about the factors that can strengthen the effectiveness of forest governance, such as clear and enforceable local tenure, meaningful local engagement, and transparency or accountability in decision-making (Agrawal and Chhatre, 2006; Ostrom, 2007).

2.2 The evolution of Community Forestry

As outlined above, CF emerged during the 1970s and 1980s as a means of responding to forest loss in developing countries (Gilmour and King, 1989) as well as to address gaps in rural development (Warner et al., 1997). CF in Asia had also increased local and democratic participation in natural resource management as a key objective – it was not simply an approach designed to address forest loss or to support administrative decentralisation. It was widely recognised that governments alone would not be able to address the crisis of deforestation, and efforts were made to encourage "people's participation" in government reforestation or afforestation programs, given past "failures by public forestry organisations to effectively protect and manage forests sustainably" (FAO, 2012, p. 41). The emergence of CF in Asia has also been supported by civil society efforts to promote local democratic accountability and greater representation in natural resource management.

The FAO was the first to define the term "CF" to refer to "any situation which intimately involves local people in a forestry activity" (FAO, 1978, p. 1). In Myanmar's Community Forestry Instructions (CFI), CF is defined in more limited and technical terms, as forestry operations in which the local community itself is involved in establishing woodlots to produce fuelwood and other products for community use, and the planting of trees and exploiting of forest products by farmers to obtain food, products and income. In this research, however, a more comprehensive definition of CF is used, developed by the Centre for People and Forests (RECOFTC, formerly the Regional CF Training Centre) to include "initiatives, sciences, policies, institutions and processes that are intended to increase the role of local people in governing and managing forest resources." The broader approach better enables the Myanmar experience to be compared with CF initiatives in other countries. CF includes both formalised customary and indigenous initiatives and government-led initiatives. It covers social, economic and conservation objectives through a range of activities that devolve forest governance through small-scale forest-based enterprises, community−company partnerships, smallholder forestry schemes and indigenous management of sacred sites of cultural importance (RECOFTC, 2013).

Rural livelihoods have been an important consideration in CF, given that the significance of forest resources to rural communities, including indigenous peoples, was previously neglected in government programs and policies (Arnold, 1991). Furthermore, it was

recognised that many local communities and indigenous peoples had a historical association with the natural forest resources on which they depended for goods and services, and had frequently developed institutional arrangements to govern the utilisation of their forest resources, even though this was not always acknowledged by governments (Gilmour and Fisher, 1991).

The objectives of CF, however, varied greatly according to its national context. In developing countries, for example, one of the objectives has often been to meet the basic needs of local communities, such as fuelwood, fodder, building materials, medicines and wild foods. Therefore, there are many reasons to increase the level of interest of local people and their participation in CF. In the past many governments of developing countries have failed to manage forests, keeping the forests in state control (Uprety, 2006) and forest management was not meeting the basic needs of the rural poor (Gilmour, 2016).

FAO played an important role in the uptake of CF internationally and in the Asia-Pacific region. Indeed, the emergence of CF as a formally recognisable modality of forest management can be traced back to the seminal paper "Forestry for local community development" (FAO, 1978). The concept was diffused globally after consecutive forestry congresses, such as "Forests for Socio-economic Development" in Buenos Aires in 1972, "Forests for People" in Jakarta in 1978 and "Forest Resources in the Integral Development of Society" in Mexico in 1985 (Uprety, 2005). New programs and projects within the rubric of CF provided support for tree planting and forest management; it was, thus, seen as a remedy for situations where scientific forest management had failed (Gilmour and Fisher, 1998).

Over time, CF has been adopted formally in many countries and adapted to diverse biophysical, social, cultural, historical, political and bureaucratic contexts (Gilmour, 2016). As a result, CF has taken on diverse guises and even names, for example, Forestry for Community Development, Farm and CF, Forestry for Rural Development, Agroforestry and Village Forestry, all of which in some way involve tree planting and management, at the village or community level by or for small farmers and the landless (Westoby, 1989). These different approaches share a stated emphasis on people-centred forest management, where forests are managed to also address social needs.

An additional pressure for the uptake of CF came from government budgetary constraints in light of economy-wide institutional reforms that many governments of developing countries were pursuing under International Monetary Fund (IMF) and World Bank

lending conditionalities since the 1990s (Tole, 2010, p. 1312). Under conditional structural adjustments, governments needed to reduce their bureaucracies to cut public expenditure. This trend, coupled with the widely-publicised failures of centralised forest management of states to control deforestation, made governments increasingly consider CF as a solution to their problems (Gilmour, 2016).

In addition to FAO's push, CF was therefore taken up by governments and international aid agencies both to stem deforestation and to progress other governance or decentralisation agendas (Gilmour and Fisher, 1998). Subsequently, various forms of CF evolved over time, but they shared the notion of participation by community groups in planning and implementing forest management. The improvement of rural livelihoods was at first perceived as a secondary outcome; however it became a more substantive objective over time through support from governments and international organisations. In some countries, a perceived fuelwood crisis was also a catalyst for initiation of CF (Gilmour, 2016).

CF in various forms is present across all regions in the world and continues to expand while still facing debates and implementation challenges. Its history in the Asia-Pacific region started in the 1980s in the form of local initiatives, largely in response to community demands and concerns about forest degradation (RECOFTC, 2013). A recent study by RECOFTC over 14 countries in the region identifies several large-scale drivers of CF, including "a light breeze of democratization" (RECOFTC, 2013, p. 2) which has led to an increasingly vibrant civil society in some countries such as Nepal. In general, citizens in this Asia-Pacific region have called for a broadening and strengthening of their political and civil rights, including the treatment of forests and other natural resources as economic assets. According to the data across 16 countries in the region, a total of 185 million hectares of forest lands are now managed under CF regimes, accounting for 34 per cent of total forest lands (Gilmour, 2016). This historical overview shows that CF has been taken up broadly as a mechanism for decentralisation and devolution of forest governance, but the results have been mixed.

2.3 Limitations or challenges with Community Forestry

This history of CF implementation has brought to light several challenges with the approach. I consider these in the broad areas of tenure uncertainty, governance challenges and forest restoration. Livelihood impacts, a major research theme is this study, are discussed later (Section 2.4).

Although CF has taken slightly different forms across the Asia-Pacific, a common challenge lies in the allocation of secure property rights and the specific rights that are allocated (see Mahanty et al., 2009). In Nepal, for example, community forest user groups (CFUGs) possess tenure rights in perpetuity to their forests (Mahanty et al., 2009), enabling them to locally manage forests and market forest products (Ojha et al., 2009). In India, however, villagers hold only limited forest rights and access under the country's Joint Forest Management program (Guha, 2001). There is a strong correlation between tenure security and improvement in forest condition (Gilmour, 2016). Chhatre and Agrawal (2009, p. 567) find that a large area of forest and a high degree of community autonomy in decision-making are associated with both high carbon storage and livelihood benefits. Conversely, community forest users with insecure property rights may extract resources at unsustainable rates. Globally, forest tenure rights of local communities remain weak, and this limits their ability to manage the forests for the full range of benefits, including commercial benefits (FAO, 2011; RRI, 2014b). As most natural forests in Asia are under state control, CF regimes generally involve some form of devolved forest management without the transfer of ownership (Fisher, 2014). Most governments in the region have claimed ownership of much of the forest lands through historical processes of expropriation, and those claims have been formalised in statutory laws. Accordingly, the importance of clear and strong property rights in contributing to sustainable forest management and delivering livelihood benefits to local communities needs to be given attention and well understood.

Strong local governance and effective institutions in CF regimes have also proven critical in achieving sustainable forest management and improving rural livelihoods (Gilmour, 2016). CF governance arrangements across the Asia-Pacific region range from active control by communities to passive participation in what are essentially government-run programs (RECOFTC, 2013). In addition, the representativeness of CF bodies has become a cause for concern, as they may become dominated by more powerful groups within participating communities and then channel benefits to those groups. Elite capture in community forest governance has therefore become a cause for concern regarding CF (Persha and Andersson 2014; Agrawal 2001). The problem of elite capture was first documented in the early CF initiatives of India and Nepal, where resources and opportunities related to CF were skewed towards wealthier households rather than the poorest households (Mahanty et al., 2009). Wong (2013) argues that strategies to address elite capture need to pay attention to the historical, socially embedded and negotiated

nature of resource governance arrangements that are usually present in local institutions. Therefore, considerable attention has been focused on ensuring that CF institutions, such as CFUGs, are governed in a transparent and inclusive way, lest they undermine equity in forest governance.

Devolution of natural resource control towards more locally controlled forestry such as CF offers a key opportunity for both improved forest management and incomes for the rural poor. This parallels trends experienced elsewhere in the world, which have shown the economic potential of locally controlled forestry (Macqueen et al., 2012). The reliance of rural communities on forests for food, shelter, education and recreation provides an incentive for management and protection. From the mid-1970s, government forest departments began to acknowledge the legitimacy of local forest use in many countries (RECOFTC, 2011a–d). Such departments had historically appropriated control of these forests and have been gradually handing back rights through CF policies (White and Martin, 2002).

Policies that support locally controlled forestry (LCF) continue to evolve and spread in a growing number of countries (Macqueen, 2012). LCF has been successfully applied for poverty reduction among local forest people as well as forest conservation and sustainable management (see also Molnar et al., 2011). Numerous studies worldwide have shown that locally controlled forestry can and does help alleviate poverty, improve forest conservation and bring about social justice (Molnar et al., 2006). Although CF commenced in Myanmar in 1995, it remains a puzzle in response to democratic devolution of forest resources.

Among these many studies on limitations and challenges with CF, critical issues such as conflict over property rights, demand and distribution of benefits under CF governance, enabling regulatory frameworks and supporting viable technology are not well analysed or understood, particularly in Myanmar. The role of CF in changing rural livelihoods and development outcomes is another key area of concern, and is the focus of this research and the next section.

2.4 Rural livelihoods

As noted above, forests have held a significant place in the livelihoods of many rural communities. This section explores the meaning and key components of rural livelihoods

according to the current literature, and discusses the livelihood-forest nexus in greater depth.

The concept of a livelihood is widely used in contemporary literatures on rural development and poverty reduction, but its meaning may vary, either due to vagueness or to different definitions being encountered in different sources (Ellis, 2000). A definition of livelihood is provided by Chambers and Conway (1992, p. 7) wherein “it comprises the capabilities, assets (stores, resources, claims, and access) and activities required for a means of living”. This popular definition has been utilised with minor modifications by several researchers adopting a rural livelihoods approach (Carswell, 1997; Hussein and Nelson, 1998; Scoones, 1998).

One of the most influential approaches to assessing rural livelihoods and developing interventions to strengthen these is the Sustainable Livelihood Approach (SLA). The sustainable livelihood framework is well established and increasingly used by research and applied development organisations, including the Department for International Development (DFID) (Adato and Meinzen-Dick, 2002). The conceptual framework analyses main causes of poverty, people's access to natural resources, livelihood activities and their relationships (Adato and Meinzen-Dick, 2002; Bond et al., 2007).

Sustainable livelihoods of rural communities are central to debates on rural development, poverty reduction and environmental management (Scoones, 1998 and 2009). According to Chambers and Conway (1992), “a livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets, while not undermining the natural resource base”. Thus, sustainable livelihoods encompass a positive relationship between poverty, food security, climatic conditions and natural resources. The SLA, hence, aims to promote development that is sustainable not just ecologically, but also institutionally, socially and economically, and that is able to produce genuinely positive livelihood outcomes (Ashley and Carney, 1999).

Scoones (1998) proposes that a sustainable rural livelihood is built upon five capital assets, namely, human capital, natural capital, physical capital, financial capital and social capital. These capital assets, under the intervention of policies, institutions and processes, can be developed to support rural livelihoods. The improvement of the five capitals or the sustainable livelihood can be determined by how much these assets can withstand vulnerability contexts, such as shocks, trends and seasonality. In recent years, researchers have undertaken livelihoods research using the sustainable livelihood framework and

have identified several problems that need critical attention. While the livelihoods framework upholds the ideas of social relations, mediating institutions and structures, most livelihood studies have overlooked these aspects, focusing largely on household assets and activities (De Haan and Zoomers, 2005). Moreover, such studies have paid less attention to the analysis of historical processes, the politics of discourse, power relations and international context (Bagchi et al., 1998; Kay, 2006; Scoones, 2009). In his 2009 paper, Scoones adds that broader political and economic contexts are also influential in rural livelihoods. This thesis sees the value of a livelihoods perspective to studying CF in terms of social, ecological and political aspects, and producing diverse outcomes.

Livelihood strategies refer to the activities deployed by households to generate a means of living (Ellis, 2000). Livelihood activities can be divided into natural resource and non-natural resource based activities. According to Ellis (2000), natural resource based activities include collection of resources from forests, food and non-food cultivation, livestock rearing, and non-farm activities such as thatching, weaving, brick making and so on. Non-natural resource based activities include rural trade, other rural services (e.g. vehicle repair), rural manufacture, remittances and other transfers such as pensions derived from past employment in the government sector (Ellis, 2000). This literature regarding livelihood activities informs my study to examine the range of livelihood strategies adopted by CF-affected rural communities in Myanmar.

Livelihood strategies are ways that households try to sustain or improve their livelihoods (Kragten et al., 2001). Drawing on reviews of livelihood strategies within the sustainable livelihoods framework, Scoones (1998) identifies three agrarian trends and farmer livelihood strategies that are especially relevant to this study, namely agricultural intensification or extensification, livelihood diversification, and migration. The first trend (intensification/extensification) relates to increased reliance on agriculture through intensification (i.e. by intensifying resource use in combination with a given land area) or extensification (increasing land area under cultivation). The second strategy, livelihood diversification, may develop wide income-earning portfolios if other livelihood options are failing to provide a livelihood. It can take place within agriculture through crop cultivation, or outside agriculture with rural people taking up non-farm labour opportunities either working in local towns or migrating afar (Ellis, 1998; Pritchard et al., 2013). Mushongah and Scoones (2012) find that a combination of agrarian and non-farm strategies helps rural households to accumulate assets and improve their livelihoods. Migration refers to movement to different localities, for short or long periods of time, or

even permanently, and is often associated with remittances that can provide an important livelihood support for rural households (Scoones, 1998). Although there are a large body of literature on livelihood strategies in most developing countries, there remain few studies of the interplay between rural livelihoods and CF in the context of Myanmar. This thesis explores the types of livelihood strategies pursued by rural people in three different localities in Myanmar.

In rural settings, different patterns of landownership and availability of different opportunities and assets shape household livelihood strategies. For example, collection of timber and NTFPs is the main livelihood activity on communally-owned land whereas settled agriculture is the main livelihood activity when lands are privately owned. Different opportunities may emerge through support from government and NGOs, or proximity to markets, opportunities for education and capacity building. In addition, migration can become an attractive option where individuals and households face declining resources, climatic variability and change, and differences in urban-rural wages (Ellis, 2000; Kelly, 2012). Rural poor, when their incomes are barely enough to provide their basic needs, may engage in seasonal migration which is becoming an important source of income to rural communities. Some even decide to move permanently to urban areas when their livelihoods collapse due to exogenous shocks like natural disasters or market changes (ibid).

This review on livelihoods and livelihood strategies highlights that rural households engage in diverse activities to generate the means of households' survival. Households have access to different assets and capacities, and different family members may avail themselves of different resources and opportunities at different times. Sometimes this is seasonal, where household members pursue different strategies at different times of the year (Adato and Meinzen-Dick, 2002). Generally, multiple livelihood strategies are used to make enough income or to provide more food security. The configuration of rural livelihoods is explored in this research.

2.5 Rural livelihoods and their relationship to forests

The value of forests to the livelihoods of rural communities has been under discussion for more than 15 years, partly driven by earlier work on CF. There is growing interest in understanding the changing role of forests in supporting the rural poor, increasing their resilience, reducing their vulnerability to environmental and economic shocks and widening their options, as well as in reducing poverty itself (Hulme and Shepherd, 2003).

Forests and forest products that have contributed in rural livelihood systems are often important in filling seasonal and other food gaps, especially in hard times (Arnold, 2001). Forests provide a wide range of direct and indirect benefits to different users, and the benefits include a range of different products and services. However, the nuanced ways in which different groups may rely on forests are not well understood, particularly as rural livelihoods undergo change.

Forests play an important role in the well-being and livelihoods of a vast number of people in both developed and developing countries; from urban citizens using forests recreationally to isolated hunters and gatherers that live in and off the forest (IUCN, 2012). In terms of environmental services, forests reduce the risk of floods and mudslides that result from natural disasters such as earthquakes and storms by absorbing water and holding soil in place, and they protect watersheds which supply fresh water to rivers – critical sources of drinking water. The IUCN (2012) therefore states that more than 1.6 billion people around the world are dependent to varying degrees on forests and trees for their livelihoods, not just for food but also for fuel, livestock grazing areas and medicine. Their significance is often greatest to the poorest households (MacGregor et al., 2007).

Livelihood strategies have implications for patterns of forest utilisation – from fishing, hunting and gathering to swidden cultivation and sedentary agriculture. The role of forests as a safety net during unforeseen shocks, such as family illness and bad harvests, has been well documented (McSweeney, 2004; Pattanayak and Sills, 2001). Forests can also help poor households during seasonal gaps in food production, such as between agricultural harvests (de Beer and McDermott, 1996; Angelsen and Wunder, 2003). Rural households may also generate "environmental incomes" from forest resources i.e. cash- or subsistence-based contributions from non-cultivated lands such as natural forests, mangroves, bush, rivers, or other wildlands. Most forest income, apart from plantation forestry, is environmentally sourced, i.e. a "subsidy from nature" with low management intensities (see Angelsen et al., 2014). Therefore, natural resources can be important for rural income and for policy interventions.

One poorly understood facet of the forest-livelihood nexus is how forests fit with ongoing transitions in rural livelihoods. Rural communities in the Global South have diversified livelihood strategies; forest income is one of the income sources that can shift in its size and importance (Vedeld et al., 2004; Angelsen et al., 2014). According to Angelsen and his colleagues' (2014) recent study on a global-comparative analysis of environmental

income and rural livelihoods, environmental income accounts for 28 per cent of total household income, 77 per cent of which comes from natural forests. They state that the poor rely more heavily on subsistence products such as fuelwood and wild foods, and on products harvested from natural areas other than forests. In this study, I build upon knowledge about the role of forest-based income, particularly how such income differs between households involved CFUGs and non-community forest households.

In the preceding section and in this section, I have outlined the complex and changing relationship between livelihoods and forests. Among these many studies on livelihoods and their relationship to forests, there remain critical gaps. A close reading of the existing studies reveals the flow of ecological benefits and environmental incomes contributed from natural forest resources. There are few studies of CF and its contribution to rural livelihoods between CFUGs and non-CFUGs. In-depth studies from a country like Myanmar could add value to these gaps by generating contextual and empirical insights (see next section). In this thesis, the questions of how a CF program can enhance local livelihoods, and how local people perceive such programs impacting upon their livelihoods, will be examined.

2.6 The context of Myanmar: Forest governance, Community Forestry and rural livelihoods

This section outlines forest management and the emergence of CF in Myanmar, where the questions regarding CF institutions, elite capture and livelihoods outlined above are yet to receive detailed attention.

Forest management in Myanmar has a long history, with former Burmese Kings declaring teak (*Tectona grandis*) as royal property and levying royalties for its extraction (Gyi and Tint, 1998). Since about 1880, the Brandis Selection System (BSS), which is now known as the Myanmar Selection System (MSS), has been applied in all natural teak-bearing forests in the country (Tint et al., 2014). The Myanmar Forest Department (FD) was formed in 1856 under the British colonial administration in order to introduce scientific forest management to commercial teak logging (Macqueen, 2012). The sustainability of forest management in the early MSS began to break down with the introduction of growth-oriented targets (involving both timber and some NTFP extraction) to generate much needed foreign exchange under the socialist military rule from 1962 to 1988 (ibid). Every district FD had to raise their timber production in order to reach the allocated targets, and the centralisation of forest management in Myanmar had very negative

impacts on the MSS (Woods and Canby, 2011). Although sustainability was still the key factor in forestry's scientific management as a discipline, Myanmar's natural forests were logged unsustainably, ignoring the Annual Allowable Cut (AAC) under MSS (ibid).

The alarming rates of deforestation throughout previous decades have done little to reduce hardship for forest-dependent people. Forest loss accelerated as commercial teak logging increased above the AAC, driving roads into formerly inaccessible areas, and exacerbating conversion for food and wood energy production from primarily subsistence agriculture (Bryant, 1997). More recent large-scale agricultural land grabs have continued this trend (Macqueen, 2012). Forest cover, which stood at 65 per cent of the total land area in the early 1900s, has fallen to 45 per cent or 67.6 million ha according to official data – but may be even lower than that (ibid). Therefore, this century-old scientific forest management system has not been able to meet local needs, reduce poverty in rural areas or sustain the country's forest resources (Tint et al., 2014).

The Myanmar government started to realise that participatory forest management was urgently needed to promote the devolution of forest management. Hence, the previous 1902 Burma Forest Act was superseded in 1992 and the government enacted the new Forest Law, which supported conservation, sustainable forestry and socio-economic benefits of local people. This 1992 Forest Law decentralises forest management to some extent and encourages private sector development and community participation in forest management (Woods and Canby, 2011). However, there are no detailed articles in the Forest Law relating to CF. It only mentions the establishment of village-owned fuelwood plantations established either by the FD or by villages by collective labour (Tint et al., 2011). This was followed by the 1995 Myanmar Forest Policy – which lays out targets for expanding the Permanent Forest Estate and Protected Areas. Significantly, the policy introduces notions of community participation in forest management, which are further elaborated in the 1995 CFI (Tint et al., 2011). All of these major changes have led to more democratic local control over natural resources, including forests. Democratic devolution of resource control has been significant for the trajectory of CF in Myanmar, offering a key opportunity for both improved management and livelihoods for the rural people (Tint et al., 2014). In this thesis, I examine CF – how it impacts on local livelihoods and why people engage with it – considering questions of land resources, livelihood activities and benefits and outcomes of CF.

The history of forest policy in Myanmar is one of continued struggle between different stakeholders such as the state and villagers. In general, there are also substantial gaps between policy and practice, which inhibit the widespread application of new initiatives to improve field practice and inform policy discourse. According to policy, there is a call for a participatory approach to forest management with an emphasis on people's participation and public awareness in forestry, wildlife and nature conservation activities, as well as in establishing plantations and increasing incomes through the application of CF and agroforestry systems (Woods and Canby, 2011). Therefore, there is a need to look deeper into how forests should be managed and by whom – forests for commercial timber production and economic development, forests for local community use or forests for sustainable management (ibid). A major problem exists in managing forests between different stakeholders such as FD and villagers.

In terms of forest governance and land tenure in Myanmar, there is state control of forests, which sets up state power in relation to CF. Under section 37 of the Constitution of the Republic of the Union of Myanmar, it is provided that the Union is the ultimate owner of all lands in the Union (The Republic of the Union of Myanmar, 2016). The forests and forest lands are managed by the FD under the Ministry of Natural Resources and Environmental Conservation (MONREC). The Department of Agricultural Land Management and Statistics under the Ministry of Agriculture and Irrigation, and the General Administration Department under the Ministry of Home Affairs, manage other lands. Reserved Forests (RF), Protected Public Forests (PPF) and Protected Areas (PA) are constituted as Permanent Forest Estate (PFE). The Myanmar Forest Policy has stipulated an increase to 30 per cent of the total land area as RF and PPF with 10 per cent as PAs in the long run (FD, 2016). The FD retains significant authority over forest management, rather than it being devolved to communities, with the result that CF faces major restrictions in forest land tenure and forest governance. This thesis aims to investigate the trajectory of CF by conducting case studies in three different localities.

In Myanmar, forest resources are believed to be valuable to rural communities where poverty and dependence on forests and forest products are high, but detailed assessments have not been conducted. Many of the tree species found in the forest lands have multiple uses and rural people can produce many forest products for subsistence use and sell them in local markets to contribute considerably to their household incomes. Communities in rural Myanmar rely more heavily on timber and non-timber forest products for their livelihoods: rural communities use fuelwood as a major source of energy for cooking,

poles, posts, wild foods and medicinal plants. A recent study by Kollert et al. (2017) on forests and trees supporting rural livelihoods in Myanmar notes that rural communities collect 4.5 tonnes of fuelwood per year per household, which corresponds to approximately 6 cubic metres of stacked wood of which 24 per cent is sold at markets, in particular in Chin State. Rural people collect non -timber fo including mushrooms, honey, medicinal plants, orchids, rattan and resin, of which one-third (i.e. 33 per cent) is sold at local markets. Most communities use forest lands for hunting wild chickens, rabbits, deer, wild pigs and monkeys. The majority of hunted animals are consumed by households, with only about 7 per cent sold at the markets (Kollert, 2017). In addition, rural communities are aware of the protective and environmental functions of forests such as the provision of fresh and clean drinking water, good microclimates, soil protection and continuous flow of spring water, protection against natural disasters, storms and flooding, and protection against seawater intrusion (ibid). This research therefore aims to assess how CF initiatives figure in the changing/dynamic livelihoods of participating communities.

CF was considered the right choice for the country to ensure fulfilment of the basic needs of local people and restoration of natural resources in degraded areas (Tint et al., 2011). The CFI (see Appendix 1) was the first regulation to recognise local people's rights to manage nearby forests for their basic needs. Under the CFI, the key local institutions in CF are the CFUGs, which are also called "Community-based Organisations" (CBOs), which establish and control community forests. They are the on-site managers of the community forests while their daily life and forest resources are tightly coupled together. A CFUG is a group of local residents who are interested in establishing a community forest and organising to do CF activities together under the leadership of a Management Committee (MC) elected by themselves. The MC of a CFUG consists of a chair, a secretary and three members. However, local residents who are not interested in participating in CF are not necessarily required to be CFUG members. Membership of a CFUG depends on the participant's willingness and the criteria set by the user group. Non-CFUG in this thesis means local residents who are not members of a CFUG and who are not involved in CF activities; however, they may have access and use rights to other natural resources except community forests.

In recognition of tenure rights of local communities, the CFI grants CFUGs a 30-year official lease over a designated forest land under joint management with the FD (Woods and Canby, 2011). CFUGs are allowed to extend the lease after 30 years depending on

the performance of user groups and development of the forest's condition. The local community, in consultation with the FD and oftentimes a non-governmental organisation (NGO), must formulate the community forest management plan at the village level. They are then beholden to follow the plan or to risk losing their community forest. In general, local communities can only take advantage of strong tenure rights and translate them into effective forest management when power asymmetries and regulatory restrictions do not prevent them from doing so (RECOFTC, 2013). This is why this thesis explores the tenure rights of local people in CF, and whether these rights are secure.

CF under the CFI is set up for the purpose of regaining environmental stability and addressing basic livelihood needs of local communities for fuelwood, farm implements and small timbers. Since the CFI was issued in 1995, many community forests have been established in different ecological zones across Myanmar. As described in the previous chapter, about 113,000 ha of community forests are being managed by local people in Myanmar. Hence, it is notable that CF has developed slowly in the country, and more needs to be done to learn how CF is performing in the different environments, given CF's importance to protecting forests in this highly-forested country. According to a recent study by Tint et al. in 2011, almost all CFUG members have supported at least a partial regeneration their forests, thereby providing a range of timber, fuelwood, fodder, non-timber forest products and ecosystem services, particularly water and soil nutrient cycling. However, there has been a lack of information about the positive or negative impacts of those community forests, particularly on non-CFUGs, in different areas. There is a fundamental problem with an exclusive focus on the interplay of CFUG members with CF. This thesis investigates how CF actually performs in different environments and how CF interacts with rural livelihoods, including for both CFUG and non-CFUG community members.

Overall, CF within Myanmar is still in its formative stages. On one hand, due to policy reforms, the government has cited CF as a positive mechanism for moving towards sustainable forest management while bringing significant improvements to local livelihoods. On the other hand, the government has often lacked the willingness to devolve real state power in relation to forests, especially over high quality forests. In this thesis, I explore the means of livelihoods of both CFUG and non-CFUG members in relation to their perceptions of CF by analysing the outcomes of CF.

Chapter 3 Research Methodology

This chapter explains the case study rationale, data collection methods, and constraints and limitations of the research. The research is based on three case studies in different ecological zones of Myanmar, for which the rationale is outlined in Section 3.1 below. The study drew on mixed methods, which included qualitative interview and focus group data and household surveys, elaborated in Section 3.2. Data analysis and interpretation are presented in Section 3.3. My position as a government employee at the Myanmar Ministry of Natural Resources and Environmental Conservation had implications for my research, and this is discussed in Section 3.4. Finally, the constraints faced in the field imposed some limitations on data collection, which are explained in Section 3.5.

3.1 Case study rationale and selection criteria

This research is based on a case study approach that uses three case studies of Community Forestry (CF) to compare and assess the implementation and outcomes associated with CF in three different agro-ecological zones in Myanmar.

A case study approach enables the researcher to explore in-depth a program, process, activity, event or one or more individuals in a *real-life context* (Stake, 1995; Flyvbjerg, 2006; Yin, 2009). As an empirical inquiry, a case study investigates a contemporary phenomenon in-depth within its grounded context, in order to understand the dynamics present within either a single case or multiple cases, and to enable case-level and/or comparative analysis (Yin, 1984; Yin, 2009). Cases are bounded by the activity and time, and researchers collect detailed information using a variety of data collection methods over a sustained period. Case study research investigates phenomena in close detail, and unpacks the operation of causal mechanisms that shape key outcomes (George and Bennett, 2005). The phenomenon under investigation in this study was the interaction of CF with rural livelihoods. A case study approach provided the best prospect for grasping how complex histories and implementation processes interact to influence livelihood outcomes associated with CF in different localities.

In order to capture a range of CF arrangements, a multiple case study approach (Yin, 2009; Eisenhardt and Graebner, 2007) was utilised in this study. Rural livelihoods were analysed across three CF sites. Each site involved village-level studies of local communities from different agro-ecological zones in Myanmar. This multiple case study approach served two purposes. First, it enabled me to explore differences in CF

implementation at the sites to understand critical in-situ factors that shaped the development of CF interventions, including biophysical conditions (Flyvbjerg, 2001; Gerring, 2007; Yin, 2009). Second, by focusing on a small but targeted number of participants and contexts, it was possible to examine different variables in the cases that shape different intervention outcomes (Yin, 2009). This is important given the multi-dimensional nature of CF (see Chapter 1), in that these programs deal with and could impact social and environmental dimensions of sustainable development.

The challenge for case study research is to move beyond the specific findings of the context to produce generalisations that are relevant to a wider group than that which has been researched (Hammersley and Atkinson, 2007). Bulmer (1983) argues that it is difficult to make useful conclusions about a total population based only on case study evidence. However, Yin (2009) counters with the argument that useful generalisations can be made regarding theoretical propositions even while case studies may not be generalisable to larger populations. Others, such as van Donge (2006), add that it is incorrect to conclude that case studies have no wider significance because a good case study involves in-depth, systematic analysis, which allows us to perceive similar or contrasting patterns in other situations. This study therefore proceeds with an awareness of these contrasting arguments about the potential for generalisability from case studies, in order to gain the richer insights that case studies can offer for this research.

As noted earlier, the three comparative cases were drawn from three different agro-ecological zones: the Dry Zone, the Delta Zone and the Hilly Zone. This selection criterion was crucial because so far in the CF literature there have been few, if any, systematic comparisons of how biophysical conditions can shape CF and its socio-ecological outcomes. Secondly, these three zones are critically important forest ecosystems in Myanmar that are believed to provide important forest products and environmental services to local communities. The study provides an opportunity to verify the significance of these ecosystems for resident populations.

In terms of the site selection procedure, two Regions and one State, out of the 15 States and Regions in Myanmar, were purposively selected based on the abundance and importance of the community forests. Hence, Mandalay Region, Ayeyarwady Region and Shan State were chosen to represent the Dry Zone, the Delta Zone and the Hilly Zone respectively. Again, three Townships (one in each Region/State) were selected objectively according to the number of community forest user groups in the selected State

and Regions. Within each selected township, I purposively chose the villages where all observations necessary for the analysis were made for my research. The biophysical feature and the selected study villages in each research site are shown in Table 3-1 and the map of the research sites is shown in Figure 3-1.

For my first case study in the Dry Zone, the selected villages are Myay Thin Twin village, which has a community forest, and Ywar Thar Aye village, which has no community forest. As Myay Thin Twin villagers have the will and capacity to make CF a part of their village-wide activities, all households are members of the community forest user group (CFUG) in the village. Since this village does not have both CFUG members and non-CFUG members, Ywar Thar Aye village, a non-CF village that has similar socio-economic and ecological conditions, was selected for comparative purposes.

In the case of the Delta Zone, two adjacent villages, namely War Kon village and Kanyin Kon village, each having a well-organised CFUG and well-established community forest, were selected. Although each village has both CFUG and non-CFUG members, I combine the two villages as a sample. The reason is that the sample size would have been too small to compare with the other cases given the small village populations; as well, both villages have similar social and environmental conditions.

The third case in the Hilly Zone is different from the first two cases. CF development in Hilly Inle watershed area has been quite advanced with the intervention from UNDP and various donors under Human Development Initiative projects for over 30 years. Apart from the villages on the Inle Lake, almost all villages in the watershed area of Inle lake have developed CF with different degree of status. For this nature of CF development in Hilly Inle region, comparing between the CF from eastern and CF from western part of the lake was done instead of comparing between CFUG and non-CFUG. The reason for selecting these two CFs was that both were established in the Inle Lake watershed area; one is located on the eastern part of Inle Lake and the other is located on the western side of the Lake. To assess the livelihood patterns of different local communities and to have a better understanding of local people's perceptions of CF in the study area, Maing Thauk CF and Lwai Nyeint CF were selected in this case.

Table 3-1: Selected Regions/State, Townships and villages in the research sites

Biophysical feature	Region/State	Township	Village	No. of community forests in study villages
Dry zone	Mandalay Region	Nyaung U	Myay Thin Twin & Ywar Thar Aye	1
Delta zone	Ayeyarwady Region	Phyarpon	War Kon & Kanyin Kon	2
Hilly Zone	Shan State (South)	Nyaung Shwe	Maing Thauk & Lwai Nyeint	2

Source: Field survey (2014)

Overall, the three research sites were selected to support various locations within the particular ecological zones in terms of different and critical forest ecosystems such as dry forest, mangrove forest and hill forest. It is important to look at these ecological zones in other parts of the country in order to understand the variation in the types of agrarian livelihoods that CF might interact with as well as different conditions for forest types.

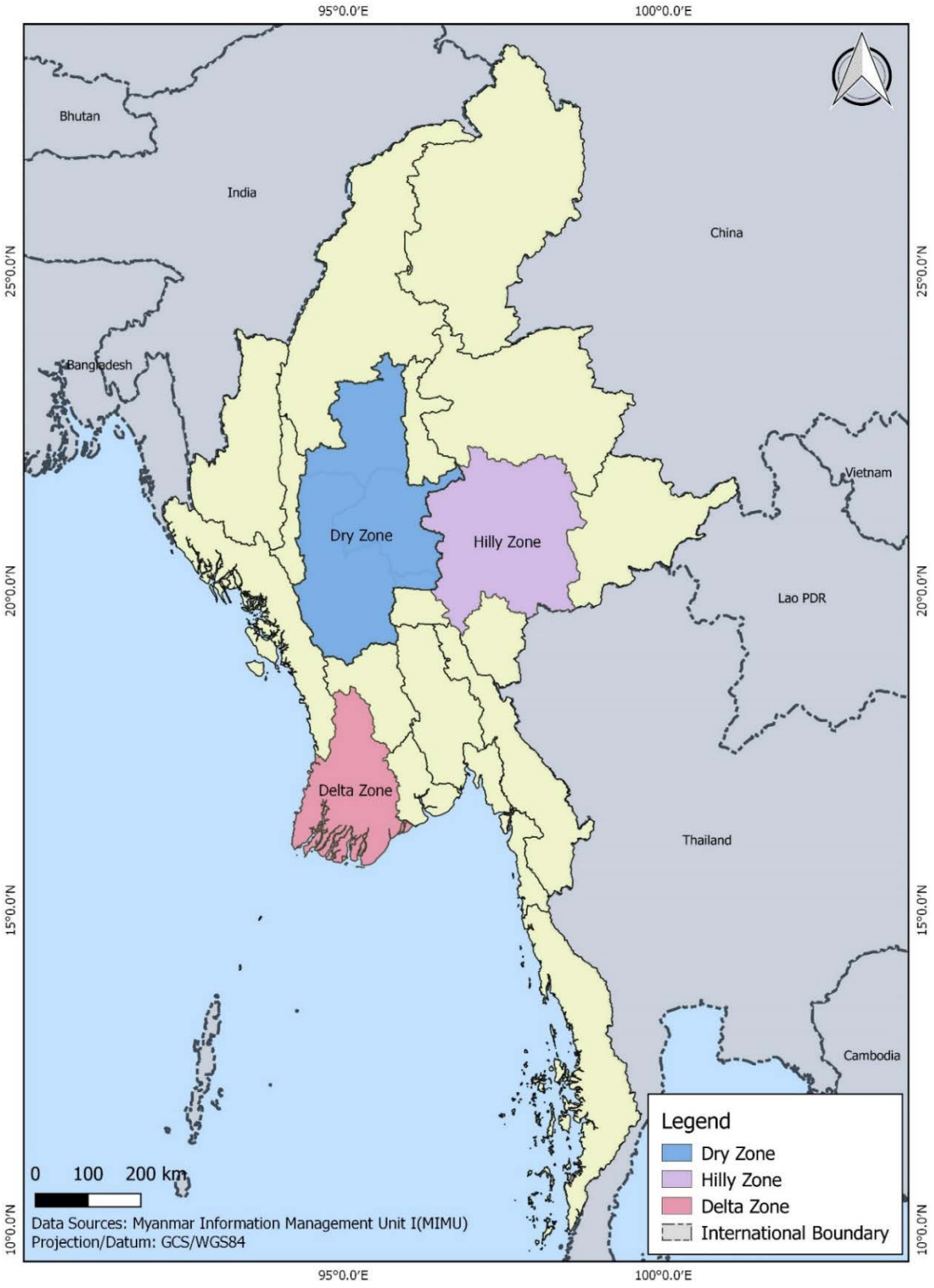

Figure 3-1: Map of Myanmar showing the location of the research sites

3.2 Data collection methods

In the livelihoods approach, scholars analyse different assets to understand livelihoods through participatory tools (Chambers 1997; Ellis 2000). Under this approach, I undertook household surveys to assess the status of villagers' asset holdings and applied qualitative methods, mainly Participatory Rural Appraisal (PRA), to explore livelihood

strategies and associated mediating processes and institutions. Unlike conventional understandings of household assets that often include land and livestock, this approach conceptualises assets in a broader sense including human and social capital.

Data were collected primarily through the use of qualitative methods, and supplemented with a household survey in the targeted areas. This mixed methods approach enabled me to quantify some household information, while qualitative data helped to provide an in-depth appreciation of local livelihoods as well as local perspectives on the impacts of CF. Bryman and Burgess (1994) note that the use of multiple methods can improve the effectiveness of research where the quantitative component maps out general patterns, and the qualitative phase reveals processes and the perspectives of those actually involved. Qualitative methods are particularly well suited to understanding the meaning that people give to events they experience (Denzin and Lincoln, 2000; Bogdan and Biklen, 2003).

The qualitative methods used in this study included semi-structured interviews, focus group discussions, and field observation. In order to code, analyse and interpret the data, I deployed the NVivo data software program (Bryman, 2012). Livelihoods in the rural communities at the research sites were analysed at the household level. Based on my review of the livelihoods literature and my participant observations, questions were formulated to analyse main themes such as local livelihood strategies, natural resource use, household activities and people's perceptions of the impacts of CF. Through the qualitative methods, I could then analyse the data on participants' perceptions and experiences with CF, and associated changes (or not) to their livelihoods. In the cases in the Dry Zone and the Delta Zone, participants were selected from community forest user groups (CFUG) and non-community forest user groups (non-CFUG), and, where possible, from different wealth strata (see below for a description of the wealth ranking process). In the Hilly Zone, all participants were chosen from CFUGs in the study villages. This follows practices for studying the differentiated nature of rural livelihoods and livelihood change in past research (Ellis, 2000; Scoones, 2009; Vandergeest, 2012; Gilmour, 2016). In this thesis, livelihood analysis, being a main theme of the research, was made in order to deepen the understanding of the existing livelihood system in the context of various livelihood activities, diversifying income sources and migration.

