

**A COMPARATIVE STUDY ON COMMUNITY FORESTRY
DEVELOPMENT ACTIVITIES IN THREE DIFFERENT AGRO-
ECOLOGICAL ZONES: A CASE STUDY OF KYAUKPADAUNG,
NYAUNG SHWE AND LAPUTTA TOWNSHIPS IN MYANMAR**

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ABSTRACT

In Myanmar, the Forest Department issued the Community Forestry Instructions (CFI) in 1995 in order to restore the productivity in degraded forests and to fulfill the basic needs for the forest products of the local people. So far, an area of 27871.5 hectares of community forests has already been established throughout the country (FD, 2003). This study assesses and evaluates the development activities, implementation processes and forest management practices of community forestry in three different agro-ecological zones. It also investigates the impacts of community forestry on environmental, social and economical aspects of the local people. Then the possibilities and constraints including biophysical, technical and social information, which would be beneficial for upgrading extension staffs and capacity building of the local people, are presented.

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1. INTRODUCTION

Nowadays, many countries in tropical Asia including Myanmar, have actively engaged in the practice of community forestry, hoping to help to restore the productivity of degraded forest lands and to promote the welfare of the local people (forest dwellers and forest dependent). In Myanmar, forests and forestlands are state owned, and are managed by the Forest Department (FD). In line with the international trend of decentralization in forest management, the Forest Department initiated community forestry in 1995 soon after the Community Forestry Instructions (CFI) were issued. It is a major breakthrough in forestry sector in order to keep pace with the changing socio-economic and environmental concerns.

In the past, there had been a sufficient ration of the population and the natural resources so that centralized management system was effective to some extent. At present, with the ever increasing population, and demand of the forest resources, the conventional system (classical management system) is not likely to work well towards sustainable forestry. On the other hand, centralized management system is not able to meet the needs of the local people so that the trend of forest management system has to be changed gradually from top-down or centralized management system to bottom-up or decentralized approach.

The Forest Department has launched Community Forestry programs in all the States and Divisions of the country because community forestry is recognized as the major strategy by which forests can be managed and utilized sustainably. In addition, it also aims at improving living conditions of the local people by supporting Forest User Groups (FUGs) to manage community forest more effectively, sustainably and equitably. It is part of the government policy of transferring national forests to community management. At present, 68843 acres (27872 ha) of community forests have already been established within the context of CFI country-wide (Planning and Statistics - FD, 2003). Community forestry programs are being implemented into two forms: FD implemented program and FD and UNDP/FAO jointly implemented programs. In doing so, community forestry implemented in the various parts of the country (different agro-ecological zones) may differ from one place to another according to the ecological conditions, management strategies and level of peoples' participation. Of course the achievement levels of community forestry may be different.

This paper evaluates the implementation activities of community forestry with holistic approach. Because of the limitations in financial and man power resources, only three community forests and three user groups from Nyaung Shwe, Kyaukpadaung and Laputta Townships were investigated. Therefore, it would not be possible to generalize the results of this study as to represent all different agro-ecological zones in the country. Nevertheless, this paper highlights the possibilities and constraints in implementation of community forestry, and the results of this research will be beneficial for sustainable development of community forestry in Myanmar.

2. CONCEPTS OF COMMUNITY FORESTRY

Community forestry was initially defined by FAO (1978) as “any situation which intimately involves local people in a forest activity. It embraces a spectrum of situations ranging from woodlots in areas which are short of wood and other forest products for local needs, through the growing of trees at the farm level to provide cash crops and the processing of forest products at the household, artisan or small industry level to generate income, to the activities of forest dwelling communities”. Community forestry is, generally, composed of three main elements:

- the provision of fuelwood and other goods essential to meeting basic needs at the rural household and community level,
- the provision of food and the environmental stability necessary for continued food production, and
- the generation of income and employment in the rural community.

In line with FAO concept of community forestry, Community Forestry Instructions in Myanmar were issued in order to encourage people oriented forest management system. It plays a significant role to transform conventional top-down forest management system to modern bottom-up approach. It is the importance of participation of the local people in both planning and implementing activities so as to ensure that all parties would share responsibilities and benefits. For all the forest users to perform their management responsibilities and to function in the FUG, they need to be aware of the different decision making flora within community forest and have enough confidence, skill and knowledge. The Forest Department has the

responsibility to encourage FUGs to share experience and ideas through a cycle of action-reflection-learning.

3. LITERATURE REVIEW

3.1. An Overview of Community Forestry in the Asia-Pacific Region

In the last decade, community forestry has become a popular term as the central theme since it assists rural poor and promotes the involvement of a broader range of land types, species and non-forestry activities such as occupational social development. According to Y. S. Rio (1992), community forests of about 1.5 million ha per year in China, 1 million ha per year in India, 100,000 ha per year in Indonesia have been established with the peoples' participation. In the medium range, Philippines, Thailand, Malaysia are planting on average 50,000 ha per year and of lesser order 10,000 ha and below are being planted in the South Pacific Islands and smaller countries. In total it amounts to about 3 million ha per year of reforestation, a large part of which is community forestry.

In China, the greatest achievement is Four Sides programme (i.e. house, village, road and waterway). Over 7.2 billion trees have been planted voluntarily under this programme and each farmer household now has 74 trees on average (Y. S. Rao, 1992). In general, with the effective encouragement of the government to the farmers, afforestation program on the cooperative forest farms and state-owned forest farms were established throughout the country, with a total managed area of 17 million hectares.

In India, Social Forestry programme has been used as a principal reforestation model. Under this program, peoples' participation and sharing of benefits between the government and the local communities are the main focus. Various plantation schemes such as village wootlots (4 – 5 ha for each village), strip plantations (50 : 50 sharing), social security to tribal families 2.5 ha for each household), forestry on private lands (800 million trees planted between (1975 - 1985) and tree farms on marginal lands (3 ha for each family) have been adopted in social forestry projects.

In the Republic of Korea, the last three decades of dedicated soil conservation and reforestation work, with peoples' participation has resulted in a great success that 66 % of the land area is now covered with forests, which occupy about 6.5

million ha. About 70 % of the forest is privately owned and was established through the efforts of some 20,000 Village Forestry Associations whose membership is about 2 million people (Y. S. Rao, 1992).

In Myanmar, community forestry has been initiated in 1995 with the purpose of the economic development of the country and regaining environmental stability and addressing basic needs of local communities (FD, 1995). It was initially implemented in the three critical areas of the dry zone, the watershed regions and the mangrove zones. At present, the community forestry programme has been launched throughout the country. The following table shows the extent of the community forests, which had been established in all the States and Divisions of the country.

