

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



**Up-scaling Community Forestry in Myanmar from Basic Needs to
Commercialization**

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December, 2015

**ဒေသခံပြည်သူ့အစုအဖွဲ့ပိုင်သစ်တောများ၏တန်ဖိုးနှင့် အရည်အသွေးမြှင့်တင်ခြင်း
(အခြေခံလိုအပ်ချက် ဖြည့်ဆည်းခြင်းမှ ရောင်းကုန်အဖြစ် ပြောင်းလဲထုတ်လုပ်ခြင်းသို့)**

**ဒေါက်တာတင်မင်းမောင်၊ တွဲဘက်ပါမောက္ခ
သစ်တောတက္ကသိုလ်**

စာတမ်းအကျဉ်းချုပ်

စီးပွားရေးဖွံ့ဖြိုးတိုးတက်မှုနှင့် သစ်တောများကာကွယ် ထိန်းသိမ်းမှုဆိုင်ရာ အကျိုးသက်ရောက်မှုများကို ပေးစွမ်းနိုင်ရန် အစုအဖွဲ့ပိုင်သစ်တောလုပ်ငန်းစဉ်များ၏ မူလဦးတည်ချက်များကို အပြောင်းအလဲပြုလုပ်ရန် အချိန်ကျရောက်နေပြီဖြစ်ပါသည်။ ယခုလေ့လာမှုတွင် အစုအဖွဲ့ပိုင်သစ်တောမှ ထွက်ရှိသည့် ပစ္စည်းများကို ရောင်းကုန်အဖြစ် ပြောင်းလဲထုတ်လုပ်နိုင်ရန် အလားအလာများကို စူးစမ်းတင်ပြထားပါသည်။ အစုအဖွဲ့ပိုင် သစ်တောများ၏တန်ဖိုးနှင့် အရည်အသွေးမြှင့်တင်ခြင်းသည် အမျိုးမျိုးကွဲပြားခြားနားသော မြေမျက်နှာသွင်ပြင် အသီးသီး၌ သစ်တောသစ်ပင်များနှင့် စိုက်ပျိုးသီးနှံများကို အောင်မြင်စွာ ပေါင်းစပ်စိုက်ပျိုးခြင်းဖြင့် ဒေသခံပြည်သူတို့၏ လိုအပ်ချက်များကို ဖြည့်ဆည်းပေးနိုင်ရန် ရည်ရွယ်ပါသည်။ သုတေသန၏ ရည်မှန်းချက်မှာ လက်ရှိခွင့်ပြုထားသောဥပဒေနှင့် ဒေသခံပြည်သူတို့၏ စွမ်းဆောင်နိုင်မှု ဘောင်အတွင်းမှ အစုအဖွဲ့ပိုင် သစ်တောများ၏ တန်ဖိုးနှင့်အရည်အသွေး မြှင့်တင်ဆောင်ရွက်ခြင်းဖြင့် ဒေသခံပြည်သူများ ဝင်ငွေတိုးတက် ကောင်းမွန်လာစေရန်ဖြစ်ပါသည်။ မြေအတန်းအစားကျဆင်းခြင်း၊ သဲကန္တာရဖြစ်ထွန်းခြင်းများကို ရင်ဆိုင်နေရသည့် မြန်မာနိုင်ငံ အပူပိုင်းဒေသနှင့် အင်းလေးကန် တိမ်ကောမှုနှင့် ရင်ဆိုင်နေရသည့် ရှမ်းပြည်တောင်ပိုင်းတို့ကို သုတေသနလုပ်ငန်းဆောင်ရွက်ရန် ရွေးချယ်ခဲ့ပါသည်။ သစ်မဟုတ်သော သစ်တောထွက်ပစ္စည်းများ၏ ဈေးကွက်လည်ပတ်မှု လုပ်ငန်းစဉ်မှာ ပြောင်းလဲမှုပုံစံ များစွာရှိပြီး ခြုံငုံသုံးသပ်တင်ပြရာတွင် များစွာ အခက်အခဲရှိပါသည်။ ယေဘုယျအားဖြင့် သစ်နှင့် သစ်ကဲ့သို့သော နှစ်ရှည်ခံပင်များဖြစ်သည့် အင်ကြင်း၊ ဝါး၊ ထင်းလောင်စာပင်များ၊ သရက်၊ ထောပတ်ပင်များကို ရှမ်းပြည်တောင်ပိုင်းတွင် ပူးတွဲစိုက်ပျိုးသင့်ပါသည်။ အရိပ်ကျမှုဒဏ် ခံနိုင်သော စိုက်ပျိုးသီးနှံများဖြစ်သည့် အာလူးနှင့် ဂျင်းတို့ကို အတူပေါင်းစပ်စိုက်ပျိုးသင့်ပါသည်။ အပူပိုင်းဒေသဖြစ်သည့် ဆိပ်ဖြူတွင်မူ သစ်နှင့် သစ်ကဲ့သို့ နှစ်ရှည်ခံပင်များဖြစ်သော ဇီး၊ ရှား၊ ယူကလစ်၊ သရက်နှင့် မန်ကျီးပင်များကို အစုအဖွဲ့ပိုင်တော၏ တန်ဖိုးကို မြှင့်တင်နိုင်ရန် စိုက်ပျိုးသင့်ပါသည်။ ဒေသခံပြည်သူများမှ ပဲအမျိုးမျိုးနှင့် နှမ်းတို့ကို သစ်မျိုးများနှင့် အတူပူးတွဲစိုက်ပျိုးရန် ဆန္ဒရှိကြသော်လည်း အဆိုပါဒေသရှိ မြေ၏သဘောသဘာဝကို ကျော်လွှား၍ စီမံအုပ်ချုပ် လုပ်ကိုင်နိုင်မည့် အခွင့်အလမ်းမှာ လွန်စွာနည်းပါးပါသည်။ အဆိုပါ အကြောင်းများကြောင့် သီးနှံနှင့် သစ်တောသစ်ပင်များ ပေါင်းစပ်စိုက်ပျိုးခြင်း နည်းစနစ်ထက် မွေးမြူရေးနှင့် သစ်တောသစ်ပင်စိုက်ပျိုးမှု ပေါင်းစပ်သည့်စနစ်ကို ဆောင်ရွက်မည်ဆိုပါက ဒေသနှင့် ပိုမို လိုက်လျောညီထွေမှုရှိမည် ဖြစ်ပါသည်။ ထို့အပြင် အဖိုးတန်မျိုးစိတ်များ ဖြစ်သည့် သနပ်ခါး၊ ဆင်တုံးမနွယ်၊ တောရှောက်တို့ကို ဒေသခံပြည်သူများ ရေရှည်ဖွံ့ဖြိုးတိုးတက်ရေးအတွက် ဒေသခံပြည်သူ့ အစုအဖွဲ့ပိုင်သစ်တောများ၏ အရည်အသွေးမြှင့်တင်နိုင်ရန် တန်ဖိုးမြှင့် စိုက်ပျိုးသင့်ပါကြောင်း တင်ပြအပ်ပါသည်။