Stratified random sampling was used in this research and the households were selected randomly from CFUG members and non-CFUG members in the Dry Zone and the Delta

Zone. For the case of the Hilly Zone, households were selected randomly from CFUG members in the study area. In the Dry Zone, a village-level study was carried out in Nyaung U Township, which was targeted for a CF program under an afforestation project by JICA and DZGD. In order to gather enough information on livelihoods and CF, two villages were selected objectively and compared, namely, Myay Thin Twin, where CF had been implemented under the afforestation project, and Ywar Thar Aye, which had not experienced CF.

The respondent households were classified into wealth categories using wealth indicators (Ellis and Bahiigwa, 2003) for comparison purposes. The wealth categories used in this research were: poor, medium and better-off. Households were categorised on the basis of wealth indicators data that was collected during household interviews and key informant interviews. Participants were asked, during focus group discussions, how they would describe a wealthy household in their community. Most commonly, the following indicators of wealth were given: the amount of agricultural land a household possesses, the type of house they own (e.g. permanent or thatch house) and the materials they use to build their houses, and their household assets. Using these indicators of wealth, households were ranked by villagers as belonging to a particular wealth category. The wealth ranking was done by the respondents after discussion and having agreed among themselves. The process that was used to categorise the households in each case study will be described in detail in the following paragraphs.

In the case of the Dry Zone and the Delta Zone, if the household had less than 4 ha of agricultural land they were identified as poor. If the households had between 4 and 8 ha they were identified as medium, and households with more than 8 ha were identified as better-off. However, the threshold of agricultural land ownership was different in the case of the Hilly Zone. With the nature of the area, if the household had less than 0.8 ha of agricultural land they were identified as poor. If the households had between 0.8 and 1.6 ha they were identified as medium, and households with more than 1.6 ha were identified as better-off.

The thresholds of housing type and household assets did not differ much across all research sites. The better-off and some medium households had permanent houses with zinc sheet roofs while the poor had thatch houses. The better-off possessed at least one television set and some of them had at least one cell phone and one motor bike (or one motor boat, as in the Delta Zone and the hill zone). In the case of the medium group, they

had at least one television set, one bicycle or one cell phone but some of them had one motor bike. In the case of the poor, very few of them had televisions or bicycles and most of them were landless.

The main data collection methods used in this research were interviews, focus group discussion, and participant observation. This approach is supported by suggestions made by Yin (2009) who notes that case study research relies on several sources of evidence, allowing crosschecking of collected data and analytical statements by triangulation (see also Denzin and Lincoln, 1998).

3.2.1 Interviews

In this study, semi-structured, in-depth interviews were a powerful tool to collect data on people's livelihoods and their perceptions of CF. Qualitative interviewing is commonly used when "studying people's understanding of the meaning in their lived world" (Flinders, 1997, p. 105). Interviews also offer thick descriptions of the subject being studied that enable readers to make decisions about transferability of study results (Merriam, 2002). In addition, qualitative interviewing is appropriately used for triangulation of information obtained from other sources and, hence, increases the credibility of study findings (Stake, 1995; Merriam, 2002).

When conducting in-depth interviews, rapport and relationships must be established, and coupled with trust: "The purpose of interviewing is to find out what is in and on someone else's mind. We interview people to find out from them those things we can't observe" (Patton, 1980, p. 196). Therefore, active listening and nonjudgmental behaviour were prioritised when interviewing for my case study research.

In total, I undertook 165 in-depth interviews covering the three study sites (Table 3-2). All participants were interviewed face to face for 30 minutes to 1 hour. With the approval of participants, I audio recorded the interviews to ensure accurate transcription (Merriam, 1998). I took handwritten notes during each interview, which enabled me to track key points to return to later in the interview or to highlight ideas of interest or importance. As a first step in the interview process, I reminded participants of the objectives of the study, research procedures, their rights to withdraw from the interviews at any time, and protection of confidentiality (following ANU Ethics Protocol 2013/695). I invited any questions about my research or research procedures. I also provided information about myself to gain their trust and establish rapport (Patton, 1980) and to gain the confidence

of the participants (van Donge, 2006). Conducting the interviews in this way allowed me to put participants at ease, and allowed for an optimal interviewing environment.

Table 3-2: Number of interviews by study sites

Study site	No. of interviews
Dry Zone	51
Delta Zone	58
Hilly Zone	56
Total	**165**

Source: Field survey (2014)

The interviews were conducted in a semi-structured format (Esterberg, 2002; Bernard, 2011) and a uniform set of open-ended questions was used to obtain: (1) household demographic information on the participants, (2) participants' access to land resources and their livelihoods, and (3) experiences and perceptions of participants on CF (see Appendix 2). Throughout the interviews, open-ended questions were used to encourage participants to respond openly and freely to queries (Kvale, 1996; Esterberg, 2002; Bogdan and Biklen, 2003).

In addition to the in-depth interviews with participants from case study villages, key informant interviews were conducted with individuals with specialised knowledge (Adata and Meinzen-Dick, 2002). Key informants are important for their knowledge about the case study setting, as well as broader insights on CF in Myanmar. I therefore interviewed key informants from various levels of government, the private sector, NGOs, village heads and community leaders to gain their perspectives on key issues related to the research questions – that is, overviews of village conditions and the implementation of CF programs and their interaction with livelihoods of rural communities across the regions. The key informant interviews were also carried out in a semi-structured format to identify and solicit local knowledge, opinions, and views of rural people. Key informants were asked how they thought CF impacted local rural communities and what measures would be required.

3.2.2 Focus group discussions

Focus group discussion (FGD) is a widely used qualitative method for data collection. FGD is defined as "a research technique that collects data through group interaction on a topic determined by the researcher" (Morgan, 1996, p. 130). The use of focus group discussion is different from village meetings in the sense that they are specifically targeted for people who share similar interests and face similar issues or problems (Robson, 2002).

Moreover, the FGD approach offers the opportunity of allowing people to probe each other's reasons for holding a certain view (Bryman, 2012). In FGD, participants are able to bring to the fore issues in relation to a topic that go beyond the household level. Therefore, FGD is a useful method in the elicitation of a wide variety of different views in relation to a particular issue that participants deem to be important and significant.

I conducted six FGDs (two in each research site) separately with groups of CFUG members and non-CFUG members just after the household-level interviews in the target villages. Each of these groups included village authorities, elderly village residents, youth and women. The village heads played a crucial role in gathering people in a certain locality where group discussions were organised. Discussions were conducted with all wealth strata of CFUGs and non-CFUGs, keeping in mind the nature of heterogeneity in the groups. During FGDs, we discussed livelihoods of villagers in general and perceptions of villagers on CF in terms of benefits, community forest conditions and their management regime.

The FGDs were also useful to triangulate and supplement the information gathered from the interviews and the participant observation. The recommended number of participants ranges from six to eleven (Greenbaum, 1998) with the time availability among participants to make discussions effective. However, in my research, the number of participants ranged from 10 to 15 with the average time for discussion being 90 minutes in each meeting.

3.2.3 Participant observation

Participant observation was carried out during fieldwork in order to observe the field context and to triangulate the responses of participants. This method enables researchers to observe and understand the people and culture by engaging themselves in the real-life setting of the research participants such as daily routines of rural people, their livelihoods and social relations. This method includes accurate watching, questioning, listening, learning, and taking notes and photos about situations such as activities of household members, situations of community forests and mutual relationships between participants. It also helps in discovering the intricacies of CF program implementation, particularly the perspectives and strategies used by actors in response to interventions in unstructured or informal settings (Punch, 2013; Bryman, 2012).

During my fieldwork, I interacted with different people at the villagers' houses, farms, monasteries and other public places. I also participated in some social events that were held during the fieldwork, for example, weddings, religious occasions, local government events and tree planting programs. I stayed at a village head's house who was not just a local community leader but also a farmer and CFUG member. My interaction with the host family members was also quite informative. I established the trust and rapport necessary with the participants by sharing information about my research. In addition, during visits to households, I could gain an understanding of their housing and living conditions through participant observation. The conditions of their community forests and management institutions were then also observed by this method.

Furthermore, I had opportunities to observe the meeting process of the CFUGs to take minutes of matters discussed in the meetings and to see participants' level of interest in CF as well as hear the voices of non-CFUGs in terms of their perceptions on CF. To sum up, participant observation helped me to understand lived experiences of rural communities which often go unnoticed in short interviews and focus group discussions.

3.2.4 Secondary documents

Although interviews and focus group discussions were the primary methods of data collection, I also collected secondary data by reviewing literature, past research and national statistics to understand the wider context in which the CF program has emerged in the study sites, and demographic factors of rural communities. Documents on the CF program and academic, policy and legal literature regarding social, economic, environmental and political issues in the study area, and in Myanmar more broadly, were analysed in detail.

Reviewing documents is used to clarify or substantiate participants' statements, and to provide thick description of the case (Esterberg, 2002; Merriam, 2002). Documents are also used as a source of new data that go beyond field research to get national level statistics, historical developments, policies and laws. I accessed official documents deriving from the Forest Department to fill out the bigger picture in terms of social and environmental trends, project trajectories, policies and laws regarding forestry and CF. I also accessed official documents, in printed form and on the internet, from sources such as FAO, World Bank, Overseas Development Institute, and the Centre for People and Forests (RECOFTC).

Wolff and Pant (1999) explain that unpublished documents, such as office records, reports, and statistics compiled or gathered by others prior to a study are also important and relevant secondary data. The official records of CFUGs, such as Management Plans, CFUGs' Constitutions and minutes of meetings, and District and Township Forest Departments' office records for CFUG formation were also a source of data for this study. While collecting secondary information during the fieldwork, I visited the offices of government and some non-government organisations, such as the Ecosystem Conservation and Community Development Initiative (ECCDI), Forest Resource Environment Development and Conservation Association (FREDA), Advancing Life and Regenerating Motherland (ALARM), Land Core Group and RECOFTC-Myanmar to obtain documents as sources of data relating to CF activities and information relating to development and livelihoods activities in the research sites. Such information was very important for me in conducting case studies of my research.

3.3 Data analysis and interpretation

Data analysis was conducted using MS Excel 2016 and a computer software package for qualitative analysis called NVivo. To organise and analyse the percentage of rural households in different wealth groups and land holding sizes of rural households, I used MS Excel 2016. For comparison purposes, I estimated the ratio of rural households in wealth categories and identified land resources accessed by rural households and income sources to analyse livelihood activities in relation to my research questions.

I collected qualitative data through audio-taped in-depth interviews which I later transcribed, and field notes from focus group discussions and participant observation. Data were then coded for different themes in relation to my research questions and I organised the data broadly into four categories: livelihood strategies, benefits of CF, perceptions of rural people on CF and perceptions on community forest condition and management regime. I used NVivo for this purpose.

3.4 Positionality of the researcher

The social position of the researcher plays a crucial part in the process and it is also an important distinction between quantitative and qualitative research. The primary instrument for data collection and data analysis in case study research is the researcher himself/herself. As an actor within the research process, it is imperative for researchers to consider their own views, biases, and limitations – throughout data collection, data

analysis, interpretation, and the reporting phases of the process. Merriam (1998) states that qualitative research assumes that the researcher's biases and values impact the outcome of any study. Researchers should neutralise or bracket their biases, though others disagree (see Burawoy, 1998), by stating them explicitly to the fullest extent possible to enable any audience of qualitative research to evaluate the validity of conclusions extrapolated from data (Altheide and Johnson, 1994). For this study, in the interest of full disclosure and guarding against unintentional or unethical influences on my interpretation of how I collected and reviewed village-level data, the following discussion outlines my personal experiences germane to this study.

I have spent more than fifteen years working in the Ministry of Natural Resources and Environmental Conservation, including eight years as an assistant manager at the training and research section under the Myanma Timber Enterprise and seven years as an assistant lecturer at the University of Forestry, both of which have shaped different informants' responses to me. From this position, I was able to gain easy access to government offices and employees, that other researchers may not be able to access. However, the villagers were sometimes suspicious due to my position with government and some villagers were at times reluctant to speak to me. Understanding this challenge, I emphasised my student status (i.e. as an ANU researcher) rather than my affiliation as a government employee, so that the villagers understood my position in the research process.

3.5 Research limitations

Some limitations of the study are identified in this section. Since the study was in three localities in Myanmar, it is important to note that results can be context-specific. Although the study was conducted in three study sites, the study focused on only one township in each site due to time constraints. Therefore, the results here may be less applicable in other locations.

The major limitation was that there is a lack of baseline data to understand the extent of change, specifically relating to the livelihood patterns of local people and the condition of community forests. Further, an additional limitation to the study proved to be the process of data collection. Since data obtained during the interviews were largely dependent on interviewees and what they were willing to share, the nature of their information was limited to their own perspectives and lived experiences. Generally, the villagers were reluctant to be interviewed by strangers from other places, which could have impacted on the quality of the data. In my case, however, the participants appeared

comfortable to answer my questions and gave their opinions on CF, improving the credibility of my data. In addition, this study's triangulation of data helped to support the accuracy of the themes mined out of the interview transcripts, and helped to verify results.

Chapter 4 Community Forestry and rural livelihoods interactions in the Dry Zone

In this case study, I focus on key themes in relation to the nexus between livelihoods and Community Forestry (CF). The study shows how CF is interacting with the livelihoods of households who are members of Community Forest User Groups (CFUGs) and those who are not. The location is the rural Dry Zone, which is densely populated and also represents one of Myanmar's critical forest ecosystems.

The case study findings are presented in three sections. The first section provides relevant background on the Dry Zone and the emergence of CF in this region and, more specifically, in the study villages. The second section describes the effects of CF on livelihoods of CFUG members, and livelihood strategies of villagers in the study area. The third section presents the results on household perceptions about how CF impacts them. The final section provides a summary and conclusion of the case study.

4.1 Background

4.1.1 The Dry Zone and Community Forestry in the Dry Zone

The Dry Zone is located in central Myanmar, about 500 km north from the old capital Yangon. It includes the southern part of Sagaing Region, the western and middle part of Mandalay Region and most parts of Magway Region (Department of Geography, 1990). The Dry Zone covers about 8.2 million hectares (ha) which is equivalent to 12 per cent of the total national territory (Forest Department, 2016), and the population of the Dry Zone accounts for about 19 per cent of the total national population (Department of Population, 2015). Population density is approximately 1.7 times the national average and thus, the Zone is characterised as more densely populated and more rural compared to the national average (ibid).

The Dry Zone has merely 700–1,000 mm of annual precipitation, since the south-west monsoon blown in from the Bay of Bengal is intercepted by the Rakhine mountain range that runs nearly north to south at the western border of the country. Rainfall is concentrated in a few months in the rainy season, with wide annual deviation and erratic duration. This meteorological character frequently brings about erratic droughts with associated crop failure, and intense showers during the mid-rainy season also result in floods in the watershed of the Ayeyarwady River. Such climatic conditions make the

environment unfavourable for agricultural production, which is a major means of livelihood, as compared to other parts of the country (JICA, 2010).

In the Dry Zone, various livelihood activities including agriculture, livestock and small-scale industries are employed by smallholder farmers singly or in combination. The Dry Zone represents a key agricultural production area of Myanmar, but is also a significant livestock producing area where draught cattle, sheep, goats and fowls are reared. Since agricultural productivity as a major means of livelihood is unstable in the Dry Zone with scarce and unreliable rainfall, local people need to rear livestock, which can quickly be monetised as urgent needs arise. Small-scale industries such as weaving, spinning, dying, carpentry, masonry, stoneware, lacquer ware and jaggery (palm sugar) production are run in almost all villages in the Dry Zone. These small-sized cottage industries provide cash-earning means for small farmers and also landless villagers in rural areas of the Dry Zone (JICA, 2010).

While Dry Zone farmers seek to diversify production systems to retain livelihood resilience, there is a chronic instability in agricultural production owing to erratic rainfall, whereas supplementary incomes from livestock and cottage industries are still under-developed. These factors have made people's lives unstable, and the Dry Zone is characterised by high levels of rural vulnerability (JICA, 2010).

Besides agriculture and livestock, rural communities in the Dry Zone are dependent on forest products such as fuelwood, fodder, bush meats and building materials for their basic needs. Villagers use fuelwood for cooking, using traditional stoves with low energy efficiency. As demand for fuelwood increases with population growth, forest resources have experienced significant deterioration in the Dry Zone. Forests in the Dry Zone have also declined due to agricultural expansion, overcutting for commercial timber, and for infrastructural and agribusiness development (Tint et al., 2014). The harsh and drought-prone environment of the Dry Zone makes for slow natural forest regeneration. Forest resources are very limited in the Dry Zone and dry forest occupies only 10 per cent of the total forest area of Myanmar (Forest Department, 2016; see Chapter 2 for definition of forest).

Having recognised the necessity to promote forest conservation and greening in the Dry Zone, in 1994 the government of Myanmar launched the "Nine District Greening

Project"[2] to tackle fuelwood shortages, restore forest cover and prevent soil erosion (Ministry of Forestry, 2005). This resulted in the re-afforestation of some 210,000 ha in the three years from 1994 (JICA, 2013). The project was implemented by the Forest Department (FD) under the Ministry of Forestry and was extended to cover an additional four districts[3] from 1995 to 1998. In 1997 the project was expanded again, through the Dry Zone Greening Department (DZGD) under the Ministry of Forestry, to an additional three Regions, 13 districts and 57 townships and covering 8.7 million ha of dry land forests (DZGD, 2013). The constitution of DZGD was amended in 2000–2001. According to the new amendment the working area of DZGD includes three Regions, 12 districts and 54 townships (excluding Gangaw District), covering 8.2 million ha of dry land forests (ibid). The majority of the DZGD's activities are implemented through local people's participation and CF (Tint et al., 2011). However, due to the severe natural environment and other limitations, the DZGD also affiliates with international organisations to carry out its re-greening program in the Dry Zone. There has not been any assessment of the longer-term outcomes of this program nor any research publications on the program.

Regarding CF implementation in the Dry Zone, the Japanese International Cooperation Agency (JICA) in cooperation with the FD carried out a three-year project named "Community Forestry Training and Extension" (COMFORT) in the Dry Zone in August 2003. The COMFORT project aimed to raise the knowledge and skills of FD and DZGD staff for promoting participatory forest management in Myanmar. Related to the COMFORT project, the JICA also carried out the "Project for the Afforestation in the Dry Zone"[4] in cooperation with the DZGD in the Myay Thin Twin Protected Public Forest in Nyaung U Township, Mandalay Region from 2003–04 to 2008–09 (JICA, 2013). The outcomes of this project were assessed by JICA in 2013 and the project's effectiveness and impact were evaluated to be high. However, the biggest lesson learned from this experience was that the government of Myanmar did not maintain accurate land registration and started the project without checking it well (JICA, 2013). This is an issue which impacted CF implementation with respect to land use rights, which will be discussed below.

[2] The project covered forty-two townships in the nine districts in the dry zone. The nine districts are Meikhtilar, Myingyan, Yamethin, Sagaing, Monywa, Pokakku, Magway, Minbu and Thayet.
[3] Two districts, Shwebo and Nyaung U, in Mandalay Region in 1995–96 and two districts, Kyauk Se and Gangaw, in Mandalay and Magway Region in 1998–99.
[4] The project, with five phases, is to promote greening in the dry zone through afforestation of multipurpose forest.

In this case study, a village-level study was carried out in Nyaung U Township (Figure 4-1), which was targeted for the CF program under the afforestation project by JICA and DZGD. In order to gather enough information on livelihoods and CF, two villages were compared, namely, Myay Thin Twin, where CF had been implemented under the afforestation project, and Ywar Thar Aye, which had not experienced CF. Although both villages are adjacent to the Myay Thin Twin Protected Public Forest, only one (Myay Thin Twin) was actively targeted for the CF program by the project. This difference in participation arose because of the two villages' different positions in relation to the main sealed road; JICA chose Myay Thin Twin because of easier road access. Though Myay Thin Twin village is not on a sealed road, it is about 5.6 km away from the sealed Nyaung U – Kyaukpadaung Road. Formerly, there was a cart road to Myay Thin Twin village from the sealed road. That was renovated under the JICA afforestation project in 2003, at the beginning of the project period (JICA, 2013). The study village that was not included as a CF participant, Ywar Thar Aye village, is located 6.4 km away from Myay Thin Twin village and 12 km away from the main sealed road. Though the village has no community forest, the villagers have access to open-access natural forests around the village, plus the village forest and individually owned customary forest lands (see details in section 4.1.3).

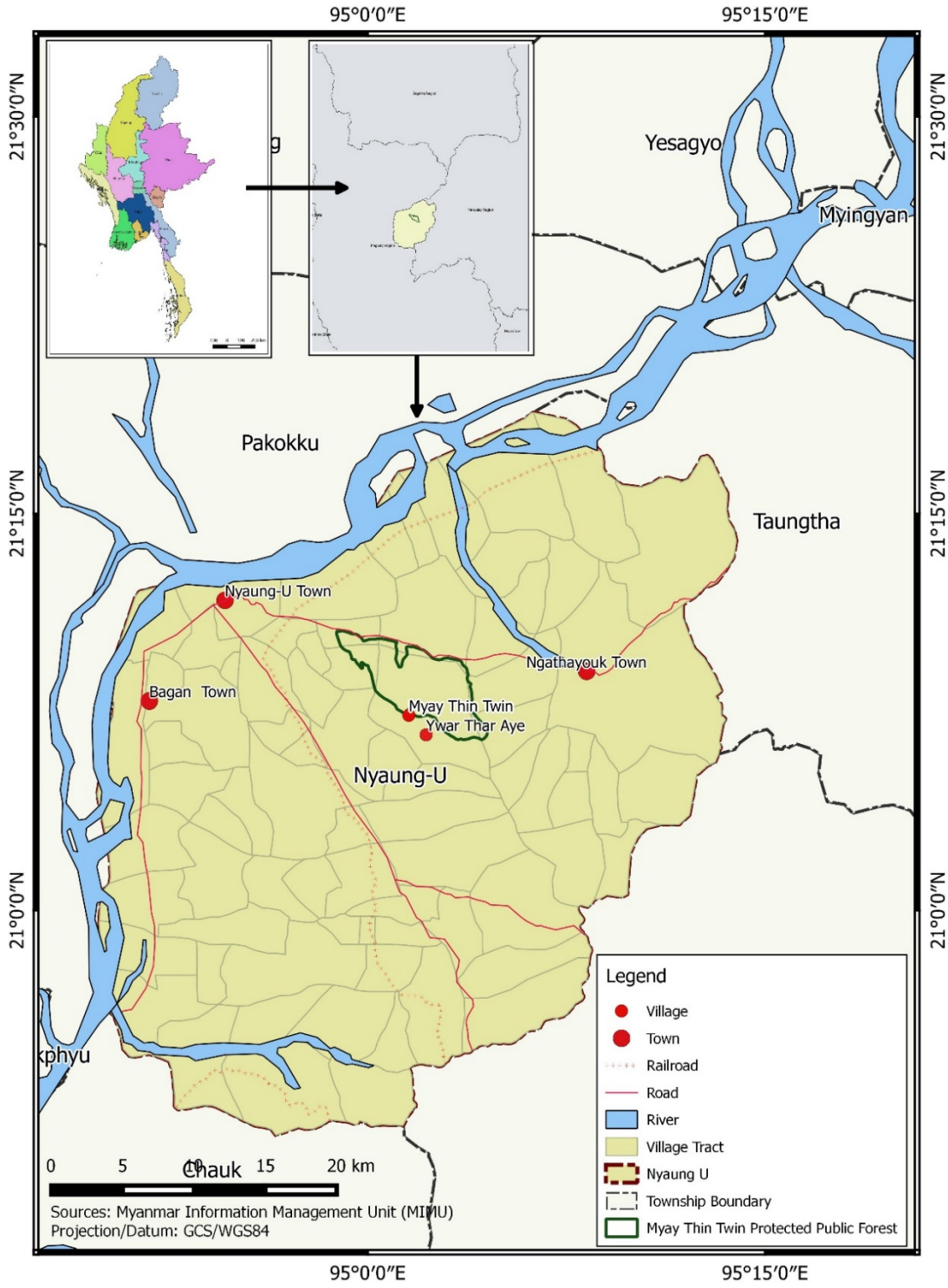

Figure 4-1: Map of Nyaung U Township showing the location of Myay Thin Twin and Ywar Thar Aye villages

The total number of households in the CF village was 167 and that of the non-CF village was 80. In order to get a better understanding of main livelihoods and forestry-related livelihoods of villagers and their perceptions regarding how CF impacts them, 35 sample households from the CF village and 16 sample households from the non-CF village (51

households altogether) were randomly selected from within the different wealth categories for household-level interviews, which were carried out during my fieldwork in June and July 2014. Approximately 40 per cent of all households in each of three wealth categories were randomly chosen for eliciting the reasons for escape and descent.

Table 4-1 shows that the numbers of poor, medium and better-off households were relatively equal in the CF village, but that medium and poor households were more prevalent in the non-CF village. The livelihood data were interpreted to assess households' socio-economic position within the community, their livelihood strategy and natural resource use.

Table 4-1: Key characteristics of the study villages

Characteristics of villages	**Myay Thin Twin (CF village)**	**Ywar Thar Aye (Non-CF village)**
No. of total households	167	80
No. of sample households	35	16
Population	852	457
Male	402	224
Female	450	233
Wealth group	Poor (34%) Medium (34%) Better-off (31%)	Poor (38%) Medium (50%) Better-off (13%)

Source: Field survey (2014)

4.1.2 Myay Thin Twin Village (CF village)

Myay Thin Twin village is about 11 km away from Nyaung U town (see Figure 4-1). The village is characterised as a farming community since the majority of the villagers are employed in agriculture and livestock.In this case study, a total of 35 households were interviewed in Myay Thin Twin village, of which the respondents in 24 households were males (69%) and 11 were females (31%). Male-headed households constitute the majority of the sample population (86 per cent of households), while the rest are female-headed. In Myay Thin Twin village, the household size has been found to vary from a minimum of two members to a maximum of eleven members. The average household size of the village is 6.3, which is larger than the regional and national average (4.4 people) (DOP, 2015). The average age of all household members is 37 years old and the average age of the household head is 61 in the village. The working age residents of the village (aged 15-64) constitute 72 per cent of the population.

The basic infrastructure of Myay Thin Twin village is of a slightly higher quality than the regional average. Most houses in the village are permanent houses with zinc sheet roofs whereas the poor tend to live in non-permanent houses constituted of thatched roofs and bamboo walls (i.e. huts). All residents are ethnic Burmese and Buddhists. For education, the village has a secondary school. But, it has no doctors or clinics and the villagers travel to Taung Zin village and Nyaung U town to access clinic and hospital care. Having close access to markets in Nyaung U, and the road improvement for the implementation of the JICA afforestation project, would suggest greater opportunity for selling agricultural crops. Regarding water resources, the villagers use piped water from Ayeyarwady River for drinking and tube wells for domestic use. There is also a village pond which is used for domestic use and some households harvest rain-water in their houses in the rainy season. Though there is no public electricity in the village, the villagers mostly use community generators for sources of lighting. The main fuel source used by the villagers for cooking is firewood, and villagers are still reliant on forests for most of their energy requirements.Myay Thin Twin village is adjacent to the Myay Thin Twin Protected Public Forest (PPF). Myay Thin Twin PPF was constituted by the FD on 8 March 2006, covering about 1,800 ha of dry land forests. It is the Permanent Forest Estate under Forest Law 1992 and administered by the Ministry of Natural Resources and Environmental Conservation. In the past, Myay Thin Twin PPF was rich in flora and fauna, and springs had even been found in some areas of the forest. Natural dry forest was thriving with a variety of species such as Than (*Terminalia oliveri*), Dahat (*Tectona hamiltoniana*), Ingyin (*Pentacme siamensis*), Sha (*Acacia catechu*), Tanaung (*Acacia leucophloea*), Tama (*Azadirachta indica*), Magyi (*Tamarindus indica*), Zi (*Ziziphus mauritiana*), Ziphyu (*Phyllanthus maderaspatensis*), Nibase (*Morinda tinctoria*) and Khaung-gale (*Rhus paniculata*). Wild animals such as barking deer, deer, fox, wildcat, rabbits and birds were also found in that forest area.

Over time, increased population with a higher demand for basic needs, felling of trees for various human needs (see below), high consumption of fuelwood for cooking and palm sugar production and the expansion of agricultural land drastically degraded the forest status and hence, resulted in dry open forest, thorn forest and bush forest conditions. Myay Thin Twin villagers maintain legal access to Myay Thin Twin PPF for their subsistence needs in terms of collecting fuelwood, fodder, wild food and medicinal plants. Particularly, the landless poor in the village are highly dependent on the forest for their food, sources of fuel and small income generation. Some villagers even dug tree roots as

their last remaining resource for fuelwood for household use and palm sugar production. Having limited options for commercial investment means that villagers depend on subsistence access to natural resources. This high pressure on forest areas around the village has accelerated not only deforestation but also soil erosion (JICA, 2013). Forests here have been declining and natural regeneration has been slow in the dry conditions.

With the aim of restoring the degraded forest landscape to improve agricultural land, water resources and various kinds of forest products for local use, since 1994 the Ministry of Forestry has been implementing the establishment of plantations including village fuelwood plantations in the Myay Thin Twin Protected Public Forest. It has also attempted to conserve the remnant natural forests together with the villagers, local authorities and forest staff. Although the personnel of the FD and Dry Zone Greening Department (DZGD) had good knowledge of forestry practices, they lacked knowledge on how to implement participatory approaches to forest management, which the JICA project attempted to address. On the other hand, it was technically difficult to expand afforestation in the Dry Zone due to the environmental and climatic constraints. The species planted in the afforestation project were local dry species such as acacias and exotics such as eucalypts. In 2001, the government of Myanmar requested that the government of Japan assist with an afforestation project using a participatory approach in the Myay Thin Twin Protected Public Forest in the Nyaung U Township, that could be used as a model for the broader expansion of afforestation in the Dry Zone (JICA, 2013).

In line with prevailing forest tenure arrangements in Myanmar, the afforestation project at Myay Thin Twin Protected Public Forest formalised local people's use rights, including access and withdrawal rights to forest resources, and to participate in decision-making about management of the forest area under the CF program. The FD indicated that the community forest had a total area of 15 ha in 2003. The villagers and staff from FD and DZGD selected 7.5 ha of marginal lands for establishment of a community forest plantation at the first phase of the project, and 7.5 ha at the second phase of the project. The purposes of establishing the Myay Thin Twin community forest were to facilitate local access to fuelwood and fodder, and access to poles and posts for agricultural tools and house construction; to improve the socio-economic status of the villagers by collecting non-timber forest resources such as plums[5]; and to restore the natural

[5] The farming community in the dry zone used to grow plum trees (*Ziziphus mauritiana*), known locally as Zi, on the boundaries of their farm land. The income generated by selling the plums supplemented household incomes.

environment. The FD and DZGD provided seedlings of Zi (*Zizyphus mauritiana*), Sha (*Acacia catechu*) and Tama (*Azadirachta indica*) to the villagers and tree planting was relatively easy for them. In addition, the project provided technical assistance to the villagers such as advice on frequency of watering, the size of planting holes, and installation and maintenance of fences to keep out animals (JICA, 2013).

According to interview respondents, the FD organised the formation of the CFUG at the village level. The FD offered payment for the villagers' labour in establishing the community forest plantation. All households in the village were members of the CFUG, and thus every household had the opportunity to participate in the establishment of the plantation and to use the resulting forest areas, with villagers receiving payment for their labour. In line with the Community Forestry Instructions (CFI) in 1995, a Management Committee (MC) was formed by consensus of the members of the users' group. The committee consisted of a chair, a secretary, a treasurer and two members. These arrangements are the same as with other CFUGs across the country. CFUG then developed a Management Plan (see Appendix 1) for newly planted forests with the assistance of DZGD and JICA experts and the plan was supposed to guide villagers' use of their community forest. After confirmation of the Management Plan, the FD issued the legal Community Forest Certificate for Myay Thin Twin village in 2004.

A governmental official at Nyaung U Township FD (June 2014) stated that Myay Thin Twin villagers had received a 30-year official lease over the forest land from the FD under the CFI. The staff from DZGD and the Japanese experts selected the type of species to plant in the presence of, but without the input of, the village head and the villagers at the beginning of the project. The villagers commented on the species selection that it was conducted without the concept of villagers' participation and initiative (household interviews, Myay Thin Twin village, June 2014). To achieve the purposes of establishing a community forest plantation, local species such as Zi (*Ziziphus mauritiana*), Sha (*Acacia catechu*) and Tama (*Azadirachta indica*) were planted on the degraded lands. The FD later transferred the community forest plantation to the CFUG to use and manage it themselves. The CF program did not involve the relinquishment of any household land claims. Therefore, the CFUG is the holder of this right, rather than individual households, and CF activities are carried out as village-wide activities (interviews with government official and village head, Nyaung U Township FD and Myay Thin Twin village, June 2014).

4.1.3 Ywar Thar Aye Village (non-CF village)

Ywar Thar Aye village is also in the Dry Zone and is situated 18 km away from Nyaung U town. Unlike the Myay Thin Twin village, the number of households and population in the village is lower than neighbouring villages (see Table 4-1). Most villagers are engaged in agriculture and non-farm enterprises, such as petty trading and small home businesses. In Ywar Thar Aye village, a total of 16 households were interviewed, of which respondents from 4 households were males (25%) and 12 were female (75%). The reason why female respondents were higher than male respondents was that most of the males worked in the field and some migrated to other place for income generation during the interview period. According to village records, however, the village has a relatively high proportion of male-headed households (94%) which is similar to Myay Thin Twin village. The average number of people per household in Ywar Thar Aye varies from a minimum of two to a maximum of seven. The average household size of the village is 4, which is lower than that of Myay Thin Twin and regional and national average. The average age of all household members is 36 which is more or less similar to Myay Thin Twin and the average age of the household head is 51 which is younger than in Myay Thin Twin. Similar to Myay Thin Twin, the working age (15-64) population of the village is 72 per cent.

The basic infrastructure such as school facilities and transportation of Ywar Thar Aye village is of a poorer quality than that of Myay Thin Twin village. Similar to Myay Thin Twin, all residents are ethnic Burmese and Buddhists. Unlike in Myay Thin Twin, Ywar Thar Aye has a relatively poorly resourced primary school. There are no doctors or clinics providing healthcare in the village. Only the ex-mid-wife, who lives in the village, supports villagers with minor health problems. The village has no market but there are a few retail shops which are run by households of medium wealth. The transportation system is limited and the villagers can only access the main sealed road (approximately 12 km away from the village) by animal drawn carts or motorbikes.

Regarding water resources, the village has a village pond for domestic use, including safe drinking water. The village had a tube well that was constructed during the JICA assisted “Rural water supply technology in the central Dry Zone” project in 2003, but it is out of order now. The villagers harvest rain-water in their houses by collection tanks in the rainy season but they face water shortfalls for about three months during summer, though there are no health vulnerabilities that result from this. As the available water in the village

pond is not sufficient for villagers, they collect and pay for the piped water from the neighbouring village, named “Zee-O”, in the dry season. Thus, the villagers spend much more time collecting water as compared to the villagers in Myay Thin Twin village. There is no public electricity in the village and they use a community-owned diesel generator for a source of light. The main energy source for cooking is fuelwood.Focus Group Discussion (FGD) and household interviews indicated that the villagers in Ywar Thar Aye village are heavily dependent upon forest products for the provision of fuelwood, small timber, fodder, farm implements and medicinal plants. During the agricultural off-season, the villagers collect forest products such as fuelwood and fodder that can be sold for cash income. Poor community members especially rely on the natural forest resources to meet their daily needs. Forest degradation has occurred in the region due to the overexploitation of timber and non-timber forest products from the natural forests.

As forests play a crucial role in livelihoods in Ywar Thar Aye, villagers had a traditionally managed forest (also known as “village forest” or *ywar paing taw* in Burmese), covering about 8 ha, in the Myay Thin Twin PPF. All the villagers managed their village forest as a common property resource. However, over time this village forest has reverted to an open-access regime, meaning people from other villages also access the forest area, with associated overuse (focus group discussion, Ywar Thar Aye village, July 2014). In response, the FD has been involved in this village since 1994, through its Nine District Greening Project, to tackle the shortage of fuelwood and restore forest cover. Subsequently, the FD and villagers carried out an afforestation program, which transformed the area into a “village supply fuelwood plantation” (called *kyay ywar thone htin site khin* in Burmese) as a part of the government’s greening project (village head, Ywar Thar Aye village, July 2014). The species planted in the program are local species such as acacias. However, villagers continued to call the fuelwood plantation their “village forest” (the FD called it a “village supply fuelwood plantation”). This village forest is different to community forest as Ywar Thar Aye villagers had no formal certificate of such forest. Since the CF program was not initiated at that time, Ywar Thar Aye villagers had no official lease for their village forest. They could only use the trees planted in the village forest and no one was responsible for managing and protecting it. This is why respondents mentioned that they had a desire to have a community forest or to transform their “village forest” into a community forest if the opportunity arose (focus group discussion, Ywar Thar Aye village, July 2014).

Household interviews in this village identified a low level of knowledge about the government's CF program. About 30 per cent of villagers who held customary forest land claims expressed concerns that if they participated in the CF program, they might lose access to their forest lands or have to share them with other villagers (household interviews, Ywar Thar Aye village, July 2014). The situation was not helped by the fact that FD staff could not clearly explain the CF program to all residents in the area, lacking knowledge about this program and the underlying legislation (CFI) (Government official interview, Nyaung U Township FD, July 2014). The FD staff could not organise the villagers to develop a community forest or to accept that the CFI would transfer legal authority for use and management rights to the villagers. Because of these factors, Ywar Thar Aye village had not yet formalised their community forest.

4.2 Effects of Community Forestry on livelihoods of CFUG members and livelihood strategies in study villages

4.2.1 Situation of land holding in study villages

Land has been a critical component of livelihoods in the study villages. In both study villages, land holding in respondent households is categorised according to their land use type as agricultural land and forest land. Respondents in both villages said that all farmers have legal land title to agricultural land. The survey findings showed that all sample households in Myay Thin Twin village had agricultural lands whereas only 88 per cent of sample households in Ywar Thar Aye village had agricultural lands. The average size of agricultural land held by each household in Myay Thin Twin village is about 6 ha whereas that held by households in Ywar Thar Aye village is about 3 ha. These figures suggest that land possessed by households shapes livelihood improvement because Myay Thin Twin villagers can produce more food on their land than Ywar Thar Aye villagers.

In terms of forest land, every household in Myay Thin Twin village has access to the community forest land because all households are members of the CFUG (Village head, Myay Thin Twin village, June 2014). In contrast, respondents in Ywar Thar Aye village reported that they had a village forest (as described earlier) and some villagers additionally had their customary forest land, also known as "*phoe-phwar-paing-taw*" in

Burmese (household interviews, Ywar Thar Aye village, July 2014). The difference lies in formal versus informal access to forest land between the two study villages.[6]

Although Myay Thin Twin village has a community forest, respondents said that there are some villagers who still use the natural forest (i.e. Myay Thin Twin PPF, see Figure 4-1) for fuelwood because over the past 10 years their community forest plantation has not grown well. Respondents explained that their community forest had just started providing a small amount of fuelwood, fodder and some NTFPs, which are not enough to support villagers' needs, and timber had not been harvested yet (see section 4.3.1). This implies that their community forest contributes a relatively small amount of forest products to the CFUG members, while non-CF forests still maintained an important role in villagers' basic needs.

Forest land tenure affects the use of forest land resources. The ideal situation is one where the forest land is legally owned and managed by the community participating in the program, or one where land tenure is very secure. During FGD, Myay Thin Twin CFUG members were concerned that the land tenure of their community forest is not fully secured and the government could confiscate their community forest land at any time. In this respect, the government official at the DZGD head office indicated during the interview that,

> CF authorization until now is just land use right certificate for certain period issued by FD and reinforced by CFI. It is not 100 per cent secure legal status apparently and something like a sort of land management scheme inside the state forest land. In most cases of land conflicts between CF and other more needed or more priority or highly authorised land uses, CF is always in loser side. (Government official interview; DZGD head office, Patheingyi, Mandalay Region; June 2014)

Nevertheless, Myay Thin Twin CFUG members reported that they did not want to lose the opportunity to manage their community forest and, they desired to establish a new community forest near their village as their existing one was relatively small in size.