Table (1) Current status of community forestry in Myanmar

No.	States-Divisions	Area (acres)	No. of FUGs	No. of members
1	Kachin	200	1	42
2	Kayah	100	1	75
3	Kayin	493.55	2	36
4	Chin	200	1	10
5	Taninthayi	-	-	-
6	Sagaing	495	10	186
7	Bago (East)	795	8	84
8	Bago (West)	2245	14	275
9	Magwe	750	3	67
10	Mandalay	5179.68	90	8437
11	Mon	145	3	38
12	Rakhine	1612.07	46	1827
13	Yangon	400	3	71
14	Shan	36004.05	95	6977
15	Ayeyarwady	20223.28	88	5131
	Total	68842.63	365	23256

Source. Planning and Statistics Division, FD, 2003 and modified by the author

Community forestry cannot be successful without the willingness of the local people to participate in this activity. Then their participation level will not be satisfactory unless they are aware of CFI and the benefits that can be gained from community forestry.

3.2. Towards the Sustainable Development of Community Forestry

It is well known that sustainability is wise use of resources and it is simply used to describe as “not killing the goose which lays the golden egg”. In order to implement community forestry successfully, the concepts of sustainability, equity, efficiency and adoptability of such activities need to be taken into account. All these are based on the concepts of people’s participation. According to Dr. Umali, (FAO, 1980), people’s participation should be based on the concensus that there are extraordinary possibilities in ordinary people. In order to achieve the effective people’s participation, there is a need for more effective sensitization by the extension staff of the government, NGOs and organizations in the focus areas. In order to be able to sensitize the local community more effectively, the FD should enhance the capacity of their staffs on community mobilization, community forestry instructions together with its role in the forest policy and its importance to the department for sustainable forest development. Community forestry would be successful only if the staffs of the FD understand and accept the concepts of CFI and are prepared to work in hand with the local people (Gyi, K.K.M and Thet, S, 2002).

Gyi, K.K. M and Thet, S, (2002) also clearly expressed that the community development activities would be more successful if combined with community development, as environmental development programmes should introduce the mechanisms by which the development process becomes the part of the culture of the people. Moreover, development depends on mobilizing people, and people’s participation is an essential element within a process in bringing a better standard of living and quality of life to its people (RAPA, 1990).

The foundation for a long-term sustainable success in community development is a self-help approach built upon traditional knowledge and encouraging a sense of ownership of the development process and resources (Sharma, 2000). Supports should be given just to help the community to overcome the difficulties in carrying out their traditional income generation activities and local

communities should be made responsible for the support they get (Gyi, K.K.M and Thet, S (2000). Therefore, the CFI of the Forest Department (FD, 1995) clearly mentions the responsibilities and duties of the users' group as follows.

- Establishment of forest plantation in barren areas
- Where appropriate, natural regeneration methods should be used in the rehabilitation of forested areas.
- Fire protection
- To carry out the required cultural operations for the development of both plantations and natural forests.
- Protection against indiscriminate felling, gridling, pruning, resin tapping, removal of barks etc.
- Protect against mining of stones, sands, earth and metals in the designated area.
- Prevention of illegal land-use activities.
- In conformity of the rule and regulation, systematic extraction and utilization of Forest Product so as to avoid wastage.
- Protection against soil erosion and environmental deterioration
- After the first rotation, the users' group shall, under the supervision of the Forest Department, engage in size preparation, seed collection, sowing, planting and tending operation.
- Implementing activities as described in the management plan.

Land and trees tenure are the most important issue in successful implementation of the community forestry programme. The rural communities cannot be expected to respond positively to such programme without reliable assurances that they will ultimately obtain the benefits of the trees they plant. Not only in Myanmar but also in all developing countries, rural people make up a large share of the total population of the countries and thus the land and trees tenure should be clearly mentioned. A serious barrier to community forestry can exist in societies in which land is owned on a communal or semi-communal basis (Gregersen; Dreper; Elz (1989). The ownership of trees may be in question. Trees may be on the forest department's lists of protected species (e.g. teak). The future rights to exploit planted trees might not be secure. Tree planting supported by the government may result in the loss of possession or control over the land farmed. Much of the forest legislation in many countries is directed towards the preservation

of forests and the creation of restrictions on their use. The intention is to preserve the forest cover and protect trees against indiscriminate cutting, but the effect of legislation is counter-productive when efforts are made to engage local people in tree growing (Gregersen; Dreper; Elz (1989).

Community forestry as well as trees growing is undoubtedly a long-term exercise. The time delay between planting trees and obtaining their benefits is cited as an important constraint on community forestry (tree growing). However, the time constraint is not an absolute barrier to implement community forestry. If people are satisfied that the benefits are sufficiently worthwhile and that they are adequately guaranteed, they will willingly take part in a variety of long term endeavors. As long as villagers can obtain intermediate benefits such as grass, fruits, small poles or other produce, they are prepared to accept the delay in harvesting. In addition, community forestry can be integrated into its sideline occupations, and short-term income generating activities such as beekeeping, sericulture, bamboo growing, mushroom growing.

4. RATIONALE AND PROBLEM STATEMENT OF THE STUDY

4.1. Rationale of the Study

In Myanmar, scientific forest management has been practiced since 1856 with sustainable basis so that 50.8 % of the country's total area is still covered with forests. In the past, the productive capacity of forests and demand for forest products by the people were balanced. Therefore, conventional forest management system or centralized forest management system worked well to achieve sustained yields. However, at present, population and demands for forest products have been increasing at an alarming rate so that centralized management system is not likely to fulfill the basic needs of the local people. There is evidence that under such system, 540,700 acres of forest areas have been degraded annually and it is equal to 0.68 % of total forested area of the country (FD, 2003). The annual planting rate is only 105,000 acres in which 25,000 acres are established by enrichment planting (Planning & Statistics, FD, 2003). That means the amount of reforestation is only 19.42 % of the annual degradation. This figure indicates that degradation rate is higher than replanting rate or reforestation rate and thus large scale plantation programs or community forestry programs need to be implemented urgently with

peoples' participation. Unless people are willing to participate in the CF programs, FD will be heavily burdened for the establishment of forest plantations to fulfill the needs of the local people because the replanting cost of 434,720 acres of forest plantations would be Kyat 1558 millions (i.e., 434720 x 3585 kyat/acre) (Myint Aung, 2003). The calculation is based on current norm of the plantation establishment. This planting cost would make dilemma to FD that could not afford it annually. Generally, annual demands of the forest products by the people are shown in Table 1.