Up-scaling Community Forestry in Myanmar from Basic Needs to Commercialization

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Abstract

A change is urgently needed in the trend of community forestry to provide economic development and forest protection impacts in rural areas in Myanmar. This study explores how to up-scale community forestry for commercial purpose. Up-scaling community forestry aims to lead successful integration of forest trees and agricultural crops across diverse landscapes to meet multiple local demands. The overall objective of the research is to improve the income of local community by up-lifting their community forests from basic needs to commercialization within the current legal framework and the capacity of local community. Two ecological zones which are facing the challenges of environmental protection, i.e. the dry zone facing land degradation/desertification and the Southern Shan State where Inlay Lake Basin is gradually degrading by time are selected to explore a participatory action research for up-scaling community forestry. Although it is hard to generalize the pattern of all NTFP markets and their functions as are extremely dynamic, it can be said that woody perennials like Ingyin (*Shorea siamensis*), Bamboo (*Dendrocalamus* spp.), Firewood species, fruit trees like Mango (*Mangifera* spp.) and Avocado (*Persea americana*) should be planted together for up-lifting community forestry in Nyaung Shwe Region. In the case of agricultural crops, cultivation of partial shade tolerant crop like potato, rhizome plants like Ginger can be used in agroforestry practice. In Seik Phyu Region, it seems very hard to up-lift community forestry for commercial purpose. Woody perennials like Zi (*Ziziphus jujuba*), Sha (*Acacia catechu*), Eu-ca-lit (*Eucalyptus* spp.), Mango (*Mangifera* spp.), Magyi (*Tamarindus indica*) should be planted to enrich the value of community forest. Although the local communities would like to cultivate Peas and Beans, Sesame and Peanut together with woody perennials, the nature of the soil, like deep cracking during excessive dryness and muddy after the rain, might make it extremely difficult to manage and overcome. All these things make it almost impossible to suggest agrisilvicultural system. However, there might be a chance to develop silvopastoral system to provide fodder for animal husbandry and fuelwood. Moreover, valuable species like Thanakha (*Hesperethusa crenulata*), medicinal plants like Sindon-ma-nwe (*Tinospora nudiflora*) and Tawshaut (*Atalantia monophylla*) can also be used for enrichment planting to up-lift community forestry for the sustainable development of local communities.