Residents in Ywar Thar Aye, who do not have a community forest, rely on village forest land and customary forest land for their daily basic needs. As described in section 4.1.3, Ywar Thar Aye has about 8 ha of village forest, which is traditionally managed by the villagers as an informal commons. During interviews, the respondents said that the

[6] In my field data in 2014, the sample households in Myay Thin Twin village do not have any customary forest land. Their village forest mentioned by the respondents is not recognised by the Forest Department and thus, I did not count it in my field memo.

landless poor and medium group who did not have customary forest land relied on the village forest to supplement their livelihoods.

During my fieldwork, I found that some residents in the village had customary forest land that provided fuelwood and some non-timber forest products (NTFPs) for their household needs (focus group discussion, Ywar Thar Aye village, July 2014). Survey data showed that the size of the customary forest land they possessed varied from 1.2 ha to 6 ha. Such customary forest lands are not legally recognised by the government but the villagers recognised them. Moreover, these household-based land use rights were not legally recognised in the land tenure system of Myanmar before the enactment of the National Land Use Policy in 2016 (see Chapter 2). In this context, some particular households, who own larger areas of customary forest land, are not willing to initiate the CF program. They are reluctant to lose their customary forest land if the CF program were to develop in their village. For example, a male respondent, aged 55, expressed his concern that:

> If I engage with the CF program, I am afraid that I might lose my customary forest land. I can extract fuelwood and some NTFPs from my own forest at any time. That's why I don't want to engage with CF program if it will happen in the future. But, if I won't lose my own forest, I will consider to engage with CF. (household interview, Ywar Thar Aye village, July 2014)

However, some poor and medium households were willing to develop CF because they would like to access land use rights with a CF certificate. Since their village forest had no legal land title, they were very keen to manage the forest land with legal forest land tenure rights from the FD. With respect to the CF certificate, the Deputy Director General at FD head office stated that land tenure arrangements in the CF program were secured with limited period use rights, such as 30 year leases. During his interview, he explained:

> having CF certificate means local communities have legal rights to establish community forest and they will have legal protection. If they have CF certificate, even the government development project will need to seek agreement with CFUGs before any implementation is initiated on their CF lands. (Government official interview; FD head office, Nay Pyi Taw; December 2015)

However, the tenure security provided by CF certificates is weak as the government retains ultimate ownership of all lands according to the constitution of Myanmar (2008). Therefore, the government official at the DZGD head office pointed out this challenge (see above).

Overall, different forest access arrangements were found between two study villages. Although agricultural holdings were different in the two villages (higher in the CF village

than non-CF village), an interesting difference was also found in relation to customary forest access. In particular, where villagers had access to customary lands (*phoe-phwar-paing-taw*), they appeared less interested in engaging in CF, particularly given the challenges in securing CF tenure in the event of competing development activities. Also, CFUG members continued to use natural forests even after CF had been established.

4.2.2 Agricultural intensification or extensification as livelihood strategy

In this case study, the livelihood strategies pursued by households included the broad categories presented by Scoones (1998), namely agricultural intensification or extensification, diversification, and migration. Assessment of livelihood strategies discussed below was based on data collected during household interviews, participant observations and key informant interviews. In both villages, all households in each wealth category depended on a combination of livelihood strategies to generate the means of household survival. Households also shifted their livelihood strategies depending on assets available to them or shocks and stresses that the households experienced during any given period of time.

Participant observation and household interviews indicated that the dominant livelihood strategies pursued by households in the study villages were agricultural intensification or extensification and migration. At least two strategies among three strategies listed above were frequently pursued in combination by individuals and households in both villages. Household interviews revealed that poor households had difficulty in purchasing fertilisers or machinery for agricultural intensification. Mostly, medium and better-off households expanded production from their unit of land through the use of fertilisers and pesticides. Furthermore, only better-off and medium households could buy farm land from others to enlarge their agricultural holdings. Therefore, agricultural intensification and migration are the dominant livelihood strategies for the majority of households except the poor.

In terms of agricultural intensification, attention is directed towards institutions that facilitate technical change in agriculture (Ellis, 2000, p. 41). The role of agricultural extension assistance is still very limited in both surveyed villages. Respondents in both villages reported that they had received assistance from the government and Non-Government Organisations (NGOs) such as UNDP in terms of agricultural education and small loans (i.e. microfinance) in order to intensify their farm lands or to rear livestock or other small businesses. However, due to microfinance supportive policies, small loans

did not noticeably contribute to improving their agriculture and livestock. Some respondents reported that they had to buy food with these loans instead of using them for agriculture. The key policy issue is that agricultural intensification is not typically carried out unless the institutions and organisations provide financial and technical assistance to farming communities. Although microfinance supported by the state is limited, villagers pursue agricultural intensification as a livelihood option.

In the Dry Zone, farmers can grow paddy, oil-crops such as groundnut, sesame, sunflower, varieties of pulses and beans, onions and industrial crops such as jute, sugarcane and cotton. But not all farmers can grow all these crops; it depends on the location and size of their farmland. As the Dry Zone is characterised by large crop diversity, various cropping systems such as mixed cropping, double cropping (two paddy crops per year) or even triple cropping (three paddy crops per year) within the perimeter of irrigation facility are observed in the Dry Zone. Respondents mentioned that these intensive modes of production, enabled through the use of fertilisers with shorter growing periods and varied cultivation practices where groundnut is mainly cultivated and 2-3 crops by mixed cropping (e.g. ground/sesame with mung bean). The vast majority of the farming households were growing two or more different types of crops. The major cash crops grown are groundnut, sesame, mung bean and pigeon pea for income, consumption or both. Some households grow maize for animal fodder. In both villages, farmers usually grow two to three crops by mixed cropping, e.g. groundnut/sesame with pigeon pea. The respondents expressed during interviews that they had intensified their cropping in order to increase acreage under crops without expanding farmland area. Household interviews reported that the farming community experienced a sesame crop failure due to minimal rainfall in 2013. Therefore, they had to purchase their sesame cooking oil from the market and they had less money to purchase other food items, which negatively affected overall food security. In this sense, respondents in both villages said that households pursued migration as a coping strategy for their livelihoods when they experienced a crop failure.

4.2.3 Livelihood activities and income sources

In this section I summarise the livelihoods of respondent households, based on the results of sample interviews in the study villages. My household interview data reveals that the primary livelihood activity in the study villages was agriculture, followed by livestock, non-farm employment, wage labour and non-farm enterprises. In this case study, the "non-farm employment" category refers to non-agricultural livelihood activity and

includes salaried employment in the government or private sector, remittances from permanent or seasonal labour in other parts of the country, and pension payments to retirees. “Non-farm enterprise” means non-agricultural related livelihood activities such as petty trading (e.g. grocery shops) or a small home business such as grinding oil from groundnuts. A few households in Ywar Thar Aye village earn income from an “other” category that includes sporadic activities such as selling snacks in the village.

Table 4-2 shows the types of income sources of the CF village Myay Thin Twin, and the non-CF village Ywar Thar Aye. Based on household interviews, most households in both study villages relied strongly on agriculture and livestock while only a few reported non-farm employment, wage labouring and non-farm enterprise. Wage labouring, which includes farm and non-farm labour, was observed in both study villages. The findings show the predominance of agriculture in local livelihoods; villagers have a low level of reliance on forest resources including community forests. No households reported an income from non-timber forest products.

Table 4-2: Types of income sources (per cent)

Livelihood Strategy	**Myay Thin Twin (n=35)**		**Ywar Thar Aye (n=16)**	
	No. of HHs	**%**	**No. of HHs**	**%**
Agriculture	35	100	14	88
Livestock	33	94	11	69
Non-farm employment	15	43	5	31
Wage labour	5	14	5	31
Non-farm enterprise	2	6	5	31
Other income	0	0	4	25

Source: Field survey (2014)

In both villages, respondent households follow similar livelihood patterns. Respondents reported that the villagers engaged in more than one livelihood activity to make ends meet. Almost all households depend on two or more income sources for their livelihoods. Interview data revealed that income from forestry did not play an important role in either village. Even in the CF village of Myay Thin Twin, households do not earn income from their community forest, but do collect fodder for their livestock and fuelwood for cooking.

4.2.4 Household annual income and expenditures[7]

In relation to income sources, interview data show that there are significant differences among incomes from agriculture, non-farm employment and livestock in the three wealth strata of Myay Thin Twin (CF village) (Figure 4-2). Average annual income per household from agriculture and livestock were found to be higher in the better-off and medium groups while the poor group generated higher average annual income per household from non-farm employment. This is because the better-off and medium households have more livelihood assets such as agricultural land and cattle. As they possess a larger amount of agricultural land resources than the poor group, they receive more annual income than the poor. Traditionally, cattle are prerequisite for tillage and transport in the study area. However, even for these groups, agricultural productivity as a major means of livelihood is unstable in the Dry Zone due to scarce and unreliable rainfall. During such periods, those with domestic animals can turn these assets into cash whenever the need arises. As poor households have a very limited area of agricultural land, they are highly dependent on income from non-farm employment. A few members of poor households permanently or temporarily worked as labourers for government or the private sector in nearby Nyaung U and cities such as Yangon and Nay Pyi Taw.

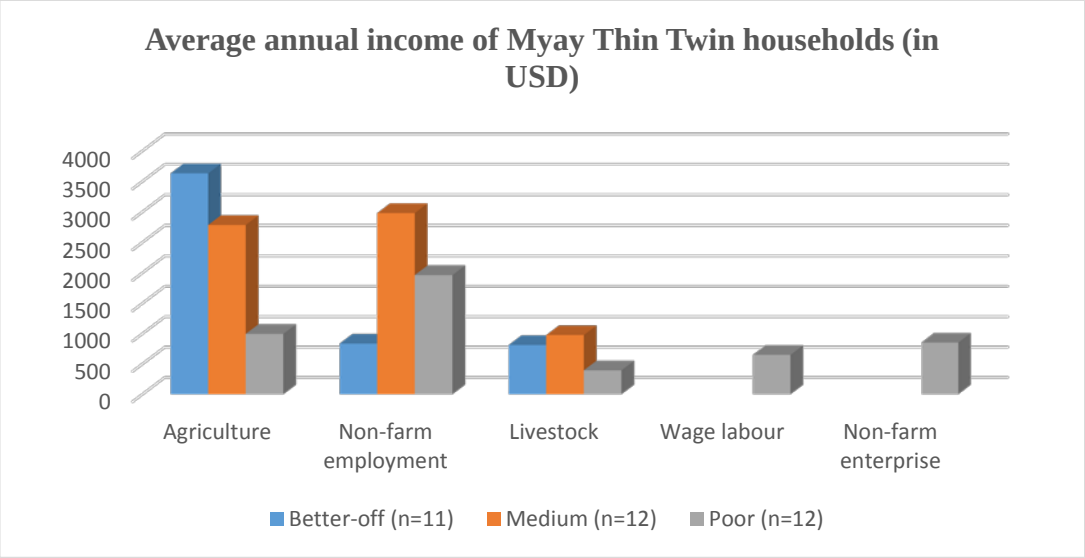

Figure 4-2: Average annual income of households in Myay Thin Twin (CF village)

Source: Field survey (2014)

[7] In this thesis, income is defined as cash revenue, while expenditures include expenses related to production or business expenses as well as expenses for consumption of goods and services. Accordingly, where one exceeds the other, this represents an imbalance between total income and total expenditure. This needs to be interpreted in light of the possibility that respondents may have reported lower incomes and higher expenditures in household surveys.

Note: The currency exchange rate at time of the survey in 2014 was 984 MMK ~ 1 USD (http://data.worldbank.org/indicator/PA.NUS.FCRF?end=2015&locations=MM&start=2012)

Based on household interviews, the data revealed that poor households have less income than medium and better-off households in CFUG. Table 4-3 shows average incomes for the three groups.

Table 4-3: Average annual income by wealth groups of CFUG members

Wealth groups	**Average income (USD/HH/year)**
Poor (n=12)	2,128
Medium (n=12)	4,850
Better-off (n=11)	3,934

Source: Field survey (2014)

Similarly, the household interviews in the non-CF village of Ywar Thar Aye indicated that the average annual income for each wealth stratum varies based on the different sources of income. Figure 4-3 shows that average annual income per household from agriculture and non-farm enterprises were found to be higher in the better-off and medium groups while the poor group gets more average annual income per household from wage labour. The main income for the better-off group is from non-farm enterprises rather than agriculture because they can invest in their own business by trading agricultural-related products instead of farming. It was also found that the medium households rely more on income from non-farm employment than agriculture. This is because members of medium households often receive a regular salary by working as staff in the government or private sector, and a few household members have even moved to Malaysia to work as unskilled labour. The major income for the poor group is from wage labour as they have less livelihood assets to depend on for their living. In the future, this might be a central feature of agrarian change in their livelihood patterns.

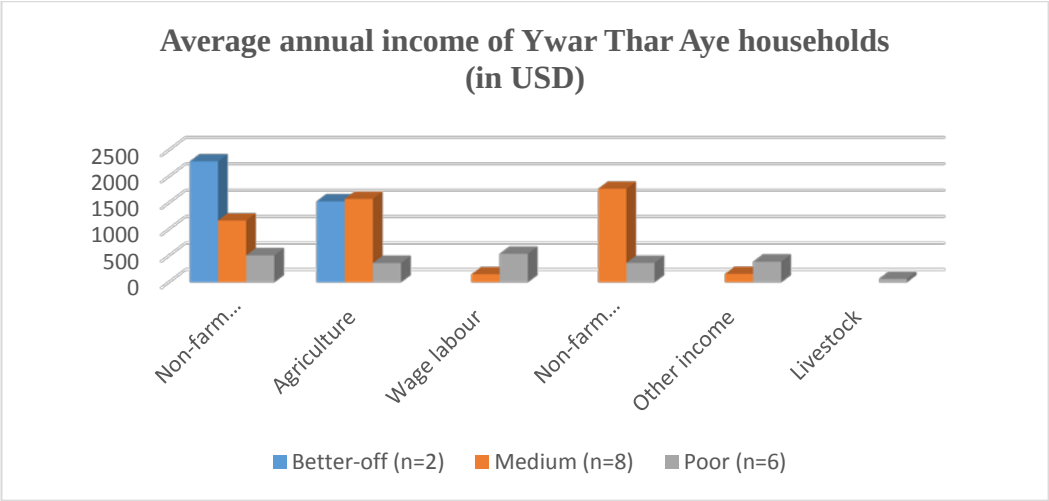

Figure 4-3: Average annual income of households in Ywar Thar Aye (non-CF village)

Source: Field survey (2014)

Based on household interviews, the data revealed that better-off households have higher income than medium and poor households in non-CFUG. Table 4-4 shows average incomes for the three groups.

Table 4-4: Average annual income by wealth groups of non-CFUG members

Wealth groups	**Average income (USD/HH/year)**
Poor (n=6)	1,008
Medium (n=8)	2,196
Better-off (n=2)	3,815

Source: Field survey (2014)

According to the respondents in both the CF village and the non-CF village, the most common areas where households spent their income were: food, investment in agriculture, education, health care, transportation and donations. These expenditures are common amongst all wealth groups of households in both study villages. Increased income through the sale of crops as a result of agriculture has an effect on households' spending. For example, more income can be allocated to purchasing food and education fees for their children instead of investing in agriculture. Furthermore, when capital from elsewhere is available it allows households to repair their houses. Only a few households spend money for agricultural investment. Findings showed that villagers did not have sufficient food to last at least one calendar year, despite working in agriculture, and thus employment outside agriculture was increasingly favoured in the villages, particularly in the non-CF village. Specifically, Myay Thin Twin CF could not provide sufficient food, or any income or employment, to villagers.

Overall, households all follow similar livelihood patterns. Both villages had diverse incomes, but mostly concentrated in agriculture and non-farm livelihoods, while poorer (landless) households relied more on selling their labour on-farm or off-farm, and out-migration.

4.2.5 Migration

In the Dry Zone, labour migration is a common livelihood strategy that households follow in combination with agricultural intensification. Migration is also the essential livelihood strategy pursued by family members in many households in the research villages. Due to the inability to practise agricultural extensification and the very limited diversification available to villagers, most household members are required to migrate to other towns or cities or even to other countries such as Thailand and Malaysia to find a job, either seasonally or permanently.

In Myay Thin Twin (CF village), interviewed respondents said villagers mostly marry other people within the village and, hence, there was strong communal feeling there to some extent and collective action was fully developed. Respondents said that their village has existed since it was one of the nineteen major villages of the Pre-Bagan Dynasty (AD 846–1297) and most households have been living in the village from generation to generation, but this is changing now as new generations marry people from outside the village. Due to the low agricultural profitability and scarcity of job opportunities in the village, many household members in all wealth groups had migrated to work as casual or permanent labour in nearby towns or cities within the previous decade (household interviews, Myay Thin Twin village, June 2014). The findings confirm that rural households have become increasingly involved in non-farm employment, including migration, and remittances from these migrants help with household finances (see Figure 4-2).

Discussion with CF villagers and household interviews indicated that younger household members would go to Nyaung U town (11 km from the village) during the summer period for casual labour in hotels, restaurants or small-scale industries. In the early monsoon season[8], they would return to the village and take up farming activities again. Household members from better-off families worked in private enterprise or the public sector. A few household members moved abroad temporarily. Previously, migration of women was

[8] The monsoon season starts at the end of May/beginning of June and goes through to early October in Myanmar.

common due to job opportunities in cities such as Yangon, Mandalay and Taungyi. However, in this day and age, men also migrate to search for jobs not only within Myanmar but outside the country. Such labour migration has occurred in all wealth categories of Myay Thin Twin village. Seen in this light, villagers, mainly youth, are looking for alternative futures or livelihood options.

Similar to Myay Thin Twin, interviewed households reported that Ywar Thar Aye village and its residents felt a certain cohesion as almost all villagers were born in the village. However, some household members in the village were out-migrants to urban areas or abroad, often temporarily. Their migration pattern is quite similar to that of Myay Thin Twin village. Respondents reported that households in Ywar Thar Aye had more difficulty in transportation due to the lack of good road access to their village. The former had good transportation due to the road improvement of the JICA afforestation project and this assisted households to get more access to towns or cities to find work. Findings from this case study show that infrastructure developed under the CF program, ironically, helps people to migrate more easily out of villages.

Overall, migration of youth, both males and females, in each wealth category in both villages is common. While precise data on migration numbers were not systematically collected, household interviews revealed that some are permanent migrants but some migrate on a non-permanent basis, mostly for between six and twelve months. Most migrants stay within Myanmar; some work in Nyaung U, Yangon, Mandalay and Nay Pyi Taw, some work in other places within Myanmar and a few migrate outside Myanmar, mainly to Malaysia and Thailand. Respondents in both villages confirmed that the proportion of labour migrants in medium and poor households had slightly increased compared to 2013. This was supported by the fact that medium and poor households were more affected by drought in 2013 and pursued labour migration as a coping strategy more often than better-off households.

4.3 Household perceptions of Community Forestry

4.3.1 Perceptions of the benefits or risks of Community Forestry

The benefits or risks of CF in this section only refer to Myay Thin Twin village as Ywar Thar Aye did not have a community forest. During household interviews, respondents were asked a series of questions in order to understand how they thought CF provided benefits to and impacts on their households and community. A common consensus from

the interviews was that CF was contributing direct and indirect benefits for households as well as for the village community.

According to the focus group discussion, all villagers considered that a large benefit during the implementation of the CF program was the opportunity for employment. As the villagers were hired for plantation activities, they earned income for their labour contributions. As all households in the village were community forest user group (CFUG) members, every household at all wealth categories participated in every stage of plantation activities and earned income for their daily efforts. In fact, the CF program in Myay Thin Twin contributed not only technical assistance in tree planting but labour wages for site preparation such as staking, digging and soil filling activities, planting activities and maintenance activities. Respondents reported that all CFUG members received a basic piece rate (per unit price) for these kinds of activities during the establishment of the community forest. Due to the lack of close record keeping, information on working days and price per piece by the time of implementing the plantation activities was sketchy and inadequate for analysis. However, the price for tree planting labour paid by the FD was higher than the wage rate on local farms, and hence, poorer and medium households actively participated in the CF program. The better-off households also participated in the CF program due to their own interests, even though the income from this source was not as important for their living. As such, household wealth did not significantly influence households' participation in the community forest activities to gain the benefit of employment and income opportunities. This implies that there was no elite capture in relation to work opportunities within the community.

As a direct benefit gained from the community forest, respondents reported that their community forest contributed four major types of forest products to their livelihoods. These were fuelwood, fodder, timber for agricultural tools, and NTFPs. CFUG members said timber, except fuelwood, had not been harvested from the community forest as yet since their community forest plantation was still only 10 years old and tree growth in the Dry Zone is relatively slow. Household interviews revealed that villagers in Myay Thin Twin cooked their food on traditional stoves, for which fuelwood was the only means for cooking. On average, one household needed 8.5 cartloads[9] of fuelwood per year (i.e. about 11 m^3 per year). According to the respondents, the villagers collected fuelwood from different sources such as farm land, natural forests and the community forest.

[9] A cartload of fuelwood = 0.84 m^3 Hoppus (Solid) or 1.07 m^3 True (Solid) or 1.274 m^3 (Stacked), Forest Department, 1993.

However, villagers never collected fuelwood from their home compound because they wanted to conserve the trees to get shade during the summer period.

Surveyed villagers in Myay Thin Twin reported that trees planted on farm boundaries were the source of fuelwood for better-off and medium groups in the village. As those wealth categories had a certain area of farm lands, they grew shady trees such as acacia, tamarind and plum trees on their farm boundaries. They pruned the trees in summer time and cut large volumes of branches for fuelwood. If they needed more, they collected fuelwood from the state-owned natural forest near their village. In the case of the poor group, which has a very limited area of farm land, they can grow only very few trees within the farm boundaries in order to collect fuelwood. Therefore, some households that have less or no farm land depend more on their community forest for fuelwood and fodder than the better-off and medium households. Although there are government plantations near Myay Thin Twin village, villagers could not collect fuelwood from such government plantations since the plantations are strictly protected for greening and soil and water conservation of the area by FD and DZGD. Therefore, villagers collect fuelwood from their community forest; this is the safest source of fuelwood collection for them because it is legally owned by the villagers. The community forest was under communal ownership and fuelwood could be exploited in accordance with the prescription of the CF management plan.

In Myay Thin Twin village, all CFUG members have equal right to extract products from the community forest after its transfer to the village. All members are able to collect fuelwood, fodder and NTFPs from the community forest in line with the rules of the CFUG committee. With respect to production and distribution of fuelwood, respondents said that they were provided with advice and/or techniques by FD and DZGD staff in order to avoid overexploitation of fuelwood and to avoid inequity in benefit sharing among members. All CFUG members were given the same amount of fuelwood. However, the pattern of distribution of forest products changed between the first and second rounds of forest product distribution. In this regard, the village head explained:

> fuelwood extracted from the community forest were distributed two times to the members with the assistance of forest staff. In the first time, we distributed fuelwood all CFUG members equally. In the second time, we sold the fuelwood with the agreement of all members and saved as a village fund. (Village head, Myay Thin Twin village, June 2014)

The village head added that they had guests such as government officials, NGOs/INGOs staff, researchers and project staff who stayed occasionally in their village for various purposes. Thus, they had to keep extra blankets, mosquito nets, and some other things such as special meals and other food for the guests and the village fund were used for these expenses. The village fund was kept by the secretary of the CFUG management committee. Usually, the amount of fuelwood extracted from the community forest was small and not enough to distribute to each household because the size of the community forest (i.e. 15 ha) was relatively small compared to the number of households in Myay Thin Twin village (i.e. 167 households). On the other hand, the community forest belonged to all households of the village and, thus, CFUG members usually sold fuelwood and spent money for common village purposes such as school building repair, road repair or other social reasons. Furthermore, money from the sale of fuelwood from the CF is now used as a slush fund for the village leaders to pay for expenses related to visits from government officials.

Of interest from the focus group discussion and interviews was that demand for fuelwood has decreased in Myay Thin Twin village alongside an increase in the use of crop residues, improved cooking stoves, and a decrease in numbers of sugar palm farmers mainly due to the recent market slump in palm sugar. Villagers use crop residues and improved cooking stoves as a source of fuel for cooking in their daily lives. This leads to decreased demand for fuelwood. Another important background factor regarding fuelwood is the recent change in economic activities in the region. Respondents said that some sugar palm farmers had ceased palm sugar production although it had been a major cottage industry and an important income source. They explained that palm sugar production needed about five times more fuelwood than household use as it had to be cooked for a long time. They also revealed that the number of sugar palm farmers had dropped to about half that of ten years ago mainly due to the recent market slump. Hence, decreased palm sugar production, which was historically important in this village, has significantly decreased fuelwood demand in the village.

Interview respondents indicated that CFUG members cut dry grasses and collected tree leaves for fodder. Sources of fodder used by the better-off and medium groups were crop residues such as maize stalk, bean stalk and ripe sugar fruits. For the poor group, however, trees and grasses in the community forest were sources of fodder. During the summer period, all villagers practised open grazing and the natural forest and the community forest were major sources of grazing area for their cattle because they did not have the

resources to acquire other kinds of feed. The leaves of trees and shrubs and grasses are cheapest and the majority of cattle rely on these among the various sources of feed. As the community forest was open to all CFUG members for grazing purposes after five years of CF establishment, respondents said the grazing area was increasing and grazing had become easier than before.

Respondents during interviews also reported that their community forest had started providing a source of materials to make agricultural tools for CFUG members. Traditionally, villagers practised tillage operation in farming and cultivated crops after the first rain in the rainy season. They prepared their farm lands using cattle and used the local-made plough and harrow for cultivation activities. Villagers used branches of trees from the community forest to make the handles for agricultural tools.

Respondents also stated that CFUG members could collect some non-timber forest products (NTFPs) from the community forest for food. Most respondents thought that the number of small animals such as rabbits, wildcats and squirrel and birds had increased after the establishment of the community forest. All members can catch small animals but most members are not interested in hunting animals due to religious reasons. Some members in each wealth group collect mushrooms and vegetables in the community forest but only a few members, particularly in the poor group, catch wild birds, lizards, rabbits and squirrels. This is because it is very expensive to buy meat from the market for poor families and these bush meats are an important protein source for them. Vegetables and mushrooms can be collected in the monsoon season, and wild animals can be hunted at all times. The management committee had no exact rules for bush meat collection but prohibited the use of fire for hunting wild animals. Most of the collectors consumed the products by themselves, and they could not sell those products to others as the quantity of products obtained from the community forest was very low. Therefore, they could not derive cash income derived from the sale of NTFPs.

In fact, 15 ha of community forest was not enough to meet the fuelwood, small timber and NTFPs needs of the Myay Thin Twin village of about 167 households. The main reason for the JICA project establishing a small community forest at Myay Thin Thin village was to let the villagers understand by themselves that it was possible to re-green an area of almost bare land in the Dry Zone if the people were really dedicated, hardworking and had enough inputs, and they understood the Dry Zone plantation process and wise management of forest plantation by themselves (Government official interview,

Nyaung U Township FD, June 2014). In this way, the project hoped to get their active and wilful participation in the long-term maintenance and wise use of rehabilitated areas (about 1,500 ha) inside Myay Thin Twin Protected Public Forest. In this regard, only one respondent mentioned that although the villagers had a willingness to establish a new CF near their village, they were not able to do it alone without initial assistance from outsiders such as FD staff or donor agencies.

Regarding other co-benefits of the CF program on the rural community, the most common response to community benefits was road improvement. In Myay Thin Twin village, road improvement, including an increase in width, was conducted during the JICA afforestation project. Before the CF program was initiated in the village, road access to the village was very poor and frequently closed, particularly in the rainy season, due to soil erosion. Therefore, road improvement was conducted before the community forest was established in order for it to be available for local transportation to the main sealed road. At the time of the research, the road allowed residents much easier travel among villages and to Nyaung U, a nearby major town, and the road was still maintained by local residents. One of the respondents said about the co-benefit of road improvement,

> this road improvement has created business opportunities for our villagers and has activated the economic exchanges in the region. (household interview, Myay Thin Twin village, 2014)

CFUG members in Myay Thin Twin village also gained the benefit of the CF program to the community in terms of a water supply facility (the deep tube well, elevated water tank and diesel engine house). They reported that the facility was installed for reforestation during the project and was handed over to the village; it was still operated and maintained by the villagers even after the completion of the project. It was used when water shortages became serious in a dry season, especially. However, the water fee (approximately MMK 9,000 per month) was a little higher than the actual cost to cover maintenance and operation costs. The water supply equipment was not used much in other seasons. The repairing and building of schools in the village was also a common community benefit mentioned by respondents during the focus group discussion. In the case of all benefits responses, household wealth did not significantly influence benefit responses.

Many households felt that CF did not result in any negative impacts on their households and communities. However, one of the respondents stated that,

> the most frequent concern among villagers is that family members will be working outside the home due to road improvement which would create a greater opportunity for livelihood diversification and, therefore, the household members will not be available to perform current household activities and to engage in farming. (household interview, Myay Thin Twin village, June 2014)

The respondents added that opportunities to hire farm labourers at low wages have decreased. One of them explained,

> although no significant negative impacts are pointed out… after implementing the CF program, our farming community encounters the difficulty to hire farm labourers because many youths in the village go to work in the cities and nearby towns and they send back money to their families. Thus, we could not get the young labourer easily as before. Besides, the labour wages became increased due to the decreasing number of farm labourers in the village. (focus group discussion, Myay Thin Twin village, June 2014)

Such background is one of the negative impacts many respondents raised during interviews and focus group discussion. By and large, respondents agreed that the benefits from the CF program were greater than the negative impacts and that no risk had emerged from the program. It is noteworthy that the road building associated with the project has increased ease of mobility to find work outside the village. Besides, the water supply equipment installed for the project is useful when water shortage becomes serious in a dry season.

4.3.2 Perceptions of villagers on Community Forestry

To answer one of my research questions concerning why Myay Thin Twin villagers engage in CF, I explore the perceptions of villagers during household interviews and focus group discussion. Surveyed households in Myay Thin Twin village were asked how they became aware of, and why they engaged in, the CF program. All respondents answered that DZGD and JICA field staff explained the program and its concept to them. The staff had played a key role in the process of formation of the CFUG at the village level. All villagers understood easily and they initiated a user group with the help of DZGD staff in conjunction with JICA. Respondents also said that all households in the village had a willingness to participate in the community forest plantation establishment according to their different aspirations. For instance, some members needed the fuelwood, fodder and NTFPs for their subsistence livelihood. Some wanted to use poles, posts and timber for building their houses. Among them, some households participated in the program because they wanted to prevent their farms from flooding and soil erosion. Some expected that trees would create a rainy effect and regulate weather favourable for crop

cultivation. As such, all households in Myay Thin Twin village engaged with the CF program by forming a highly inclusive CFUG with equitable practices.

In turn, Ywar Thar Aye villagers were also asked whether they were aware of the CF program and how they perceived the program, whether they desired to engage with it or not. Based on data from household interviews and focus group discussion, 75 per cent of the households conveyed a strong willingness to participate in planting trees near their village through the CF program in the future. However, 19 per cent were not willing and 6 per cent were not certain. In particular, most poor households and some medium households wanted to implement a CF program but some medium wealth and better-off households were not willing to participate in a CF program as some of them had their own customary forest land where they could use the forest products at any time. Some had no extra people to be involved in the CF program. Some were concerned that their customary forest land would be confiscated by the government if the program was initiated. A man, 55 years old, articulated his issue in the following manner,

> I don't want to participate in CF because all household members in my family are busy with our daily routines for living. And I don't want to lose my customary forest land because of CF. I am afraid that the Forest Department will confiscate my forest land and make it community forest land. (household interview, Ywar Thar Aye village, July 2014)

As mentioned earlier, this lack of interest in CF was because Ywar Thar Aye already had their village forest as a common property resource. However, respondents said that their village forest often became open access because of the informal commons management that led to a "tragedy of the commons". Therefore, a more common perspective from the interviews was that the remnant village forest should be conserved before it had entirely gone and villagers preferred to transform their village forest into community forest if the opportunity arose. In contrast with the view expressed by the informant above, the majority of the villagers, especially poor households, were interested in the CF approach because they saw benefits in transforming the village forest into a community forest with formal land tenure rights.

In terms of community forest condition, CFUG members in Myay Thin Twin village were asked how they perceived the current situation of their community forest. All respondents thought that the trees planted in the community forest had been thriving well and the remaining trees had been growing remarkably fast. However, due to field observation, the community forest of Myay Thin Twin village had shown poor performance in terms

of survival rate[10] and growth of planted trees. Therefore, the community forest has not begun timber harvesting to get building materials so far. The interviewed households perceived that they still required technical and financial support in order to improve the growth performance of their community forest.

In terms of sustainability of the community forest management system, Myay Thin Twin CFUG members were asked during focus group discussion and household interviews how they conserve and manage their community forest. Respondents answered that their community forest has been controlled and managed well in recent years. This is in part because one of the villagers was hired as a forest guard to protect the community forest. Especially in the dry season, a village resident was employed as a contract worker to prevent forest fires. The funds for the employment of a forest guard to patrol and prevent forest fires were provided by FD in the research village. However, the FD stopped paying for the forest guard in 2013 since it was apparent that the planted trees had been growing well and the CF had been maintained in a good condition without large forest fires. Furthermore, the FD lacked funds to employ a village resident.

Because of this, no villagers took the responsibility to protect their community forest. CFUG members are occupied with agricultural work and other livelihood activities, and they cannot afford to hire a forest guard on their own. With respect to long-term management of the community forest, therefore, the most common response from villagers was that all CFUG members were responsible to conserve and manage their community forest as a principle, but the community needed FD staff to guard/patrol their community forest in order to avoid outsiders cutting trees for fuelwood.

In fact, CFUG members in Myay Thin Twin village were concerned about how to protect and manage common property resources because conflicts occurred due to illegal cutting. Although the risk of intra-community conflicts was minimised due to equal benefit sharing among CFUG members, they did encounter conflicts with neighbouring villagers who cut trees in their community forest. As described above, constrained by having no time to control and protect their forest, villagers needed regular visits by FD staff to manage their forest.

In Ywar Thar Aye village, informants stated that they thought the CF program would create positive impacts to improve their livelihoods. In this sense, villagers, apart from

[10] The survival rate of community forest of Myay Thin Twin village was 54 per cent at its age of 7 years (Tint et al., 2011).

some households which have customary forests, expressed their desire to develop CF or to transform their existing village forests into community forests with secure land and forest tenure rights. At the time of the research, FD staff said that such claims by Ywar Thar Aye villagers would justify the implementation of a CF program by the FD in the near future (Government official interview, Nyaung U Township FD, July 2014).

4.4 Summary and Conclusion

This case study examined the interactions of the CF program with rural livelihoods, taking into account different livelihood activities, access to land resources and benefits of the community forest. Here, I summarise the main findings that address the key questions of my research.

Insights from my analyses in this case study suggest that access to land resources, either agricultural land or forest land, has been an important means of improving local livelihoods. As we saw, almost all villagers in the CF village of Myay Thin Twin had their own agricultural land for cultivating crops to improve their livelihoods. Similarly, most villagers in the non-CF village of Ywar Thar Aye mainly rely on agriculture for their livelihoods. This case study confirms that agricultural land contributes to livelihoods of rural households, both CFUG members and non-CFUG members, going beyond food production and economic benefits. Similarly, access to community forest land has been an important means of livelihoods of villagers. However, as we saw, forest products from the community forest were a tiny proportion for CFUG members till now. Based on the findings presented in this case study, I argue that access to land resources remains critical for villagers, providing means to improve their livelihoods. Nevertheless, access to land resources for farming and forest products alone will not provide a sufficient condition for improving livelihoods as livelihoods diversify.

This case study reveals that young people are no longer interested in accessing forest land and they prefer out-migrating. As we saw in this case, out-migration of youth has created labour shortages and inflated wages in farming. The findings indicate that agrarian livelihoods alone have not improved local livelihoods, and non-agricultural activities, including migration and non-farm enterprises, are necessarily pursued by villagers. Migration also generates favourable conditions for enhancing local livelihoods.

Regarding the outcomes of the CF program, this case study found that insecurity of land tenure for the communities in Myay Thin Twin village existed due to the weak basis of

CFI. But, Ywar Thar Aye villagers were interested in adopting the CF program as they perceived that CF grants official leases for land tenure of at least 30 years. As seen in this case study, some CFUG members in Myay Thin Twin village received benefits in terms of forest products from their community forest, while some households did not care about the community forest as they had other sources of forest products. Nevertheless, all households enjoyed other indirect benefits such as road improvement and water supply equipment in the village. Although there were no inter-community conflicts, due to equal benefit sharing, CFUG members required technical and financial assistance from the FD to enable them to manage their community forest sustainably and to avoid conflicts with neighbouring villages over illegal cutting.

I conclude that the interaction of CF with rural livelihoods in this case study depended upon patterns of resource use within villages, wealth categories and households. For those depending on forests for various subsistence uses, CF has made a difference, while for households whose livelihoods are diversifying away from agriculture, it has been less significant. This case study confirms the role of CF for people's livelihoods and the importance of common pool resource management for restoring degraded forestlands through plantation.

Chapter 5 Community Forestry and rural livelihoods interactions in the Ayeyarwady Delta

In this case study chapter, I examine the impact of Community Forestry (CF) on the livelihoods of connected villagers in the Delta Zone. The research was designed to compare livelihood strategies between two groups, community forest user group (CFUG) and non-community forest user group (non-CFUG) members in two villages in the Ayeyarwady Delta. During the early stages of the fieldwork, both groups were selected within one village, though this was later modified to two villages due to the sample size within the CF village being too small (see Chapter 3). Within Myanmar, CF for mangrove forest restoration and management was mainly introduced in the Ayeyarwady Delta. Mangroves represent critical forest ecosystems in Myanmar, providing goods such as forest products and environmental services such as storm protection, but the forests are threatened by fuelwood harvesting, agricultural land expansion and aquaculture. The findings and discussion of this case study show that the outcome of CF in the research sites has created improved livelihood conditions for CFUG members, but also created a process of enclosure, restricting the village poor (represented within non-CFUG members) from accessing the community forest. In this chapter, I explain the reasons why local people engaged in CF as a livelihood strategy and why some people could not engage in it.

This chapter presents the results of the Delta zone case. The first section includes background information on the Ayeyarwady Delta zone and the emergence of CF in the Ayeyarwady Delta and in the study villages. The second section describes the livelihood activities of villagers in the study area, and impacts of CF on livelihoods of CFUG members. Towards the end, this chapter presents results on household perceptions regarding the benefits of CF and how they manage their CF. The final section provides a summary and conclusion of the Delta case. I discuss the main arguments regarding how CF impacts livelihoods of CFUG members as compared to non-CFUG members in the Delta zone.

5.1 Background

5.1.1 The Ayeyarwady Delta and Community Forestry in the Delta

Mangroves in the Ayeyarwady Delta are now recognised as one of the most threatened ecosystems in Myanmar. The major cause of rapid decline and deterioration of mangrove

forests has been identified as agricultural expansion, which is in line with government policies to promote self-sufficiency in food production (Fujita and Okamoto, 2006). As the Delta is heavily populated and a centre of agricultural processing and production (Than, 2001; Xiao et al., 2006), it is responsible for approximately 35 per cent of the country's rice production (FAO, 2013). Another major factor is over-extraction of fuelwood and a boom in the charcoal industry in the 1970s, when there was high urban demand for cheap cooking fuel. Charcoal making has been illegal since 1993 (FAO, 2003) but it still continues in the region. Furthermore, mangroves are increasingly being converted for industrial shrimp farming, mainly oriented for export, as well as commercial fishing ponds and salt farms (Tint, 2008). In 1990, the State Peace and Development Council (SPDC) proceeded to declare Myanmar "open to free enterprise". Therefore, the development of fish and prawn industrial farms has been gaining momentum in Myanmar since 1998 and has rapidly spread along the coastal zone (WRM, 2002).