Table (2) Annual demand of some forest products by the people

No.	Items	Unit	Amount
1	Hardwood	cubic ton	650000
2	Fuelwood	ton (million)	18
3	Pole	number	110000
4	Post	number	519000
5	Bamboo	number (million)	121
6	Thatch/Dani	number (million)	80

Source. trsdK:om:opfawmuÖyifrpDrHudef:? (twGJ 1)?

In order to develop community forestry in a sustainable manner, evaluation and assessment of community forestry activities should inevitably be conducted in all CF programmes. However, the effectiveness of community forestry through user groups has not yet been evaluated widely and there is still a lack of this kind of comparative study with holistic approach on community forestry practices and implementation processes. In fact it is of crucial importance to observe the possibilities and constraints for successful implementation of community forestry, which could provide invaluable technical and social information for future community forestry development.

4.2. Problem Statement of the Study

The following factors have been identified as the problems, which could limit the successful implementation of community forestry programme.

1. Lack of information on possibilities and constraints of community forestry.
2. Insufficient extension services and information dissemination concerning with the CFI.
3. Weakness in practical experiences (i.e. social and technical arrangements) of the extension staffs and farmers (FUG).

5. OBJECTIVES AND EVALUATION CRITERIA OF THE STUDY

5.1. Objectives of the Study

5.1.1. Development objective

The development objective of the study is to improve the living conditions of the people through benefits accrued from environmental restoration within the context of CFI.

5.1.2. Specific objectives

The specific objectives of the study are:

1. to investigate the possibilities and constraints of community forestry established in different agro-ecological zones.
2. to provide technical and social information to the extension staffs and farmers in upgrading their practical capacity for efficient implementation of community forestry.
3. to examine the contributions of CF to the local people in terms of forest products, which could attract the active participation of the local people towards sustainable community forest management.

5.2. Evaluation Criteria

Community forestry provides a combination of social and technical arrangements. Management plan of a community forest contains different silvicultural activities, management strategies, responsibilities and benefits sharing among the FUG members, which makes the monitoring and evaluation of their implementation complicated. In order to provide an objective evaluation of the

effectiveness of community forestry, five criteria were examined for each user group (Henry Wood & Willem H.H. Mellink et. al., 1992). These are as follows:

(a) User group identification

Whether or not the members of the user group had been properly defined.

(b) Protection and afforestation (Plantation establishment)

Whether or not the user group had accepted the responsibilities for protection of the forest as evidenced by a system of protection and compliance with the system. Whether or not afforestation as specified in the plan had been conducted.

(c) Utilization of forest products

Whether or not forest products including grass, firewood, bamboo, pole & post, in-phet (leaf of *Dipterocarpus tuberculatus*) etc., were being systematically utilized.

(d) Decision making process

Whether or not the committee and user group as a whole were meeting regularly and making decisions.

(e) Conflicts resolution

Whether or not conflicts existed within the user group, which were hampering the implementation of the plan.

6. METHODOLOGY

To fulfill the research objectives, two research methodologies were adopted as follows:

1. structured questionnaire survey and semi-structured interviews with FUG members, and key persons
2. community forest inventory

6.1. Questionnaire Survey

Structured questionnaire survey and semi-structured interviews were used for the FUG member of each community aiming at the investigation of biophysical, technical, social information and community forest management system. In order to conduct the questionnaire survey, 25 % of FUG members of respective community were selected randomly and questions were raised face to face. Semi-structured interviews were also undertaken with 5 key persons from each community for cross-checking.

6.2. Community Forest Inventory

Forest inventory was carried out to investigate the forest growth conditions and species composition. Sample plots of size (10 m x 25 m) were established and distributed systematically in each community forest of different regions. There were 10 sample plots of size 0.25 ha for each community forest. The layout of sample is shown:

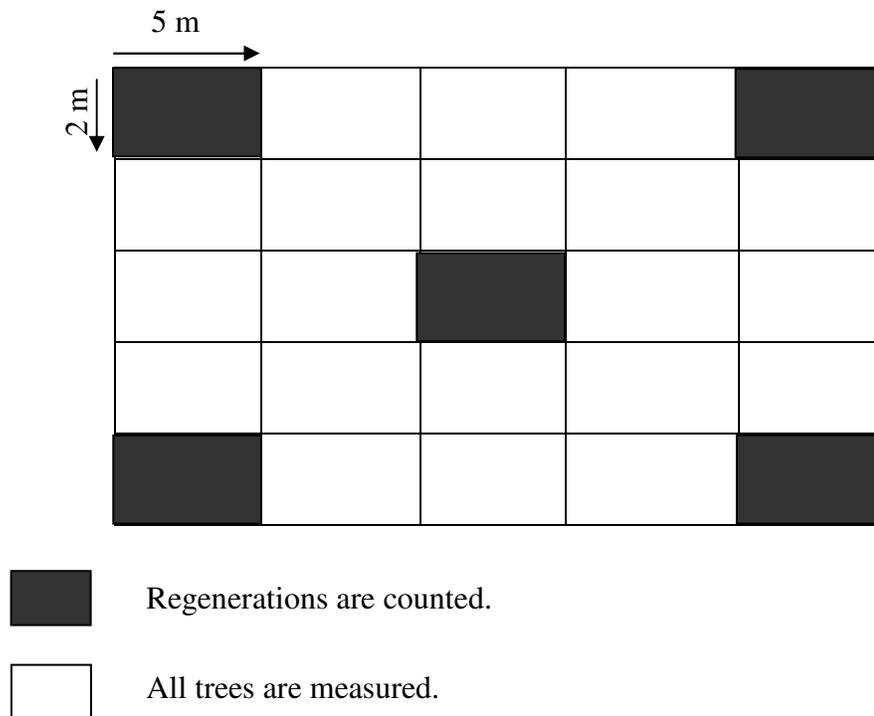


Figure 1. Layout of sample plot.

6.3. Analysis of Field Data

All the data collected were processed and analyzed using Microsoft Excel 2000 and the results are presented. Then the overall evaluation is made through the Goal Achievement Matrix analysis (GAM). The Goal Achievement Matrix evaluates alternative options within a matrix format on the basis of how well each achieves a set of pre-determined goals or objectives. It is a suitable process for evaluating the direct and indirect effects of alternative plans. The GAM process relies upon the identification of a set of objectives or "goals" that any project should achieve (Hill, 1968). These broad objectives are further refined to define quantifiable criteria against which the objectives can be assessed. The process allows for the weighting of both the objectives and criteria to ensure that those considered most "important" are given a suitable value in the analysis.