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1. Problem Statement (Rationale)

At present, the development of community forestry is roughly 4,064 hectares per year (Forest Department, Myanmar 2014). It is extremely slow – much slower than the annual target of 26,000 hectares a year that would be needed to meet the government Master Plan target of 918,000 hectares of community forest by 2030. If Myanmar Forest Department continues to carry out according to the current Community Forestry Instructions, its aim will be to satisfy basic needs. It clearly stated neither to develop community forestry as a regional development forestry operation nor a large scale operation to import an industrial enterprise based on forest products (Forest Department, Myanmar 1995). Unsurprisingly, it leads to the lack of incentives and the main challenge now is how to ensure the progressive (recovery or enhancement) modification in community forestry.

Food and Agriculture Organization – FAO (2015) estimated that 546,000 ha of forest area in Myanmar were destroyed annually and as a result, Myanmar lost 2,730,000 hectares (10,579 sq mi) of forest between 2010 and 2015. Losing 1.7% of its forest cover annually, there is currently only a little above 40% forest cover left. According to United Nation Development Program – UNDP reports in 2010, poverty in Myanmar fell from 32% to 26%. However, poverty rate must be reduced by half in a period between 1990 and 2015 according to millennium development goal. The current policy of the Union of Myanmar tries to explore measures on poverty eradication for rural people. Evaluation of the World Bank Group Experience with Managing Forest Resources for Sustainable Development (2013) reveals a shift in the forest sector by putting poverty alleviation and sustainable economic development on equal footing with conservation.

Thus, to provide economic development and forest protection impacts in rural areas, a change is urgently needed in the trend of community forestry from addressing basic needs of local communities to commercialization which ensure productive and environmentally sustainable income earning opportunities. “Commercialization has been associated with efforts to politically empower and economically advance some of the most disadvantaged sections of society ... for social justice, social welfare, land reform, rural poverty and political empowerment” (Neumann and Hirsch 2000). “Commercialization leads to the successful integration of forest trees and agricultural crops across diverse landscapes to meet multiple local demands for products and services. Crucially, the integration, can if manage well, increase soil productivity and help maintain the resilience of landscapes in meeting growing demands for food in the face of climate change” (Macqueen 2012).

“There are numerous diverse location-specific enterprise / commercial opportunities that might also provide a strong incentive for communities, NGOs and the private sector to invest in long term CF support” (Tint, K., et al 2011). These opportunities are governed by different agro-ecological conditions, livelihood needs and markets. This study will explore successful commercialization of community forestry in two distinctive ecological zones.

2. Research Aim

The overall objective of the research is to improve the income of local community by up-lifting their community forests from basic needs to commercialization within the current legal framework and the capacity of local community. The specific objectives of the research are:

- To identify the woody perennials and agricultural crops important for rural livelihood with the help of local community
- To identify key opportunities and constraints in up-scaling community forestry
- To present possible recommendations to up-lift community forestry from basic needs to commercialization

3. Analytical Framework

The analytical framework planned to adopt for the current study is outlined in Figure 1. As community forestry is proposed to develop from fulfilling the basic needs to commercialization, the focus of the analysis is based on the holistic thinking of key constraints and opportunities that have to be faced in commercialization of community forestry in Myanmar. In order to define these, the perceptions of different stakeholders, community forest user groups (CFUGs), CSOs, private sector and the forest department representing the government, etc will be assessed using PAR tools. The following framework conceptualizes that each stakeholder has the responsibility for the development of successful commercialization of community forestry: secure commercial forest rights, fair investment, capacity development and enterprise-oriented organization.

