EXPLOITATION AND MANAGEMENT OF FOREST RESOURCES BY LOCAL PEOPLE IN MYANMAR: THE CASE OF PALE TOWNSHIP, SAGAING REGION

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SUMMARY

The purpose of this study is to assess the forest resources exploitation and management of local people in Pale Township, Sagaing Region, Myanmar. Data were collected through structured questionnaire survey, focus group discussion and key informant interviews. 211 households were selected randomly from eight villages located inside reserved forests and outside reserved forests. These data were analyzed using descriptive statistics, frequency tables, percentages, Chi-square test (cross-tabulation). The results indicate that 78.2% of the respondents' households rely on the forest resources for both subsistence needs and sale. But only 15.6% depends on forest resources as their main income source. Household characteristics such as education level, household size and main income sources are influencing the forest resources exploitation. Households inside the reserved forests received more forest income than the households outside reserved forest. Age, education and size of the household did not significantly influence the forest income. Meanwhile, gender and knowledge about sustainable forest management are the factors that influence the participation of local people in forest management. Mitigation measures such as access to higher education, alternative income generation opportunities, reduction of household size, fuel-wood substitutes, awareness raising program for participation, community forestry that empowers local communities in forest management were suggested to be enable the realization of the goal of sustainable forest management.

Keywords: Forest Resources Exploitation, Myanmar, Participation, Sustainable Forest Management.

1. INTRODUCTION

There are millions of communities that depend on forests and they are a part of large ecosystems that provide society with many different benefits. According to FAO (2010), forests provide employment and livelihoods for a large proportion of the population, particularly in developing countries. It is estimated that about 350 million of people who live inside or on the fringe of forest are dependent on these areas for subsistence and income, with an assumed range of 60 million to 200 million indigenous people who are almost entirely reliant upon the forests for their subsistence and survival (FAO, 2012). UNDP (1998) mentions that nearly a third of the world's people, almost all of them are poor, depend directly on what they can grow, gather or catch. And while everyone on earth ultimately depends on its natural systems, the poor are particularly vulnerable to degradation of those systems. Therefore, the approach of forest management has shifted from management for a single objective of wood production to an ecosystem approach that tries incorporating the production of multiple outputs into forest management decisions by recognizing the current and future interests of many stakeholders and beneficiaries. According to Turner (1998), good forestry is most likely to flourish under special management and planning laws, which enable a balance to be struck between public and private interests as they affect forestry and other land uses operating within or adjoining forestlands.

Myanmar is endowed with rich renewable and non-renewable natural resources and is known for its high level of biodiversity. About 43% of the country's total land area is still covered with natural forests (FAO, 2015). Due to elevation, topography, rainfall, soil, temperature and other variations, Myanmar is covered by seven different forest types with total areas of 29,041,000 hectares, the most abundant types of forests are mixed deciduous forests and the smallest portion the forest area is covered by mangrove forests. About two thirds of the population derives their livelihoods from agriculture, forestry and fishery. In local areas, people are highly dependent on forests and non-

timber forest products for their livelihoods. Myanmar's forest cover decreased due to over-exploitation of forest, shifting cultivation, over-harvesting of fuel-wood and charcoal, over-grazing, forest fires, agricultural expansion, mining, infrastructure development, urbanization and other factors. Forest cover changes in Myanmar during the period from 1990 to 2015 decreased from 58% in 1990 to 51.5% in 2000, 49.3 % in 2005, 47% in 2010 and is projected to further decline to 43% in 2015 (FAO 2015). There is a need to sustain the natural forest resources since they satisfy a lot of our basic necessities. Myanmar has about 29 million hectares of forest that are owned by the State (FAO 2015).

On the other hand, with increasing population, the demand for fuel-wood and other forest products exceeds the carrying capacity of natural forests. Moreover, regardless of the significant contribution of the forest resources to the livelihood of forest dependents in Myanmar, deforestation remains high. The high rate of deforestation is probably because of inadequate involvement of the communities in the sustainable forest management practices through the integration of their livelihood activities into the sustainable forest management initiatives (FAO, 2010). Sustainable forest management aims to ensure that the goods and services derived from the forests meet current needs while at the same time ensuring their continued availability and contribution to long-term development needs. Sustainable forest management rests on the conservation of biodiversity and realization of the socio-economic functions of forests. In its broadest sense, sustainable forest management encompasses the administrative, legal, technical, economic, social, and environmental aspects of the conservation and careful use of forests resources with increased livelihood options.

2. THEORETICAL FRAMEWORK

2.1. Forest resources exploitation and livelihood of local people

Forests are the sources of both tangible and intangible benefits to poor people, tangible benefits like (new) agricultural land, non-timber forest products (NTFPs), timber and intangible benefits like improving micro-climate condition and on-site ecological services are the examples of benefits that can be obtained from forests (Vedeld et al., 2007). According to the World Bank, forest depending population is over one billion, one third of the world's total population is using biomass fuels, and billions of people are relying on indigenous drugs produced from herbs and extractives collected from the forests. More than a fifth of protein requirements depend on hunting and fishing on forested land in some developing countries (CIFOR, 2008). Forest resources are significant contributors to rural livelihoods for some of the continent's poorest people (MacGregor et al., 2007). (Vedeld et al., 2007) stated "Poor people often depend directly on non-cultivated natural resources. Many of these are found in forest environments".