As human interventions have increased over recent decades, it has led to forest degradation and deforestation. Mangroves occupied about 253,000 ha in the Ayeyarwady Delta in 1924, but by 2001 this area had reduced to about 111,000 ha – a loss of about 56 per cent over 77 years. Major drivers for the clearance of natural mangrove forests have been the conversion of land to agriculture and shrimp ponds, and the intensification of charcoal production. This is often a livelihood of last resort for the landless poor but most citizens depend on biomass fuels as there is no effective alternative fuel supply (Tint et al., 2014). The loss of mangrove forests was compounded by Cyclone Nargis in 2008. It destroyed extensive areas of mangroves, and in its aftermath desperately poor people were obliged to cut more fuelwood than before to sell in order to survive. The consequence has been that around 80 per cent of the remaining mangrove forests in the Ayeyarwady Delta were lost, and the total area of mangroves in the Ayeyarwady Delta had fallen to just about 24,000 ha by 2010 (ibid). As a result, mangrove forest deforestation is recognised as a critical environmental issue (Phyu, 2012).

Due to the fact that environmental deterioration and natural disasters are threatening lives and livelihoods of local communities in the Ayeyarwady Delta, restoration of mangrove forests is a high priority for the Government of Myanmar, and international organisations, INGOs and NGOs duly reflect this concern. The Forest Department (FD) started mangrove plantations in 1981, and has established over 405 ha of mangrove plantations in the Delta zone annually since then. However, there is no proper record or any data on

the quality of regeneration of mangrove plantations. Over this period, UNDP, FAO, JICA, and other INGOs' projects provided the necessary assistance for conservation of mangrove forests in Myanmar (MSN, 2006). Additionally, Forest Resource Environment Development and Conservation Association (FREDA), a local NGO focusing on forest/mangrove and environment conservation, has been implementing the "Mangrove Reforestation Project" in the Ayeyarwady Delta since 1999 in collaboration with Action for Mangrove Reforestation (ACTMANG) of Japan.

The FD has also affiliated with the Japan International Cooperation Agency (JICA) to implement integrated mangrove rehabilitation projects for rural communities in the Delta zone. From 2002 to 2005, JICA and FD implemented "The Study on Integrated Mangrove Management through Community Participation in the Ayeyarwady Delta" in five reserved forests in Laputta and Bogalay Townships in the Ayeyarwady Delta. The objectives of the study were to formulate the integrated mangrove management plan (IMMP) for rehabilitation and sustainable use of mangrove resources by rural communities, to implement the pilot project, to enhance capacity building of stakeholders and to transfer the relevant technology to Myanmar counterpart personnel through training. JICA submitted its Final Report on this study to the government of Myanmar. Their report presented an IMMP, with the overall goal of establishing coexistence of vivid mangrove vegetation and people's lives in the study area through the rehabilitation of degraded mangroves and livelihood improvement of the local people by various CF activities under the authorisation of the CFI.

With the objective of managing mangrove forests sustainably and helping reduce poverty, the technical cooperation project titled "The Integrated Mangrove Rehabilitation and Management Project through Community Participation in the Ayeyarwady Delta in the Union of Myanmar" was one of the projects with which JICA supported FD in the implementation of community development and mangrove forest management within the Ayeyarwady Delta from 2007 to 2013. In addition, JICA implemented a five-year "Mangrove Rehabilitation Plan for Enhancement of Disaster Prevention in the Ayeyarwady Delta" project in Kadonkani Reserved Forest, Bogalay Township, Phyapon District, Ayeyarwady Region from 2013 to 2017. The objective of this five-year project was to establish a disaster prevention structure in the cyclone-affected area. To achieve this objective, the project focused on activities such as establishment of about 1,154 ha of mangrove plantation, cyclone shelter construction and provision of vehicles and boats. All these projects were intended to regenerate mangrove forests and to do so in ways that

would provide sustainable income opportunities for a large number of poor in the Delta region. As mangrove is one of the critical forest ecosystems in Myanmar, projects such as these offer conservation and rehabilitation of mangroves through social forestry programs such as CF.

As a consequence of the degradation of mangrove forests and land use changes over time in the Ayeyarwady Delta, rural communities that depend on fishing and aquaculture for their livelihoods also realised that the reduction of fish catch and the loss of biological benefits would consequently affect their livelihoods (FD and JICA, 2005). Moreover, environmental deterioration and natural disasters threatened the lives and livelihoods of local people, and local communities in the Ayewarwady Delta are aware of the role and importance of the existence of mangrove forests and want to regrow mangroves. Rural communities realised that the places they encroached in the mangroves to grow rice decreased productivity after some decades and agriculture became economically unviable. They, therefore, started to make contacts with the FD to establish community forests in those areas (Tint, 2008). The very first community forest in the Ayeyarwady Delta was established in Byan Gyi Kon village in Laputta Township. The leader of Byan Gyi Kon village joined FD to form a CFUG immediately after hearing about the Community Forestry Instructions (CFI) on the radio news in 1995. It became one of the oldest community forests in Myanmar (Tint et al., 2011). To date, a total area of community forests covering over 3,800 ha comprising about 2,000 ha of plantations and over 1,800 ha of natural forests under conservation has been established in the Ayeyarwady Region (FD, 2014).

5.1.2 Emergence of Community Forestry in the study area

Since the issuance of CFI in 1995, more attention has been given to integrated mangrove management and reforestation through a CF scheme that has aimed to improve rural livelihoods and ecosystem services in the Ayeyarwady Delta. In this context, one of the leading local NGOs working for forest conservation and environmental and rural development, Forest Resources Environment and Development Association (FREDA), started a five-year “Mangrove Reforestation Project” phase-by-phase in the Southern Pyindaye Reserved Forest in 1999 with aid from ACTMANG of Japan. The aim of the project was to establish mangrove plantations under the CF program according to CFI. In 2001, FREDA, in cooperation with FD, initiated CF in the study villages, War Kon and Kanyin Kon, by facilitating the villagers to establish community forests on land that the

villagers had already occupied for agriculture. Originally, these rice fields in the Reserved Forest were forested lands that were gradually encroached by the villagers. However, after six to seven years of encroachment, the average yield per acre of the encroached rice fields declined due to poor drainage and high salinisation which were not favourable for rice farming. The villagers who had already encroached and some non-encroacher households were interested in becoming involved in the CF program while those doing home gardening on "garden land" (*Uyin* in Burmese)[11] and fishing were not interested in participating in the CF program.

The reason for engaging in the CF program was that villagers wanted to secure their encroached land as CFUG members. Before the CF program was initiated in the study area, nearly all CFUG members already had a combination of degraded mangrove forest land and degraded rice fields (both were FD land) that had not been registered yet. Hence, they wanted to formally register their lands as community forests with the support of FREDA. Further, FREDA offered incentives such as rice, T-shirts, footwear and knives to CFUG members in each activity of the planting operations at the initial stage of the CF program. Therefore, villagers joined the CF program because of the potential for more secure access to land and forest resources and the incentives offered by FREDA. In this way, the original owners of the degraded rice fields became CFUG members and most of the landless households had no chance to become members. In reality, households maintain specific claims to the mangrove forests, and the community forest is split into individual plots under collective management according to these previous household claims. According to the recent instruction of the state in 2013, FD has been recognising and legalising villages having total households of 50 and above that have already settled in the Reserved Forests (RF) and Protected Public Forests (PPF) across the country. In the Ayeyarwady Delta, there were 287 villages (including my study villages) that had 50 households and over settled in the RF and PPF, and the extent of the area of land encroached for settlement, agriculture and other uses had a total of about 84,000 ha (Ayeyarwady Region FD, 2014). FD formally recognised all these villages and legalised individual household claims for land use rights.

During CF implementation, FREDA supported the CFUG members in writing the application to establish community forests and a community forest management plan, because FREDA recognised that the villagers were not able to undertake these tasks. The

[11] Garden land, *Uyin* in Burmese, means the land, which is used for growing vegetables and flowers.

FD also assisted in the formation process of community forests; however, support for CFUG members in the implementation of community forest activities was not a prioritised FD activity. The high priority duties of the Township FD office were forest law enforcement, revenue collection and the establishment of government plantations. Therefore, the main involvements of FD were introducing and explaining about CF and supporting villagers to formulate CFUG to have the community forest certificate granted. The community forest certificate permitting the community to use the land for 30 years is released by the District Forest Officer. After 30 years, the duration of land lease can be extended if the community desires to extend and the performance of CFUG satisfies the District Forest Officer. In principle, the community is authorised to manage the community forest collectively. Although community forest management should be collective as under CFI, in practice individual households operate and manage their community forest plots in the study area. FD recognised such a different management regime in this case due to the history of formation of villages in the study area, and in addition, villagers have few positive experiences of past collective activity (see also Okamoto, 2014).

5.1.3 General characteristics of study area

The study area is in Phyarpon Township, situated in the Ayeyarwady Delta zone of Myanmar (Figure 5-1). In order to ensure enough information could be obtained reflecting the interaction of CF with rural livelihoods, two adjacent villages, each with a CFUG and established community forest, were selected as study villages. The two villages, named War Kon and Kanyin Kon, also both have community forest users and non-community forest users. Both villages are situated adjacent to the Phyarpon – Ahmar road which is accessible to motor vehicles only in the dry season[12]. The villages belong to Ahmar Sub-township of Pyarpon Township and lie about 15 km from Ahmar. As the two villages are very close to each other, the socio-economic conditions of people are very similar and the means of their livelihoods are not very different. The main reason for the comparison in this chapter is to find out how livelihood outcomes differ between CFUG and non-CFUG members due to the development of CF.

As described earlier and in Chapter 3, both villages have similar social and environmental conditions, and their community forests were established in the same year with the aid of the same donor agency, JICA, and FD. In this case study chapter, therefore, I will present

[12] Dry season is from November to May in Myanmar.

the results of household information and outcomes of CF in relation to livelihoods of CFUG and non-CFUG members.

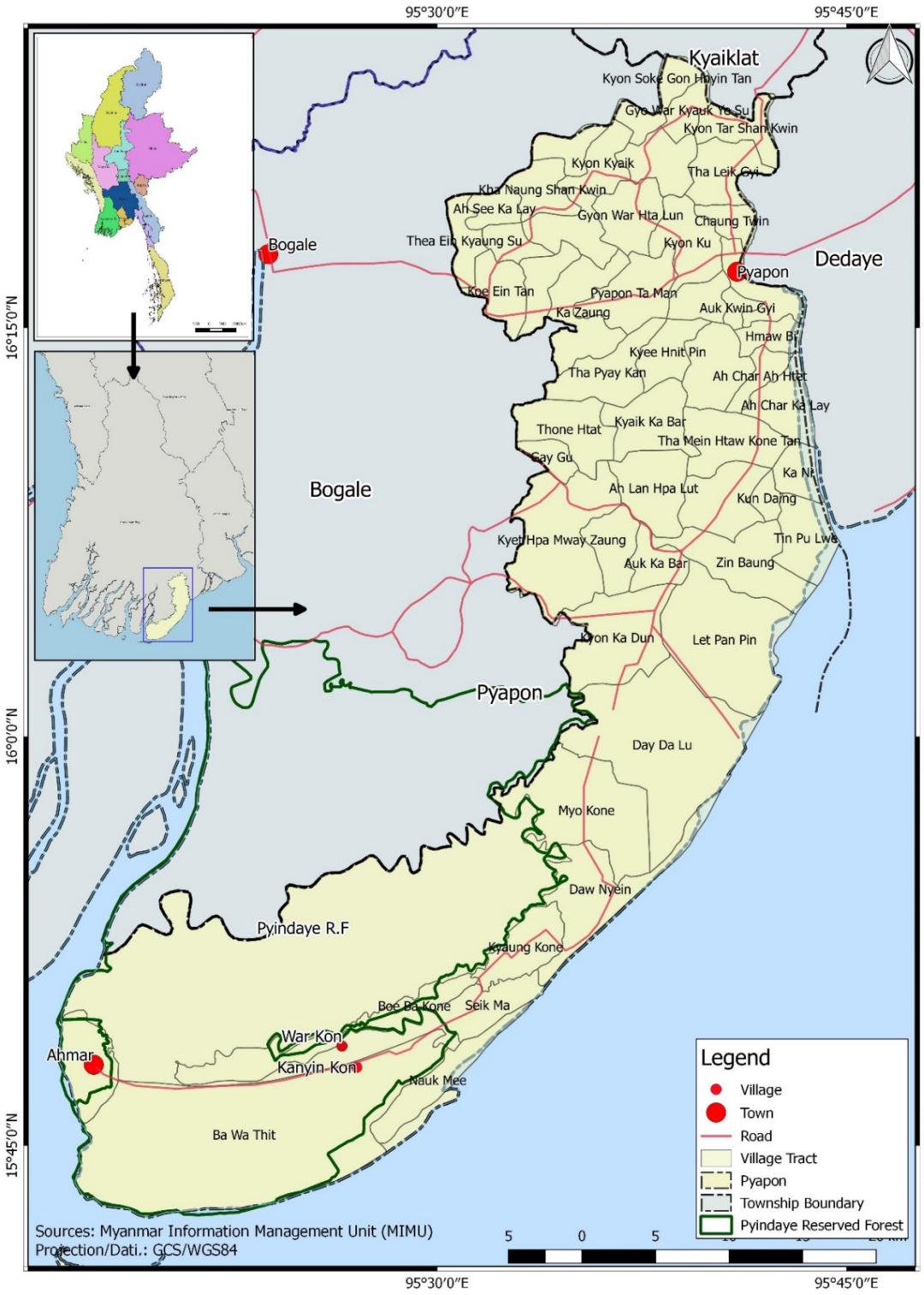

Figure 5-1: Location map of the study area

The total number of CFUG households in the study area is 116 and that of non-CFUG households is 185. In order to get a better understanding of main livelihoods and forestry-

related livelihoods of villagers and their perceptions regarding how CF impacts them, 30 CFUG households and 28 non-CFUG households were randomly selected for household-level interviews, which were conducted during my fieldwork in November and December 2014.

In terms of general household information, the survey indicated that Bamar (94 per cent) was the majority ethnic self-identification in study area, while the rest identified as Kayin (4 per cent) and a smaller number of Rakhine (2 per cent). As part of rural Ayeyarwady Delta zone, most houses in the study area are constructed with nipa-thatch roofs, bamboo mat walls and timber or bamboo posts. Only a few households can afford to construct their houses with wooden structures and zinc sheet roofs, and these households are considered wealthy. Electricity is generated privately by a small number of households, and a majority of households rely on candles, kerosene and batteries for sources of lighting. The main energy source for cooking is fuelwood, although a few households use dried coconut fronds and coconut husk as a fuel source. The main sources of water for drinking and daily use are dug wells and rain-water ponds. Respondents commented that some households had to spend some money for their drinking and daily domestic use, around 5,000 MMK per month on average.

The survey data showed that male-headed households make up the majority of the sampled population in both CFUG and non-CFUG households: 93 per cent and 96 per cent of both groups respectively were male-headed and 7 per cent and 4 per cent were female-headed. Traditionally in Myanmar, the husband is nominated as the head of the household and this was also true in the study area. In this case study, the household size varied from two to ten in CFUG households and two to seven in non-CFUG households. Data shows that the average size of the CFUG family is 5, which is larger than the regional average (4.1 people) and national average (4.4 people). the average size of a non-CFUG household is 4, which is slightly lower than the national average but the same as the regional average.

There are other international organisations with development programs in the study area. The United Nations Development Programme (UNDP) initiated a microcredit project in both villages in 2003. However, UNDP has now handed over its microcredit assets to Pact (Myanmar), an international non-government organisation (NGO). Furthermore, an international NGO, named Medecins Du Monde (MDM) France, has been implementing the Mother and Child Health project in Phyarpon Town and assisting villagers through

health care loans with the cooperation of the Ministry of Health and Sports. As micro-finance and support from relatives are common sources of loans, with interest rates of 5 per cent to 20 per cent, almost all households seek access to the loan systems of Pact (Myanmar) and MDM, which come at a very low interest rate, with the main purpose of investing in small businesses. In this regard, respondents said that household debt is not a major issue for villagers except a few landless poor households, which are not accessible to such microfinance project.

According to the wealth ranking, it was found that wealth ranks ranging from poor, medium to better-off in CFUG members were 50, 23 and 27 per cent, and 68, 21 and 11 per cent in non-CFUG members respectively. Some key features of the study area are summarised in Table 5-1.

Table 5-1: Key features of the study area

Features	**CFUG**	**Non-CFUG**
No. of total households	116	185
No. of sample households	30	28
Wealth groups	Poor (50%) Medium (23%) Better-off (27%)	Poor (68%) Medium (21%) Better-off (11%)
Year community forest established	2001	
Size of community forest (ha)	263	

Source: Field survey (2014)

5.2 Effects of Community Forestry on household livelihoods and livelihood strategies

5.2.1 Situation of land holding

Household surveys and interviews revealed that access to land has played an important role for villagers in improving their livelihoods. Land holding in respondent households is categorised according to land use type as agricultural land and community forest land. Agricultural land in this case study includes two types of land use: land use for rice cultivation and land use for home gardening. Respondents stated that villagers possess both rice fields and garden lands, held under a family leasehold arrangement (from the government), i.e. tillage right system in which households held the document (Form 7), for agricultural use according to the Farmland Law and Vacant, Fallow and Virgin Lands Management Law, both enacted in 2012. Household surveys indicated that 61 per cent of CFUG households and only 39 per cent of non-CFUG households held agricultural land.

The average size of agricultural land held by CFUG households is about 1.5 ha whereas that held by non-CFUG households is about 1 ha. These figures show that CFUG households had more agricultural land than non-CFUG households.

Due to the topography of the Ayeyarwady Delta, the study area is categorised as the agro-ecological zone "R3S1"[13] by the land use division of the Myanma Agriculture Service (FD and JICA, 2005). These lands are normally regarded as having poor drainage and saline soils that are not always favourable for rice farming, but are suitable for home gardening. All interviewed households revealed that garden land played a crucial role in their livelihoods, as they used them to grow cash crops such as coconut, betel nut, betel leaves and some fruit trees, and were able to sell these crops to traders.

In terms of community forest land, the average size of land per household is approximately 4 ha, according to survey data. These community forest lands are formally recognised by FD under the CF program. CFUG members hold formal documents to manage their community forest lands. The community forest land is the source of forest products such as building materials, fuelwood and other non-timber forest products (NTFPs) for both household consumption and income generation for CFUG members. Although non-CFUG members are not involved in the CF program, they may have access and use rights to other open-access natural resources that are outside the community forests.

According to the household interviews, over half (57 per cent) of the non-CFUG members are landless in the study villages. Landless households engage in catching crabs on a subsistence basis. Since the majority of landless households suffer difficulties in maintaining their livelihoods, they must also work as farm labourers during the peak agricultural season. Thus, farm labour is particularly important for landless households to earn income. However, some members of landless households migrate to seek non-farm jobs in response to decreasing opportunities for rural farm labour in the Delta area, together with growing industrialisation in other parts of the country.

Overall, the extent of agricultural land holding size is higher in CFUG households than non-CFUG households. Regarding community forest land, all CFUG members have rights to use and manage forest land while non-CFUG members do not have any forest land. Therefore, it can be suggested that CFUG members have two types of land use (i.e.

[13] "R3S1", where R3 indicates annual rainfall of above 2,540 mm and with two continuous months of dry summer and S1 indicates soil of Fluvisols/Gleysols.

agricultural land and community forest land) whereas non-CFUG members have only one land use type which is agricultural land. Although both CFUG and non-CFUG members cultivate agricultural land to produce food and cash crops, only CFUG members can produce forest products from their community forest land both for household use and selling purposes. This increased ability to produce forest products in CFUG members results in more household income for purchasing assets and better housing materials, which is attributed to their wealth status.

5.2.2 Agricultural resource use in the study area

The Ayeyarwady Delta is one of the most important agricultural regions in Myanmar. Lowland rice crop cultivation is the main livelihood activity for rural farmers in the Delta region. Although rice is the main crop for the Delta area, some farmers grow oil-seed crops and pulses following rice. However, the cropping pattern and intensity depend on soil type, soil fertility and water availability. If irrigation[14] is favourable, for instance, the farmers practise multiple cropping (Htway et al., 2014). The overall cropping and resource use patterns vary greatly across the Delta depending on rain and irrigation water availability. The total rice production area of the Ayeyarwady Delta was more than 25 per cent of total national rice sown in 2007–08 (Htway et al., 2014). In terms of summer rice cultivation, almost 80 per cent was grown in the Ayeyarwady Delta (Zaw et al., 2011). It is also a dynamic area with increasing investment in the agricultural sector. Although the Delta is not the area with highest poverty rate in the country, it can still be categorised in the high range because of the prevalence of poverty (at 26 per cent) (WFP, 2014). Particularly noteworthy are high concentrations of landlessness (32.6 per cent) (Htway et al., 2014).

Agriculture in this case study includes two types of farming: rice cultivation and home gardening. Field interviews in study area reveal that most of the land around the sample villages is less favourable to growing rice and more favourable for garden lands – a traditional cropping system involving coconuts, betel nuts and betel leaves. Due to the small cultivation area, vegetables, commercial flowers and fruits are mostly cultivated in the home compounds. Such production represents supplemental activities that support the

[14] Flood irrigation is the main type applied for rice crop cultivation among the irrigation systems in the Delta. Sprinkler irrigation is the second-most applied irrigation system, mainly for vegetable crop cultivation. Furrow irrigation is used for crops such as oil-seed and pulses crops. The source of irrigation water for households is from streams/rivers. Some households rely on rainwater for crop production. Some farmers can access or use water from their own open wells or tube wells and others share access (Htway et al., 2014).

income and nutrition of marginal villagers. Landless people (particularly non-CFUG members, in this case) do not have any arable land, including garden lands, except for their residential land. It was found that the number of CFUG member households possessing paddy fields and garden lands was higher than non-CFUG members.

As described in the above section, the study area is situated in the salinity zone of the Ayeyarwady Delta, and thus rice production from the paddy field is relatively low. Respondents reported that they mainly planted monsoon paddy on their farmland and it produced about 25 to 30 baskets[15] per acre (0.5 to 0.6 tonnes per acre). This production rate is relatively low compared to the average production rate in Ayeyarwady Region (25 to 70 baskets or 0.5 to 1.4 tonnes per acre in 2015–16) (DOA, 2016). Therefore, respondents (apart from two households) said that rice crop production from their farmland was not sufficient for household consumption for the whole year because of the small cultivation area and yield. It was also noted that households in both CFUG and non-CFUG could not use inputs such as arable land, labour, financial capital and agricultural tools and equipment including cows and buffalos in rice farming.

Since the contribution of rice farming to total income was low, respondents said that garden lands played a key role in the livelihoods of villagers and was the main source of income for their households. Interview respondents also stated that garden land was designated as agricultural land. All agricultural lands (i.e. paddy fields and garden lands in this chapter) are registered with the government and a Land Use Certificate (Form-7) is issued by the Township Farmland Management Body, which is administered by the government. Respondents said that the government provides loans to farmers for rice crop cultivation, but not for home gardens due to agricultural policies. Loans provided by the Myanmar Agricultural Bank under government policy range from approximately 120,000–150,000 MMK[16] per acre[17] (~305–380 USD/hectare) and thus are not big enough for rice crop cultivation. Most of the loans disbursed are spent on purchase of chemical fertilisers. Although the loans are only provided for rice crops due to government policies, households in both CFUG and non-CFUG are doing both rice cultivation and home gardening as agriculture is one of the largest contributors to households' total income.

[15] 1 ton = 48.7 baskets (paddy with husk)
[16] 1 USD ~ 984 MMK at the time of the survey in 2014
[17] 1 acre = 0.4 hectare

5.2.3 Livelihood activities and income sources

With the nature of the study area, a number of livelihood activities were observed during interviews. The most common livelihood activities include agriculture, fishery and forest product collection in the community forest. Households with non-farm employment, non-farm enterprises, livestock rearing and wage labouring have higher income, however fewer households undertake these activities. In the "non-farm employment" category, many of the activities and associated incomes are from remittances from permanent employment or seasonal labour in the government service, private industries and fish firms in other townships, in the city, or in other countries. Mostly, the villagers work in cities such as Yangon, Pathein and as seasonal labour in adjacent townships. "Non-farm enterprise" in this study means non-agricultural related livelihood activities such as petty trading (e.g. grocery shops) and crab trading at home. A few households earn income from an "other" category that includes selling vegetables and snacks in the village occasionally.

Table 5-2 shows types of income sources of CFUG and non-CFUG households from the study area. Among the income sources of CFUG households, it was found that collection of forest products in the community forest was the most popular source of income with 22 households out of 30 sample households engaged in this activity, followed by agriculture with 20 households and fishery with 14 households. Due to the limited availability of arable land including community forest land, the majority of the households in non-CFUG members depend on fishery (16 households) and non-farm employment (11 households). The difference in main sources of income between CFUG and non-CFUG was found to be significant as there were differences in the proportions of households relying on different sources of income.

Table 5-2: Types of income sources (per cent)

Items	**CFUG (n=30)**		**Non-CFUG (n=28)**	
	No. of HHs	**%**	**No. of HHs**	**%**
Forest product collection	22	73	5	18
Agriculture	20	67	9	32
Fishery	14	47	16	57
Livestock rearing	13	43	3	11
Non-farm enterprise	12	40	8	29

Non-farm employment	11	37	11	39
Wage labour	6	20	7	25
Other income	2	7	4	14

Source: Field survey, 2014

As noted above, respondent households perform a number of livelihood activities throughout the year; some activities are done year round while others are done seasonally. Household interviews show that both CFUG and non-CFUG member households engage in more than one livelihood activity to make ends meet. CFUG members are more reliant on CF, from which they draw an income, than non-CFUG members.

Based on interview data, respondents in CFUG households stated that all CFUG members engaged in forest-based livelihood activity as they collect forest products both for household use and for sale. As fuelwood is predominantly used for cooking in the study area, non-CFUG members are required to buy the fuelwood at a cheap price from CFUG members. Besides fuelwood, non-CFUG members can buy building materials, such as poles and posts for constructing or repairing their houses, from CFUG members. In this way CFUG members earn income from the community forest and non-CFUG members fulfil their basic livelihood needs.

5.2.4 Household annual income and expenditures

By sources of income, the results based on household interviews show that there are significant differences among incomes from the community forest, agriculture and fishery in the three wealth groups of CFUG households (Figure 5-2). Average annual income per household from forest products, fisheries, agriculture and non-farm employment are found to be higher in the better-off and medium groups while the poor group receives higher average annual income per household in wage labour, non-farm enterprises and the "other" category. This is because the better-off and medium groups have more livelihood assets such as labour availability, agricultural land and community forest land. As they possess a larger amount of land resources than the poor group, they receive more annual income than the poor. At the time of the study, the better-off households commented that they generated approximately USD 611 per household per year through the sale of forest products such as fuelwood, poles, seeds and propagules from their individually-held forest land, while the medium and poor households received about USD 242 and USD 90 per household per year respectively.

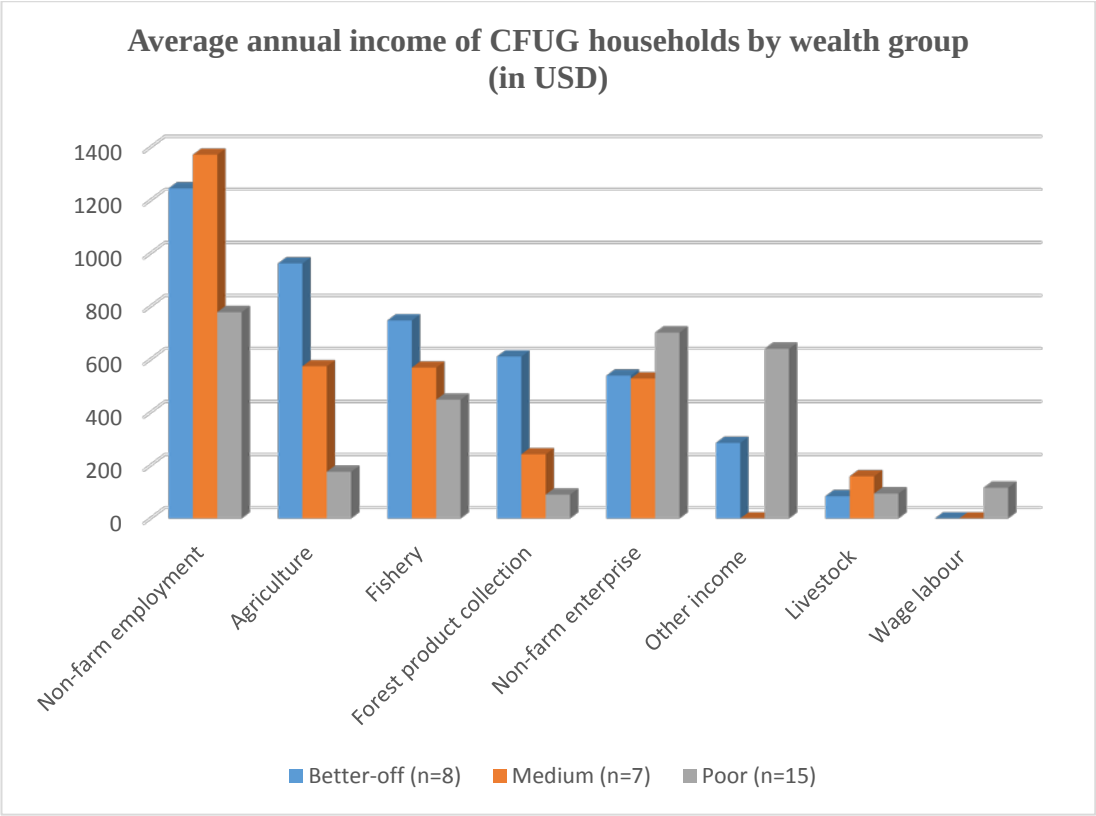

Figure 5-2: Average annual income of CFUG households by wealth groups

Source: Field survey (2014)

Based on household interviews, the data revealed that better-off households have higher income than medium and poor households in the CFUG. Table 5-3 shows the average income for these groups.

Table 5-3: Average annual income by wealth groups of CFUG members

Wealth groups	Average income (USD/HH/year)
Poor (n=15)	1,115
Medium (n=7)	1,671
Better-off (n=8)	2,708

Source: Field survey (2014)

In the case of non-CFUG members, the interviews with respondents indicated that the average annual income in each wealth stratum varies depending on the different sources of income. Figure 5-3 shows that the average annual income per household from agriculture, non-farm enterprises and non-farm employment were found to be higher in the better-off and medium groups while the poor households had higher average annual income per household in wage labour and the "other" category only. The main income for the better-off group is from agriculture because they have more agricultural lands and

assets while the major income for the poor group is from wage labour as they have less livelihood assets to depend on for their living. Income from forestry does not play an important role for all wealth groups of non-CFUG households but it provides a contribution to the better-off group. Although non-CFUG members do not own the community forest land, a few better-off households own a certain area of residential land adjacent to mangrove forest and are able to collect and sell forest products from their home compounds.

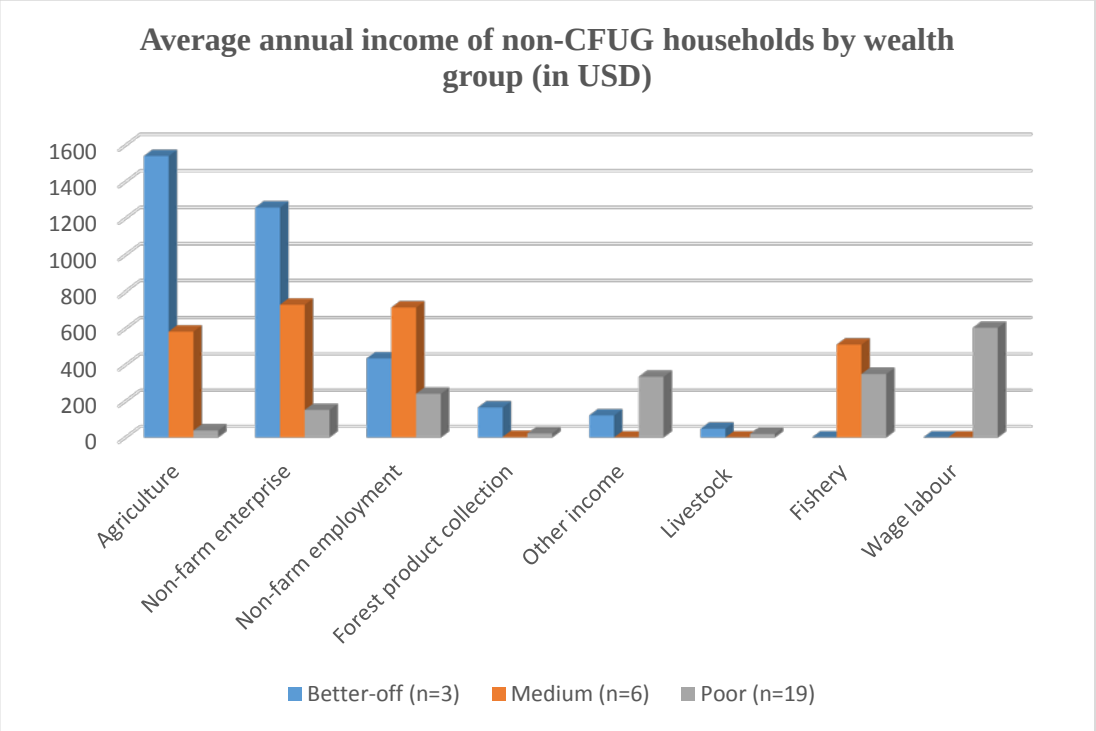

Figure 5-3: Average annual income of non-CFUG households by wealth groups

Source: Field survey (2014)

Similar to CFUG members, better-off households have higher income than the medium and poor households in non-CFUG. The average income for these three groups is shown in Table 5-4.

Table 5-4: Average annual income by wealth groups of non-CFUG members

Wealth groups	**Average income (USD/HH/year)**
Poor (n=19)	966
Medium (n=6)	2,305
Better-off (n=3)	3,495

Source: Field survey (2014)

The most common areas where people in the study area spend their income are: clothing, food, donations, travelling charges, education, health care and investment in agriculture

and fishery. These results are consistent amongst the wealth categories of both CFUG and non-CFUG households. Findings revealed that the most costly expenses of respondent households were food, education and investment in agriculture and fishery. More importantly, CFUG members have saved income through the sale of forest products as a result of CF and they can purchase food and education fees for their children, and begin to spend more money on luxury items such as televisions, cell phones and motor bikes. However, poor households in non-CFUG members could not spend as much on these items as CFUG members since they spend more on food.

Overall, both CFUG and non-CFUG households had diverse incomes. CFUG households mostly concentrated on non-farm employment, agriculture and fishery, while non-CFUG households relied more on agriculture and non-farm livelihoods. A key point is that CFUG households obtained more income from the sale of forest products from the community forest than non-CFUG households. More specifically, the better-off households in CFUG earned more income from selling forest products than the medium and poor households.

5.2.5 Migration

Migration is one of the livelihood strategies pursued by most interviewed households in the study villages. Interview data revealed that some family members in both CFUG and non-CFUG households were required to migrate seasonally or temporarily to other townships or cities in the country to find non-farm jobs for their livelihoods. Although agricultural labour is one of the traditional livelihood activities in the study area, decreasing employment opportunities in agriculture and increasing demand for unskilled labour in peri-urban areas and cities enable people in both groups to migrate. Wealth categories did not affect migration since family members in all wealth groups were migrating.

Household interviews revealed that seasonal labour demand is dominant in the Delta area, especially in fishery production in coastal villages. As rice is mainly grown in monsoon and post-monsoon seasons in the country, demand for agricultural labour usually occurs during the rainy and summer seasons. However, villagers work on rice cultivation from June to August in the study villages because salinity causes most landowning households tend to produce low rice yields for household consumption rather than sale. Further, households which have garden land do not require a large labour force because their garden lands are small in size and they do not require much labour throughout the year.

For fishery production, the peak period of working is from August to March and the owners in fishery production usually employ labourers to catch fish during that time. In this case study, villagers from both CFUG and non-CFUG move to coastal villages and work at fishery production during the agricultural slack seasons. The findings show that such seasonal labour migration is an important part of the livelihoods of villagers in this case.

At the time of the research, survey results indicated that the percentage of households with some family members out-migrating was slightly higher in non-CFUG households (39 per cent) compared to CFUG households (37 per cent) (see Table 5-2). In the Delta case, migration appears to play an important role in livelihoods of both non-CFUG members and CFUG members. The discussion on migration with respondent households indicated that landless poor in non-CFUG households seasonally migrate to coastal villages to work in fishery production. After the peak period of working in fishery production, they usually return to their villages and engage in farming again in the early monsoon season. Some family members in medium and better-off households in non-CFUG temporarily migrate to work in private factories in cities such as Yangon, Pathein and Hpa-an.

Informants in both CFUG and non-CFUG members stated that migration for wage labour had developed as more profitable jobs outside villages became available. Although CFUG households have individually owned community forest plots that contribute to household income, the trend of migration is increasing. As a household with no available agricultural land, this CFUG member needed to find labouring work outside the village. One female CFUG member described labour migration as follows:

> I have 4 ha of community forest plot but have no rice field or home garden land. I have a big family with nine household members. My 56-year-old husband and two sons (26 and 18-year-old) work as the fishing wage labour at fishery production in nearby coastal villages for our livings. The other 16-year-old son and I are working on my community forest plot that provides forest products for household use and a small income. However, it does not account for a large part of the household income for our big family. (CFUG member, Kanyin Kon village, December 2014)

Her account shows the connection between no agricultural opportunities due to landlessness and migration for labouring work outside the village. Another interview with a non-CFUG member highlighted the development of out-migration as follows:

> I have 0.8 ha of farmland but I could not cultivate paddy for two years because of a lack of financial capital. I have no community forest land and my family mainly depend on my salary when I seasonally move to the coastal villages to work as the fishing wage labour. I usually earn approximately 610 USD per 8 months from this job. In the other months, I trap the mud crabs in the other's community forest plots and it contributes the secondary income for our livelihood. (Non-CFUG member, Kanyin Kon village, December 2014)

In this case, a lack of capital has left the family unable to effectively make use of their land. Overall, migration of men is common in the study area, and CFUG household members tend to migrate permanently while landless non-CFUG household members migrate seasonally. Therefore, it appears that landless members in non-CFUG are more mobile than landed CFUG households. Migration has increasingly become a central feature of life in the study area, particularly for poor non-CFUG households. Probably because of local seasonal labour demand and because of decreasing on-farm labour costs, internal rural-rural migration occurs in both CFUG and non-CFUG members.

5.3 Household perceptions of Community Forestry

5.3.1 Perceptions of the benefits or risks of Community Forestry

The community forests are located near the villages (both community forests and villages are in close proximity within Compartment No. 56 of Pyindaye Reserved Forest) and these community forests have been providing mangrove forest products and environmental services, such as storm protection, flood control and protection of natural habitat for fish spawning, in the interests of the rural communities. No significant risks were pointed out during the interviews except that residents were very concerned about maintaining their household claim to the land included with the community forest. The research findings revealed that there were several benefits of community forests as perceived by CFUG members. Respondents who were CFUG members said they were now gaining the main benefits by receiving incomes from the sale of fuelwood, poles, posts, nipa palm (*Nypa fruitcanas*), seeds and propagules that they collected on their own plots within the community forests. Apart from forest products, their community forests provide some fishery products, such as crabs and fish, which are part of the community commons and available to members for subsistence and income due to the ecological significance of the mangrove forest.

Household interview data showed that income generation from selling forest products featured strongly for CFUG members. In the study area, villagers cannot afford other sources of energy for their daily cooking. As there is no grid electricity in the villages,

the main energy source used by all households for cooking is fuelwood. The major source of fuelwood for CFUG members is their community forest plots. As non-CFUG members do not have their own community forests, some households extract fuelwood from the reserved forest and some who do not have family labour and time for collecting fuelwood have to buy it from CFUG members. The income generation potential featured strongly for CFUG households and one of the CFUG members said:

> One household needs varying from 3 to 6 ton of fuelwood per year depending on the household size. The market value of the fuelwood at the villages is approximately 25 USD/ton (~25,000 MMK/ton). The customers are non-CFUG members in our village and neighbouring villagers. (CFUG member, War Kon village, November 2014)

According to the above quote, CFUG households increase their household income by selling fuelwood extracted from community forests to non-CFUG members or people in other villages because every household needs fuelwood for cooking.