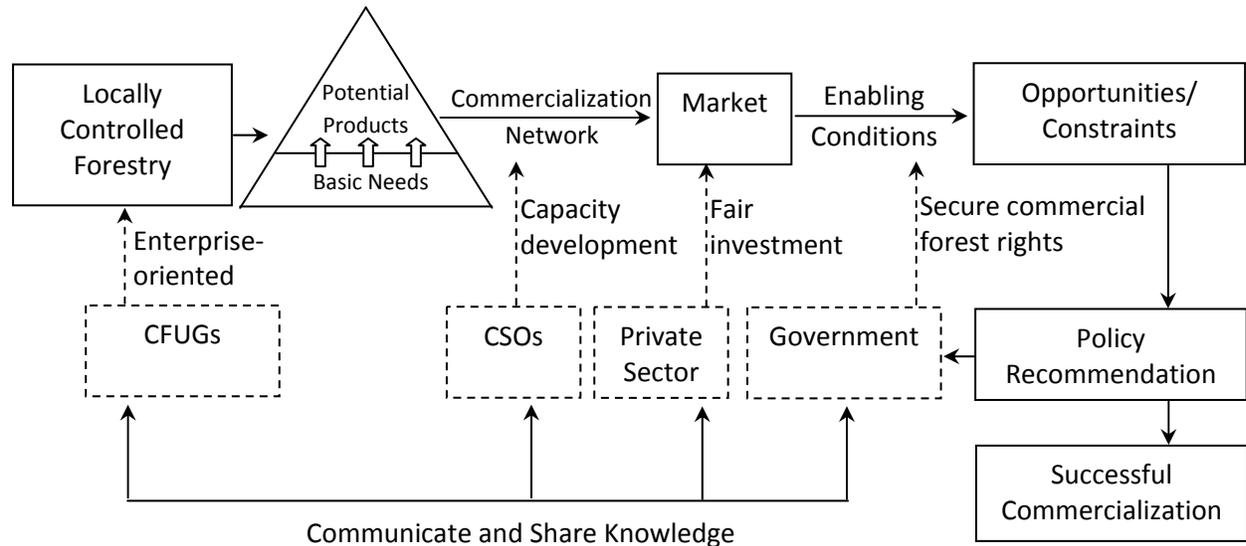


Figure 1: Analytical framework for the successful commercialization of community forestry in Myanmar (Adopted from Macqueen 2012)

4. Method (PAR Tools)

The nature of the research is community-based participatory approach that equitably involves different levels and types of stakeholders in the research process. “Participatory research is defined as systematic inquiry, with the collaboration of those affected by the issue

being studied, for purposes of education and taking action or effecting change” Green et al (2003). It also encompasses different methods, tools and approaches as Participatory Rural Appraisal (PRA), Participatory Action Research (PAR), and Farmer Participatory Research (FPR).

In this research, it tries to make a change in community forestry from traditional way of fulfilling the basic needs to more innovative way of commercializing the products. It also recognizes the distinctive nature of communities in different ecologies and is planning to work with the participation of communities who hold a sense of common identity and shared fate (Israel et al 1998).

Evidences indicate that with the application of the PAR tools, it will be able to a) improve communicative rationality, b) address power imbalance among different stakeholders, c) change the world collaboratively and following reflection, d) increase responsiveness and accountability of Forest Department. Transect Walk, Key Informants Interview, Matrix Scoring Technique and Focus Group Discussion are being used in a PAR process (Table 1).

Table 1. Participants who joined Different Types of PAR Tools in Each Village

PAR Tools	Participants		
	Male	Female	Total
Transect walk	3	0	3
Key informant interview	10	5	15
Matrix	2	1	3
FGD	5	5	10
Total	20	11	31

5. Study Sites

Myanmar has varying ecological conditions and each has its distinctive opportunities and constraints for successful commercialization of Community Forestry. When considering for commercialization of community forestry, the central ecological question is how to harvest the resource without diminishing its capacity to regenerate or degrading the environment. Considering from that aspect, it will be most suitable to explore the potential constraints and opportunities from two ecological zones which are facing the challenges of environmental protection, i.e. the dry zone facing land degradation/desertification and the Southern Shan State where Inlay Lake Basin is gradually degrading by time from the environmental effects of increased population.

First of all, CFUGs which have more or less ten years of establishment, have potential commercial use and reach to harvest age according to the Management Plan in two different ecological zones were selected. After that Sulaykone and Ywarthitkyi villages from Seik Phyu Township of dry zone and Konlon and Lwenyaint villages from Nyaung Shwe Township of Shan Plateau area which were indicated as the most suitable CFUGs by the relevant local forest authorities were selected for PAR. In addition, Kyaukngat and Painnekone villages which also have communal bamboo forests are selected to include all aspects in PAR.