7. PROFILES OF THE STUDY AREAS

7.1. Location

This study covers three community forests and three villages, namely, Le-gyi, Lwe-nyeint and Kwin-chaung. Each village lies in different agro-ecological zones; Le-gyi village is located at Latitude 21° 00.915" North and Longitude 95° 15.465" East in Kyaukpadaung Township of the Dry Zone. This village is about 5 miles away from the northern side of the Mt. Popa, which is recognized as an Oasis of the Dry Zone, in Myanmar. In this village, community forest was established as early as in 1996 aiming at producing fuelwood, pole & post and agricultural implements in order to fulfill the household needs of the local people. In addition, the other reason of community forestry is to restore the environmental conditions. Hence, this village has been one of the earliest community forestry in the Dry Zone after Kann-Phyu village community forest. The area of the community forest is only 60 acres in which 50 acres are degraded natural forest and 10 acres are plantations.

Lwe-Nyeint village is situated at Latitude 19° 50.522" North and Longitude 96° 17.256" East in Nyaung Shwe Township of the mountain ecological zone. The village lies in the watershed area on the western bank of the Inle Lake (i.e., in Inle – Anauk Protected Forest), which is the second biggest lake in Myanmar. Community forestry has been introduced in 2000 and the village has been managing an area of

600 acres of community forest, which is composed of 500 acres of degraded natural forest (degraded Indaing forest) and 100 acres of plantation.

Kwin-Chaung village is located at Latitude 15' 44" North and Longitude 94' 33" East in Laputta Township of the Mangrove ecological zone. The village initiated community forestry in 1998 and the households of the village have got an opportunity to manage an area of 420.77 acres of community forest. It is observed that there are only 19.0 acres of natural forest, managed by a household, and the rest is plantation.

Table (3) Location and area of community forests

Villages	Ecological Zones/ Townships	no. of FUG members	Year of establishment	CF area (acre)		Total area (acre)
				NF*	PT**	
Lwe-Nyeint	Mountain/ Nyaung Shwe	90	2000	500	100	600
Le-Gyi	DryZone/ Kyaukpadaung	212	1996	50	10	60
Kwin-Chaung	Mangrove / Laputta	83	1998	19	401.77	420.77

*NF = Natural Forest

** PT = Plantation

7.2. Demography

Le-Gyi village is composed of 212 households with the largest population of 1150 while Kwin-Chaung village has 83 households with the smallest population of 282. In the mean time, the population of Lwe-Nyeint village is 600, which consists of 90 households.

Table (4) Demography of three villages

Villages	total hh	FUG memb:	Ave: family size	CF area (acre)		Major employment	Literacy	Tribal composition %			
				NF	PT			B	K	I	O
Le-Gyi	212	21	5.4	40	20	Agri:	90 %	100	-	-	-
Lwe- Nyeint	90	90	6.6	500	100	Agri: & Fishery	92 %	24	-	56	20
Kwin- Chaung	83	83	3.4	15	420	Agri: & Fishery	83 %	65	35	-	-

B = Bahma, K = Kayin, I = Inthar, O = Others

7.3. Community Organizations

Most of the villagers in three villages have been involved in many community organizations, and participating especially in social and religious affairs. The following table shows the name of organizations existing in three villages.

Table (5) Community organizations in three villages

Villages	USDA	YM	YW	IG	RE	RC	CS	FR	PO	CO	BS
Le-Gyi	✓	✓	✓	-	✓	✓	-	-	✓	-	-
Lwe- Nyeint	✓	✓	✓	✓	✓	✓	-	-	✓	-	-
Kwin- Chaung	✓	✓	✓	✓	✓	✓	-	-	✓	-	-

USDA = the Union of Solidarity and Development, YM = Young Men Group,

YW = Young Women Group

IG = Income Generation Group, RE = Religion Group, RC = Red Cross, CS = Credit Societies, FR = Farmer Group, PO = Political Organization, CO = Co-operative,

BS = Burial Societies

Table shows that there are 6 to 7 various organizations in the study areas. These organizations are able to contribute beneficial effects including health, social, educational, economical benefits to the local people for overall development of community as a whole. The important thing is enthusiasm of the people to participate regularly in the development activities.

7.4. Edaphic and Climatic Conditions

Soil samples were taken from each of three community forests and tested at the laboratory of the Forest Research Institute, Yezin. The climatic and edaphic factors of three villages are shown in table 5.

Table (6) Edaphic and climatic conditions of three communities

No.	Community forests	Climatic conditions*		Soil properties	Forest types
		Mean annual rainfall (mm)	Min: Max: temperature (C')		
1	Le-Gyi	625	14 – 38.5	Sandy loam	Dry forest
2	Lwe-Nyeint	1542	7.6 – 28.8	Clay loam	Indaing forest
3	Kwin-Chaung	2767	17.1 – 36.6	Clay loam	Mangrove

* Monthly climatic data (1981-1990) of Department of Meteorology and Hydrology

Depending on the climatic and edaphic conditions, the natural vegetations in three community forests are different. In Le-Gyi CF, the typical dry forest species such as than (*Terminalia oliveri*), te (*Diospyros burmanica*), dahat (*Tectonal hamiltonia*), thabut-gyi (*Miliusa velutina*), phyauk-seik (*Holoptelea integrifolia*) are found. In Lwe-nyeint CF, indaing forest species especially in (*Dipterocarpus tuberculatus*), ingyin (*Pentaceme siamensis*), thit-si (*Melanorrhoea usitata*), letpan (*Salmalia malabarica*), zee-phyu (*Embllica officinalis*) and khabaung (*Strychnos nux-blanda*) are dominated. Mangrove forest species such as tha-me (*Avicennia officinalis*), la-mu (*Sonnertia caseolaris*), la-me (*Sonneratia alba*), byu-chidauk

(*Rhizophora candelaria*), thayaw (*Grewia scabrida*), kanasoe (*Heritiera fomes*), kanbala (*Sonneratia apetala*) and thin-baung (*Phoenix paludosa*) are grown in CF of Kwin-chaing village.

7.5. Livelihood and Infrastructure Development of Three Communities

Local people in three communities mainly depend on agriculture for their livelihoods. The production is mainly for subsistence consumption. The income from off-farm employment is also important as a supplement to the household needs. Generally, livelihood of the rural people is based on farm-household systems. It consists of three inter-linked and interactive subsystems. The farms with its crops and livestock activities are the production units of the farming system of each household, which is a decision making unit. Off-farm components and social relationships are also important in rural society.