CFUG members also receive income through the sale of construction materials such as poles, posts and nipa palm. CFUG respondents said during interviews that they built their houses with poles and posts harvested from their community forests. Traditionally, poles are used for house roofing, walls and standing posts for betel seedlings (a bamboo substitute). Most of the villagers who grow betel leaf plants as cash crops need to buy the poles on which the plants climb and the price of one pole is about USD 2.5 (~2,500 MMK). Posts are essential forest products for building or renovating houses. Nipa palm leaves are commonly used as housing materials for roof thatching and for walling in the study area. It is in high demand and villagers can purchase nipa palm from CFUG members and/or from local markets. CFUG members could sell surpluses of such construction materials to other, needy households for shelter.

CFUG members stated that they collected seeds and propagules of some mangrove species in their community forests and sold them to make income. In particular, members, who have successful Thame (*Avicenia officinalis*) plantations now maturing, have received monetary benefits from the sale of Thame seeds which cost USD 2.5/basket (~2,500 MMK/basket). The buyers were FREDA, Township FD and some CFUG members who liked to plant Thame trees in their community forest plots. During a key informant interview, one of the management committee members in Kanyin Kon village highlighted the benefits of plantations established in his community forest plot:

> under the collective management regime in CF areas, I individually own a total 8 ha of community forest plot. Of which 2.4 ha is plantation and 2 ha is conserved for environmental services. The rest 3.6 ha is natural mangroves. I have been collecting and selling seeds, fuelwood, pole and post from my plantation since 2007. Though I didn't earn money in the beginning of the CF program, I become to improve my income from my CF plot with increasing age of the plantation. I had generated USD 1,118 through the sale of forest products in the last year. (Management committee member, Kanyin Kon village, December 2014)

Results showed that there were several possibilities identified by CFUG members to improve their household income from the community forests. Indeed, CFUG members can achieve a doubling of prices for "thinbaung" (marsh date-palm or *Phoenix paludosa*) used for poles (from approximately USD 5 to USD 10) if they can sell their products in the nearby coastal region (about 50 km distant from their villages). However, members said they did not have boats to transport their products and they could not wait for delayed payments. Therefore, they had to sell them to the traders who visited their villages and offered up-front payment in cash. Thus, CFUG members suffered from earning low income from their community forests and tried to find options to increase the income from the sale of forest products collected from community forests.

All CFUG informants during interviews stated that mangrove forests served as a source of not only forest products but also fishery products to local communities. Due to its peculiar ecosystem of mangrove forests, catching mud crabs and fishing in the study area is widespread and the communities are also dependent on fishing activities and aquatic products for food security and income. CFUG members can catch mud crabs in their community forest plots throughout the whole year but there is less benefit to non-CFUG members or landless people. Community forests have contributed in supplying these fishery products to needy users in a timely manner, as a form of charity to the village poor. Overall, these forest products and fishery products are crucial examples of direct benefits from community forests to the livelihoods of villagers.

For non-CFUG members, interview data revealed that they did not obtain benefits of community forests in terms of forest products. Basically, only CFUG members have a right to extract forest products from their own community forest plots in accordance with the prescription of the management plan. Therefore, non-CFUG members mainly rely on the open-access natural mangroves and naturally growing trees that exist on their residential land to produce forest products for their basic livelihood needs. However, resources of natural mangroves are limited and thus, they have to purchase fuelwood and some NTFPs either from CFUG members or from local markets. With the culture of the

study villages and from a social point of view, however, some wealthy CFUG members allow landless and poor non-CFUG members, specifically those who are their relatives, to collect fallen dry twigs for fuelwood and to catch smaller quantities of mud crabs for subsistence in their community forest plots.

CFUG and non-CFUG households of the study area valued the improvements of ecosystem services contributed by community forests. As the community forests were well protected, all CFUG and non-CFUG respondents reported that their community forests provided environmental protection as they experienced Cyclone Nargis that hit the Ayeyarwady Delta in May, 2008. Many lives and houses in the study area were saved in the context of Nargis, which destroyed about 38,000 ha of mangroves (Mohamed, 2009). The community forests in the study villages took the least impact and all villagers survived. However, fuelwood and timber were needed for reconstruction of some houses in the villages post Nargis. Therefore, CFUG members had redoubled their efforts to plant mangrove tree species with the aid of FREDA and FD despite the hardship and devastation caused by Cyclone Nargis. To date, the communities are enjoying improved mangrove ecosystem services of their community forests in terms of wild plants and fisheries, improved habitats for wildlife and protection against adverse impacts of strong winds and waves. In addition, CFUG members stated that their community forests provided aesthetic value to the community from improved forest conditions.

During interviews with CFUG members, they revealed that there were several social benefits that seemed to be emerging from the CF program. Perhaps the major one is creating a new social forum, with potential for rural level development planning, improved social cohesion and confidence. The CFUG members are regarded as having the social capital to work as a village-level civil society in the form of CFUG in line with the CFI. Through the CF program, CFUG members have been participating in training, workshops and exposure visits conducted by governmental and local and international non-governmental organisations. The local level training and workshops are certainly raising the level of awareness of CFUG members. Participating in workshops and training is one of the most basic activities of the CFUG management committee members and a chair of the War Kon CFUG management committee stated:

> I have been attending several trainings, seminars and study tours both from the government and NGOs. These activities have been helping me to enhance my knowledge and skill related to community development, organisational management, leadership development and forest management. Most of the CFUG members can increase not only the interest in tree planting and knowledge about

> mangrove forest but also improve the awareness of their rights and responsibilities of being a member through the CF program. (Chair of management committee, War Kon village, November 2014)

Although it was difficult to measure, CFUG members stated that significant skill development such as leadership skills and conflict management skills had improved in the communities and social support structures had developed in the villages. Overall, these social benefits are flowing only to CFUG members who operate and manage their community forest plots.

In the study area, no significant risks of community forestry were pointed out during interviews. The research findings revealed that community forests contribute economic, ecological and social benefits to the livelihoods of the CFUG members. However, some non-CFUG respondents stated that they lacked access to such kinds of benefits, apart from ecological benefits, of community forests. Therefore, non-CFUG members also want to apply for membership or try to create another community forest by claiming specific land area from FD with secure tenure and allocating land to individuals with recognised individual ownership. Overall, CFUG members get more benefits from the community forest than non-CFUG members. The products from the community forest are utilised for individual household purposes, instead of benefiting every villager equally. This will lead to increasing inequality and differentiation between CFUG and non-CFUG members. Elite capture is prominent in this case study and findings confirm that better-off CFUG households obtain more benefits from CF than medium and poor ones.

5.3.2 Perceptions of households on Community Forestry

In this section, the perceptions of CFUG and non-CFUG respondents of the study villages concerning CF awareness, willingness to engage, community forest condition and management will be discussed.

The findings of this case study show that all CFUG and non-CFUG respondents are aware of the productive and protective roles of community forests, and CFUG members have developed positive attitudes towards planting mangrove tree species that provide them useful forest resources, and combat threatening environmental problems. During the discussion, the majority of CFUG members explained that community forests secured their future and trees should be planted to meet their basic livelihood needs. It has been found that the establishment of community forests in the study villages was socially accepted by the rural communities and all CFUG members enjoyed owning and managing

their community forests. Non-CFUG members also explained that most of them had an interest in learning about mangrove forests and gaining knowledge and interest in tree planting. They hoped to receive a community forest land area allocation based on their own capability, knowing how to get fuelwood and timber as well as catching the crabs from mangroves. They would be allocated reserved forest land by the FD. Both CFUG and non-CFUG members revealed that they were aware of the importance of community forests in reducing disaster risk such as storms, floods, etc.

In this case study, some non-CFUG members were involved in seasonal non-farm labouring outside their villages and they were not interested in participating in the CF program. Non-CFUG members reported that they had diverse reasons for not engaging in the CF program in the beginning, but they started to become interested in the scheme over time. Most non-CFUG members stated during interviews that the one of the main reasons for not joining in the CF program was a lack of interest. They said that they did not have enough time for major tasks of community forest activities because they had to prioritise income-generating activities for their livelihoods. Further, another reason for not joining in the CF program was land scarcity. About half of the non-CFUG members were landless in the study villages and thus, they could not participate in the CF program from the outset. Only those villagers who were daring enough to encroach into the reserved forest were able to participate in the CF program run by the state, and they were even able to hold onto their claim to the forest land. They can formalise their claim to CF land by engaging in the CF program. An interview with a government official in Phyarpon Township FD reported that FD recognised and legalised a number of villages (including my study villages) having total households of 50 and above that have already settled in the reserved and protected public forests in the Ayeyarwady Delta according to the recent instruction of the state in 2013 (see section 5.1.2). In this regard, non-CFUG members felt that inequality in property rights within communities and forest land was captured by elites for their own benefit in accessing resources. With this realisation, non-CFUG members wanted to claim community forest land that could be passed on to their children. For example, the following story of one 52-year-old man reflected non-CFUG members' reasons to desire to join CF:

> I arrived to the Kanyin Kon village with my wife and children from War Kon village, due to a lack of job, last three years ago. As I arrived here late, I did not get a chance to participate in CF due to a lack of land. I have a strong interest to engage in CF as I like to collect forest products such as fuelwood and timber for household use. In the future, I hope I could improve the livelihood by earning money from the sale of forest products. In addition, I want to transfer CF land to

> my children for their future. In terms of the experience in catching crabs and fishes, the resources are restricted in quantity years by years. As a non-CFUG member, there was indeed less in terms of available forest products after the CF program, although some CFUG members allow us to collect fuelwood in their CF plots. So, I want to have my own CF plots in order to conserve mangroves and utilise the resources sustainably. (Non-CFUG member, Kanyin Kon village, December 2014)

Embedded in this circumstance is the allocation of village property rights over forest land with the traditional pattern of ownership (prioritising the original owners of the degraded rice fields) from the start (see section 5.1.2). The injustice in land distribution under the CF program in the study area provides strong support for the need for land redistribution. Some non-CFUG members who are poor are unable to satisfy their basic needs with income earned from the community forest and by direct subsistence from forest resources. At the time of the study, non-CFUG members expected to engage in the CF program and to have their own CF lands officially allocated by the FD to improve their livelihoods and to handover to younger generations. In this context, FD would get involved in redistribution of community forest land ownership or providing new community forest land for landless people so that non-CFUG members could participate in the CF program. In a sense, CF could redress injustices or reinforce equity and help villagers to improve their livelihoods.

With respect to the forest condition, community forests in the study area have unambiguously improved through increased protection and controlled product extraction by CFUG members. Based on focus group discussion, all CFUG respondents rated the condition of their community forests as degrading after Cyclone Nargis in 2008. Since Cyclone Nargis hit the Delta region, many trees in both community forests fell and a number of residents' houses were destroyed. The villagers needed timber for reconstruction of their houses post-Nargis and cut certain trees. Hence, respondents said the condition of community forests declined after 2008 and restoration of the mangrove forests was urgently needed. For this reason, CFUG members start replanting trees in their community forest plots with seedlings from FREDA and FD every year. Therefore, community forests in the study area are currently increasing the number of trees per hectare. CFUG members usually watch or patrol their plots that are threatened by outsiders (from other villages) cutting trees for fuelwood and they usually extract forest products with control to cover a range of their livelihood needs. By participant observation, the overall state of community forests is good and community forests are protected well by CFUG members.

In terms of community forest management, CFUG members responded that their CF land was allocated to operate and manage individually, but overall management is carried out by the whole CFUG collectively. The management regime of both War Kon and Kanyin Kon community forests is collective management with each member controlling individual forest plots and this can stop unsustainable use of common property resources. A Management Committee member from Kanyin Kon village commented that they can manage their CF plots without any difficulties and he explained,

> We know that community forest management should be collective according to the CFI. However, our CF management is more effective if each member operates and manages their own plots themselves with the sense of ownership. Even though we cannot conduct the tasks of CF activities stated in the management plan exactly, we can manage our CF plots with serious efforts as we have more intimate knowledge of our locality. (Management Committee member, Kanyin Kon village, December 2014)

CFUG members want to retain their privilege, i.e. retain land where they squatted using CF as a mechanism.

The local knowledge of villagers is useful in managing forest resources sustainably as their livelihoods depend on it. They know which local mangrove species are useful and appropriate and how to grow them. Further, they practise selective felling for multiple products for subsistence and market. CFUG members reported during interviews that they have managed their community forests effectively and efficiently for the sustainability of the resources.

In thinking about the connection between collective management and sustainability of resources, several conflicts or disputes over resource access within or among communities were identified by CFUG members. Interviews with CFUG members reported that the most frequent concern about their community forests was illegal cutting by their neighbours and outsiders from other villages. They said small-scale, illegal extraction of mangrove forest products had been taking place in their CF plots. As non-CFUG members and neighbouring villagers had been excluded from rights to CF lands, they would illicitly access the CF areas. They cut fuelwood and poles, and collected mangrove seeds and propagules in the CF plots without asking the permission of the owners. In this regard, CFUG members could not try to challenge such illegal cutting and intrusion by outsiders. One of the Management Committee members of War Kon village responded that intra-community conflicts due to illegal cutting could not be resolved by themselves and he explained:

> we are struggling to prevent illegal cutters and no CFUG member wants to get into intractable conflicts with these people. And we did not receive help from either FD or other government line agencies effectively for resolving such conflicts. So, we are reluctant to challenge them and rule-breaking is increasingly high. We need FD's support and back-up in this case. Currently, we resolve the issues by ourselves from the social aspect. We just warn the illegal cutters not to cut the trees without our permission. However, it does not work. (Management committee member, War Kon village, November 2014)

In practice, FD support for community forests in the study area is limited to annual inspection visits at which some technical assistance on forest management is offered. According to informants, CFUG members require follow-up supervision, monitoring and evaluation of FD to assess their problems and seek solutions. Although members use a common protection method, including patrolling or watching, to guard against the threats of their common property access, there remain problems with illegal cutters. CFUG members expressed their desire for the FD to improve support in law enforcement so that illegal cutters were prohibited. Currently, they usually dealt with the illegal cutters through a process of warnings or punishment under the village administration. Findings from this case study indicated that not all CFUG members were able to maintain their community forests without FD's follow-up support, supervision and monitoring.

Overall, community forests in the study area have supported the livelihoods of CFUG members in terms of economic, ecological and social benefits. There is recognition that they have a right to use mangrove forest resources, such as timber and NTFPs, both for subsistence and alternative income for their households. Communities perceive that the positive impact of CF implementation has been an improvement in forest cover and conditions, which plays an important role in ecosystem services. With increased protection and proper management of community forests, CFUG members have the financial profitability of their forests to improve their livelihoods. However, forests are no longer an open-access resource and inequitable access to forest resources for non-CFUG members has become the critical issue. This also affects how the FD becomes involved in access disputes. The non-CFUG members, who previously were not interested, want to claim property rights and resource access to mangrove forests by applying for membership of CFUG because they can see that the community forest fulfils basic needs by means of multiple benefits. This case study shows a clear trade-off between the effective reforestation of the CF through private management of plots, versus equity in relation to access to CF program and resources.

5.4 Summary and Conclusion

This case study discussed the interaction of CF with livelihoods of CFUG and non-CFUG households in the Ayeyarwady Delta. I summarise the main findings, placing them in the key theme of land resources accessed by villagers, their livelihood strategies including migration, and benefits and outcomes of CF that was established in mangroves.

Based on the findings presented in this case study, I argue that access to land and forests has been an important means of livelihoods of both CFUG and non-CFUG members. The discussion on current use of natural resources indicated that agricultural land resources are vital to the livelihoods of villagers as they are the main sources of food and income in their daily lives. This case study reveals that a vast majority of villagers, including CFUG and non-CFUG households, have not exited from agriculture. As we saw in this chapter, even CFUG members who have community forest land remain reliant on agricultural land for their economic and social advancement. Similarly, access to forests has been an important means of livelihoods of villagers. Nevertheless, following the introduction of the CF program, the poor in the village witnessed strong enclosure and reduced access to forests. This case study highlighted that only CFUG members were beneficiaries of the CF program and access to community forest land remained critical for poor non-CFUG members to improve their livelihoods.

While we see strong links between land resources and livelihoods, this case study also explored other livelihood activities, including migration, to illustrate how these activities differ between CFUG and non-CFUG members. Based on the findings, I argue that household income activities are diversified and diversification of livelihoods offers opportunities to enhance social and economic benefits of both CFUG and non-CFUG households. Insights from this case study indicate that CF plays a significant role in improving livelihoods of CFUG members as it generates income from the sale of forest products. However, non-CFUG households, especially the landless poor, have to choose livelihood options other than agrarian and forestry-based livelihoods. Migration as a livelihood strategy, as I have highlighted in this chapter, interacts with different livelihood activities such as farming, non-farm enterprises, wage labouring and small business. This case study confirms that migration has significant effects, improving livelihoods of villagers.

Regarding the benefits of community forestry, the initial processes of land allocation under the CF program generated unequal outcomes favouring landed people (i.e. CFUG

members). This led to adverse effects, including dispossession from forest land, particularly for the landless poor. The impacts of past injustice still influence the livelihoods of the poor in the village, who remain poor and landless. They do not have their own community forest plot to meet their needs for fuelwood. However, my findings reveal that income generation from selling surplus forest products strongly featured for CFUG members. This is because they own a larger amount of community forest lands due to unequal allocation of community forest plots from the beginning of the CF program. Therefore, the initiation of CF solidified processes of enclosure restricting poor people's access to forests. Additionally, the tenure situation was complex to begin with since the land was originally forest reserve land. The CF program in this study area seems to only support landed households, which could reinforce inequity.

This case study shows a clear trade-off between the effective reforestation of the CF through private management of plots, versus equity in relation to access to CF programs and resources. This case study also highlights the inequality of resource access and claimed property rights from the perspective of non-CFUG members. As described earlier, community forests were established on a combination of degraded rice fields and forest land. Thus, the original owners of the degraded rice fields became CFUG members and landless households had no chance to become members. Additionally, elite capture was observed among CFUG members as wealthier households owned more community forest land than poor households when CF was implemented. Many non-CFUG members, nowadays, hope to apply for membership either by redistribution of land in the existing community forest or trying to create another community forest to reduce intra-community inequality in access to the resource, as they perceive that CF provides benefits and livelihood inputs to user groups more than others. This case study confirms that local elites (mainly better-off CFUG members, see section 5.3.2) control community forests and some non-CFUG members are claiming property rights for resource use through participating in the CF program.

After implementation of the CF program, CFUG members interviewed discussed how forest cover was improving and they could manage their own forest plots effectively. Although CFUG members are authorised to manage the community forest collectively according to the CFI, the community forest area is split into individual plots which allowed CFUG members to operate and manage their own plots. This is an exceptional case and can only be found in the delta case among the three research sites.

In conclusion, CF, in this case study, has created favourable conditions to improve livelihoods of CFUG members. But it has restricted the landless poor's access to forests and non-CFUG members are highly reliant on non-forestry based livelihoods such as agriculture and migration. This case study suggests that the outcomes of improved community forest conditions include income generation opportunities for CFUG members, and that landless poor households in the study villages remain disadvantaged despite the promised outcomes of CF.

Chapter 6 Interactions of Community Forestry with rural livelihoods in the Hilly Zone in southern Shan State

In this case study chapter, I explore how Community Forestry (CF) interacts with livelihoods of people in the Hilly Zone, specifically in southern Shan State. In particular, I examine the role of CF in benefiting the livelihoods of community forest user group (CFUG) members. The first section provides background on the development of CF in the Hilly Zone broadly and emergence of Maing Thauk Community Forestry and Lwai Nyeint Community Forestry in the study area. The second section includes effects of CF on household livelihoods and livelihood strategies in the two CF areas. The third section details household perceptions regarding benefits and management of their community forests in the two study sites. The final section provides a summary and conclusion of this case study chapter, presenting the main argument that CF remains critical for livelihoods of Maing Thauk CFUG members, but Lwin Nyeint CFUG members have access to other more lucrative livelihood options, making CF less important to their livelihoods.

6.1 Background

6.1.1 Shan hill region and Community Forestry in Shan hill region

Shan hill region, also known as Shan Highland, is one of the country's vast mountainous areas. It possesses different types of forests and high biodiversity. The whole region is made up of hill ranges, steep river valleys and an elevated plain, also known as the Shan Plateau. Shan State is largely rural and it comprises various ethnicities. The population of Shan State is over 5.8 million (Department of Population, 2015) and Shan people are one of several ethnic groups that inhabit the area. Other ethnic minorities such as Pa-O, Intha, Lahu, Lisu, Taungyo, Danu, Ta'ang, Ahka and Jinghpaw (Kachin) (Eliot, 1997) also live throughout the Shan hill region. The people in Shan State are largely Buddhists and are mainly engaged in different agricultural patterns such as farming with or without terraces, shifting cultivation and horticulture. The primary economic livelihoods of the ethnic minorities in the area are supported by upland farming (including upland rice, sugarcane, potatoes, garlic, tea) and by fisheries and tomato farming in floating gardens. The Shan hill region is also known for its silver, zinc, lead and ruby mines which are in the northern and eastern areas.

Due to the location and lack of rural development initiatives in the past, public services and physical infrastructure in Shan State are relatively limited. The general state of health

care in Shan hill region is poor as public hospitals lack basic equipment and facilities. Educational opportunities are extremely limited in Shan State, as many areas have been engaged with ethnic minority insurgencies and were beyond central government control. Only about 8 per cent of primary students in Shan State reach high school according to official statistics (CSO, 2009). As Shan State is the largest area (155,800 km^2) in the country, the State is divided into three parts for administrative purposes, namely Shan (South), Shan (North) and Shan (East). Inle Lake, the second largest freshwater lake in Myanmar, is located in southern Shan State, and it is home to many endemic species and migratory birds. Inle Lake is also where the unique leg-rowing[18] Intha people live in floating villages. The lake itself is shallow, but 23 km long and 11 km wide. It is renowned for a number of traditional cultural and livelihood practices, which have also attracted investment for the country's booming tourism industry. Since 2010, tourism has expanded in the region after the political transformation of the country. The beauty of the Lake and its unique biological and cultural diversity attract foreign tourists, and a growing tourism industry also presents opportunities for local people's livelihoods.

In Shan hill region, a diverse range of natural forests such as hill deciduous forest, hill evergreen forest and pine forest support rich biodiversity. However, deforestation rates, particularly in the Inle Lake watershed area, have significantly increased since the mid-19th century, due to overexploitation of forest resources, legal and illegal timber cutting, intrusion of agriculture, shifting cultivation and the development of infrastructure (Sidle et al., 2007 and Furuichi, 2008, cited in IID, 2012). According to Tint and Hla (1991), only 52,089 km^2 of forested land comprised dense canopies and 30,681 km^2 comprised sparse canopies in Shan State in 1989. Therefore, since the early 1990s, the Government of Myanmar has carried out forest restoration in Shan hill region with the aims of conserving water resources and preventing land-slides and soil erosion in hillside areas of the watershed. In this regard, the Forest Department (FD) has focused not only on conserving remnant natural forests, but on establishing plantations in the denuded area together with the local people in Shan State.

In particular, reforestation through planting local species and exotics such as eucalypts has been extensively implemented in the watershed area of Inle Lake, which has rich historic and cultural values, and significant environmental values due to its invaluable ecosystem services and high biodiversity. Since the late 1990s, deforestation and

[18] Intha people row boats while standing on one leg at the back edge of the boat, curling the other leg around a long oar and propelling the boat by rowing with the leg curled around the oar.

unsustainable land use practices have resulted in widespread soil erosion on the mountain ranges near Inle Lake and accelerated sedimentation on the bottom of the Lake. The water surface of the Lake has been reduced from 104 sq miles in 1934 to 63 sq miles in 2007 and water quality has also significantly declined (UNDP, 2012). The whole bed of the Lake has also silted up by about 2 m according to the latest 10 year records (ibid). The Lake's water is now polluted and not suitable for drinking due to the residue of chemical fertilisers and pesticides used in the agricultural sector. In addition, several droughts since 1989 have brought about serious threats to Inle Lake's biodiversity and its ecosystem. All these factors represent major concerns to the local economy, and social, environmental and cultural values. In recognition of an urgent need to regenerate the depleted forest areas in the Inle watershed, afforestation and reforestation activities were implemented by the FD in collaboration with the local community under the Inle Lake Watershed Greening Program in 1999.

After the issuance of Community Forestry Instructions (CFI) in 1995, the United Nations Development Programme (UNDP) commenced a CF project in collaboration with the FD to satisfy the basic needs of local people and environmental conservation in southern Shan State as a part of the Human Development Initiative (HDI) programme. As of 1996, about half of the community forests of the country had been established in Shan hill region and the FD had established 234 CFUGs comprising 10,992 members in Shan State (FD, 2014).

Before 1999, the forested areas around Inle Lake were not under the "Permanent Forest Estate" category. As these forested areas are designated as watershed areas of Inle Lake, there was no commercial or state-supported logging in this area. However, most of these forests were commonly used by local communities for their basic daily needs, and some parts, specifically those adjacent to agricultural lands, were traditionally owned and managed by those farmers to meet the need for fuelwood. In 1999, this forested area in the western part of Inle Lake was designated by FD as "West Inle Protected Public Forest", and that in the eastern part was demarcated as "East Inle Reserved Forest" in 2001 (FD, 2001a).

This case study focuses on two CF areas, namely Maing Thauk Community Forestry (MTCF) and Lwai Nyeint Community Forestry (LNCF), which were implemented in the Inle Lake watershed area in Nyaung Shwe Township. A village-level study was conducted in Nyaung Shwe Township (Figure 6-1), which was targeted for both CFs

initiated by UNDP and FD. In this chapter, livelihoods of the two communities involved in the CF program were comparatively analysed in order to get enough information reflecting the interaction of CF with livelihoods of CFUG members in the hilly region. A key point in choosing two CF areas here is that all villages are engaged in CF and there are no non-CF villages in the study area.

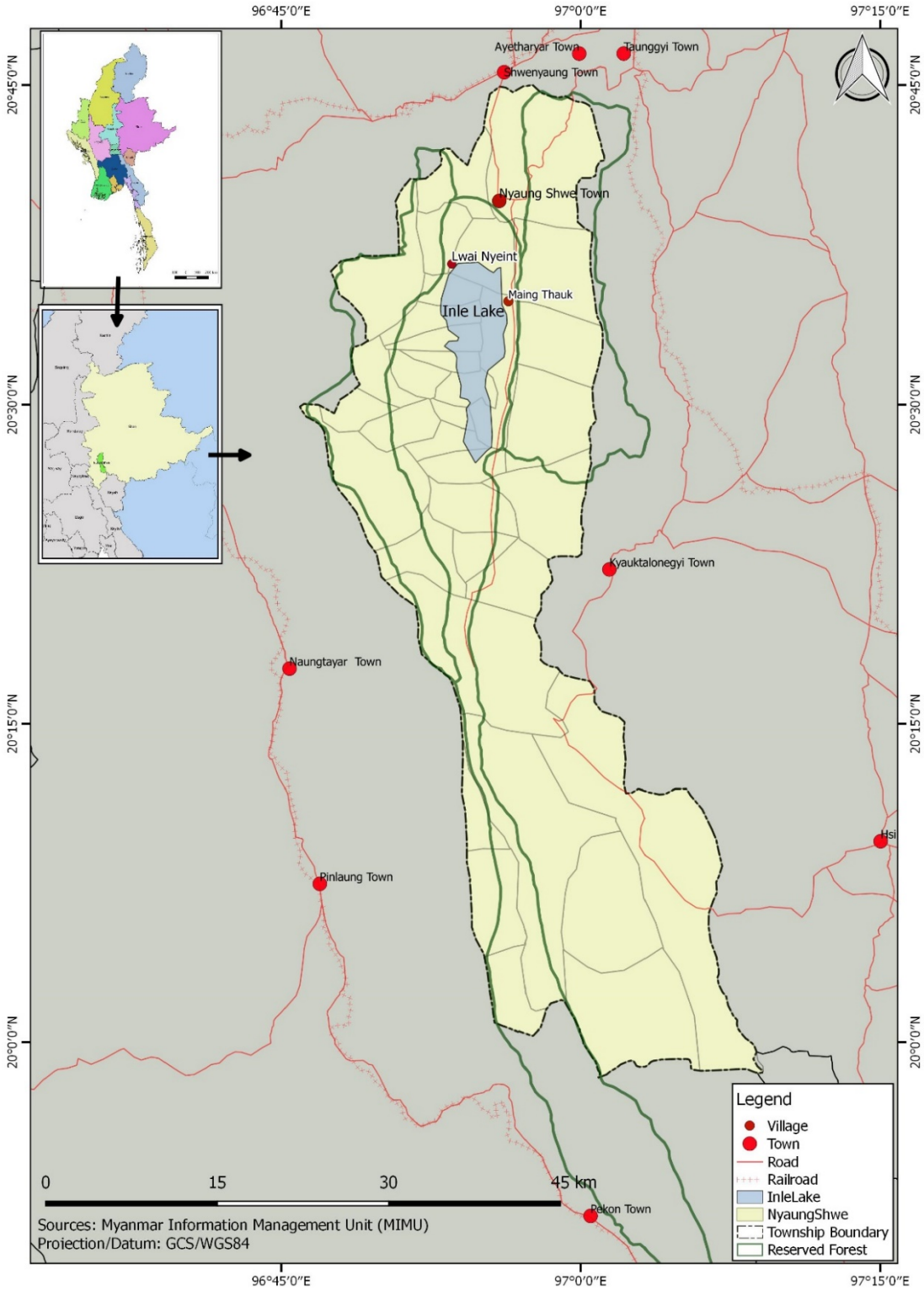

Figure 6-1: Map of Nyaung Shwe Township showing the location of the study area

The total number of households in Maing Thauk CF is 284 and that of Lwai Nyeint CF is 125. In order to get a better understanding of the main livelihoods and forestry-related livelihoods of households and their perceptions on how CF impacts them, 31 sample households from Maing Thauk CF and 25 from Lwai Nyeint CF, 56 households altogether, were randomly selected for household-level interviews, which were carried out during my fieldwork in August and September 2014.

According to the wealth ranking, it was found that wealth ranks ranging from poor, medium to better-off in Maing Thauk CF were 39, 39 and 23 per cent, and 48, 32 and 20 per cent in Lwai Nyeint CF respectively. Some key characteristics of both communities are shown in Table 6-1.

Table 6-1: Key characteristics of Maing Thauk and Lwai Nyeint communities

Characteristics of Communities	**Maing Thauk Community**	**Lwai Nyeint Community**
No. of total households	284	125
No. of sample households	31	25
Wealth group	Poor (39%) Medium (39%) Better-off (23%)	Poor (48%) Medium (32%) Better-off (20%)
Year community forest established	2001	2000
Size of community forest (ha)	506	243

Source: Field survey (2014)

6.1.2 Maing Thauk Community Forestry in East Inle Reserved Forest

Maing Thauk Community Forestry (MTCF) is located in the eastern part of the Inle Lake in the Nyaung Shwe township, Taungyi District, Shan (south) State. It is situated near the Nyaung Shwe – Nan Pan permanent road and lies within the "East Inle Reserved Forest" which was demarcated by the government in 2001 (FD, 2001a). The MTCF was established in the degraded natural forest (hill deciduous forest), and the community forest area is rather extensive, encompassing about 505.85 ha. This MTCF was approved in 2001 and it is one of the oldest and largest CFs in the Nyaung Shwe township. The area consists of degraded natural forest (92 per cent) and plantation forest (8 per cent). The MTCF is managed by four villages, namely Pay Bin Kon village, Taung Zay Bar village, Lay Eain Kon village and Myaung Gyi village.

In 2001, the staff of the Township FD and UNDP contacted the villages and urged them to apply for the CF program. The village heads of Pay Bin Kon and Taung Zay Bar villages organised all residents in their villages to form a CFUG and engage in the CF program. At the village meeting, they formed a user group, comprising 95 members, and elected CFUG committee members. These villagers also decided to encourage people from Lay Eain Kon village to become involved in their CF program, as Lay Eain Kon village is located in an upstream area. Although Lay Eain Kon villagers did not know about the CF program at the time of the development, they engaged in the program eventually after staff from FD and UNDP explained the program. However, residents of the fourth village, Myaung Gyi, were not interested in becoming involved in the CF program at that time. Therefore, MTCF was initiated by only three villages, namely Pay Bin Kon village, Taung Zay Bar village and Lay Eain Kon village in 2001. The Myaung Gyi villagers eventually engaged in the CF program in 2004, because they realised that only members could access the community forest and have use rights to any kinds of benefits of the community forest in accordance with the CFI (focus group discussion, MTCF, August 2014). Thus, at the time of the research, all villages in this sub-region were engaged in CF. Due to the emergence of people's participation in the Maing Thauk CF program, there were no non-CF villages in the area.

FD staff from the township supported the user groups to write the application to register for CF and to prepare the CF management plan, as they recognised that the official procedure (including paperwork) was too difficult for the villagers to prepare alone. The FD officially certified the MTCF in 2001 (FD, 2014). According to the management plan of MTCF, CFUG members identified three reasons behind the establishment of their community forest (FD, 2001b):

- To conserve natural water sources such as natural springs, streams, etc.
- To prevent soil erosion and land-slides by means of conservation of natural forest in hillside areas of the watershed
- To produce forest products such as fuelwood, poles and posts, and NTFPs, by means of conserving the existing natural forest and establishing plantations in the degraded area.

Villagers depended on water sources for drinking and domestic use. Since the conservation of forests for water sources was the most critical issue for the villages, villagers shared the idea that all households in four villages would be included as user group members of Maing Thauk community forest. To achieve the objectives of MTCF,

new silvicultural systems such as conservation of existing natural forest, enrichment plantations and agroforestry systems were adopted by CFUG members, with the support of the FD staff.

Since MTCF had been formed from natural forest stands, silvicultural operations were implemented with 5-year rotations starting from 2002 to harvest the fuelwood. MTCF was managed by a coup system and it was divided into five coups (see Figure 6-2) and operational activities such as planting, weeding and enacting forest fire prevention measures were carried out annually according to the Maing Thauk community forest management plan (FD, 2001b).

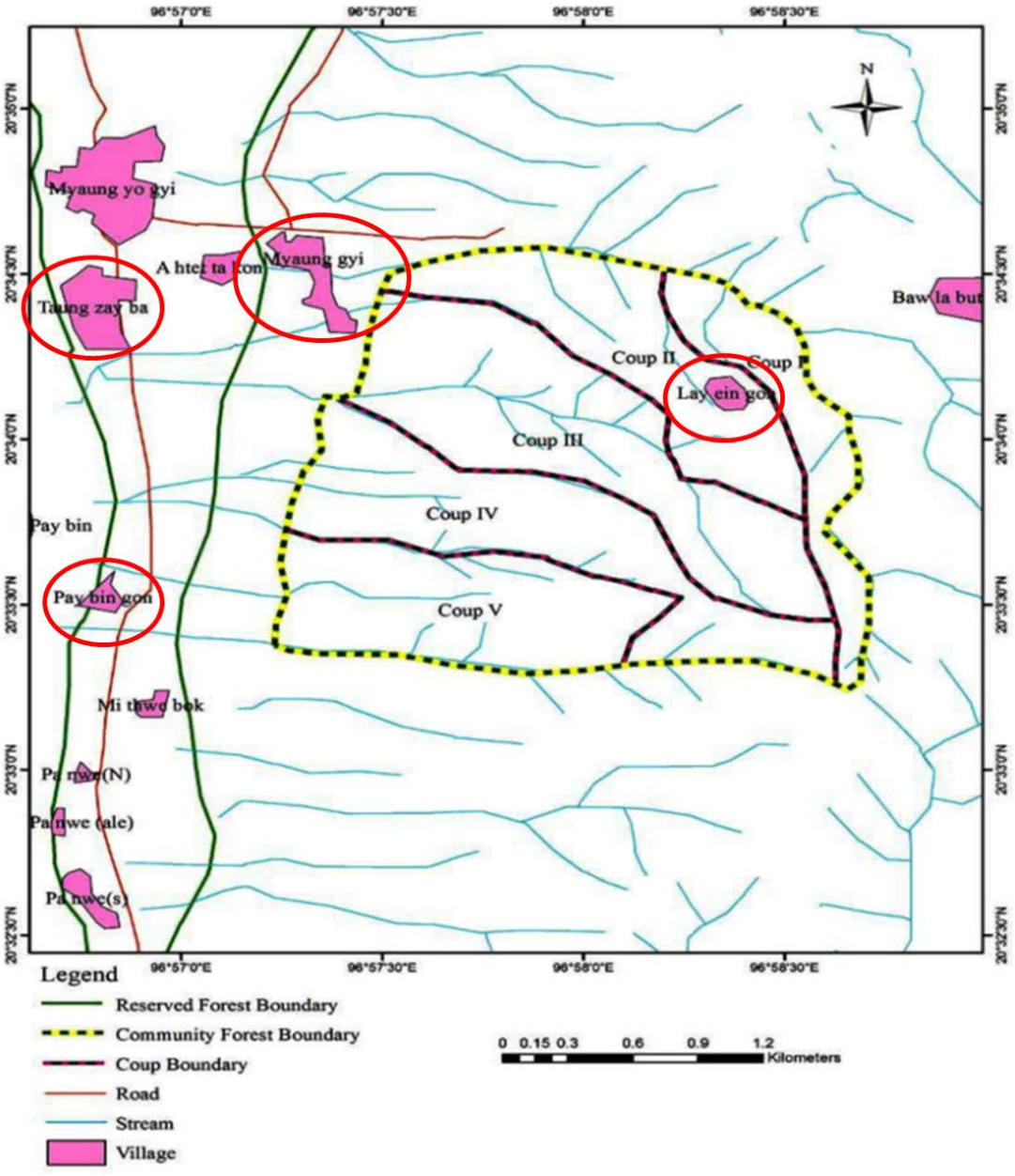

Figure 6-2: Map showing MTCF by coups (villages involved in MTCF are circled)

Respondents reported that people from Myaung Gyi village joined MTCF after 2004. After that, the management system with the 5-coup system was changed into a sub-community forest system because it was difficult to organise the villages to carry out community forest activities. Therefore, the villagers divided their MTCF into four sub-community forests to be managed individually by each village according to an agreement made at a CFUG meeting of villages (see Figure 6-3). Later, the villages separately formed a management committee with at least five members for each CFUG. However, the FD had not yet approved this change at the time of the field interviews. A government official interviewed reported that the process was undergoing review, and the change in the management regime would be approved in the near future (Nyaung Shwe Township FD, August 2014). To date, MTCF is managed by the villagers based on a sub-CF system instead of the coups system which was practised in the past. Some other settlements (see Figure 6-3) beyond the four villages that have been discussed are not involved in MTCF but those villages engage in another CF program in the region. Although MTCF is formed by four villages, I mainly focus on Pay Bin Kon and Myaung Gyi villages in this study; only residents in these villages were interviewed because of time constraints.