Table 2. Description of the CFs/CFUGs in the study site

Location	CF/ Village	Year of Establishment	CF area (acres)			Members
			Plantation	Natural Forest	Total	
Nyaung Shwe	Kwanlon	2001	-	65.00	65.00	51
Nyaung Shwe	Lwenyaint	2000		600	600	90
Nyaung Shwe	Kyaukngat	2001	-	670	670	116
Nyaung Shwe	Painnekone	2001	-	185.00	185.00	76
Seik Phyu	Sulaykone	2003	50.00	20.00	70.00	40
Seik Phyu	Ywarthitkyi	2006	300.00	-	300.00	134

6. Findings from Participatory Action Research

6. 1. Findings from Transect Walk

From the discussion with the locals during Transect Walk of community forest in Nyaung Shwe (Table 3), it is clear that local communities are not able to participate in decision making regarding the harvest of products from community forests. Community forest can provide poles and firewood only for subsistence consumption, religious and village development purposes. However, the decision is solely by the Chairperson which is very common in most of the CFUGs in Myanmar. Even though some medicinal plants exist in the area, they can only satisfy the subsistence needs at present. The only woody perennial which can fulfill the cash needs of local communities is bamboo (*Dendrocalamus* spp.) in their homestead. The adverse state is compounded by poor soil quality, illegal cutting by adjacent villages and agricultural encroachment.

Table 3. Transect Walk at Kwanlon Community Forest in Nyaung Shwe

Land use	Village	Agricultural land	Community forest
Soil type	Mountainous red brown	Mountainous red brown	Mountainous red brown
Species	Acacia, bamboo, Mezali	Maize, Turmeric, Sugarcane, Onion	Ingyin, In, Gaw, Thitsi, Yemane, Ngu, Yindaik, Eu-ca-lit
Time of harvest	Requisite	Seasonal	Requisite
Harvest product	Bamboo	All crops	Pole, firewood
Income Source	Fulfill cash needs. 1500 Kyats per bamboo	Major income source Medicinal plants for consumption	For subsistence consumption, religious and village development purposes
Benefit sharing pattern	Private-owned	Private-owned	Chairperson's decision Harvested block by block
Opportunities	Good and fertile soil	Good and fertile soil, Accessible	Some fertile land to introduce agroforestry

Constraints	Unclear tenure	Pest, Abnormal pattern of rain as planting depends only on rain water	Forest degradation, poor soil quality, illegal cutting by adjacent villages, agricultural encroachment
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While looking at the communal forest in Nyaung Shwe (Table 4), the communal forest has clear ownership. Although there is a constraint in accessibility to market like remoteness, extreme rurality, poverty, etc., the local can freely sell their bamboo products with no restriction from Forest Department. Maize, Turmeric, Sugarcane, Onion, Ginger and Pigeon pea are mostly found in agricultural land. Ingyin (*Shorea siamensis*), In (*Dipterocarpus tuberculatus*), Gaw (*Castanopsis spp.*), Thitsi (*Melanorrhoea usitata*), Yemane (*Gmelina arborea*), Ngu (*Cassia fistula*), Yindaik (*Dalbergia spp.*), Eu-ca-lit (Eucalyptus spp.) and bamboo (*Dendrocalamus spp.*) are generally found woody perennials in community forests. Bamboo of *Dendrocalamus spp.* which can get 1000 to 1500 Kyats for each is the most suitable woody perennial to up-lift community forestry in Nyaung Shwe. It will be beneficial if CFUG members can actively participate starting from the choice of species to inclusive decision-making on when and how to harvest.

The fact that the locals do not grow bamboo in community forest though they have indigenous knowledge on bamboo planting technique indicates the need to facilitate understanding of clear rights and tenure regarding CF and their hesitation and disbelief to get return from their effort. Instead of pure agricultural encroachment, suitable agroforestry system with bamboo cultivation and gap planting of natural resources should be encroached to up-lift community forestry from basic needs to commercialization.

Table 4. Transect Walk at Painnekone Communal Forest in Nyaung Shwe

Land use	Communal forest	Agricultural land	Community forest
Soil type	Red earth	Red earth	Mountainous red brown
Species	Bamboo	Ginger, Pigeon pea	Acacia, Mezali
Time of harvest	Requisite	October, November	Requisite
Harvest products	Bamboo	All crops	Pole, firewood
Income Source	1000 kyats per bamboo	Major income	Only subsistence need
Benefit sharing pattern	Ownership by individual household	Ownership by individual household	-
Opportunities	Freely commercialize		Support seedlings by FD
Constraints	Poor accessibility to market	Rain-fed	Unproductive soil

The nature of Transect Walk at Seik Phyu (Table 5) is totally different from Nyaung Shwe from the aspect of opportunities and constraints. However, the common point is that there is no participatory process in decision making as the decision is solely by Chairperson of the committee.