Due to location, physical isolation and lack of rural development initiatives in the past, the physical infrastructure and the public services are relatively limited especially in Kwin-chaung village as compared to other villages. Income opportunities have remained limited in these communities. As a combined effect of population growth and unsustainable resources use in the past, the ecological balance is now rapidly degrading through excessive removal of forest cover.

Among three communities, infrastructure, communication and transportation facilities of Kwin-chaung are not satisfactory. It may be due to the location of the village which is accessible only by boat or motor boat. There are no schools and health care centre in the village. The villagers have to rely on monastery for education of their children. For the health problems, they have to go to Laputta by motor boat, which takes about 3 – 5 hours. Other two communities, fortunately, have primary schools, clinics and public services. Transportation and communication facilities are also available. As a consequence, the living standard of two communities, Le-Gyi and Lwe-Nyeint, is relatively higher than that of Kwin-Chaung.

8. RESULTS OF THE STUDY

The results of this study are presented based on five criteria: whether or not forest user groups have been implementing forestry activities as prescribed in the management plan within the context of CFI.

8.1. User Group Identification

The definition of the composition of the forest user group is one of the most important tasks to be conducted during community forestry investigations. Under CFIs, the forest is handed over to a FUG which is then responsible for management of the forest and which receives the benefits from the forest. If the user groups are not properly defined before the forest management plan is approved, some legitimate users may be excluded, leading to conflicts during implementation.

In the course of the study, selected respondents from three villages (three user groups) were examined whether or not the members of the user groups had been properly defined. The responses of the respondents are shown in Table 7.

Table (7) Identification of forest user group

No.	Villages	Total no. of respondents	Properly defined (%)	Not properly defined (%)
1.	Lwe-nyeint	90	82	18
2.	Le-gyi	212	58	42
3.	Kwin-chaung	83	100	0

Source: Field study, November- 2003

According to the results, Kwin-Chaung and Lwe-Nyeint FUGs are considered to have been properly defined. All the respondents (100 %) of Kwin-Chaung village and 82 % of respondents from Lwe-nyeint village expressed that they became the members of FUG by their own interests in community forestry. In Kwin-chaung village, the members believe that mangrove forest is the major source of income and the best fencing, which prevents erosion and flooding not to destroy their agricultural crops. However the FUG of Le-gyi is considered to have been improperly defined because only 58 % of respondents from Le-Gyi village replied positive answers concerning with FUG identification.

In order to investigate the awareness of the respondents concerning with the purposes of community forestry and rights and responsibilities of the FUG members, related questions were raised and their understanding level is shown in Table 8.

Table (8) Awareness of the respondents concerning with rights and responsibilities

No.	Villages	Purpose of CF		rights and responsibilities	
		Understand (%)	Do not understand (%)	Know (%)	Do not known (%)
1	Lwe-nyeint	86	13	41	59
2	Le-gyi	72	28	40	60
3	Kwin-chaung	90	10	81	19

Source: Field survey, November, 2003.

According to the results as shown in Table 8, most of the FUG members from Kwin-chaung (90 %) and Lwe-nyeint (86 %) knew well the purposes of community forestry while only 41 % of respondents of Le-gyi realized about that. In relation to the rights and responsibilities of FUG members, 81 %, 41 % and 40 % of respondents from Kwin-chaung, Lwe-nyeint and Le-gyi villages respectively replied that they knew about these. In this case, the members would not be able to know about the rights and responsibilities if the responsible persons (extension staff) did not explain well at the initial stage of community forestry.

8.2. Afforestation and Protection of Natural Forests

The respondents from three villages were posed questions and forest inventory were conducted in order to observe whether or not the user group had accepted the responsibilities for protection of forest and whether or not afforestation as specified in the plan had been conducted. The results are shown in Table 9.

Table (9) Protection and afforestation status in three community forests

No.	Villages	Sil: operations*		Afforestation		Remarks
		Yes (%)	No (%)	Yes (%)	No (%)	
1	Lwe-nyeint	0	100	100	-	only in the 1 st year
2	Le-gyi	0	100	100	-	only in 1 st the year
3	Kwin-chaung	55	45	100	-	up to present

*pruning, thinning, weeding, fire protection

Source: Field survey, November, 2003

According to the results of the study, it was found that all the respondents from Lwe-nyeint and Le-gyi communities did not carry out silvicultural operations whereas 55 % of members of Kwin-chaung community implemented such operations as prescribed in the plan. In the case of afforestation, all forest user groups established forest plantations but only in the first year (initial year) except Kwin-chaung FUG, which has been establishing forest plantations (mangrove forest plantations) from initial year to present. The reason behind is that Kwin-chaung FUG considered their community forest as a source of forest products for daily use as well as major source of income so that they have established forest plantations annually. Therefore, the user group has taken its own initiative to establish a seedling nursery and produce seedlings for the neighboring villages in order to generate extra income. According to the results of forest inventory conducted in three community forests, the survival percentages of each forest are shown in Table 10.

Table (10) Survival percentage of seedlings in plantations

No.	Villages	Afforestation area (acre)	Year of establishment	Survival percentage
1	Lwe-nyeint	100	2000	5 %
2	Le-gyi	10	1996	20 %
3	Kwin-chaung	401.77	1998	100 %

Source: Field survey, November, 2003

Among three FUGs, Kwin-chaung has established and protected forest plantations efficiently as compared with other two FUGs. Hence Kwin-chaung plantation has the survival percentage of 100 %. The lowest survival percentage of 5 % was observed in Lwe-nyeint and 20 % in Le-gyi. It was noted that the climatic and edaphic conditions of mangrove plantations of Kwin-chaung are naturally more favourable than other two plantations. It was also known that FUG members of Lwe-nyeint and Kwin-chaung could not protect fire so much so that almost all of the community forest plantations were destroyed by the forest fire.

In the case of natural forests, the achievement levels of protection were investigated and the results are shown in Table 5. For this, semi-structure interviews and informal discussions were made in order to know their opinions in relation to community forest conditions.

Table (11) Achievement level of protection of natural forests

No.	Villages	Area (acre)	Achievement level %	No. of respondents
1	Lwe-nyeint	500	75 %	90
2	Le-gyi	50	50 %	212
3	Kwin-chaung	19	100 %	83

Source: Field survey, November, 2003.

The results indicated that the FUG of Kwin-chaung community has fully accepted responsibilities for the protection of their forests. More than half of the FUG members of other two communities also accepted and implemented protection activities as prescribed in the plan. Basal area per hectare and species composition of each forest can be seen in Table 12 (only trees with DBH \geq 5 cm).