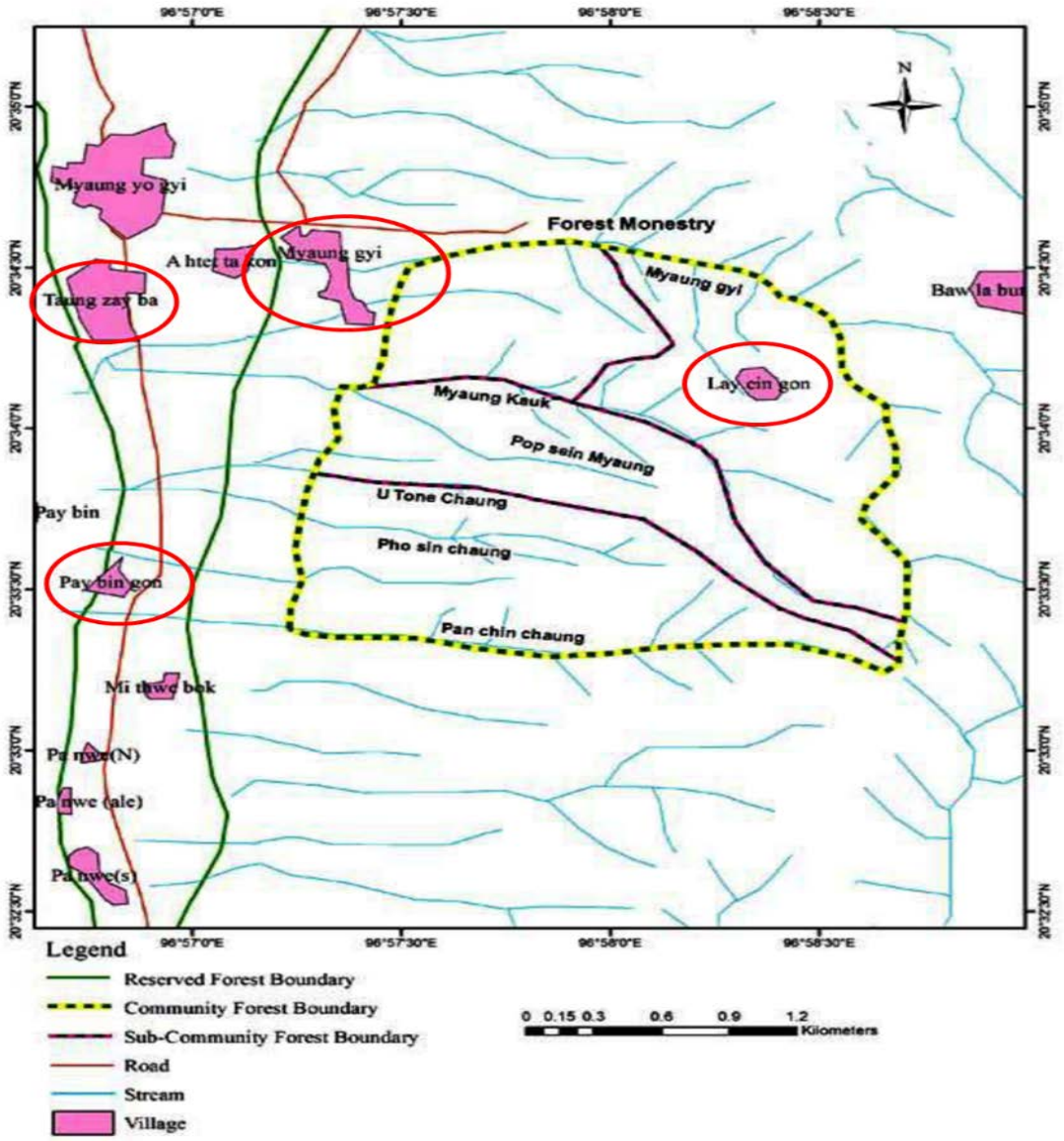

Figure 6-3: Map showing the sub-community forests of MTCF (villages involved in MTCF are circled)

6.1.3 Lwai Nyeint Community Forestry in West Inle Protected Public Forest

Lwai Nyeint Community Forestry (LNCF) is situated in the West Inle Protected Public Forest in Nyaung Shwe Township, Taungyi District in southern Shan State. The LNCF lies in the watershed area of the Inle Lake and the CF area is rather extensive and covers about 243 ha (see Figure 6-4). The LNCF was officially certified by the FD in 2000 (FD, 2014) and the area consists of degraded natural forest (90 per cent) and plantation forest (10 per cent).

Upon the commencement of the UNDP CF project, the UNDP and FD staff organised local people to develop a participatory approach in the CF program. Similar to the MTCF,

the village head of Lwai Nyeint village organised all residents in the village to become involved in the CF program and to be members of the user group. At the village meeting, villagers formed a user group, comprising 90 households, and agreed that all households were willing to become user group members in the LNCF. As a reflection of this concept, the silvicultural operations for the community forest, such as weeding and fire protection, were allocated to one family member from every household until the trees grew to a certain size. In this sense, no villagers had complaints about participating because they had the will and capacity to make such operations a part of their village-wide activities. The other reason for taking part in those operations was that every household in the village had been producing forest products both for subsistence and income and they wanted to avoid conflict over land issues in the future.

The village easily initiated the CF program because the Township FD staff supported the user group in the application procedures, which the villagers were not able to do alone. The CF management plan was also drawn up with the assistance of FD staff in the presence of all CFUG members. In their management plan, CFUG members identified four objectives behind the establishment of their community forest (FD, 2001c):

- To sustainably produce non-timber forest products for local use
- To raise awareness of environmental conservation of the village community
- To organise people's participation in the project with the aim of conserving the natural forest and environment
- To improve the socio-economic status of CFUG members by means of extracting forest products from the natural forest.

Similar to the MTCF, silvicultural systems such as enrichment plantation and agroforestry systems were practised by CFUG members with the support of the FD staff according to their management plan (FD, 2001c).

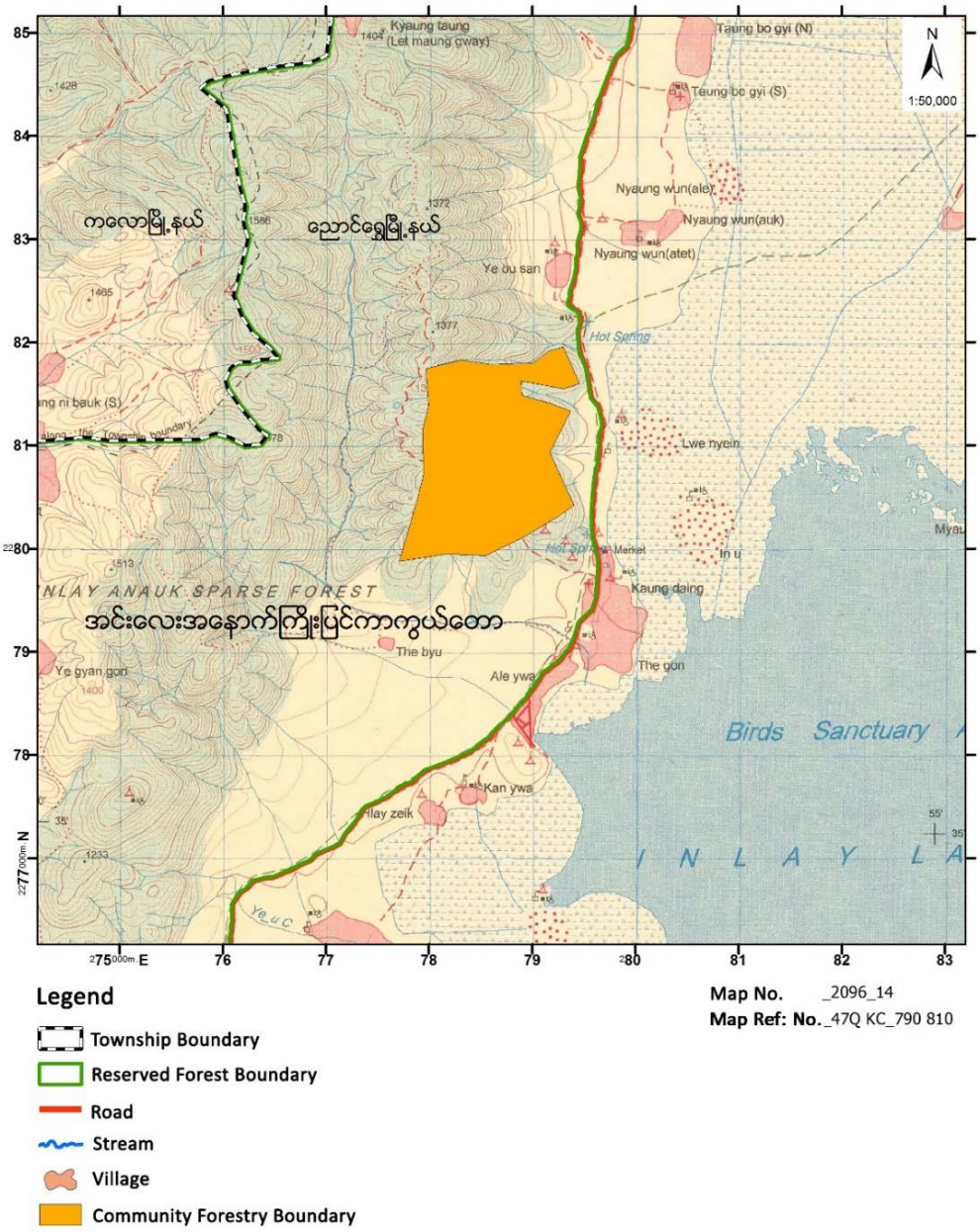

Figure 6-4: Map showing Lwai Nyeint Community Forestry

6.1.4 General household information of the study area

The main livelihood of Maing Thauk CFUG members is upland cultivation from which the major crops are sugarcane, turmeric (*Curcuma longa*) and Malar (*Curcuma petiolata*) and people cultivate upland rice, leek and garlic as minor crops. At the time of the survey, however, some household members within the community were employed in the tourism industry, which has expanded in the region. Inle Lake was nominated as one of nine key national sightseeing sites for the development of tourism by the Myanmar government in 2001 (IID, 2012). The Lake is an ASEAN (Association of Southeast Asian Nations) heritage site, declared in December 2004, as well as being a Protected Area System (PAS)

(MOECAF, 2014). It is increasingly popular as a destination for foreign tourists for its high biodiversity and cultural values. The Lake is also famous as a major destination for Buddhist pilgrims, for both domestic and international visitors (IID, 2012). With the rapid development of tourism, local communities have job opportunities in the hotel zone within the Lake and its fringe areas. It was observed that this shift of livelihood pattern towards the tourism industry affected not only agricultural work but also CF activities. Due to the nature of work in the tourism industry, local people have chosen to migrate out of their villages and no longer contribute their labour to agriculture and forestry-related livelihoods. Maing Thauk CFUG members interviewed highlighted that the growth of tourism is transforming local livelihoods and mobility through labour migration.

General household information on Maing Thauk CFUG members was obtained based on interviews and participant observation. During interviews with Maing Thauk CFUG members, respondents reported that their villages are characterised by farming, since the majority of the villagers are employed in upland agriculture (see section 6.2.2). A total of 31 households were interviewed in Maing Thauk CFUG members, where 48 per cent of the respondents were males and 52 per cent were females. In this village, male-headed households constituted 81 per cent of all households, while the rest were female-headed. The average household size in Maing Thauk CFUG members is 4 which is slightly lower than the regional average (4.7) and national average (4.4).

Through my observations, the basic infrastructure of the villages in the two CF areas is similar and both are of a slightly higher quality than the regional average. Most houses in the area are built up with zinc sheet roofs whereas the poor construct thatched-roofed houses. There is no complex diversity in ethnicity in the villages. Intha is the major ethnic group, with a very few Shan, Danu and Bamar. Respondents said that almost all the residents are Buddhists. There is a monastery located on the middle of the hill in the Maing Thauk community forest and the chief monk plays a key role in religious and other development activities. In Maing Thauk community, monks are influential actors who support village heads in village affairs because they have the capacity to exercise certain influence over the villagers. Since monks are generally accepted as community leaders, all villagers respect and obey the monks. Therefore, government officials always try to organise monks to accomplish development projects, including the CF program. They are of great value in organising the villagers to accomplish a project.

For education, the children in the villages can go to the local State-run high school on the Nyaung Shwe – Nan Pan sealed road. However, there are no health care stations in the study area, and residents access hospital services in Nyaung Shwe town, which is about 11 km away from the villages. There are no daily marketplaces in the villages, and residents buy food and household necessities at the five-day rotating markets around the Inle Lake. For many years, the market place has rotated after five days in one place to another in the given area. Therefore, villagers can make money by selling their agricultural products or some non-timber forest products (NTFPs) collected from the community forest only once in five days. Regarding water resources, the community mainly rely on stream water (i.e. surface run-off) for both drinking and domestic use. The villagers have had access to electricity since 2011. Before electricity was supplied, all residents used fuelwood and charcoal for cooking and used candles for sources of lighting. However, some households that cannot afford the costs of electricity still use fuelwood and charcoal for cooking. Electrical supplied to the study area results in reduced harvest pressure on forest trees. This shows that villagers are still relying on forest resources such as fuelwood and NTFPs for household use or selling them for their livelihoods. Therefore, CF intervention as a pathway is important for villagers to access natural resources. In the case of Lwai Nyeint CFUG members, general household information was gathered from the informants during household interviews and through participant observation. Respondents reported that the majority of villagers are mostly engaged in non-farm related livelihoods such as motor boat transportation and fishing in the Lake rather than agriculture (see section 6.2.3). I observed that the basic infrastructure in Lwai Nyeint village is relatively poor at a local level although the village is easily accessible. Some houses in the village are stilt houses within the Lake and some are built on the shores of the Lake. Similar to Maing Thauk CF areas, Intha is the major ethnic group, a very few Bamar, Danu and Taung-yo are living in the village, and almost all residents are Buddhists.

A total of 25 households out of 125 in Lwai Nyeint CFUG members were interviewed, of which 4 informants were male (16%) and 21 were female (84%). In some cases, this was because households were headed by widows and in other cases, men were working away from the village for wage labour.

In contrast to the Maing Thauk community, the village elders are influential actors who support the village head in village affairs and development activities. Village elders are generally senior male villagers and are the most respected persons in the village. They

are knowledgeable and have leadership experience to solve important village issues. Hence, the village head, with the support of village elders, is able to initiate new groups to implement development activities that relate to the welfare of the villagers. Hence, most respondents reported that the village head had a lead role in their village.

Unlike in Maing Thauk community, Lwai Nyeint community has only a relatively poorly resourced primary school. Similar to the Maing Thauk community, Lwai Nyeint community has no clinic or health care centre and the nearest hospital is in Nyaung Shwe town, which is about 10 km away from the village. There is no daily market place in the village, and all residents go to the five-day rotating markets around Inle Lake. The main water sources for drinking and domestic use for the residents are lake water and dug wells in the monastery. A very few households have installed tube wells at their own expense and they share the water with their neighbours for free. Thus, residents said they have not faced yearly water shortfalls. Lwai Nyeint village has been linked into the national electricity grid since 2013, and every household is entitled to apply for electricity connection. However, respondents said that not all residents could apply for electricity because the utility charges differed between households depending on the assets they possessed. Apart from households that use electricity for cooking and as a source of lighting, other households in the village still rely on fuelwood and charcoal for cooking, and use candles, batteries and kerosene as sources of lighting. Therefore, respondents commented that pressure to harvest forest trees for fuelwood can be reduced by supplying electricity in the village. All of this is important because data show that access to forest resources remains critical to the livelihoods of villagers, and hence CF intervention provides a platform to promote villagers' livelihoods.

Respondents said that floating garden agriculture and fishing are the traditional livelihoods of Lwai Nyeint villagers, but to date, most households earn more income from fishing and non-agricultural related activities such as motor boat transportation (see section 6.2.3). Similar to the Maing Thauk CFUG members, Lwai Nyeint villagers have also engaged in the tourism industry in Inle Lake since 2010. Previous studies indicate that tourism is rapidly growing in Inle Lake and international tourist visits to the Lake increased from 20,000 in 2009–2010 to 110,000 in 2013–2014 (MOHT, 2014). Unlike Maing Thauk community, however, people who own motor boats in Lwai Nyeint village are more keen to operate boat transportation for tourists in Inle Lake rather than working on construction sites in the hotel zone. In addition, Lwai Nyeint village is very close to the famous Khaung Daing natural hot spring, which is a regional tourist attraction. With

these conditions and the rise of tourism in their region, some villagers, including farmers, increasingly engage in tourism businesses, and they have lower engagement in agriculture and forestry.

6.2 Effects of Community Forestry on household livelihoods and livelihood strategies

6.2.1 Situation of land holding

Land holding in this case study refers to agricultural land and community forest land holding by Maing Thauk CFUG members and Lwai Nyeint CFUG members. Agricultural land in this study area includes two types of land use: land use for settled agriculture and land use for floating garden agriculture, which will be discussed in detail in the next section. Respondent households reported that all agricultural lands held by villagers are registered with government with a leasehold (legal tillage right system) right of agricultural lands that were the properties of the families. The findings of this research revealed that 68 per cent of Maing Thauk CFUG members held agricultural land while just 32 per cent of Lwai Nyeint CFUG members owned their agricultural land. The main livelihood of Maing Thauk CFUG members is settled agriculture whereas that of Lwai Nyeint CFUG members is non-agricultural activity. The average size of agricultural land managed by Maing Thauk CFUG members is about 0.8 ha whereas that managed by Lwai Nyeint CFUG members is about 0.25 ha.

Regarding community forest land, all households in the study villages are members of the CF User Group. Survey data revealed that a total of 506 ha of community forest land was managed by Maing Thauk CFUG members whereas a total of 243 ha was managed by Lwai Nyeint CFUG members (see Table 6-1). Both community forest lands are the source of forest products such as fuelwood, medicinal plants, wild food and bamboo, both for household use and income generation for CFUG members.

Overall, agricultural land ownership and the extent of land holding size is higher in Maing Thauk CFUG members than Lwai Nyeint CFUG members. Therefore, it was found that Maing Thauk CFUG members are able to cultivate more land and to produce more food and cash crops than Lwai Nyeint CFUG members. In terms of community forest land ownership, all CFUG members in both study areas have use rights and management rights over their community forest land. In particular, CFUG members who do not have any agricultural land rely on community forest land to a certain extent for their daily needs.

6.2.2 Agricultural resource use in the study area

Information on livelihood strategies pursued by the members of Maing Thauk CFUG and Lwai Nyeint CFUG was gathered based on field observations, key informant interviews and data collected during household interviews. A vast majority of respondents reported that they depend on a combination of livelihood strategies to survive in the study area. Interviews indicated that households shifted their livelihood strategies depending on agricultural land or job opportunities in the region. The most typical livelihood strategies pursued by households in both Maing Thauk and Lwai Nyeint were agricultural intensification and migration. The latter is discussed in detail in section 6.2.5. Agricultural extensification is not typically done nowadays because farmers in the two study sites are not able to expand their agricultural land to increase their overall agricultural production. As the villages are located close to the Inle Lake Wildlife Sanctuary, which was established in 1985, extending cultivable land is prohibited and villagers are only allowed to cultivate existing agricultural land. Therefore, agricultural intensification is the only viable option for increasing agricultural productivity in both study sites. Agricultural intensification is also done by farmers who use the floating gardens (mainly in Lwai Nyeint village) because it is not possible to extend the gardens easily (see below).

With the nature of the study area, agriculture in this case study includes settled agriculture and floating garden agriculture. Interview data show that Maing Thauk CFUG members who own agricultural land practise settled agriculture whereas some members in Lwai Nyeint CFUG practise floating garden agriculture.

According to interviews with Maing Thauk CFUG members, an upstream community, living uphill of their community forest, practised shifting cultivation to grow upland rice and turmeric before 1999. However, such farming practices have been prohibited by the FD since the East Inle Reserved Forest was gazetted in 2001, in order to conserve the Inle Lake watershed area. As the CF program was introduced to the upstream community in 2001, the shifting cultivators have changed their farming practices to settled upland farming around their houses and on the arable land between the community forest and their village. In other words, they were organised to voluntarily shift from agriculture extensification to agriculture intensification, and to participate in the CF program. For the downstream community in MTCF, farmers pursued agricultural intensification to increase agricultural productivity per unit area. They did not receive government assistance, such as small loans that would enhance production, due to unsupportive

agricultural policies[19]. Although most of the farmers are unable to afford fertilisers, machinery and tools to increase productivity per unit area, they use irrigation and other management techniques that enhance production (household interviews, MTCF, August 2014). Therefore, many households commented that they have to pursue agricultural intensification rather than extensification and most CFUG members have not exited from farming as they earn more income from farming than from other sources.

Household interviews with Lwai Nyeint CFUG members revealed that villagers are practising a unique pattern of agriculture, i.e. traditional floating garden agriculture. Floating garden agriculture is a unique feature of Inle Lake and it forms a tourist attraction, as well as being a major source of income for local people. It was first noted in early descriptions of Inle Lake (Annandale, 1918), and started to develop as a significant agricultural sector in the 1960s. The primary crop is tomatoes and other vegetable crops include garlic, onions, long beans, cucumbers and flowers. The floating gardens in Inle Lake have become a nationally significant production area for tomatoes, supplying markets all over the country (Brunse, 2012). Seventy-five per cent of the tomato yield is exported to Yangon and other States and Regions of the country. The tomato farming has occurred in response to high prices, though production costs are also relatively high (IID, 2012).

Making floating gardens (also known as floating islands, and called “Kyun Myaw” in Burmese) in Inle Lake is the traditional practice of the Intha ethnic community, to grow tomatoes and vegetables. Floating gardens are formed in the Inle Lake from coarse grasses, sedges, reeds and other aquatic vegetation, some of which grow submerged while others have floating runners with aerial parts well above the water surface. Intha people are prudent in using floating gardens for hydroponic farming. Black silt from the bottom of the Lake is carried by flat boats and spread over it to the extent that the garden bed does not sink, but remains afloat. Farmers cut off portions of these floating gardens and tow them to the selected sites, and then they are anchored with bamboo poles. The floating gardens thus become a growing medium for planting vegetables and flowers, from which a lot of income is derived (MOECAF, 2014).

Household interviews with Lwai Nyeint CFUG members indicated that the majority of farmers in the village practised floating garden agriculture as the village is near the Lake shore. One of the respondents, a tomato grower, explained how they use floating gardens

[19] In Myanmar, only farmers who grow paddy receive assistance such as small loans from government.

and the practice of floating garden agriculture, which contributes to the diminishing area of the Lake:

> after forming the floating gardens, we can grow tomatoes on them for about 15 years or until the garden beds can float. If the crop productivity decreases, we abandon the old floating gardens along the shores of the Lake to extend arable land. Then we form a new floating garden to grow tomatoes. We usually use chemical fertilisers and pesticides to increase crop productivity to earn more income. (Lwai Nyeint CFUG member, LNCF, September 2014)

Local farmers reported that commodity prices fell in 2011–2012 and it affected local household incomes (see also Jensen and Saw Mon Theint, 2012). The high use of fertilisers and different pesticides, insecticides and fungicides goes far beyond the recommended rate, with little benefit in improved production (see also Butkus and Myint Su, 2001; Brunse, 2012). The management of intensive farming on floating gardens has led to excessive and inefficient use of fertilisers, with serious consequences for the water quality and ecological health of the Lake. In addition, the water surface area of the Lake has experienced shrinkage due to abandoned floating beds at the shores and the expansion of new floating gardens within the Lake. Respondents said that fish populations in the Lake had also declined due to the use of chemicals in floating garden agriculture.

Since the rapid expansion of tomato farming on the floating gardens has created numerous problems, including inappropriate agricultural practices that cause ecological damage to the Inle Lake and create health hazards for farmers and local residents, the government laid down policies in 1992 to reinforce conservation efforts of Inle Lake and its biodiversity values. During interviews, discussion on current use of agricultural practices indicated that expansion of floating gardens within the Lake was prohibited by the government with the objectives of conserving Inle Lake for greater ecological stability. Local farmers are encouraged to develop a system to allow renewal of floating gardens, recycling and replacement of old floating gardens without extending the total area of the gardens (household interviews, LNCF, September 2014).

Overall, Maing Thauk CFUG members mostly engage in settled agriculture to grow sugarcane while Lwai Nyeint CFUG members cultivate tomatoes on floating gardens. The findings revealed that Maing Thauk CFUG members were still mainly dependent on agriculture but Lwai Nyeint CFUG members had turned to seeking other livelihood options due to various problems with the floating gardens as described above.

6.2.3 Livelihood activities and income sources

Based on the interview data in the case of Maing Thauk CFUG members, the most common livelihood activities include agriculture, on-farm or off-farm wage labouring, non-farm employment and forest product collection in the community forest. Table 6-2 shows types of income sources of Maing Thauk CFUG households from the study area. Among the income sources of respondent households, it was found that agriculture was the most widespread source of income, with 23 households out of 31 sampled households engaged. This was followed by wage labouring with 18 households, and non-farm employment with 11 households. In the "wage labouring" category, people are working as casual labourers in the on-farm or off-farm sector on a daily basis. The main livelihood of households who do not have agricultural land is casual labour in agriculture. The "non-farm employment" category in this case study refers to non-agricultural livelihood activity and includes salaried employment in the government or private sectors such as school teachers, hotel staff and salespeople, and remittances from household members in other parts of the country. A few households earn income from an "other" category that includes making cheroots, sewing clothes and renting a cattle cart in the village. Respondents reported that a few households earn some income from collection and sale of forest products such as fuelwood, medicinal plants and edible plants and animals from their community forest.

Table 6-2: Types of income sources of Maing Thauk CFUG households (per cent)

Items	Maing Thauk CFUG (n=31)	
	No. of HHs	%
Agriculture	23	74
Wage labour	18	58
Non-farm employment	11	35
Other income	3	10
Forest product collection	2	6

Source: Field survey (2014)

In the case of Lwai Nyeint CFUG members, survey data shows that the diversity of livelihood activities of respondent households is higher than that of Maing Thauk CFUG members. Household interviews revealed that the most common livelihood activities include non-farm enterprises and fishing, followed by agriculture, wage labouring, livestock rearing and non-farm employment. Table 6-3 shows that non-farm enterprises are the main source of income with 16 out of 25 sampled households engaged in this activity, followed by fishing with 13 households. In this case study, "non-farm enterprise"

means non-agricultural related livelihood activities, including tourism-related activities such as motor boat transportation, home-based shops, trading fish and selling commodities at the market place. With the tourism development in Inle Lake, non-farm enterprises have become the primary income source for Lwai Nyeint CFUG members' livelihoods. This is because their village is located at the near-shore zone of the Inle Lake and villagers who own motor boats can earn income from water transportation for visitors in the Lake. In the "other" category, income sources are spread among selling gold colour foils to domestic visitors to offer them at pagodas, and food to feed seagulls in the Inle Lake. Although Lwai Nyeint villagers have a community forest, respondents reported that CFUG members did not earn income from their community forest.

Table 6-3: Types of income sources of Lwai Nyeint CFUG households (per cent)

Items	**Lwai Nyeint CFUG (n=25)**	
	No. of HHs	**%**
Non-farm enterprise	16	64
Fishing	13	52
Other income	8	32
Agriculture	7	28
Wage labour	7	28
Livestock	6	24
Non-farm employment	3	12

Source: Field survey (2014)

Overall, the findings revealed that diversity of household livelihood activities in Maing Thauk CFUG members was quite limited as compared to Lwai Nyeint CFUG members depending on the biophysical condition of the villages and tourism booming in the region as well. Households in both Maing Thauk and Lwai Nyeint CFUG members engage in more than one livelihood activity to make ends meet. Although both Maing Thauk and Lwai Nyeint villagers have community forests, they were highly reliant on non-forestry related livelihood activity at the time of the study. Some family members in both Maing Thauk and Lwai Nyeint CFUG households have become engaged in the tourism industry rather than in agriculture and fishing. In addition, income from CF does not represent a significant share of household income for Maing Thauk CFUG members, and Lwai Nyeint CFUG members do not appear to earn any cash income from their community forest. This case study confirms that both Maing Thauk and Lwai Nyeint CFUG members have a low level of reliance on forest products from their community forests to earn household income.

6.2.4 Household annual income and expenditures

By sources of income, the results based on household interviews show that there are significant differences across incomes from agriculture, non-farm employment, community forestry and wage labouring in the three wealth groups of Maing Thauk CFUG households (Figure 6-5). Average annual income per household from agriculture and non-farm employment were higher in the better-off and medium groups while the poor group gets a greater share of their annual income per household from forest product collection and farm or non-farm wage labour. The findings revealed that the better-off and medium wealth groups had more agricultural land, and thus they could produce more cash crops than the poor households. The majority of households in the medium and poor groups reported that they mainly relied on non-farm employment rather than agriculture. This might signal even lower reliance on agriculture in the future by villagers. Results show that the better-off households generate approximately USD 711 per household per year through the sale of forest products such as bamboo and medicinal plants from their community forest, while the poor households receive about USD 732 per household per year. Income from collection of forest products represents the third most important income source, for both the poor and better-off households. Income from the community forest does not play an important role for the medium group as they simply have access to other more lucrative livelihood options. But they reported that their community forest provides some contribution to their daily needs. In particular, poor households who do not have agricultural land definitely rely on natural resources, including the community forest.

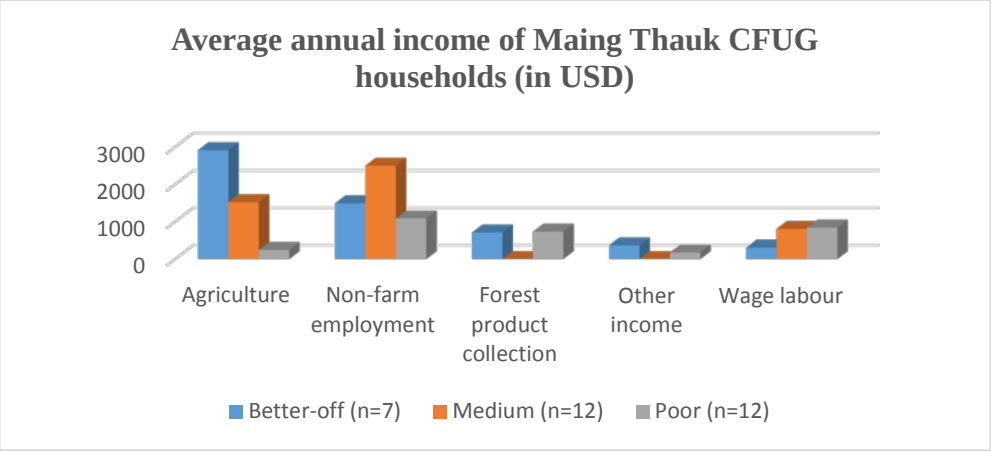

Figure 6-5: Average annual income of Maing Thauk CFUG households by wealth group (in USD)

Source: Field survey (2014)

Based on my field survey, the data showed that, as expected, better-off households have higher incomes than medium and poor households in Maing Thauk CFUG. Table 6-4 shows the average annual income for each wealth class.

Table 6-4: Average annual income by wealth groups of Maing Thauk CFUG members

Wealth groups	**Average income (USD/HH/year)**
Poor (n=12)	1,464
Medium (n=12)	2,276
Better-off (n=7)	3,963

Source: Field survey (2014)

In the case of Lwai Nyeint CFUG members, interviews with respondent households indicated that the average annual income of each wealth stratum varies depending on the different sources of income. Figure 6-5 shows that average annual income per household from non-farm enterprises, fishing and agriculture were found to be higher in the better-off and medium households than the poor households. This is because the former groups possess more boats and fishing gear than the latter group. It was observed that the better-off group was more reliant on non-farm enterprises, fishing and non-farm employment than agriculture. This implies that the livelihood options of the better-off households have shifted from traditional agriculture to non-agricultural based livelihoods. However, the medium households earn more income from non-farm enterprises such as motor boat transportation, home-based shops, trading fish and selling commodities at the market place, agriculture (i.e. floating gardens agriculture) and fishing. According to the survey data, the poor households rely on all income categories described in Figure 6-6. Although better-off and medium households do more fishing than poor households, poor households draw a higher proportion of their household income from fishing (i.e. they depend upon it more) as well as non-farm employment. During the interviews, a number of respondents commented that villagers have had more opportunities to do non-farm work since 2010 as there were opportunities to work as hotel staff or driving motor boats in the tourism industry. However, the findings reveal that income from CF does not figure in any of the wealth groups of Lwai Nyeint CFUG members, although it might provide basic needs of some villagers to some extent.

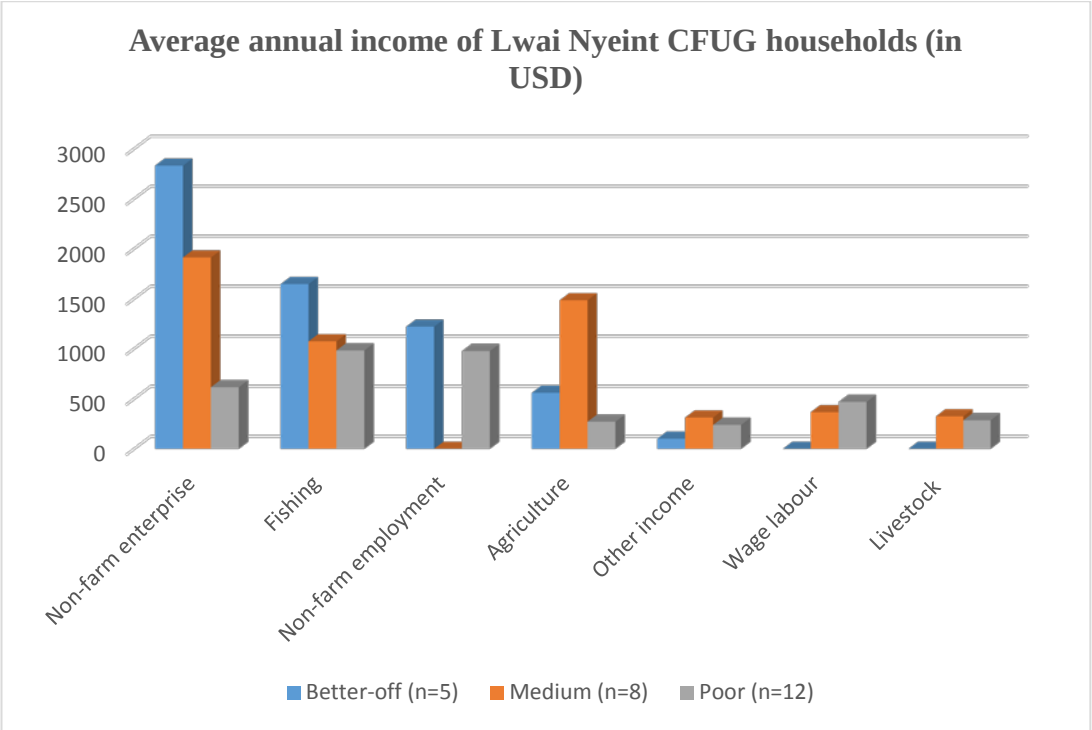

Figure 6-6: Average annual income of Lwai Nyeint CFUG households by wealth group (in USD)

Source: Field survey (2014)

Similar to Maing Thauk CFUG members, field survey data showed that better-off households had higher incomes than medium and poor households in Lwai Nyeint CFUG members. The average annual income for these three wealth classes is shown in Table 6-5.

Table 6-5: Average annual income by wealth classes of Lwin Nyeint CFUG members

Wealth groups	**Average income (USD/HH/year)**
Poor (n=12)	1,398
Medium (n=8)	2,629
Better-off (n=5)	4,022

Source: Field survey (2014)

The most common areas where households of both Maing Thauk CFUG and Lwai Nyeint CFUG spend their income are: investment in agriculture, food, education, medical fees and transportation. These results were consistent amongst the wealth categories although the better-off wealth households reportedly put significantly more income towards investment in agriculture than the medium and poor wealth households. This could be because better-off households have the financial means to produce more cash crops (i.e. sugarcane, maize, tomatoes) than other households. For example, in the case of Lwai

Nyeint CFUG members, tomato growers buy hybrid seeds imported from China, Thailand and other countries in order to grow bigger and better tomatoes. They also need to buy fertilisers and pesticides to protect their crops from insects. Respondents from both Maing Thauk and Lwai Nyeint CFUG households reported that the most costly expenses were food, investment in agriculture, education and medical fees. Although MTCF provides food and income to CFUG households to some extent, it is not sufficient for them. LNCF could not provide any food and income to CFUG households.

Overall, both Maing Thauk and Lwai Nyeint CFUG households had diverse incomes. CFUG households of Maing Thauk and Lwai Nyeint mostly concentrated on agriculture and non-farm livelihoods. A key point is that only CFUG households of Maing Thauk increased their income through the sale of forest products from their community forest but CFUG households of Lwai Nyeint did not earn any income from their community forest. More specifically, the better-off and poor households in Maing Thauk CFUG earned more income from selling forest products than the medium households.

6.2.5 Migration

In this case study, most migration for the members of both Maing Thauk CFUG and Lwai Nyeint CFUG is temporary. Temporary youth migration to work in the cities and tourism industry has been a significant feature in the study area. Household interviews indicated that youth out-migration has emerged since 2010. However, the members of Maing Thauk CFUG are characterised by relatively higher out-migration of family members than those of Lwai Nyeint CFUG according to the household survey.

In the case of MTCF, young educated females left for employment in the government service as primary school teachers and some youth left for employment in Taungyi as salespeople or in hotels near their villages. This is because job opportunities in agriculture are decreasing and more profitable jobs are arising in the region, and increasingly, migration occurs. This migration trend has likely accelerated significantly in recent years, in part due to the booming tourism industry (focus group discussion, MTCF, August 2014). Therefore, many youths in the village are engaged in non-farm jobs instead of working in agriculture and remittances generated from migration are used to change their economic and social status. One female respondent, aged 45, who has six family members said:

> our family have one acre of agricultural land and we grow sugarcanes, which support the income for our livings. But, one of my sons and his wife are working in the hotel on the shores of the Lake. My son is a bell-boy and he is being paid MMK 70,000 monthly and his wife is a staff and she earns MMK 80,000 per month. Their employer provides food and accommodation for the staff, therefore they could send back money for us. They are happy to work in the hotel instead of working on-farm because the farm work is tiresome. Although we lost our family labour on-farm, the income from such kind of non-farm job is way much better to support our livelihoods. (Maing Thauk CFUG member, MTCF, August 2014)

Her account shows the mixed nature of household income, with off-farm income sources being a significant contributor. In the case of LNCF, unlike MTCF, working as government staff or as a public servant is less common but some family members temporarily migrate and work at hotels near their village. Respondents said that the villagers are less confident to go another place to find a job rather than doing their traditional work such as fishing and floating garden agriculture, for their livelihoods. On the other hand, they enjoy running their own businesses such as motor boat driving, home-based shops and fish trading, within the village. However, a drop in key agricultural commodity prices such as tomatoes has recently encouraged some tomato growers to leave for employment as staff in hotels or resorts around Inle Lake. With rapid tourism development in the region since 2010, the villagers mostly depend on non-farm jobs, together with their traditional livelihoods (focus group discussion, LNCF, September 2014). Especially, farmers who want to give up unsustainable agriculture migrate to seek jobs in the hotel zone within the Lake and its fringes.

Embedded in this context, a growing tourism industry facilitates the employment of local people. According to my survey data, about 14 young people among the sample households in Maing Thauk CFUG and about seven young people in Lwai Nyeint CFUG have migrated for work in tourism.

The members of both communities did not migrate permanently or internationally because people in the study villages are of Intha ethnicity; they have been settled around Inle Lake since the time of their ancestors and they stated aspirations to remain in their native place. Although out-migration across the study area is a contemporary development, it has not become a central feature of life in the studied villages, particularly in Lwai Nyeint village. In terms of CF, however, the significant advantage of migration is that households depend less on forest resources for their livelihoods if they have alternative livelihood options to meet their basic needs.

6.3 Household perceptions of Community Forestry

6.3.1 Perceptions of the benefits or risks of Community Forestry

In the case of Maing Thauk CF (MTCF), respondents stated that the CFUG members could harvest forest products for household consumption in accordance with the prescription of their community forest management plan. As mentioned in section 6.1.2, one of the reasons behind the establishment of MTCF was the need to address a water shortage in the downstream community, and the conservation of watershed forest was the most critical issue for Maing Thauk CFUG members. Therefore, the members decided to prohibit the collection of fuelwood from watershed areas of the main streams (Myaung Gyi chaung and Pan Tin chaung), that flow through their community forest, for five years (from 2001 to 2005) during the initial stage of the CF program. During this period, however, the village head granted rights to collect fuelwood to the poorest members for household use as an exceptional case. At present, all Maing Thauk CFUG members can extract forest products such as fuelwood, poles, posts, bamboo, thatch, lacquer, food and medicinal plants for their subsistence consumption and to sell in the local market.

Based on interviews and focus group discussion with Maing Thauk CFUG members, the poor households of Maing Thauk CFUG produce posts and poles under the control of the CF management committee for building their houses. However, better-off and medium households of Maing Thauk CFUG seldom produce any kinds of timber logs and building materials. They purchase building materials from the market rather than extracting these materials from their community forest. A few poor households buy bamboo or thatch from the market to build their houses because they intend to conserve their community forest, rather than extracting forest products.

Besides building materials, Maing Thauk CFUG members collect some products such as fuelwood, medicinal plants and wild foods from the entire community forest for both subsistence use and income. As fuelwood and charcoal are the main energy sources for cooking, members collect fuelwood from the community forest, but some households who have farmlands get fuelwood from wild trees along the fences of their farms. Only the poor households make charcoal on a small scale and sell it in the local market for income. The poor also produce lacquer, which is used for plying boats, from the community forest to supply local demand of Intha people in the region. A majority of Maing Thauk CFUG members collect wild foods such as fruits, buds and leaves of various plants from their community forest. Some poor households usually collect medicinal

plants during the rainy season for income. Findings reveal that MTCF provides benefits in terms of building materials, fuelwood and several kinds of NTFPs to CFUG members, especially to poor members.