Onion, pepper, sesame, peanut, maize are the agricultural crops which have to fulfill the needs of income for the locals at Seik Phyu. However, the locals are facing problems as a result of prolonged drought which need to spend more inputs for water such as digging wells for cultivation. Commonly seen woody perennials in community forest are Sha (*Acacia catechu*), Htanaung (*Acacia leucophloea*), Mezali (*Cassia siamea*) and Zi (*Ziziphus jujuba*). The state of community forest is threatened by encroachment of Maize plantations, construction of Pagoda, monastery and religious buildings inside community forest area, construction of railway across community forest, and grazing of animals, especially goats. Sindon-ma-nwe (*Tinospora nudiflora*) and Tawshaut (*Atalantia monophylla*) are famous medicinal plants and might be able to use in up-scaling community forestry.

Table 5. Transect Walk at Sulaykone Community Forest in Seik Phyu

Land use	Agricultural land	Community forest
Soil type	Silty Clay loam	Sandy soil
Species	Onion, pepper, sesame, peanut, maize, Sindon-ma-nwe, Tawshaut	Sha, Htanaung, Mezali, Zi, Sindon-ma-nwe, Tawshaut
Time of harvest	Seasonal	Requisite, For village development purpose
Harvest product	All crops	Firewood, Medicinal plant (Sometimes to export industry)
Income source	Agricultural crops are the main source of income Medicinal plants only for consumption	Only Subsistence
Benefit sharing pattern	Owner's decision	No participatory process in decision making Only Chairperson's decision
Opportunities	Irrigation to cultivated land, Medicinal plants collection	Seedling supply by FD
Constraints	Drought, water shortage gradually leading to a change from paddy field to farms High price of agricultural input including water such as well digging	Poor soil fertility, drought, and encroachment of Maize plantations. Construction of Pagoda, monastery and religious buildings, construction of railway across CF without compensation, grazing animals, especially goats

6.2 Findings from Key Informant Interview

Local people in Shan State used to own large bamboo communal forests which they traditionally handed over to their children. Painnekone communal forest alone earned more than 12,000,000 kyats per year. Thus, it is natural to see bamboo (*Dendrocalamus* spp.) as first

priority species in ranking woody perennials. Then, it is followed by deliberate willingness to cultivate firewood species as there is still no substitute to replace it in cooking, heating and lighting. Ingyin (*Shorea siamensis*) which can serve as timber, post and pole for domestic use stands at the third place.

Regarding to important agricultural crops, paddy cultivation which cannot be integrated in up-lifting community forestry is excluded. The local communities in four different villages at Nyaung Shwe prioritize Maize, Ginger, Potato, Sugarcane and Chili as the most priority species. From the aspect of most selling products, bamboo and firewood which are the products of communal and community forests come first, followed by agricultural products like Maize, Ginger and Chili. When local communities are encouraged to consider the possible combination of woody perennials and agricultural crops, fruit trees like Mango and Avocado come out in their wish list.

From Table 6, it is clear that Woody perennials like Bamboo (*Dendrocalamus* spp.), Ingyin (*Shorea siamensis*) and Firewood species including Acacia, fruit trees like Mango (*Mangifera* spp.) and Avocado (*Persea americana*), and Agricultural crops like Maize and Ginger are the most promising species to use in up-scaling community forestry.

Table 6. The Choice of Species for four different categories by Key Informants in Nyaung Shwe

Species	Important woody perennials	Important agricultural crops	Most selling products	Potential agroforestry species
Bamboo	43	0	46	0
Firewood spp.	29	0	11	0
Ingyin	17	0	0	0
Acacia	8	0	0	12
Thitya	8	0	0	0
Teak	0	0	0	12
Mango	0	0	0	22
Avocado	0	0	0	13
Maize	0	32	9	18
Ginger	0	14	7	0
Potato	0	14	0	0
Sugarcane	0	13	0	0
Chili	0	10	5	0

(The numerical value signifies the number of key informants who chose their preferred species for different categories)

All the woody perennials listed by locals at Seik Phyu, like Zi, Sha, Eu-ca-lit and *Prosopis* spp. are especially for firewood. The local communities from two different villages at Seik Phyu consider Peas and beans, Sesame, Onion, Peanut and Pepper as important agricultural crops. The most selling products surprisingly do not include any agricultural crops. Based on the discussion with key informants, it might be related to decline in crop yield because of climate change. One of the informants even stated that they have to convert rainfed paddy field to farmland because of poor rainfall, yet again agricultural production is still vulnerable because of extreme drought coupled with changed rainfall patterns. Similar to Nyaung Shwe, when local

communities in Seik Phyu are encroached to choose woody perennials and agricultural crops for agroforestry, fruit trees always appear in their wish list. In this case, they choose firewood spp., fruit trees and Sesame for agroforestry practice.