Table (12) Stand conditions of three community forests

No.	Name of CF	Average DBH of trees (cm)	Basal area (0.25 ha)	No. of species in study area
1	Lwe-nyeint	7.0 cm	2.7 m ²	16
2	Le-gyi	8.2 cm	4.1 m ²	16
3	Kwin-chaung	6.8 cm	5.6 m ²	9

Source. Field survey, November, 2003.

8.3. Utilization of Forest Products

In the study areas, the people largely depend on forests for their livelihoods. Forest provides substantial amount of wood and non-wood forest products to the households. It is crucially important to utilize forest products in a sustainable manner. In order to observe whether or not forest products were being systematically utilized as prescribed in the plan, questions were raised and the responses are shown in Table 13.

Table (13) Percentage of respondents who utilized forest products as prescribed in the plan and who did not.

No.	Villages	No. of respondents	Utilized as prescribed in the plan (%)	Did not utilize as prescribed in the plan (%)
1	Lwe-nyeint	90	64 %	36 %
2	Le-gyi	212	52 %	48 %
3	Kwin-chaung	83	93 %	7 %

Source. Field survey, November, 2003

The results in Table 6 indicated that 93 % of respondents from Kwin-chaung collected and utilized forest products with the agreement of FUG committee as prescribed in the plan whereas 64 % and 52 % of respondents from Lwe-nyeint and Le-gyi respectively did the same.

It was obvious that fuelwood is the main source of energy in all villages and it can be obtained from three different sources, namely, community forest, market and farm. It was known that all the Kwin-chaung respondents obtained enough fuelwood

(100 %) for their households from community forest. In Lwe-nyeint village and Le-gyi villages, the respondents attained only 86 % and 75 % of household's requirement from community forests respectively and the rests had to be collected from their farms. It was noticed that all community forests have the potential to supply considerable quantities of fuelwood (green and dry branches) if the silvicultural operations such as thinning and pruning are carried out as prescribed in the management plan.

In the case of building materials (pole & post), although respondents from Kwin-chaung obtained 100 % of building materials from community forest, the members of Lwe-nyeint and Le-gyi FUGs got incomparable amount of these materials, 12 % and 20 % respectively. Therefore, the people have to rely on market for the building materials. Lwe-nyeint respondents had to purchase 78 % and Le-gyi 68 %. It was known that farms of the respondents could provide some amount of these materials.

The financial values of forest products, which were obtained from community forest and utilized annually per household, are shown in Table 14. The calculation was based on local market prices.

Table (14) Calculated financial values of forest products from community forests utilized annually by a household

No	Villages	Financial values of forest products (Kyats)				Total kyats
		Pole & post	Fuelwood	Bamboo	In-phet	
1	Lwe-nyeint	3150 (9 x 350ks)	28800* (12 month x 2400 ks)	1200 (60 x 20 ks)	804 (67x2ksx6m)	33954
2	Le-gyi	5600 (16 x 350 ks)	38400 (12 month x 3200 ks)	-	-	44000
3	Kwin-chaung	17500 (70 x 250 ks)	33600 (12 month x 2800 ks)	-	-	51100

* Lwe-nyeint village has been using FRI produced A1-stove.

Source: Field survey, November, 2003.

The results indicate that the amount of financial value of forest products annually collected and utilized by a household of Kwin-chaung village (51100 kyats per year) is larger than those of the other two villages and such amount is approximately equal to one-third of total annual income of a household. Similarly, each and every household of Lwe-nyeint and Le-gyi FUGs consumed the forest products, which accounted for 33954 kyats and 44000 kyats per year respectively. If all the respondents (members of FUGs) from three villages did not have these forest products from their respective community forests, they would have to spend a large amount of money. As a member of FUG, each household could save such amount of money annually.

In order to show the value of community forests clearly, the total financial values of forest products annually consumed by each community (i.e., each village) are presented in Table 15.

Table (15) Financial values of forest products annually consumed by each village

No.	Villages	Total households	Annual consumption by a household (Kyats)	Annual consumption by a village (Kyats)
1	Lwe-nyeint	90	33954	3,055,860
2	Le-gyi	212	44000	9,372,000
3	Kwin-chaung	83	51100	4,241,300

Source. The author's analysis, 2003

8.4. Decision Making Process

Decision making process reflects the unity of members and ability of FUG committee. The types of decisions being made include: when to open the forest for harvesting; the system of protection; conducting afforestation and silvicultural activities; benefit sharing or sharing of forest products; and altering the composition of the committee or the user group itself. It is necessary to investigate whether or not the committee and user group as a whole were meeting regularly for any conflicts or problems and making decision on consensus basis, which only could achieve the

sustainable development of community forestry. The results of questionnaire survey are shown in Table 16.

Table (16) Decision making process

No.	Villages	Percentage of respondents		
		Chairman	Committee	Don't know
1	Lwe-nyeint	38 %	51 %	11 %
2	Le-gyi	53 %	32 %	15 %
3	Kwin-chaung	16 %	74 %	10 %

Source. Field survey, November, 2003.

Concerning the community forest management, harvesting of forest products, taking responsibilities and benefit sharing, 74 % of the Kwin-chaung FUG members confirmed that decisions were made by the committee whereas 51 % of Lwe-nyeint FUG members agreed that the committee decided in their case. Among the three communities, Le-gyi has some problems of unity. As a consequence, Le-gyi FUG could not organize members successfully so that most of the members said that decisions were made by the Chairman and only 32 % answered that decisions were made by the committee. It was interesting to note that, the members of Kwin-chaung and Lwe-nyeint villages are united under the guidance of the village elders and monks. Generally, they do not make formal meeting in relation to CF and other village development activities. Most of the villagers (men and women) used to meet regularly at the monastery every Sabbath day for religious purposes. At that time, they used to discuss every aspect of the village including religion, social, health, education, crop productivity, economy etc. of the village. If it is necessary to make decision or share benefit or take responsibilities, decisions are made together with the kind support of village elders and monks.

8.5. Conflicts Resolution

Conflicts may exist within the members of FUG, which can hamper the implementation of the plan. The conflicts include: illegal harvesting; unwillingness to follow decisions; encroachment to the forests; unwillingness of users to contribute protection or forest works, which do not provide immediate benefits; additional claim for use rights; and grazing of livestock within the forests. These conflicts are a kind of challenge to the FUG. The important fact is how the members or committee solve or overcome these conflicts or problems. The practical capacity of the FUGs can be raised by solving these problems themselves. The following table shows whether or not the conflicts existed within the members and how they had they solve these problems.