Moreover, Maing Thauk CFUG members benefited not only from forest products but also from environmental services such as water supplies from their community forest. According to the Maing Thauk CFUG members, streams flowing through the MTCF provide sustainable fresh water to households from recovering water springs after protection of the watershed area of the community forest for five years. Although there are wells and tube wells downhill from the forest, only some households can use water from the wells for drinking and general use due to the distance from a well to the house. A majority of households mainly depend on surface water from streams for drinking and general purposes. Therefore, results showed that most of Maing Thauk CFUG members benefited in terms of water supplies from their community forest.

In discussion with Maing Thauk CFUG members, no significant negative impacts were pointed out and they noted approvingly that the CF program has largely achieved one of its objectives, i.e. to address the water shortage problem which was a major threat to households' livelihoods. This is why Maing Thauk CFUG members orientate community forest protection for water supply more than production.

In the case of Lwai Nyeint CF (LNCF), interview respondents reported that their community forest provides forest products such as fuelwood, bamboo and thatch for household consumption. Since their community forest was formed from natural forest stands, which were degraded at the initial stage of the CF program, members were told by FD staff not to collect fuelwood or cut trees from their community forest for three years in order to conserve the remaining trees. After three years, Lwai Nyeint CFUG members extracted the remaining planted eucalyptus trees for timber logs with the help of FD staff and built a primary school as a community benefit (Village head, LNCF, September 2014). In addition, fuelwood was equally distributed to all members three times by the CF management committee with the assistance of Township FD staff.

Similarly in the case of MTCF, Lwai Nyeint CFUG members gain household benefits contributed by their community forest in collecting forest products to support their daily needs. However, the poorest households including widows, spinsters and aged persons are specially allowed to collect fuelwood for household use and prohibited from selling in the local market as they have been identified as especially disadvantaged groups within

the community (focus group discussion, LNCF, September 2014). As a community use, in addition, Lwai Nyeint CFUG members agree to use fuelwood from their community forest for religious ceremonies and festivals at the monastery every year. Depending on the forest condition, which will be discussed in detail in the next section, Lwai Nyeint CFUG members receive no significant benefit from harvesting wild food and medicinal plants, unlike in the case of MTCF.

Despite the common features of both MTCF and LNCF in terms of benefits from forest products, differences were found in the environmental benefits of CFUG members, depending on the area. During the interviews, no environmental benefits from their CF were widely reported by Lwai Nyeint CFUG members, whereas Maing Thauk CFUG members reported that they had received improved water supplies as a result of conserving their community forest. Moreover, no significant negative impacts except illegal extraction by outsiders in the community forest were found in the case of LNCF. Illegal cutting is a common feature of both MTCF and LNCF in this case study. Overall, CFUG members' benefits contributed by the community forests are considerably different between the MTCF and the LNCF. Findings reveal that MTCF provides a wide range of forest products and environmental services for individual and community benefit whereas LNCF provides only a certain amount of forest products to its members and community because their community forest condition is comparatively worse than MTCF. The community forest condition and illegal cutting will be discussed in detail in the next section.

6.3.2 Perceptions of households on Community Forestry

In this section, the perceptions of CFUG members of both MTCF and LNCF in the research sites concerning community forest condition and management will be discussed.

In MTCF, respondents said their community forest condition had improved due to gradually decreasing the production rate of fuelwood and charcoal for cooking since 2010, as local people had access to electricity (see section 6.1.4). According to Maing Thauk CFUG members, the better-off and medium households are now using electricity and hence the amount of fuelwood and charcoal can be reduced in their daily lives. However, some households still need to reserve fuelwood because electrical supplies are sometimes cut off while cooking. During focus group discussion, all Maing Thauk CFUG members perceived that the remnant trees in their community forest had been growing well and some planted trees would not survive due to forest fires during the dry season.

Although the Township FD distributes seedlings to members free of charge, members' interest in planting trees is less due to difficult growth of trees on the rocky and stony soil. Therefore, the Maing Thauk CFUG members are willing to preserve the natural forest rather than establishing forest plantations. Besides, the labour requirement for plantations is a major factor taken into account.

In the case of LNCF, respondents commented that their community forest condition was found to be slightly improved because, while remnant trees are scarce, there has been natural regeneration. During the focus group discussion, Lwai Nyeint CFUG members stated that fuelwood consumption had significantly decreased due to the availability of electricity in their village since 2013. Such factors can be the solution to improving community forest condition by reducing the harvest of fuelwood. At the time of the study, some wildlife was present such as rabbits and wildcats, but overall the biodiversity was poor in their community forest (focus group discussion, LNCF, September 2014). Overall, this case study shows that CFUG members of both MTCF and LNCF, except the poor members, reduced their use of fuelwood as a source of energy after their villages were connected to electricity in the two study sites. Although the poor in both CF areas continue to use fuelwood for energy, this case study highlights that fuelwood consumption could be reduced if all villagers were able to connect their households to electricity. This provides a platform to promote opportunities for conserving community forests.

In terms of forest management, all Maing Thauk CFUG members intend to conserve and manage their community forest in order to get sustainable water supplies, to produce sustainable forest products and to reinforce efforts in the maintenance of Inle Lake and its watershed area for the long term. In this regard, Maing Thauk CFUG members have adopted the selection felling method suggested by FD staff for harvesting fuelwood (focus group discussion, MTCF, August 2014). When they cut one tree for fuelwood, they must leave two trees with better, straight stems. In this way, the members conserve their community forest, allowing subsistence use of fuelwood and expecting to use poles and posts for building materials in the future. Maing Thauk CFUG members perceived that their community forest management had resulted in more efficient use of forest resources while conserving and protecting trees in the community forest.

Respondents of LNCF indicated that illegal extraction was occurring through their community forest, although the situation had improved slightly. Local people from

neighbouring villages cut trees and bamboo in their community forest. The Lwai Nyeint CFUG members address such problems and conflict over illegal cutting with the assistance of FD staff. They need support from the FD to protect their trees to grow large enough to be used for timber in the future. They said that they want to strengthen their institution to conserve and manage sustainably in order to achieve the objectives of CF. Respondents reported that most Lwai Nyeint CFUG members are much more interested in earning money from the tourism industry and other non-forestry related livelihood activities. In other words, they do not rely on their community forest for income generation to support their livelihoods, and all CFUG members intend to protect their community forest in line with their objective in establishing it. Overall, Lwai Nyeint CFUG members are not interested in CF to date and they want to protect and manage their community forest with FD support.

To sum up, the condition of the Maing Thauk community forest is better than that of the Lwai Nyeint community forest and it provides more forest products and environmental benefits to its CFUG members than in Lwai Nyeint. Maing Thauk CFUG members expressed greater interest in conserving and managing their community forest for water supplies than Lwai Nyeint CFUG members, who were more interested in non-forestry based livelihoods.

6.4 Summary and Conclusion

In this case study chapter, I show that CF has impacted livelihoods of villagers in two CF areas, Maing Thauk CF and Lwai Nyeint CF, in the Hilly Zone. However, livelihoods are changing with the growth of tourism, access to land resources, and migration.

It has already been highlighted that both Maing Thauk and Lwai Nyeint CFUG members combined different on- and off-farm activities. It seems that diversity in household income activities offers improvement of livelihoods in both groups. Diversity of income sources is the norm in rural livelihoods (Barrett et al., 2001; Sick, 2014) as this case study also confirms. In both Maing Thauk and Lwai Nyeint communities, we can see that there are different possible combinations or changing livelihoods among the villagers since the tourism industry started booming in the region in 2010. In this case study, the findings provide some support for the argument that agriculture has become less important to both groups of CFUG members. However, based on this case study, I argue that agriculture remains critical for Maing Thauk CFUG members to improve their livelihoods. Lwai Nyeint CFUG members also have a strong reliance on agriculture, even though tourism

development often takes precedence over other livelihood activities. This case study confirms that CFUG members are likely to shift their livelihoods with rapid tourism growth because family members in households can enjoy higher incomes from jobs in the tourism industry.

The case study suggests that access to land resources remains critical to livelihoods of both Maing Thauk and Lwai Nyeint CFUG members. As we saw in section 6.2.1, Maing Thauk CFUG members have greater agricultural land holdings than Lwai Nyeint CFUG members as Maing Thauk CFUG members mainly practise settled agriculture whereas Lwai Nyeint CFUG members mostly practise floating gardens agriculture, which is their traditional practice. Access to land facilitates CFUG members' access to human, social and financial capitals and this is more prominent in Maing Thauk CFUG members. In this case study, the significance of access to land in Maing Thauk community suggests that farming is closely tied to the ways villagers make their livelihoods. Although the links between farming and improvement of livelihoods have become weak in Lwai Nyeint community, the case here suggests that access to land and farming has complemented other livelihood activities to enhance livelihoods.

Out-migration of both Maing Thauk and Lwai Nyeint CFUG members for non-farm employment in the tourism industry is becoming a common pattern in this study area. Out-migration has had significant effects, boosting rural incomes in many ways. It is important to highlight that CFUG members have diversified their livelihood strategies by combining migration with other farm and non-farm pursuits. These seemingly positive changes, mainly facilitated by migration, support the argument that rural prosperity emanates from non-farm employment and other livelihood options (Adhikari and Hobley, 2013). On the other hand, I have also found evidence to support the argument that migration introduces changes to the household and family unit, with members working outside of home villages, and a relative impact on agriculture and CF due to decreasing family labour. Currently, migration does not occur on a large scale in the study villages, but the trend is increasing. Livelihood circumstances in home villages encourage people to leave, and this can overshadow CF impacts and reduce its importance. On the whole, this common pattern for providing livelihoods of local people affects their traditional agriculture and fishing as well as need for forest resources.

Given the benefits of the CF program, the findings of this case study reveal that benefits derived from Maing Thauk community forest are more significant than those from Lwai

Nyeint community forest. Maing Thauk CFUG members perceived that their community forest provided forest products and ecological benefits, while Lwai Nyeint CFUG members had lower reliance on their community forest in terms of collecting forest products as well as ecological benefits. As we saw in Maing Thauk community, the members specifically addressed the water shortage, which was a main problem for the community, by conserving the watershed area of the main streams flowing through their community forest. Although there may be replenishment of groundwater naturally, it is hard for villagers to know about that. Hence, it is an exception in this place.

In terms of perceptions of villagers on CF, Maing Thauk CFUG members indicated that their forest condition had improved with good vegetation cover, and thus, they desire to sustain achievements of their CF by actively participating and managing it in line with their management plan. Moreover, all members believe that the community forest is an integral part of their livelihoods because the forest plays an important role in meeting their basic needs. In contrast with Maing Thauk, Lwai Nyeint CFUG members perceived that their forest condition was less improved and biodiversity was poor. Findings revealed that Lwai Nyeint CFUG members could simply enjoy higher incomes from moving into new livelihood activities.

In conclusion, livelihoods of Maing Thauk CFUG members have interacted with CF since the CF program came into effect by providing their daily needs, specifically by solving the water shortage problem by conserving watershed areas. Lwai Nyeint CFUG members simply have access to other more lucrative livelihood options compared to Maing Thauk CFUG members, such as high-value vegetable production and tourism sector labour opportunities.

Chapter 7 Key findings of cross-case analysis

This chapter compares the major findings of the three case studies from three of Myanmar's distinct ecological zones, namely the Dry Zone, the Delta Zone and the Hilly Zone in Myanmar. In this chapter, I interpret and compare key findings to advance my argument that Community Forestry (CF) in Myanmar has prioritised different outcomes, depending on donors (i.e. the external financial supporters). These differences, together with the distinct environments and livelihood transitions present at each site, have produced different outcomes at the three sites. My interpretation of the results speaks to the interaction of CF with local livelihoods at the three study sites, which together represent a range of diverse conditions in which CF is being undertaken in Myanmar.

7.1 Revisiting the implementation of Community Forestry in study areas

Community forests are now well established in the different localities and they have integrated with the livelihoods of rural communities in different ways and to different extents. The overall principles in the Community Forestry Instructions (CFI) are to fulfil basic livelihood needs for fuelwood, farm implements and small timbers for local communities and to reforest degraded forest lands (Woods and Canby, 2011). To date, however, CF has evolved in different ways, depending on the implementation process and donors.

As described in Table 7-1, at the initial stage of CF implementation, duration of land lease for the establishment of community forest, and resource endowments, were similar across the three CF zones. Differences were found across the three sites in relation to the type of community forest (i.e. CF plantation, CF formed from natural forest, or mix of plantation and natural forest), the objectives of the CF, the formation of CFUGs, and the management regimes of CFs. The table below shows that the Delta Zone site had some important differences in relation to CFUG formation and management. These are discussed in turn below.

Table 7-1: Features of CF across the case study sites

Key features	Case study		
	Dry zone	**Delta zone**	**Hilly Zone**
Institutional CF arrangement	Community lease for 30 years, but with possibility of extension	Community lease for 30 years, but with possibility of extension	Community lease for 30 years, but with possibility of extension
Initial donors	JICA	JICA	UNDP
Type of community forest	CF Plantation (*Acacia catechu, Azadirachta indica, Zizyphus mauritiana*)	Mix of plantation and natural forest (*Avicenia officinalis, Sonneratia apetala*)	CFs have been formed from natural forest
Main objectives of CF	To produce forest products, mainly fuelwood	To produce forest products and increase household income from the sale of these products	To protect ecosystem services and sustainable use of forest products
CFUG formation	All households in the village are CFUG members	Self-selection within village to form CFUG	All households in the village are CFUG members
Management regime of community forest	Collectively managed by CFUG	Collectively managed by CFUG on individually owned plots	Collectively managed by CFUG

Source: Field survey (2014)

7.1.1 Similarities of Community Forestry implementation in the three zones

When CF is implemented in Reserved Forests and Protected Public Forests (Permanent Forest Estate – PFE) the Forest Department (FD) under the Ministry of Natural Resources and Environmental Conservation (MONREC) plays a central role. However, when CFs are located in unclassified forests, the areas fall under the jurisdiction of the Ministry of Agriculture and Irrigation (MOAI) or General Administration Department (GAD) of the Ministry of Home Affairs. Usually, CF establishment under MONREC is much faster than under the MOAI and GAD. There are several steps and procedures to pass through with the GAD, for example sometimes it takes three to four years to get CF certificates. This is because of the absence of a comprehensive National Land Use Policy in Myanmar, which is still in the draft form (Government official interview, Yangon, December 2015).

Regardless of the land classification and agency involved, CFUGs gain a 30-year official lease to co-manage forests with the FD under the CFI. The CFI was promulgated as a way

of promoting/establishing a "Participatory Forestry Approach", one of six imperatives stated in the Myanmar Forest Policy (1995). However, CFI was developed as an instruction rather than a law because the legislators, at that time, thought that the nature of CF was not distinct from plantation forestry, which was already covered in the existing forest law. In practice, CF is found to be a variant form of participatory forest management rather than plantation forestry. Being an instruction issued by FD rather than a law, the CFI is not strong enough to deal with land tenure issues such as customary land use with local communities and indigenous people. This is a significant reason why CF has not progressed as rapidly as hoped in Myanmar (Government official interview, Yangon, December 2015). Macqueen (2012) confirms that CFUGs in Myanmar still rely on a very insecure CFI that carries little weight in law. If the tenure is not clear or secure in management and use rights, the state can easily take back community forests and control over forest management or reallocate the lands for other use. In this event, the management of community forests by villagers will be undermined, affecting local trust in CF and local people's willingness to invest time in it.

Obtaining a CF certificate, therefore, does not provide certainty of the duration of land lease, and most CFUG members, apart from a few management committee members, do not understand their rights as they lack legal literacy. In addition, even local FD staff often had a weak understanding of CF concepts, roles and responsibilities, and local people's rights, in some cases in Myanmar. This issue has been observed more broadly in the Southeast Asian region, where field staff who are implementing CF from government and NGOs have often been unaware of local rights and responsibilities (RECOFTC, 2007). On the other hand, national policy-makers recognise that having supportive policies and laws for CF can aid in effective implementation of the CF system for local forest users (ibid). Hence, the authorities under MONREC are trying to upgrade CFI to a law to identify legal rights, obligations and powers that are not clear to local participants (Government official interview, Nay Pyi Taw, December 2015).

Internationally, there is broad recognition that security of tenure is a prerequisite to improving forest conditions and the livelihoods of rural people. This is evident in countries such as Nepal, where forest management rights have been transferred to rural communities (Larson et al., 2010), and in countries such as in China and Vietnam, where significant forest management rights have been granted to individual households (Xu et al., 2010; Nguyen et al., 2008). In the three sites, a broad bundle of rights (elaborated by Schlager and Ostrom, 1992) had been transferred to the community forest user groups.

CFUG members in my cases held five types of rights: access, use, management, exclusion and alienation rights. They are not permitted to rent out or sell the community forest lands. However, CFUG members in all cases have rights to transfer the community forest land to his/her descendants in the form of inheritance (see Appendix 1). In this regard, granting secure use and management rights through tenure reforms to CFUG members represents a necessary step for improving forest management and consequently for enhancing the livelihoods of CFUG members. As we saw in Chapter 5, CFUG members in the Delta Zone were able to manage their individually owned community forest plots effectively, and to improve their livelihoods from the sale of forest products.

Insights from this research support the view that the initial resource endowment plays an important role in the CF program. Regarding the initial resource endowment, there are two key factors that have shaped the outcomes of the CF program: 1) the quality of forest allocated to the rural community; and 2) the area of the community forest. Mahanty et al. (2009) argue that the quality of forests determines what resources are immediately available, and the nature and extent of investments that are required to achieve a productive resource base. In the early stage of the implementation of CF in Asia, it was commonly observed that most forest land transferred to local people was poorly stocked or totally barren land (Nguyen et al., 2008). Enters et al. (2009) point out that some countries, such as Nepal and the Philippines, allocate some higher value forest resources for CF, but more often CF focuses on degraded forests. Building on the case from Myanmar, I showed that community forests were similarly established on barren lands in the Dry Zone and degraded forest lands in the Delta Zone and the Hilly Zone. The recent findings of Tint et al. (2011) also demonstrate that most of the forest areas targeted for CF in Myanmar are in a relatively degraded condition or have no trees at all. This presents a dilemma. The community wishes to secure access to productive forests for CF so that they can immediately use forest products to obtain livelihood benefits. However, in the study sites, communities often argue that the low quality of forests for CF are too much burden for them and they find it takes a long time for the forest to grow or regenerate, and to be able to extract forest products. In the Dry Zone case, for example, the CF established on barren land has resulted in a poorly stocked forest contributes only a very small portion of livelihood needs. On the other hand, the government remains reluctant to allocate quality forests for CF, as they are afraid of reckless exploitation and poor management by communities. The predominant focus on degraded lands originates, to some extent, from a lack of trust in communities' capacity to effectively manage higher value forests,

as well as government interests in maintaining a stake in valuable forest resources (RECOFTC, 2007; Gerrard, 2007).

In respect to the size of community forests, the community forest in the Dry Zone is relatively small compared to the numbers of households in the village and their forest product demands. Usually, community forest products are collected in small quantities and are insufficient to meet the needs of each household, particularly when the CF belongs to all households in the village, which is true in most of Myanmar. For example, in the Dry Zone case, the community forest of 15 ha is used by 167 households. The forest products, mainly fuelwood, extracted from the community forest are not enough for the community's daily needs, driving them to use crop residues from their farms or other sources, such as trees planted within farm boundaries. In contrast, community forests in the Hilly Zone case are moderately large in terms of forest area compared to the numbers of households (as seen in Chapter 6). However, the community forests in the Hilly Zone were established with the main aim of protecting the watershed area of Inle Lake. Accordingly, CFUG members prioritised conserving their community forests rather than using forest products. Community forests in the Delta Zone case are different. The CFUG members individually own their CF plots in various sizes under the CF scheme. In this regard, the forest products are allocated for household use and the members earn money from the sale of products.

In this way, the initial resource endowment, such as quality and size of forest, shapes the availability of forest products and the extent to which these are integrated into local livelihoods. Mahanty et al. (2009) suggest that unless governments have the political will to transfer valuable forests, rural communities will not get substantial benefits from CF. Furthermore, the benefit flow is affected by the size of the forest area, and the number of households involved in the user group. Without addressing these constraints, the potential benefits that can be returned to communities will remain limited (ibid).

7.1.2 Differences in Community Forestry implementation in the three zones

In addition to the shared features discussed above, differences were found in CF implementation depending on the zones. The first difference was found in the extent of participation by villagers to form CFUGs, and management regimes in CF at the village level. As we saw in the Dry Zone and the Hilly Zone, CFUG consists of all households in the village. Although CFI focuses on a self-selection process in formation of CFUGs, in practice all households joined the CFUG in such cases because they desired to share

benefits equally and to avoid conflicts between members in relation to resource use. This finding is supported by a recent study in Myanmar by Okamoto (2014) since local people, in Okamoto's study, perceive the CF program as a village-wide activity and products from the community forest are used for community purposes, benefiting every villager almost equally. In contrast, in the Delta Zone, not all villagers were involved in CFUG as in the other two cases. Only some households formed the CFUG, and therefore, there were variations in benefits flowing from CF to each member. Based on the cases in the three different zones, this thesis can draw an insight that a CF program in which the whole village is involved (see Chapters 4 and 6) contributes community benefits rather than household benefits whereas a CF program in which some households are involved (see Chapter 5) contributes household benefits rather than community benefits. Although Tint et al. (2011) found that collective management and protection of community forest areas split into individually owned plots seems to prove more efficient and effective in managing community forests, there are equity risks with this approach (see below). Yet, in line with their findings, the community forest area in the Delta Zone was split into individual plots at the outset, and legally allocated to individual households, allowing them to earn income from forest resources and so that the area could be managed more effectively.

The second difference involves the objectives of CF. In the case of the Dry Zone, CFUG members established the CF plantation primarily in order to produce fuelwood, and the members manage their community forest collectively. However, CFUG members in the Hilly Zone formed their community forests from natural forest stands and collectively manage them to protect their CF for ecosystem services. In contrast, CFs in the Delta zone are a mix of plantation and natural forest, and community forest areas are split into individual plots and formally allocated to CFUG members to manage their plots in order to get economic return from CF. Basically, those who had pre-existing informal claims to that land maintained those claims in this case. Insights from this research suggest that different kinds of CFs with different objectives and management regimes turn out different results regarding livelihoods of villagers, species planted, and the condition of forests.

Revisiting the principles of CFI, the overarching objectives of the CF program are to fulfil the basic needs of local communities and to reforest degraded areas. At the time of the research, CFUG members in the Delta case had started thinking that they could generate substantial income from the community forests and aspired for CF to improve their

livelihoods and tackle food insecurity. Therefore, they wanted to produce high-value timber from their community forests rather than low-value poles. Increasing the potential for timber supply from community forests has interested local investors in community forests for commercial production. Therefore, the objectives of the local communities for implementation of CF seem to be changing over time (Executive Director, Land Core Group, Yangon, December 2015), and will be an issue for CF programs to address in the future.

The differences between household and village-level management of CF deserve further comment. As noted earlier, although community forest management should be collective under CFI, in practice FD recognised households' individual claims for land use rights in the study area based on instructions of the state (see Chapter 5). This contrasts with village-level management in the Dry Zone and the Hilly Zone. Although the CF area in the Dry Zone case was providing some fuelwood to CFUG members and the Hilly Zone CF case showed improved forest condition, the greatest reforestation gains were seen in the Delta Zone case wherein CFUG members increased household incomes by managing community forest plots, and forest condition has improved. Yet the evaluation of CF effectiveness is more complex than this suggests. Pagdee et al. (2006) point out that determining the effectiveness of CF needs to consider several key issues at the same time, in line with the livelihood and environmental goals of CF, as well as other goals related to governance that may not always be explicit. For example, the primary policy objectives may relate to improving livelihoods of the community and ensuring that forests are managed sustainably, while part of the rationale of implementing CF may be to support decentralisation as a means to reverse deforestation (ibid). Nevertheless, most observers agree that community-based forestry aims to deliver two key outcomes: improved forest condition and enhanced livelihoods of those managing the forests. This thesis provides evidence to support this argument: in the Delta Zone particularly, CFUG members have had significant effects, improving livelihoods and forest condition, but this has come with the exclusion of forest access for non-CFUG members as I discuss below.

7.1.3 Donor engagement in Community Forestry

At all three sites, donor agencies strongly supported the CF program by providing initial resources, such as project costs and in-kind materials, from the start. One of the weaknesses of CF implementation in the study areas is that CFs have emerged as a result of project-driven activities, reflecting donor priorities at each site. As we saw in Chapter

6, donors such as UNDP prioritised rural development and food security but did not emphasise CF activities. The other donor, JICA, prioritised participatory reforestation through CF, as we saw in Chapters 4 and 5. Donor agencies, for example UNDP, that may not have any obvious connection to forestry may either help or harm the program. Therefore, if CF initiatives are largely externally driven by donor agencies, then the initiatives are unlikely to succeed as the bulk of decisions regarding CF are often made by the donors. For example, if the donor agency is concerned about the welfare of local people, this may become the focus of the project, whether or not it is the first priority for the local people.

Across the board, a strong initial reliance on donor agencies as well as FD raises questions about the longer-term sustainability of the CFUGs. Across the three sites, CF was practised in line with the different approaches of the main donors from the outset. These shaped the different objectives of community forests at each study site, their impact on the institutionalisation of CFUGs and the success of CFUGs (Government official interview, Nay Pyi Taw, December 2015). In addition, the willingness of local communities to participate in CF was unknown or unclear in all three cases because CFs at all these sites emerged from externally-induced project-driven decisions rather than villager-motivated initiatives (i.e. self-initiated CFUGs) elsewhere in Mandalay Region and Ayeyarwady Region in Myanmar (Chairman, Advancing Life and Regenerating Motherland (ALARM), Yangon, December 2015). In fact, local communities in the study areas adopted the CF program because projects fully provided start-up financial capital for them and it could be said that they are project-driven and not community-driven CFs. Thus, donor priorities and approaches have influenced the success of CF and sustainability of CFUGs in all three cases. In addition, there is no proper monitoring and evaluation system or technical backstopping beyond the project period. Because of this, CFUG members seemingly become less interested in the CF program after donor support stopped. As this has not been well covered in the literature, this thesis draws new insights about the links between donor engagement, CF trajectory and potential challenges to the sustainability of CFUG activities in the long run.

7.2 Differential livelihood activities among the study sites

7.2.1 Land resources and livelihood activities of rural communities

Insights from the three case studies suggest that access to land remains critical to rural livelihoods, particularly for the rural poor. As we saw in all cases, the land resources used

by rural communities include agricultural land, which continues to be important in households' food security and income, as is forest land.

Agricultural land is the main source of food and income for the vast majority of the households. Across the study sites, households tend to own their agricultural land; rental of agricultural land is much less common. This finding is supported by observations made by MOECAF (2012) and IID (2012) where all agricultural lands are registered with the government to have legal tillage including rights to sell or mortgage. However, the mean size of agricultural land differs between the different ecological zones in this research. For example, the mean size of agricultural land owned by the individual household is much bigger in the Dry Zone than in the Delta Zone and the Hilly Zone. Due to the abundance of flat land and lowland plain characteristics, the average area of agricultural land held by households is greater in the Dry Zone than in the Delta Zone and the Hilly Zone. As revealed in Chapters 5 and 6, a high rate of landlessness is a common feature of villages in the Delta Zone and the Hilly Zone. For instance, over half of the non-community forest user group (non-CFUG) members in the Delta Zone are landless poor and they do not have access to agricultural land. Poor people's access to agricultural land has further diminished in recent years due to increased land prices and opportunities to choose non-agrarian livelihoods.

As farming is still important for rural households in the study area, agricultural land access is a main factor for residents' food security and income source. All case studies reveal that agricultural land is not only an agrarian asset linked to food production but it is also an important asset that underpins livelihoods. Access to land facilitates households' access to housing, education, health, clothing and other social matters. Given the multiple functions of land, households' access to land is a key means for improving their livelihoods. Yet this is changing with new employment opportunities, such as tourism in the Hilly Zone case.

Forest land was found to be an important resource. It is used for a variety of household needs such as fuelwood, building materials, wild food, medicinal plants and so on. In this research, community forest user group (CFUG) members depend on their community forest land while non-CFUG members rely on the natural forest, which is open access, and village forest (see Chapter 4) for their livelihood needs. Over the three cases, community forest land is found to be useful for villagers' livelihoods because it is an important source of fuelwood and other forest products for household use and generating

income. This is especially true in the Delta Zone where community forests provide monetary benefits to the community. This feature of community forest land has also been highlighted by others (see Tint et al., 2011, Macqueen, 2012 and Tint et al., 2014).

In this research, landless poor who were non-CFUG members in the Dry Zone and the Delta Zone were keen to access community forest land as they had become aware the importance of access to community forests for their livelihoods. As we saw in Chapter 5, CFUG members could receive several benefits from their community forests (fuelwood, income from forest sale) while non-members could not. In this case, contrary to the expectation of scholars and policy-makers, CF has restricted the landless poor's access to community forests, effectively creating enclosure through institutions that fail to account for the needs and aspirations of the poor (Wolford et al., 2013). In this regard, community forest land was already informally claimed by households before the CF program started. As FD recognised and legalised encroached land with over 50 households within the reserved forest in 2013 (see Chapter 5), the CF initiative did nothing to change this arrangement of land. Restricted access to community forests through CF and to agricultural land through high prices has been a double advantage for the better-off CFUG members in the Delta case. They get to keep their informal claims, as well as to benefit from the new CF tree planting initiative. The landless were excluded before, and remain excluded after the CF. Evidence from "rising" economies such as Indonesia and Vietnam also indicates that lack of access to land and other natural resources is an important source of marginalisation of rural people (Peluso et al., 2012; Bonnin and Turner, 2012). This is a worrying outcome of the private allocation of lands in the Delta case in particular.

Finally, the research has shown that the significance of land for villagers' livelihoods is changing, and this has implications for CF. At an international level as well, the nexus between land and livelihoods (and poverty) has occupied substantial space in academic discourse in recent years (Rigg, 2005; Mahanty et al., 2006; Barney, 2012; Dressler et al., 2016). Some scholars now claim that land is reducing in importance as a livelihood base and as a locus of action to address rural poverty (Lehmann, 1978; Rigg, 2006). Rigg (2006, p. 194) argues that "Land has lost its strategic role for the rural households and instead it is other factors and capabilities, which come into play: education, skills and networks, for example." Based on the findings presented in this chapter, I support the view that agricultural land is becoming less important to some villagers but, as I discuss later, villagers still aim to enhance their land access. In two cases except the Dry Zone, villagers try to improve their livelihoods in multiple ways ranging from accessing

community forest areas to out-migration. For some households, however, access to agricultural land remained important. In time, this turn away from land-based livelihoods may have implications for the level of interest in and commitment to CF, which could be a fruitful area for further research.

7.2.2 Diversity of household income activities and livelihood strategies

It has already been highlighted that rural communities perform a combination of different agrarian and non-agrarian activities. Some scholars argue that the importance of agriculture for poverty reduction and livelihood improvement has diminished following a process of deagrarianisation (Bryceson et al., 2000; Rigg, 2006). The number of people employed in agriculture has declined, and the share of agricultural incomes of households has decreased while non-farm income has become the major source of income. In the individual cases in this research, the composition of household incomes varied greatly depending on the nature of the areas. For example, people in the Dry Zone are mainly dependent on dryland agriculture followed by livestock rearing and non-farm employment. However, households in the Delta Zone are mainly dependent on agriculture and fisheries, forest product collection and non-farm employment. The case is different in the Hilly Zone, where people are mainly dependent on agriculture, wage labour, fishing, non-farm employment and non-farm enterprises. It seems that the diversity of household income activities offers an improvement of livelihoods of rural communities. Livelihood diversification is the norm in rural communities (Barrett et al., 2001; Sick, 2014) as this research also confirms.

Across the three cases, rural households are able to diversify their income through a mix of agrarian and non-agrarian livelihoods. Depending on the livelihood activities of rural communities, different income sources that contribute to households' survival are observed in three different ecological zones. Some households depend on two or more income sources for their livelihoods but some depend on four to six income sources. Furthermore, at each site, villagers had differing levels of forest reliance. Households allocated their family labour and time to natural resource based and non-natural resource based activities, when households had access to community endowments such as grazing land and community forests. Yet only in the Delta case did villagers rely on their community forests for income. In the other two sites, villagers used their community forests only for household use rather than earning income. Across all three cases, this

research finds that community forests are integral parts of livelihoods of villagers to differing extents and in different ways.

The phenomenon of out-migration was found at all three study sites, with the availability of urban or overseas jobs one of the main reasons for this occurrence. In this sense, villagers might see out-migration as a livelihood strategy to export surplus labour or insure against risk in farming with steady income from remittances as observed elsewhere (Barney, 2012; Keely and Tran, 1989). A recent study conducted in ten low- and middle-income countries suggests "…farming is not a favoured option for the younger generation in rural areas of developing countries, even those in which agriculture remains the mainstay of livelihoods and the rural economy" (Leavy and Hossain, 2014, p. 38). Kelly (2011) also suggests that migration is a common livelihood strategy in rural settings and that rural people migrating to cities and to peri-urban areas leads agrarian transitions in all Southeast Asian contexts. This is confirmed in this research since migration as part of the diversification strategy is common in all three case studies and remittance income also reduces reliance on forest products. This research finds that many of the hypotheses relating to agrarian change suggested by Rigg (2006) and others are supported by the results of case studies. Across the three sites, there was evidence that some households were engaged in off-farm livelihoods. At the same time, there was a continued reliance on farm production for some households such as better-off and medium households.

Across the three sites, out-migration of the working-age population has implications for reliance on forests and also labour availability in management of CF. This research finds that migration affects labour scarcity and increases labour costs in both agriculture and CF. For example, youths from most households leave their villages as job opportunities are limited and on-farm labour wages are relatively low compared to other jobs in nearby towns or cities. Hence, there are fewer people able to work per household and these changes decrease agricultural yields with labour shortages. In terms of CF, migration adversely affects the management of community forests, due to the reduced number of family members able to share in community forest activities. Only students and older people in families are left in the villages, especially in the Dry Zone case. Thus, migration has brought a decline in the labour available for managing community forests and increased on-farm labour wages due to labour scarcity in both community forest activities and agriculture. The research confirms that migration is changing the nature of rural communities and the nature of people–forest interactions and yet it has not been addressed or considered in CF to date.

To sum up, livelihood strategies of rural people seem to mediate improved village livelihoods in the short term. However, village livelihoods will continue to depend on agriculture to some extent since migration patterns are dynamic and not a universal strategy for all community members.

7.3 Interplay of Community Forestry and rural livelihoods

CF provides a range of benefits that impact the livelihoods of rural people. In many countries, collaborative forms of community-based forestry initially focused on providing local people with access to subsistence goods such as non-timber forest products (NTFPs), fuelwood and timber for local construction (Gilmour, 2016). NTFPs have historically been used to complement livelihoods (see e.g. Kusters and Belcher, 2004 for Asia). In Myanmar, community forests provide a wide range of different forest products and ecosystem services to the different users (see e.g. Tint et al., 2011 and 2014).

At the time of the study, community forests at all three sites have started providing direct benefits to rural people to supplement their livelihoods. Community forests studied in this research are well established and have become an integral part of rural livelihoods. All CFUG members commented that they now enjoy a wide range of both direct and indirect benefits of their community forests, and no significant negative impacts were pointed out. Across the three cases, the general pattern is that CFUG members get direct benefits flowing from forest products through community forests, at least for their household use. However, benefits can be different and unequal, particularly between CFUG members and non-CFUG members and within CFUG members (intra-communities) by wealth groups, depending on the locality. Indirect benefits such as environmental services, community infrastructure for social services and broader social networks and social cohesion provided by CF also vary across the three study sites. The following Table (7-2) shows the benefits of CF obtained by rural people at all three sites.

Table 7-2: Benefits of CF for CFUG members at three study sites

	Dry Zone	Delta Zone	Hilly Zone
Forest products			
NTFPs	✓	✓	✓
Fuelwood	✓	✓	✓
Pole and post	×	✓	×
Timber	×	×	×
Ecosystem services	✓	✓	✓
Additional benefits	✓	✓	✓

Source: Field survey (2014)

Although CF can lead to a wide range of livelihood benefits, this depends on improvements to the forest condition, and on households being able to access the forest (Tint et al., 2011). Theoretically, a move from government to community tenure should remove some significant barriers to pro-poor forestry, particularly for outsiders acquiring benefits and reduced resource degradation through open access. The forest condition is improved by shifting from government to a community-based tenure regime (Mahanty et al., 2006). This thesis also confirms that community forests are no longer open access in all sites and the forest conditions have unambiguously improved through increased protection. Based on my survey findings, the forest condition is significantly improved in the Delta Zone and the Hilly Zone (Lwai Nyeint CF is an exception in the Hilly Zone case because the forest cover in Lwai Nyeint CF is less improved). The major forest products consumed by CFUG members in all cases include fuelwood and NTFPs. Only in the Delta Zone case did CFUG members get financial returns from the sale of forest products from their community forests.

In terms of indirect benefits, CFUG members in all three cases have experienced improved environmental services that are partly important for their livelihoods. However, the environmental services that local people gained from CF are different depending on the sites. For example, CFUG households in the Dry Zone experienced improved soil protection benefits while those in the Delta Zone experienced improved environmental protection from storms (e.g. Cyclone Nargis) and ecosystem function to protect the natural habitats (e.g. for crab and fish spawning). CFUG households in the Hilly Zone (i.e. Maing Thauk CF) experienced improved water supplies, a particularly important issue in their villages, by recovering the natural water spring as a result of the CF program. Although the extent of the environmental services of the CF program vary depending on

the location and surrounding environment of the villages, the benefits are village-wide and all villagers, including non-CFUG members (in the case of the Delta Zone), are equally enjoying services that support local livelihoods. Similar findings were reported by Tint et al. (2011) in their recent study on CF in Myanmar.

Aside from the forest products and ecosystem services of CF, CFUG members enjoy additional benefits from the CF program. Due to the needs of the villages and donors who supported the implementation of the CF program, other benefits such as infrastructure and social benefits such as opportunities to attend training and seminars were observed at all three sites. As we saw in Chapter 4, the donor (JICA in this case) established road improvements, and installed water supply equipment for villagers to save time in water collection. School facilities were donated by the Ministry of Natural Resources and Environmental Conservation in acknowledgement of their participation in the CF program. This infrastructure has been of great benefit to CFUG members in the Dry Zone case. However, the same donor JICA did not support any infrastructure in the case of the Delta Zone. This is probably due to the fact that the local NGO FREDA implemented the CF program in the study area under the JICA project and mainly focused on the rehabilitation of mangrove forests rather than infrastructure development. However, CFUG members in the Delta Zone gained broader social network benefits, for example, study tours and attending workshops held in cities and other countries (Thailand in this case). Nevertheless, this opportunity was only provided to CF management committee members so they could learn about and discuss CF at these events. CF in the Hilly Zone was supported by the UNDP and the donor played a major role in complementing the rural development but with minimal emphasis on CF. The UNDP helped the Lwai Nyeint CFUG to build a primary school with timber logs from their community forest to create educational opportunities. Therefore, this thesis finds evidence to support that the additional benefits were valued by communities at the three sites.

While collaborative forest management has sometimes contributed significantly to improving rural livelihoods, this has not always happened in a way that targets the poorest members of communities; benefits have often been captured by elites (Gilmour, 2016). In terms of benefit distribution, this research found that CFUG members got equitable benefits from their community forests except in the Delta Zone. As we saw in the case of the Dry Zone and the Hilly Zone, all villagers perceived the CF program as a village-wide activity and all households in the village were involved in the program as members to protect and manage the common property. That is why the benefits (forest products) from

community forests are utilised for public purposes and the benefits are often shared almost equally between all villagers.

However, many analyses of benefit distribution from community-based forestry claim that local elites often capture a major share of the benefits (Iversen et al., 2006; Kamoto et al., 2013; Lund and Saito-Jensen, 2013). This is of concern not only because of the inequity in benefit sharing, but also because such inequity can lead to a breakdown of the socially accepted rules and norms that underpin the governance of CF and to institutional instability (Gilmour, 2016). This research found inequity in the distribution of benefits in the Delta Zone. This is because of the institutional patterns from the very outset of the CF program as we saw in Chapter 5. Benefits were often captured by elites, even among CFUG members, as they have a range of assets such as human, financial and social. Most of the landless poor did not get benefits from CF formation: they were excluded from previously informal access to resources in this case. This would ultimately make for an unsustainable CFUG in the community as conflicts could emerge over unequal benefit sharing, and between CFUG and non-CFUG members in relation to access to natural resources and land.