From Table 7, it can be concluded that Woody perennials like Zi (*Ziziphus jujuba*), Sha (*Acacia catechu*), Eu-ca-lit (Eucalyptus spp.), fruit trees like Mango (*Mangifera spp.*), Magyi (*Tamarindus indica*) and Agricultural crops like Peas and Beans, Sesame and Peanut could be used in up-lifting community forestry for commercialization.

Table 7. The Choice of Species for four different categories by Key Informants in Seik Phyu

Species	Important woody perennials	Important agricultural crops	Most selling products	Potential agroforestry species
Firewood spp.	25	0	9	0
Zi	18	0	1	5
Sha	15	0	1	10
Eu-ca-lit	6	0	0	0
Prosopis spp.	6	0	0	0
Magyi	0	0	0	9
Mango	0	0	0	9
Dahat	0	0	1	0
Palm	0	0	1	0
Peas & Beans	0	25	0	0
Sesame	0	14	0	5
Onion	0	13	0	0
Peanut	0	10	0	0
Pepper	0	10	0	0

(The numerical value signifies the number of key informants who chose their preferred species for different categories)

6.3 Findings from Matrix Scoring Technique

Matrix Scoring Technique present similar results as the choice of important woody perennials in Nyaung Shwe, with Bamboo (*Dendrocalamus spp.*) with highest score of 79, followed by Ingyin (*Shorea siamensis*) with the score of 59. These species are followed by Gaw (*Castanopsis spp.*) and In (*Dipterocarpus tuberculatus*). although Ngu (*Cassia fistula*) stands at the 5th place, the resulting score is too low that it can be neglected (Table 8).

In the case of Seik Phyu, Zi (*Ziziphus jujuba*) comes first as it can not only satisfy firewood need, but also useful as fruit, juice and vinegar. After that comes Sha (*Acacia catechu*) and Htanaung (*Acacia leucophloea*) followed by Eu-ca-lit (Eucalyptus spp.) and Tama (*Azadirachta indica*). Even though Tama gets the lowest score, it should be encourage to plant as it provides many useful compounds that are used as *pesticides* and could be applied to protect stored seeds against insects. Its leaves, barks, flowers, fruits, twigs, gums, seeds and oil also have medicinal value (Table 9).

Table 8. Results from Matrix Scoring at Nyaung Shwe

Species	Ingyin	In	Gaw	Bamboo	Ngu
Resource tenure	7	6	6	9	3
Resource (Seedling)	7	5	4	8	2
FD Support	5	4	3	6	1
Time taken	5	4	4	9	2
Consumption	7	4	4	11	1
Cash crop	6	3	4	9	1
PLR support	8	5	5	9	3
Access	7	4	5	9	1
Market	7	4	5	9	1
Total	59	39	40	79	15

Table 9. Results from Matrix Scoring at Seik Phyu

Species	Sha	Htanaung	Zi	Tama	Eu-ca-lit
Resource tenure	6	6	6	6	6
Resource (Seedling)	5	6	6	3	3
FD Support	5	5	5	5	6
Time taken	2	2	6	3	4
Consumption	6	6	6	3	4
Cash crop	3	2	2	2	2
PLR support	2	4	6	6	4
Access	3	2	2	2	2
Market	3	2	2	2	2
Total	35	35	41	32	33

6.4 Findings from Focus Group Discussion

Word Cloud is used to help in finding out the most prevalent words during Focus Group Discussion and getting a general idea of how to up-scale CF (Figure 1). It is very clear that bamboo which appears 86 times and firewood which appears 60 times from Focus Group Discussions are the key players to up-lift community forestry in Nyaung Shwe, Southern Shan State. Major forest products traded at local markets of Nyaung Shwe included fuelwood, poles, posts, bamboos and finished bamboo products. Value-added bamboo products enjoyed the highest demand followed by bamboo and posts. “The problem is even though bamboo related training has been received from Forest Department or NGOs, there is a limited resource of bamboo in the village area and has to buy from neighboring villages” (Lwentyaint FGD). However, Lwentyaint community forest provides opportunity for local communities to access microfinance from Cooperatives Bank. In the case of Kwanlon, “there is a need to learn the techniques about making bamboo-based handicrafts. Villagers don’t take bamboo shoots from bamboo clumps for sustainability. Bamboo is cut 5 out of 20 in one clump and the best ones are sold out but infected ones are used for fencing” (Kwanlon FGD). “Bamboo is marketed as

both villages are willing to take “the guarding duty alternatively by forming groups or hiring guards and strictly and systematically manage the harvesting and grazing (Ywarthitkyi FGD).