Table (17) Conflicts resolution

Villages	Conflicts			Resolution by		Remarks
	no	some	many	FUG/committee	outsiders	
Lwe-nyeint	-	✓	-	80 %	20 %	
Le-gyi	-	-	✓	-	-	could not solve
Kwin-chaung	-	✓	-	75 %	25 %	

Source. Field survey, November, 2003.

According to the results of the study, it was observed that the Le-gyi village had many conflicts which were hampering the implementation of the plan. The FUG of that village could not solve these conflicts themselves because the committee does not have skill and confidence for conflicts resolution, and knowledge about CFIs. In addition, the committee did not contact the respective forest staffs for advices and helps. In contrast, although the other two communities, Lwe-nyeint and Kwin-chaung, faced some conflicts such as the land-use, benefit sharing and taking responsibilities, they could overcome most of the problems by themselves. In both villages, most of the decisions were made by the committees on consensus basis so that the members are not divided and consequently big conflicts are avoided. It indicates the practical ability of these FUGs, which can run community forestry

activities with their own decisions. It is an essential requirement of a FUG to implement community forestry successfully and sustainably.

9. OVERALL EVALUATION OF THE THREE COMMUNITY FORESTS THROUGH GOAL ACHIEVEMENT MATRIX ANALYSIS

According to the subjective valuation process, each community forest (each village) was assigned a point of 1 to 10. Within each of the three objectives or goals identified, there was a set of criteria developed to assess the project's level of achievement of the objective. Each of these objectives and criteria was then given various weights. The selection of the criteria was subjective. However, as far as possible, the weights allocated to each of the objectives and criteria were based on quantitative and qualitative data, which reflect the relative attitudes of the local people.

The weight of each objective is multiplied by the weight of each respective criterion. Then, the result is multiplied by the score of relevant community forest (score of respective village). The sum of these products results in an aggregate score for each community forest. The goal is to compare the preferential ranking of community forestry of three villages. On this ranking, the weighted mean 1 to 3 is considered to be ineffective, 4 to 7 partially effective and 8 to 10 effective.

In this GAM, **“effective”** means the FUG meets the most criteria (as mentioned in 5.2. Evaluation criteria). The FUG is considered to be **“ineffective”** if most criteria have not been met. The objectives and criteria together with their assigned weights are shown in Table 18.

Table (18) Goal Achievement Matrix for three communities: Lwe-nyeint, Le-gyi and Kwin-chaung villages

Objectives	OW (%)	Criteria	CW (%)	Lwe-nyeint CF Points (1-10)	Aggre: Pts: for Lwe-nyeint (OWxCW) x (points)	Le-gyi CF Points (1-10)	Aggre: Pts: for Le-gyi (OWxCW) x (points)	Kwin-chaung CF Points (1-10)	Aggre: pts for Kwin-chaung (OWxCW)x (points)
to examine the contributions of CF to the local people	30	Availability of	45	7	9450	5	6750	10	13500
		-Fuelwood	45	3	4050	3	4050	6	8100
		-Pole & Post	10	5	1500	0	0	0	0
		-Bamboo							
Total			100		15000		10800		21600
to investigate the possibilities and constraints of community forestry processes	35	-FUG identification	10	6	2100	5	1750	8	2800
		-Protection	25	5	4375	5	4375	10	8750
		-Afforestation	25	3	2625	4	3500	10	8750
		-Utilization	25	7	6125	5	4375	8	7000
		-Decision making	10	7	2450	3	1050	7	2450
		-Conflict resolution	5	7	1225	3	525	7	1225
Total			100		18900		15575		30975
to support the technical and social information	35	-Socio-economic conditions & participations	25	7	6125	5	4375	9	7875
		-CF management & sil: operations	75	5	13125	4	10500	8	21000
Total	100		100		19250		14875		28875
Total aggregate points					53150		41250		81450
Weighted mean					5.3		4.1		8.1

Source. The author's analysis

OW = Objective weighting

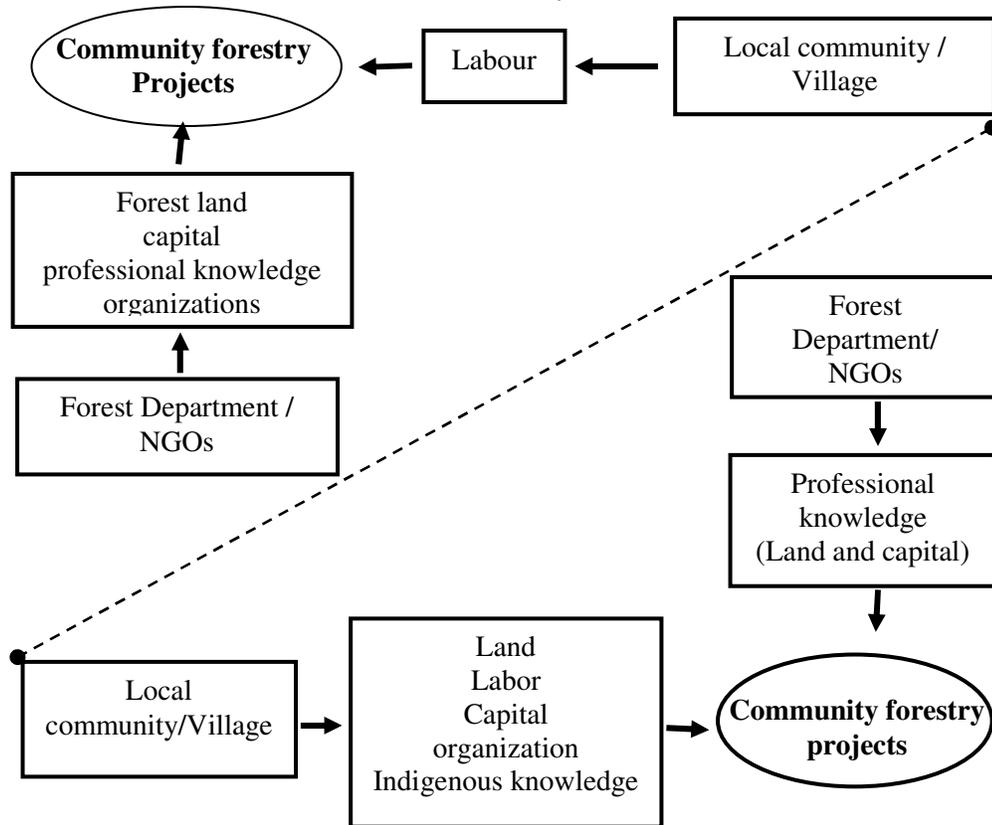
CW = Criteria weighting

On the basis of an assessment of five criteria and Goal Achievement Matrix analysis, Kwin-chaung FUG is considered to be effective. However, other two FUGs (Lwe-nyeint and Le-gyi) are considered to be partially effective. In this case, some members of the user group had not taken responsibilities for protection and afforestation. Some households living close to the forest claim to know nothing about the user group or the management of the forest. The most likely causes of problems in this case are an artificial definition of users, lack of good leadership and little immediate benefit to the users. Therefore, the success and the effectiveness of community forestry activities in these villages greatly depend on the participation level of the local people and continued assistances (i.e. technical assistances) of the extension staff.