To sum up, all the CF programs provide a range of livelihood benefits to CFUG members in the three regions. Yet significant income was only obtained by CFUG members in the Delta Zone. Another issue emerging was the inability of CFUG members to protect their improved forest from non-CFUG villagers and outsiders. Intra-community conflict is normally resolved socially through negotiation at a village level, but conflict with outsiders between villages (i.e. inter-community conflict) is difficult to resolve and members need the FD's back-up to prevent unlawful acts. Tint et al. (2011) note in their recent study that almost all of the CFUGs had ongoing problems with effective protection. They state that most CFUGs struggle to exclude outsiders from illegal cutting and the members do not want to get into conflicts with neighbouring villages. This has been a challenge in all three regions and how these tensions can be reduced in the future is still an open question.

7.4 Perception of Community Forestry

7.4.1 Engagement of local people with Community Forestry

Over the three cases, local communities have engaged with the CF program for different purposes and in different ways as described in section 7.1.2. In the CF program, the

fundamental part of CF implementation is to understand the basic concepts of CF and roles and responsibilities of CFUG members at village level (Tint et al., 2011). At all three sites, local people were organised and encouraged to adopt CF by the Township FD and Dry Zone Greening Department (DZGD) (only in the Dry Zone case) staff in collaboration with the project staff at the time of formation. Field staff transferred information, which includes forest conservation activities through the CF program, to local communities in order to raise awareness of the role of CF in improving local livelihoods. Accordingly, local communities in each individual case engaged with the CF program according to their different purposes and different aspirations.

In respect to the interests and effective participation of CFUG members, insights from this research suggest that only CFUG members in the Delta Zone have become more interested in the management of their community forests, because of the opportunity to secure land. CFUGs in the Dry Zone and the Hilly Zone were becoming less interested in CF over time as their community forests show no significant income for the individuals. Unlike the CFs in these two cases, CFUG members in the Delta zone continued to have strong interest and engagement after external support stopped. Similar findings were reported by Tint et al. (2011), who discussed that collective management and protection of CF split into individually owned plots seemed to prove more effective and efficient in the Delta Zone than other management regimes practised by CFUG members elsewhere. Yet the significant equity implications argue against this as a primary strategy for strengthening the sustainability of CF. In a sense, FD reconfigures rights and governance arrangements within the CF in the Delta Zone. However, issues of inequity had not yet been resolved by FD.

Although it is not covered in my research areas, communities in ethnic minority areas in Myanmar are very much interested in the CF program because they believe that it is the only means to protect their land from land grabs under certain circumstances (Chairman, Advancing Life and Regenerating Motherland (ALARM), Yangon, December 2015). This fact is supported by a recent study by Woods and Canby (2011). They argue that upland ethnic farmers are now relying on CF as a legal measure to safeguard their village lands, although by doing so they are granting greater administrative control over these areas to the FD. Seemingly, this is occurring not only in ethnic minorities but also in local communities across the country in order to secure land tenure, which is an integral part of their livelihoods.

The results highlight that tenure security is an important consideration in motivating people to participate in CF – it was significant in the Delta case and there is evidence also of its importance for minority groups. But at other sites, a range of factors such as the process of CFUG establishment and off-farm livelihood opportunities led to reduced participation in the CF program.

7.4.2 Relationship between Forest Department and local communities

The establishment of forest plantations is the main responsibility of the Forest Department (FD). The FD is responsible for managing forests, including natural forests and plantations, across the country through sustainable approaches. Accordingly, CF has been mainstreamed into the major tasks of the FD.

As for the sustainability of community forests, the relationship between the government and CFUG members is an important factor because the community forests are co-managed by communities with government officials, specifically with FD staff, under the CF program in Myanmar (see section 7.1.1). Villagers in all three cases had close contact with Township FD staff at the implementation stage of the CF program in their villages. After establishing the community forests, FD staff could not visit the villages regularly due to the other high priority duties of township offices and limited budgets. Therefore, the relationship between FD staff and CFUG members has become less close than before. This may affect the sustainability of community forests, especially in the Dry Zone and the Hilly Zone, because it is almost impossible for local people to sustain community forests by themselves. This is because all households are CFUG members in these two cases and there remains a question over who is responsible for protecting and monitoring community forests to prevent illegal cutting by outsiders. In the Delta case, in contrast, CFUG members can manage their community forests with a “sense of ownership”, which means that CFUG members feel they own the forests and have confidence in their ability to manage their forests sustainably and benefit from their endeavours. They commented that they could manage their community forests by themselves without the assistance of FD staff; however, they still need the FD’s back-up in protection of their forests. In this case, staff from the local NGO, FREDA, frequently visited and provided assistance to the communities throughout the project period phase by phase, and FREDA staff often visit CFUG members and their forests. The findings argue that the sustainability of CF has meant more interaction with FD staff and also CF has given CFUG members a “sense of ownership”.

To sum up, the research has shown a perceived change in relationships between CFUG members and government. The majority of CFUG members were aware of the CF program before initiating it in their villages. FD staff and project staff explained about the CF program and provided technical assistance to the CFUGs.

7.4.3 Forest management regimes in Community Forestry

In the two cases of the Dry Zone and the Hilly Zone, CFUG members *collectively* manage their CFs and their management regimes are not effective. Although CFI articulates that CFUGs organise for collective action in management, production and utilisation, some CFUGs have been practising other patterns of management as well (Tint et al., 2011). Collective management of CF split into individual plots proves more efficient and effective in operating every step of the CF activities than other types of management regimes because a "sense of ownership" is a motivational factor for progress and sustainability of CF (Tint et al., 2011). In light of the insights generated from the three cases, the outcome of CFs being collectively managed in the Dry Zone and the Hilly Zone is relatively weak CF governance as compared to the Delta Zone in which individually allocation is practised. For equity outcomes, FD has authority to reconfigure rights and governance arrangements within CFUG and non-CFUG members in the Delta case.

It is important to note here that the case studies also highlight the importance of forest management regimes in solving threats such as illegal cutting in community forests. Across the three cases, the most frequent concern of CFUGs is threats by outsiders who cut trees for fuelwood and building materials. Therefore, CFUGs prevent such illegal action with FD's support as members cannot solve the conflicts with illegal cutters. CFUG members, except in the Delta case, need the FD's support to protect their CFs by patrolling and monitoring regularly because their CFs are collectively managed and no one household wants to be accountable for watching the CFs. Based on individually owned and managed CF plots, CFUGs in the Delta case do not need much support from the FD to manage their CFs. But they expect the FD's back-up to prevent or solve unlawful acts of rule-breakers to protect their forests. Otherwise, CFUG members will not sustain their community forests and FD is needed for inter-village regulation. Findings show that the issue with collective management is that threats to the community forest are not well addressed.

My findings confirm that, to ensure forests are protected from external actors, implementation of CF needs continuing external support such as technical and financial

assistance from the government, NGOs and donor agencies. Therefore, it is also important to recognise the effects of external organisations on the villagers' practice of CF.

7.5 Summary and Conclusion

This chapter has compared findings from three sites on how CF and rural livelihoods interact and to assess whether livelihoods of rural people can be improved by engaging in CF in Myanmar. The discussion was organised around the major themes that emerged from the cases in preceding chapters.

In terms of the emergence and institutional set-up of CF, this research suggests that the community forests at all three sites emerged as a result of a project-driven approach and hence they are well established in the study areas but there is no proper monitoring and evaluation system. The engagement of local people in forest management is becoming steadily established through schemes such as forest land allocation and other modes of participatory forest management. However, the studied community forests are relatively small compared to village sizes, household numbers and forest product demands. The types of community forest also influence the benefits received by rural people and the level of interest of the community in the long run.

In terms of the land resources and key livelihood activities of rural households, this research finds that most households are farmers and they follow very similar livelihood strategies in each case. At the same time, livelihoods are diversifying, based on opportunities at each locality. All the land use types in the study areas are used by households for both consumption and income generation. There is evidence that farming is still important and agricultural lands play an important role in household economies. Forest lands and/or community forest lands, while still important, are not as central to livelihoods of rural communities although CF is an integral part of their livelihoods. The landless poor and non-CFUG members expect community forest lands to improve their livelihoods because CF is one of the tools for possessing land resources for them; however they are ultimately constrained in how those lands can be allocated and used. Moreover, the growth of migration and off-farm income is changing the significance of and interest in CF. This will likely become more prominent in the future and could diminish the viability of CF in some localities.

In terms of the interplay of CF and rural livelihoods, this research suggests that community forests in some localities contribute significantly to improving rural

livelihoods. The majority of CFUG members at all three sites consider that there are no significant negative impacts or risks and accept that they mostly benefit from community forests. The benefits of community forests include a wide range of different forest products and environmental services. Moreover, the additional benefits of CF programs, such as road improvement, which creates business opportunities for local communities and schools for education of their children, are highly valued. Over the three CF sites, only rural communities in the Delta Zone who were involved in the CF program get financial benefit on an individual basis from the sale of fuelwood and some NTFPs. But this is at a cost to non-CFUG members, and may not be socially sustainable in the long run. The CFUG members in the Dry Zone and the Hilly Zone were gaining the intended benefits from their community forests for household use at the time of the study and they expect to produce valuable timber, posts and poles for building their houses in the future. Hence, CF provides for rural communities in different ways and to different extents.

Chapter 8 Conclusion

The future success of Community Forestry (CF) in Myanmar and the rest of the developing world will hinge upon how well it provides for rural livelihoods and whether it helps to reduce forest decline. To date, CF has developed slowly in Myanmar and, consequently, there is limited knowledge of how it is faring on these two criteria of livelihoods and forest recovery. This thesis therefore aimed to explore the interaction of CF with livelihoods of local people in rural Myanmar by comparing how it influenced the livelihoods of CFUG members and non-CFUG members in three different ecological zones across the country.

The findings from my case studies in the three different ecological zones lead to several conclusions. First, most village household livelihoods at all three sites continue to depend to differing extents on land resources, including agricultural land and forest land. The cases here suggest that access to land resources remains important to household livelihoods. At the time of the study, local communities had little to no formal land or resource use rights in forests under Myanmar national laws and policies. Only community forests enabled local communities to have any forest land use rights afforded to them, in conjunction with the local Forest Department (FD). Although CFI in Myanmar was an instruction rather than a law, it still provided a means to address insecure forest access for villagers. At the same time, CFI-secured lands could easily be over-ridden by planning laws and infrastructure development (see below).

Second, community forests were contributing some livelihood benefits, but this varied by location and CF arrangement. In some cases, the level of dependence on farming livelihoods was also changing. Factors such as migration and livelihood diversification to off-farm income sources were being actively taken up as a means of improving livelihoods. In particular, the case studies showed migrant households becoming less reliant on forestry-based livelihoods. CF in the Delta Zone significantly strengthened economic returns to CFUG members. In contrast, CF in the Dry Zone and the Hilly Zone did not provide significant livelihood contributions. CFUG members in the latter two cases could not use their community forests to their full potential to improve their livelihoods. Community forest plantation in the case of the Dry Zone is still young and could not provide many forest products apart from fuelwood and fodder; so far even these are very limited. Meanwhile, the main objective of community forests in the case of the

Hilly Zone is to protect ecosystem services rather than to produce forest resources to supplement the livelihoods of CFUG members.

Where benefits were gained, they took two major forms: (1) forest products, and (2) environmental services. CF is oriented towards the development of livelihood assets (natural assets, physical assets, financial assets, human assets, and social assets) at the rural level. These assets or capitals produced by CF play a crucial role in rural development and improvement of villagers' livelihoods. Although no community forests have begun commercial harvesting so far, CF offers afforestation/reforestation schemes supported by the government that help meet local fuelwood demand. The case studies confirmed that all poor households used fuelwood as a source of energy. If these households do not have their own private land or community forests to meet their requirements for fuelwood, such situations lead to hardship for these forest-dependent people. The reliance of villagers on forests for fuelwood, fodder, wild food and medicinal plants provides an incentive for protection and management of forests through CF.

Forests are devolved to communities in Myanmar with the goal of reforestation in degraded areas and improving livelihoods by giving communities access to an important livelihood resource. Democratic devolution of resource control towards more locally controlled forestry such as CF offers improvements in both forest management and livelihoods for the rural poor. This thesis finds both environmental and social outcomes from CF in all cases, but economic outcomes only in the Delta case. The case studies reveal that CF facilitates improvements in forest conditions to some extent. It can generate positive effects on local livelihoods by contributing direct and indirect benefits to communities. However, in general, governance arrangements follow a model of passive participation in state- and donor-dominated initiatives.

In addition to these findings on the impacts and governance of CF, several future challenges have been highlighted. The challenge of insecurity of forest land tenure results in slow progress of CF. CFUG members are concerned about confiscation of their community forest lands by the state since CFI as a legal instrument does not stand up to other planning and development decisions and mechanisms. Furthermore, most villagers would not be aware of the legal complexities regarding the CFI. Communities are often granted tenure to highly degraded forests or barren forest lands, severely limiting the potential of CF to contribute to local livelihoods. CF has developed slowly in Myanmar due to the above-described reasons. Changes in the distribution of statutory forest land

tenure over the past two decades demonstrate that, today, communities possess nearly 50,000 ha of forests and CFUGs currently rely on a very insecure policy instruction that carries little weight in law. This, in part, underpins the slow progress by the government towards its target of 918,000 ha of community forests.

Inequality of access to community forests and land was a concern, particularly in the Delta Zone. There, the inclusion of poor people and other marginalised people remained an unresolved challenge to CF. CF in this case may not serve the poor or other marginalised people if other, more powerful, agents (i.e. other landowning villagers) are able to capture its benefits. These inequalities of resource access need to be addressed within a broader understanding of the marginalised position of many rural communities. Specifically, in the Delta Zone, these inequalities within communities may be better resolved through reallocation of community forest land on a collective rather than individual basis. In practice, the issue of inequity is addressed by FD by confiscating community forest lands from CFUG members who are not really working on the lands and giving those lands to non-CFUG members who are interested in engaging with CF. In this regard, FD reconfigures rights and governance arrangements within CFUG and non-CFUG members in the Delta case.

Local communities in all case studies face continuing threats from outsiders. CFUGs are currently facing challenges to the protection of community forests due to illegal cutting done by neighbouring villagers. There is a serious lack of monitoring and evaluation systems and post-formation support from FD staff as well as a need for good governance by both FD and CFUGs. In summary, these challenges are reasons why CF has developed slowly in Myanmar.

In conclusion, CF in Myanmar is simultaneously responding to forest protection and local livelihoods to some extent, but significant challenges remain. For CF to expand its reach and impact, CF can partially support local livelihoods in some cases, but does not inherently do so. Restrictions on forest resource use in favour of conservation objectives (e.g. in the case of the Hilly Zone) can limit livelihood options, and benefit-sharing arrangements can undermine marginalised groups. Although CF promotes positive outcomes for the environment and improved local livelihoods, the case studies show that achieving both benefits simultaneously can be a challenge. Since CF has evolved over the past two decades in Myanmar, more evidence-based analysis of its impacts is, therefore, needed to assess its overall contribution to sustainable forest management and

improvement of local livelihoods. It is evident that more time and effort are needed for CF to reach its potential in Myanmar.

On the whole, this thesis covers 20 years of CF in Myanmar and looks at the impacts of CF on social capital such as livelihoods, access and control over forest resources, economic capital such as household incomes and environmental capital that CF has generated in three different areas. As this thesis has shown, CF interventions have a positive impact on the livelihoods of CFUG members to some extent in all areas. Among the three cases, the case study in the Delta Zone has undoubtedly had impressive impacts on forest cover and significant economic impact at a household level. However, this case noted that forest land allocation did not specifically target the poorest members of communities.

In closing, this thesis has shown the spatially and socially differentiated impacts of CF. While CF provides a platform for people to participate in forest governance, its full potential in supporting rural livelihoods has yet to be realised. In recognition of the outcomes of CF so far, there are a few areas for attention in the future here, for example, security of community forest land tenure, condition and size of forest areas involved and conflict over property rights.

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Appendix (1) Community Forestry Instructions (1995)

Community Forestry Instructions

Introduction

1. For the purposes of supporting the economic development of the country and regaining environmental stability and addressing basic needs of local communities, active participation by the rural population is urgently needed to plant trees in barren lands and to reforest degraded areas. To achieve these goals **Community Forestry Instructions** are issued by the Forest Department prior to the formal enactment of the **Community Forestry Rules**.

Definition

2. Community Forestry means: Forestry operations in which the local community itself is involved; such as:
   - establishment of woodlots where there is insufficient fuelwood and other products for community use
   - Planting of trees and exploiting of forest products to obtain food supplies, consumer products and incomes at farmers' level.

3. Community Forestry is neither a regional development forestry operation nor a large-scale forest operation to import an industrial enterprise based on forest products.

Areas where Community Forest can be Established

4. Community forests can be established in the following areas:

   (a) With the permission of the government, on reserved forest, unclassed forest, protected forest and land at the disposal of the State.

   (b) Village owned fuelwood plantations established with the permission of the Director General of the Forest Department.

   (c) With the permission of the owner (s) on private owned land or land owned by government organisations or non-government organisations

Areas Permitted for the Establishment of Community Forests

5. Community Forests will be permitted to be established in the following areas:

   (a) In degraded natural forests where natural regeneration is difficult.

   (b) In areas where there is potential to meet the local demand for forest products

   (c) Areas suitable for the establishment of Community Forest and where there is need to conserve soil and water resources

(d) Natural forests which for various reasons should be managed by the local community
(e) Forest lands traditionally managed by the local community

Application for the Establishment of Community Forest

6. Households that would like to establish the Community Forestry shall form the users' group.

7. By consensus, a management committee must be formed from the members of the users' group. This committee shall consist of a chairman, a secretary, and 3 members.

8. On behalf of the users' group, the chairman should apply to the District Forest Officer through the Township Forest Officer for the establishment of a Community Forest. (Annex 1)

9. If the application is accepted, the District Forest Officer will have to identify and specify the site for the establishment of the Community Forest. Details of action taken together with a map of the site will then be submitted by the District Forest Officer to the State/Divisional Forest Officer with copies forwarded to the Director General and the Director of the Planning and Statistics Division of the Forest Department. If the land applied for the establishment of the Community Forest is not under the management of the Forest Department, the District Forest Officer will need to undertake instructions from the District Forest Conservation Committee.

10. The Director General of the Forest Department will give authority to the District Forest Officers to act according to Section 15 of the Forest Law.

Allotment of Land for the Establishment of Community Forests

11. In the allotment of land to each household of members of the users' group, the District Forest Officer has to determine the size of the land to be allocated according to the climate, the type of soil, species to be planted and the degree of planting, tending and conservation that could be accorded.

Duration of Land Lease for the Establishment of Community Forest

12. The duration of land lease for the establishment of Community Forest is initially set for 30 years.

13. After a period of 30 years, the District Forest Officer will, with the approval of the Director General of the Forest Department, determine whether or not to extend the lease depending on the performance and the desire of the users' group.

Preparation of the Management Plan

14. Upon receiving permission to establish a Community Forest, the users' group has to draw up a management plan according to the form (annex 2) prescribed by the Forest Department, and forwarded to the District Forest Officer for confirmation. Advice of responsible forest officer will be taken in the preparation of the plan.

Certificate for the Establishment of Community Forest

15. After confirmation of the management plan, the District Forest Officer will issue the Certificate for the Establishment of Community Forest (Annex 3). Forest law, forest rules, instructions, and restrictions relevant to the Community Forest will be attached.

16. If the users' group is found to neglect or to violate the existing forest laws and forest acts, community forestry instructions, rules, regulations and prescriptions of the management plans, the District Forest Officer has the right to revoke the issue of the certificate.

Assistance from the Forest Department

17. The Forest Department has to provide the following assistance to the users' group free of charge:

    (a) Seeds and seedlings necessary for the establishment of Community Forest for the first rotation.

    (b) Technical assistance and expertise necessary for the establishment, cultural operations management and utilization of Community Forest so as to attain sustainable development,

Responsibilities and Duties of the Users' Group

18. The duties and responsibilities of the users' group are as follows:

    (a) Establishment of forest plantations in barren areas
    (b) Where appropriate, natural regeneration method should be used in the rehabilitation of forested areas.
    (c) Fire Protection
    (d) To carry out the required cultural operations for the development of both plantations and natural forests.
    (e) Protection against indiscriminate felling, girdling, pruning, resin tapping, removal of barks etc.
    (f) Protect against mining of stones, sands, earth and metals in the designated area
    (g) Prevention of illegal land use activities
    (h) In conformity of the rules and regulations, systematic extraction and utilization of forest products so as to avoid wastage.
    (i) Protection against soil erosion and environmental deterioration
    (j) After the first rotation, the users' group shall, under the supervision of

the Forest Department, engage in site preparations, seed collection, sowing, planting and tending operations.

(k) Implementing activities as described in the management plan

Prohibitions

19. No members of the users' group shall engage in the following activities

(a) Activities not prescribed in the management plan of the Community Forest

(b) Apart from inheritance, selling or renting of the Community Forest

(c) Metal mining and other activities that would cause forest degradation

(d) Construction of undesirable houses or sheds for the conservation of the Community Forest

(e) Apart from Agroforestry, use of land allotted for community forest for gardening or shifting cultivation

Exploitation of Forest Products from Community Forest

20. User's group can exploit the forest products of the Community Forest in accordance with the prescription of the management plan

21. No tax shall be levied on the users' group or members of the users' group concerning the forest products exploited for personal use

22. Surplus forest products can be sold to non-members of the village at reasonable prices. Taxation shall be exempted from the sale of these products

23. The users' group can market the surplus forest products to areas outside the village

24. For marketing of the forest products to areas outside the village, tax shall be levied by the Forest Department at specified rates

25. The users' group will use the incomes mainly for the implementation of the management plan and for the development of the Community Forest

26. Only surplus incomes can be used for social welfare and economic development of members of the users' group in line with the wish of the members

27. The users' group can utilize the forest products of the Community Forest and surplus cash to develop business enterprises that produce value added products

Funds

28. The fund of the users' group will be managed as follows:

    (a) The secretary of the management committee will keep a detailed account on particulars pertaining to the funds.

    (b) The secretary can, with the approval of the management committee, keep a certain amount of money in hand. Funds excess of that amount shall be kept in the bank or in a secure place.

    (c) The bank account must be opened jointly by the chairman and the secretary.

    (d) The secretary must submit the particulars of the financial accounts at least once a year to the users' group.

Price Setting

29. The users' group can freely sell the products of the Community Forests at current market prices.

Receipts

30. For all the forest products sold from the Community Forest, the users' group shall issue receipts. For the products that are to be transported to areas outside the township, a set of three receipts would have to be prepared. One receipt will be issued to the buyer, another submitted to the Township Forest officer and the third to be kept with the management committee. For forest products that are to be transported within the township, a set of two receipts must be prepared. One will be issued to the buyer and the other be retained by the management committee.

Permission for Transportation of Forest Products from the Community Forests

31. Forest products from the Community Forest can be transported within the township with the receipt of the users' group.

32. Forest products of the Community Forest that are to be transported to areas outside the township and within the country need a removal pass in accordance with Forest Law Section 23. They must not be transported together with forest products obtained from other sources.

Offenses and Penalties

33. Users' group must adhere to the directive and instructions issued for the Community Forest, Forest Laws, regulations and instructions periodically issued by the Forest Department.

34. Violation of the above mentioned laws, directives, regulations and instructions can lead to legal actions which include the termination of the Community Forestry Enterprise.

35. Any violation of forest law and forest act will result in punishment in accordance to the terms mentioned there in.

Records

36. The secretary of the management committee will have to keep a detailed record concerning planting, tending and production activities in forms attached to the management plan.

37. The Township Forest Officer, and the District Forest Officer will inspect the Community Forest and its records as conditions permit. Instructions and corrections are to be provided when they are deemed to be necessary.

Report

38. At the end of the budget year, the management committee of the users' group must submit a progress report to the District Forest Officer through the Township Forest Officer within the period of one month.

39. The District Forest Officer shall submit the progress report of the users' group together with his comments and recommendations to the State/ Divisional Forest Officer within two months after the end of the budget year. A true copy will be forwarded to the Director General and the Director of the Planning and Statistics section of the Forest Department.

Dr. Kyaw Tint
Director General
Forest Department

Annex (1)

Government of the Union of Myanmar
Ministry of Forestry
Forest Department

Application for the Establishment of the Community Forest

Through the Township Forest Officer of ---------- Township

To

The District Forest Officer Ref.No.

---------- District Dated.

---------- State/ Division

Sir,

1. Users' group mentioned in paragraph 2 from ------- Township, --------- Village comprising of ( ) households, hereby apply for the establishment of the Community Forest in the following forest land in accordance with the announcement made by the Director General of the Forest Department. Please find the enclosed map.

(a)	Township		----------
(b)	Village		----------
(c)	Name of forest/location		----------
(d)	Boundary	East	----------
		West	----------
		South	----------
		North	----------
(e)	Area		----------
(f)	Type of forest		----------
	Type of Vegetation		----------
(g)	Land ownership		----------

Annex (1)
Continued

2. Members of the users' group are as follows:

No.	Name	Father's Name	NRC. No.	Signature
1.				
2.				
3.				
4.				
5.				

3. If it is approved, users' group hereby declare to follow the community forestry rules, regulations and instructions and forest laws and acts issued, and to strive for the long term benefit of the village populace and the development of the Community Forest.

Signature of the Chairman of the users' group ----------
Name of the Chairman of the users' group ----------
Date ----------

Annex (2)

Management Plan for the Community Forest

Table of Contents

Annex (3)

Government of the Union of Myanmar

Ministry of Forestry

Forest Department

Certificate for the Establishment of Community Forest

U/ Daw ----------
Chairman
----------Users' group
----------Village
----------Township
----------District ----------State/Division

1. I hereby authorize you to establish a Community Forest in the following location according to the Forest Law-------Forest Act----- and Community Forestry rules and regulations. Members will be under the management of the users' group mentioned in paragraph 2. This document is issued for the complementation of the management plan confirmed on ----------

   (a) Name of village forest and location ---------- (b) Boundary ---------- ---------- (c) Area ----------

2. Members of the users' group are as follows:

No.	Name	Father's Name	NRC. No.	Signature
1.				
2.				
3.				
4.				
5.				

Certifying Officer

Signature
Name
Designation
Date

Community Forestry Progress Report

Table of Contents

Appendix (2) Indicative Interview Questionnaires

Household Questionnaires

1. Household (HH) basic information

Date	
Village	
Township	
Name of interviewee	
Name of household head	

1.1 Current HH demography/labour

No	Age	Gender (Male/Female)	Relationship to informant	Education level (class attended)	Official or community positions	Salary/Subsidies (MMK/month)
1						
2						
3						
4						
5						

1.2 HH property (by observation)

House status: □ Permanent house □ House on stilt □ Thatched house

Does your HH own any of the following items?

Item	Yes	No	Number of item HH owned
TV/VCR			
Radio/Cassette player			
Camera			
Bicycle			
Motorcycle			
Motor car/truck			
Fans			
Sewing machine			
Furniture			
Kitchen utilities			
Jewelry			
Others (e.g. Chainsaw, …)			

1.4 Migration (Ask of the Household head)

- Place of origin □ Native □ Migrant
- If migrant, how long have you been here? _____ years _____ months
- Where did you migrate from? □ Urban □ Other village……
  ….
- What did you primarily do there before migrating?
- Why did you move here?

2. HH livelihoods

Ask HH to list all main livelihood activities. What are the main activities that people in this HH do for income and subsistence?

Paddy land	
Shifting cultivation	
Livestock	
other crops	
NTFPs (e.g. Medicinal plants, honey, …)	
Non-agriculture activities (e.g. non-farm business, SME, …)	
Others	

2.1 HH land resources

HH land resources

Plot No.	Type of land	Size (acre)	Legal status of the land (registered with the government or not)	Year HH obtained the land (year)	Sources of land (self-occupied, given by parent, borrowed, rent …)	HH current activities on the land	Production / products and their volume HH collected from the land (sufficient rice?; productivity)	Changes on HH activities on the land over the last 5 years
1								
2								
3								
4								
5								
6								
7								

- In recent 5 years, are there any newly constructed paddy land, newly cleared shifting cultivation plots, or any plots sold out, or borrowed by household? If yes, why?

- Do HH feel the shortage of cultivation land? If yes, do you have any ideas on how to cope with land shortage?

2.2 HH cash income in 2013 obtained from agricultural crops

Crop product sold	Volume sold (kg)	Price/unit (MMK/kg)	Total amount of cash obtained (MMK)	Who is buyer/from where?

- HH's total amount of money obtained from the sale of crop products in 2013: _____ MMK

2.3 HH Livestock production/income

Livestock	Number (head)	Purpose of raising (to sell, HH use, …)	Source of money for buying livestock (where)	Total amount of money obtained from livestock sale (MMK)	Year of sale (year)
Cow					
Buffalo					
Pig					
Chicken					
Duck					
Others					

- Total household cash income derived from livestock sale in 2013: _____ MMK

2.4 HH harvest of timber and NTFPs

HH activities in the forest

Products HH obtained from the forest	Who in the HH conduct the activity (wife / husband / men / women)	Quantity of product HH obtained from the forest (e.g. total volume (kg), frequency….)	Purpose in collecting the products (owned use/ to sell)	Total cash income derived from the sale of product (MMK/year)	HH constraints in collecting those products
Medicinal plant					
Honey					
Fuelwood					
…..					
Timber					

2.5 Labour/employment

- What? _____
- Which type of paid you received for wage employment?
  □ Piece rate basis □ Daily basis □ Long-term basis

How much do you get (per piece, per day, per month/year)?

Did you get any payment in kind?

□ Sesame □ Ground nuts □ Maize □ Onion □ Clothing □ Other

How much or what was the value of the in-kind goods/services? _____ MMK/day

- Agriculture wage total _____ MMK

2.6 Business activities

- Do you have any income from business activities?
- What kind of enterprise did you operate? _____
- How long has the enterprise been operating?
- Where do you operate the enterprise?
  □ Home □ Other fixed location
- When did you start?
- Who owns the business?
  □ Household □ Shared with others
- Which people in the household work in this enterprise?
- Did you hire anyone over the past 12 months?
- Who are your customers?
  □ Other household or individual
  □ Small enterprise
  □ Larger enterprise
  □ Government or public firm
  □ Local traders
  □ Media men
- What was your main source of money for setting up the business?
  □ Own saving
  □ Relatives
  □ Government bank
  □ Private bank
  □ Other financial institution
  □ Local group
  □ NGO
  □ Other

- Have you tried to borrow money to operate or expand your business in the past 12 months?
- How much did you make in the last month or year?
- Have you got a certificate for the business or did you not need it?

2.7 Do you have any other income sources (apart from agricultural production, labour, business)?

Ask interviewee to list all remaining cash income sources of the HH in 2013 and fill in the table.

HH additional income sources in 2013 (if any)	Total amount (MMK)

2.8 Supports to HH in recent years

Ask interviewee to provide information on all supports provided by the government and non-governmental organisations in recent years. Supports could be cash, rice, inputs for agricultural production (e.g. fertiliser, seedlings). Information obtained is used to fill in the table below.

Types of support (cash, rice, fertiliser, seedlings, etc.)	Sources of support (from where)	Quantity (how much)	Year of support (year)

2.9 HH debt

Ask interviewee to list all HH debts (if any), including sources of loan, amount from each source, purpose of obtaining loan, interest rate, time of repay, and HH's capacity to repay. Information collected is used to fill in the table below.

Source of loan (from where)	Total amount (MMK)	Purpose of obtaining loan	Annual interest rate (%)	Time of repay (year)	HH's capacity to repay in due time (difficult/easy/impossible)

2.10 Food expense and home production

Food expense and home production

Food item	Food purchase			Home production			In-kind
	Total month (in the past 12 months) of purchasing food	Total amount of quantity purchased (unit/month)	Total amount of money spent for purchasing (MMK/unit)	Total month (in the past 12 months) of consuming food which is grown or produced	Total amount of quantity (unit/month)	Total amount of money HH have to spend in the market to buy this quantity (MMK/unit)	Total value of food consumed that HH received in kind (in the past 12 months)
Grains and cereals							
Eggs and milk products							
Cooking oils							
Vegetables							
Fruits and nuts							
Fish and meat							
Spices and condiments							
Sweets and confectionery							
Non-alcoholic beverages							
Alcoholic beverages							
Tobacco and tobacco products							
Misc. food products							

Food expense and home production

Food item	Do you produce enough of the following items for your family? (if yes, enough to sell some? If no, how much shortfall?			How much you need to buy per (day/month/) and how much would you spend on it? Do you ever find you don't have enough money to buy it – what happens then?		
Grains and cereals	y/n	Shortfall	Excess	X kg	$/kg	
Eggs and milk products						
Cooking oils						
Vegetables						
Fruits and nuts						
Fish and meat						
Spices and condiments						
Sweets and confectionery						
Non-alcoholic beverages						
Alcoholic beverages						
Tobacco and tobacco products						
Misc. food products						

2.11 Please tell me about any other main expenses in your family.

Ask interviewee to list HH key expenditure in 2013 and amount associated with it. Information collected is used to fill in the table below. (Prompts: education, health, daily kerosene, fuel for moto...)

Main HH expenditure in 2013 (or day or month)	Total amount (MMK)

2.12 Fuelwood

- Do you mainly collect your own fuelwood or do you sometimes buy fuelwood?
- If collect: Where did you collect the fuelwood? (Major collecting source)

  □ Farm land □ Community managed forest □ Government plantation □ Home compound □ Natural forest
- If you buy: how much of fuelwood do you purchase each month?
- How much did you pay for each unit of fuelwood? (MMK)

3. Community Forestry (CF) and HH perception on CF

3.1 Have you ever heard about CF program in this area?

IF YES:

3.2 Can you tell me what you know about this program?

3.3 Do you participate in any way in the CF program? And how?

3.4 Do you think it has caused any changes in your HH activities?

Information collected is used to fill in the table below.

HH activities on different types of land	**Prior to participation in the CF program**	**At present (when the program being implemented) and in the future**
Paddy land		
Shifting cultivation		
Agroforestry		

Fuelwood collection		
Harvest of timber (for owned use and to sell)		
Collection of medicinal plants		
Clear new plots		
Reuse plots after fallow period		
Wildlife hunting		
Collection of honey/mushroom		
Others		

FOR ALL INFORMANTS (I.E. NOT JUST IF THEY KNOW ABOUT CF)

3.7 Apart from your HH, have you seen any changes more broadly for peoples' customary practices on land and forest resources? If yes, what are the changes? Are they caused by the CF program?

3.8 Have you noticed any changes in relationships among households in the village in recent times? If yes, what are the changes? Are any of these changes related to the CF program?

3.9 Have you observed any changes caused by the CF program concerning relationships between your village and neighbouring villages in using forest land and forest resources? If yes, what are the changes? Are any of these changes related to the CF program?

3.10 Have you seen any changes concerning relationships between villagers and Forest Department in recent times? Is this related to the CF program and how?

3.11 If you are involved in the CF program, what kinds of benefits do you think your household and the village can get from the program?

3.12 What will happen if these do not eventuate?

Will anything change in your use of forest land and forest resources if these benefits don't eventuate?

3.13 How do you rate the condition of the forest near in your village now compared to 1995?

□ Increased □ Decreased □ Same □ Don't know

3.14 If aware of CF, what do you think are the most important products to support/produce?

Indicative Interview Questions for Village Heads

Name of interviewee
Organisation
Responsibility
Date of Interview

1. Please let me know about your position and role in the village.
   a. Are you involved in any CF activities and how?
   b. Any role in the program planning or later stages e.g. (program activities selection, beneficiaries selection, planning, implementation, M&E)

2. When did community forest establish in your village? How long was the duration of program? What has happened since outside support stopped?

3. From your perspective, are there any benefits from the community forest? Who gains these benefits?

4. What are the impacts of the community forest on the villagers?

5. Do you hear about the problems and constraints in implementation activities? If yes, what are they? Were any steps taken to address these? (explain)

6. Tell me about how the CFUG operates (membership, meetings, role etc.) – what challenges do they face?

7. How does the current use of forest products compare with (before CF/5 years ago/3 years ago)? Why?

8. What are the main livelihood activities in the village?

9. What are the main changes in the village more broadly in recent years?

10. Forest products – prices, patterns of use.

Indicative Interview Questions for Focus Group Discussion

1. Who in the community is involved in CF and why? Why do some people not get involved?

2. What are the impacts of the community forest on the villagers?

3. Have you noticed any challenges with CF? What? How are these dealt with (or not)?

4. How important will forest products be for your livelihood in the future?

5. Can you tell us about the main forest products you get from the community forest, their use and harvesting procedures?

6. Has this changed through CF or is it the same as before? How?

Indicative Interview Questions for key informants (Local administrators)

Name of interviewee
Organisation
Responsibility
Date of Interview

1. Please tell me about your role in the organisation, and relationship to CF activities in the region.

2. Please let me know about any policies related to community forest in your organisation.

3. According to your experiences, what are the motivation factors to join the CF program for the forest users?

4. Please let me know about your training program for the forest users. Have you noticed any gaps in knowledge that need to be addressed?

5. What are the criteria of site selection for the community forest establishment?

6. Do your organisations coordinate with other agencies for CF activities? If yes, please explain in detail.

7. What are the impacts of the program on the forest users? Do they receive any benefits from CF? If yes, what are the benefits and how do they get it?

8. What are the strengths and weaknesses of CFUGs. (planning, implementation, M&E, people's participation, duration and others)

9. What are the strengths and weaknesses of CF overall?

10. Could the program transfer the lands to the CFUGs after establishing the community forest? Why or why not?

11. Overall, do you think the community forest is successful? Why or why not?

12. Are there any external factors that affect CFUGs and CF generally (forest policy, market)? Discuss.

13. Do you have any other reflections on the future of CF?

Questions Guide for key informant interviews (Government officials and personnel in non-governmental organisations)

Name

Role and Responsibility at your Organisation

Experience on Community Forestry

1. From your perspective tell me the overall objective of Community Forestry (CF) in Myanmar?

2. What is the role of CF for sustainable livelihoods in rural Myanmar?
   a. How can Forest Department support sustainable livelihoods of local communities?
   b. What are the challenges and prospects for shifting from protection orientation to production in CF?

3. In your opinion, what kinds of issues have faced CF in Myanmar?
   a. What are the advantages and disadvantages of community forest?

4. What do you think is needed in order to achieve full and effective participation of local communities in CF? (e.g. resources, will, incentives, capacity)

5. What is the Forest Department's role in CF (e.g. coordination, training, resourcing, regulations etc.)

6. Do you have any other reflections on the future of CF?

Benefits from CF

1. What kinds of benefits do you think local communities may gain from CF program?

2. What do you think products from CF are distributed within communities (e.g. which groups get access or not; is it based on HH size; wealth status)?

3. How do you ensure transparency and equitability of benefit sharing among CF members?

4. Do you think the forest products that the local communities extract from CF are enough for their livelihood (basic or daily needs)? If no, how do you think people meet their daily needs (e.g. off farm, ...)?

5. Are non-CFUG members prevented from using the commons (i.e. products from CF)? How?

6. What happens if there is a dispute on the use of CF resources? (e.g. Disputes among CFUG members? Disputes between CFUG members and non-CFUG members?)

Tenure arrangement

1. How does CF fit in with current systems of land and forest tenure in Myanmar? How about in CF areas?
   a. Are there any conflicts in land use around CF? (e.g. infrastructure, concessions etc.)
   b. If there are conflicts, how are they dealt with?
   c. Have there been any recent changes or plans for change?

2. Are customary rights recognised in the land tenure system for CF areas?

3. What kinds of access rights are possible in community forest? (e.g. collection of NTFPs, household building materials, land for cultivation, timber for sale...)

4. Can such rights be transferred by: Sale? Gift? Loan? Can such rights be inherited? Or willed?

5. Do you see any types of disputes or disagreement on land tenure and conflicts over benefit sharing in CF areas?

6. Do the local communities have rights to commercial sales of CF products? Why or why not? If yes, which products?

7. If communities were given rights to sell CF products, how could this be managed for sustainable use?