7. Discussion

Up to now, most of the community forests are protection and conservation based and thus ecological conditions of most of the community forests have been improved. However, socio-economic conditions of CFUGs are more or less the same without any changes. Communities are heterogeneous as of gender, class or power. Their diverse interests make it hard to generalize the pattern of all NTFP markets and their functions as are extremely dynamic socially, temporally and spatially. Successful up-scaling of community forestry in Myanmar depends upon devolution and grassroots empowerment. However, as mentioned by Macqueen (2012), the potential paradox in Myanmar is weak political commitment to allow the concept of commercialization on actual ground and encouraging and trust building with locals which leads to lack of support from Private Sector which leads to the shortage of investment in community forestry enterprise. Moreover, benefits from participation in community forestry development can be quite uneven, both within and between CFUGs. For example, the chairperson is under no obligation to take on board the opinions of the members and microfinance from Ministry of Cooperatives is available only to Lwenyaint CFUG. Lack of business skills and insufficient technology at local community highlight the involvement of CSOs is yet to be fully explored. The situation is compounded by insecure land and resource tenure and use rights for commercial purposes resulting weak community interest and participation in community forestry purposes.

Nonetheless, by triangulating the PAR tools, it can be said that woody perennials like Ingyin (*Shorea siamensis*), Bamboo (*Dendrocalamus* spp.), Firewood species, fruit trees like Mango (*Mangifera* spp.) and Avocado ([*Persea americana*](#)), have the potential to be planted together for up-lifting community forestry in Nyaung Shwe Region. In the case of agricultural crops, the provision of shade can cause a net effect of complex interactions which need to address through management activities. In general, fruit and seed-yielding crops tend to be relatively shade-intolerant and might not be suitable for agroforestry system. That is the reason why most of the local communities are hesitant to invest in agroforestry based community forests. However, most of the community forest land has low fertile soils and there is a chance that the relative importance of light might even decrease by a shortage of nutrients. Thus, cultivation of partial shade tolerant crop like potato can also be encouraged. Moreover, rhizome plants like Ginger which has very good shade tolerant quality and strong economic incentive can be used in agroforestry practice. If the local communities want to grow Maize, it will be suitable to grow only when the trees are very small. It is because although the trees can be useful as windbreaks, Maize is light demanding and so shade may reduce crop yields.

In Seik Phyu Region, it seems very hard to up-lift community forestry for commercial purpose. Woody perennials like Zi ([*Ziziphus jujuba*](#)), Sha (*Acacia catechu*), Eu-ca-lit (*Eucalyptus* spp.), Mango (*Mangifera* spp.), Magyi (*Tamarindus indica*) should be planted to enrich the value of community forest. The local communities would like to cultivate Peas and Beans, Sesame and Peanut together with woody perennials. The soil in general is useful for farming. If there is a systematic irrigation system, even paddy can be cultivated. The problem is the deep cracking during excessive dryness which turns into mud that is very sticky after the rain. Thus it is extremely difficult for the local communities to manage and overcome physical problems though there is very high natural chemical fertility. All these things make it almost

impossible to suggest agrisilvicultural system, i.e. cultivating agricultural crops inside community forests together with woody perennials. However, without seeing animal grazing as constraints but as a challenging opportunity, there might be a chance to develop silvopastoral system to provide fodder for animal husbandry and fuelwood. Moreover, valuable species like Thanakha (*Hesperethusa crenulata*) can also be used for enrichment planting inside the community forests of Seik Phyu. There is also an opportunity to plant medicinal plants like Sindon-ma-nwe (*Tinospora nudiflora*) and Tawshaut (*Atalantia monophylla*) to up-lift community forestry for the sustainable development of local communities.

8. Conclusion

The resources to up-lift the community forestry can generally categorized into four types which are land, forest, human and financial resources. Judging only from the aspect of addressing the basic needs of the local communities, the resources are substantial. However, if it is to consider regaining environmental stability and poverty reduction, the local communities might not have desired woody perennials in their community forests and also the financial resource to get the seedlings. It is true that the Forest Department takes the responsibility to support the seedlings. However, these exotic forest tree seedlings are totally different from native forest tree seedlings and fruit trees that are important in the daily life of local communities.

The legal framework plays a vital role in up-scaling community from basic needs to commercialization. Even though the paper suggested developing Public Private Community Partnership (PPCP) in its conceptual framework, Myanmar's CFUGs currently rely on a very insecure Community Forestry Instructions (CFIs) that carries little weight in law (Macqueen 2012). Thus, instead of developing detailed models and safeguards for commercialization, this paper tries to focus on the possible initiatives within the current CFI boundary.

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