10. COMMUNITY FORESTRY MODELS FOR THE FUTURE

Community forestry in Myanmar is designed as a partnership model between the government, represented by the field staffs of the Forest Department, and the community (local people), represented by the user group for a particular forest. Under this partnership, the user group has to accept the responsibilities for management of the forest and the field staff must become extension agents, providing advices and supports to the user groups. In future community forestry programme, Joint Forest Management (JFM) model and Support Service model should be taken into consideration as priority in order to release the burden of the Forest Department and to achieve the environmental rehabilitation through people's participation.

Current CF model in Myanmar



Joint Forest Management (JFM) model and Support Service model

11. SUGGESTIONS AND RECOMMENDATIONS

The correct definition (proper definition) of the user group is an important component for the success of community forestry. This fact can be seen in the case of Kwin-chaung community. The villagers must have a chance to determine who will be legitimate users of the forest and they must be free from the influences of political leaders, local elites and administrative boundaries. Artificial definition of the forest user group must be avoided because it would hamper the successful implementation of community forestry programme.

Some people want to be members with great expectation of getting something (material incentives) from the Forest Department. In spite of giving something (i.e., material incentives) to the people in order to involve in community forestry

programme, it would be better explaining the tangible and intangible benefits which can be gained from community forestry.

The definition of user groups is much easier for existing natural forests and old plantations, than for new plantations because the benefits can be available from existing natural forests within a short period of time. Therefore, afforestation programme needs to be incorporated into the management plan of the community forestry in order to increase forested area, and filter those who are actually interested in community forestry or not.

There is a critical situation concerning with the awareness of the rights and responsibilities of the user group and management plans of community forests. Except Kwin-chaung FUG, only one third of the members could discuss about the rights and responsibilities of the user group. Moreover, only about one-fourth of the members have knowledge about the management plan of their community forests. This is very important fact that community forestry cannot be implemented successfully without the FUG having knowledge about its rights, duties and responsibilities and work schedule (management plan). Therefore, forestry extension activities and information dissemination among the rural people should be promoted with momentum.

Generally, those user groups (more than half of the members from all FUGs) which are operating effectively or partially effectively have managed the natural forests, conducted afforestation activities and organized the utilization of forest products with the agreement of the forest management committee. However, all user groups are still weak in implementation of silvicultural operations (weeding, thinning, fire protection etc.) as prescribed in the management plan. Therefore, monitoring and assessment of these community forestry activities should be conducted regularly by the extension staffs (i.e., FD). If necessary, demonstration for each activity of silvicultural operations should be done. The successful implementation of community forestry often requires the support and strengthening of the user group through ongoing field supports, trainings, improved legislative backing and by overcoming administrative blockage.

Community forestry is not always high on the list of priorities for individuals because they are otherwise engaged in agricultural activities, paid employment and ritual obligations and involved in social and religious affairs in their life. If

individual household is able to obtain most of its forest product needs from its own sources, then it is unlikely to devote a lot of energy to community forestry activities. These factors should be borne in mind by the extension staffs with implementing community forestry program and developing peoples' participation. Therefore, it is necessary to mobilize, sensitize, motivate and organize the people in order to devote their time and willingly participate in community forestry development activities.

Social conflicts are very common within the members of FUGs. In general, the committee (FUGs) have less confidence and skill in decision making and conflicts resolution both in social and technical aspects. It was found in Le-gyi village where there are some cases of pasturing and encroaching agricultural lands to the community forest. This situation calls for efficient supports and advices of the extension staff (Forest Department). Therefore, not only technical advices but also effective legal supports and enforcement should be provided by the Forest Department particularly to such community.

The decision making through committee or consensus basis is found to be very effective to achieve the peoples' participation. Regular meetings (formal or informal), social and religious affairs can also improve the unity of the local communities, which could create everything what the community wants. The extension staffs should take into account Kwing-chaung and Lwe-nyeint cases which are good examples for developing peoples' participation.

The issues of resource security (land and tree tenure) and trust can also be impediments to the development of community forestry. Decentralization in forest management is just at its infant stage and local people do not have enough confidence in community forestry at least up till now. Therefore, the Community Forestry Instructions need to be explained thoroughly to the local communities. Then the confidence and trust between the local people and the government (FD) on long term authority to manage the community forests (land and trees) should be established.

In addition, community forestry should be integrated into it sideline occupations, and short-term income-generation activities such as beekeeping, sericulture, bamboo growing, mushroom growing etc. The different components of various agroforestry systems can also be incorporated into community forestry for immediate benefits and long term environmental security because all agroforestry

systems possess three attributes; sustainability, productivity and adoptability. These activities can keep the communities' interests alive while the trees are growing and will benefit them in the long term.

12. CONCLUSION

This study is a valid strategy for implementing the government forest policy. In total contrast to the situations of the local people under the conventional forest management system, all of the villagers (FUG members) under community forestry program have legal access to the forest products and community forests are now being protected in a sustainable manner by the user groups. In fact, the current situation is an infant stage of community forestry development programme and the great endeavours including labour, capital and technology of both the Forest Department and local people need to be invested for sustainable development of community forestry. In order to do so, the implementation of community forestry through user groups needs to be seen in the context of both the social environment and the importance of forest products to the users. On the part of the extension staff (i.e., Forest Department), devoting time, patience and close and frequent contact with the local people are the major factors for the success of the community forestry. These factors can also enhance the peoples' interactive participation and self-mobilization as well. Respecting culture, traditions, customs, and indigenous knowledge of the local community and having sympathy, equity and transparency can bring about success in community forestry. Commitments on land tenure and trees ownership, immediate and long-term benefits, effective extension programmes and supports (i.e. legal, materials and technical supports) by the FD are major imperatives for the sustainable development of community forestry in Myanmar.

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