According to income data from over 24 developing countries covering about 8,000 households of 360 villages, (Angelsen et al., 2011) stated that income from forest activities contributes about 20% of total household income while other environmental income occupies more than 25% (i.e. the same as incomes from growing crops). In a World Bank report, it is stated that more than 1.6 billion people worldwide dependent on forests and trees for their livelihood (World Bank, 2008). With regard to forest related livelihood and poverty eradication, (Kamanga et al., 2009) mentioned that it is important to understand that the forest income dependence in planning of natural resource utilization at all levels of governance, natural resources are important for rural income and, policy interventions including securing and enhancing the natural resource base, designing participatory management and monitoring systems, securing poor people's rights of access to such resources, increasing values added by establishing markets and marketing systems, and broadening poor

people's livelihood base must be addressed for the rural development. "Forest resources, while providing a safety net, could also provide a launch pad for innovation, economic development and poverty alleviation, as they have elsewhere" (MacGregor et al., 2007).

Babulo et al., 2008 stated that the extent to which the forest is used and how people depend on forest environmental products differ across households, and, how does a household rely on a particular economic activity in general and forest environmental resources in particular varies according to the household's resource endowment, demographic and economic characteristics of the household and exogenous factors such as markets, prices and technologies. 'Rural dwellers in tropical forest regions rely on forests to support their incomes. They use forest products for subsistence or for sales in markets. To improve forest livelihoods, it is important to understand what factors influence the income derived from forests. Total income and income from forest resources among rural dwellers in tropical forest regions are influenced not only by market access and prices, but also by organizational, institutional, and social factors. These factors influence the diversity of resources to which the poor have access and result in specializations in livelihood strategies '(Zenteno et al., 2013).

Empirical findings have proved that household characteristics such as household size, age and sex of the household head, education status, asset holdings and other income opportunities are found to have influenced on household's decision on forest resources uses (McElwee, 2008; Kamanga et al., 2009; Tesfaye et al., 2011; Tumusiime et al., 2011). For example forest income study in Vietnam by McElwee (2008) had stressed on the significant relationship between age of the household heads and the use of forest resource by the households. McElwee (2008) found out that younger households (household head < 30 years old) depend more on forest extraction due to the fact that they are less accessible to the government jobs and local wage labour than middle-aged and older households. The same results appeared in case study by Tesfaye et al. (2011) in Ethiopia where older households dependent less on forest income since they are not able to do forest works as much as the youngers do. However, the World Bank's meta-analysis of forest income by Vedeld et al. (2007) did not reveal household age as a significant factor influencing forest incomes.

Size of the household, sex and education of the household heads are also observed in most studies to have significant influence on household's forest income (Babulo et al., 2008; Kamanga et al., 2009; Tesfaye et al., 2011; Tumusiime et al., 2011). Babulo et al. (2008) explained that larger households are more likely to engage in forest-related activities as a dominant strategy since they normally have larger number of members who are not skillful to participate in high income earning activities other than forest activities. Also male headed households and educated household heads have higher chance to get involved in skillful jobs and thus are less involved in low-return forest activities (Kamanga et al., 2009; Tumusiime et al., 2011). Other factors such as size of land and livestock holding units also have significant influences on households' dependence on forest income where the first two factors provide households with higher income earning opportunities on agriculture and livestock in order to be less dependent on forest income (Babulo et al., 2008; McElwee, 2008; Tumusiime et al., 2011). (Khaine et al., 2014) also stated that local people who have low income and no alternative income opportunities are more dependent on forests for their economies than high-income population.

2.2. Participation of local communities in forest resources management

According to Banarejee et al. (1997) participation in forest resources management refers to the active involvement of various stakeholders in defining forest sector and conservation objectives, determining

beneficiaries, managing forest resources, resolving conflicts over forest uses, and monitoring and evaluating the performance of forestry and biodiversity conservation projects. 'Local people are located very close to natural resources. They can supervise resource management better than central government officials, who have legal authority over vast area. Decentralization can also lead to equitable distribution of the benefits from natural resources. This will lead to an improvement in the livelihood of forest users. In some areas local people were working as guards, and deforestation rates in such areas were generally lower than in areas where only government guards worked' (Teye 2008). In the absence of local stakeholders in forest management and development processes, forest reserves and off-reserve forests are continuously subjected to encroachment by fringe communities (Glover, 2005).

'Sustainable management of forest reserve is linked to participation of forest-dependent communities in the management and the utilization of benefits to improve livelihoods. Sustainable forest reserve is an integral component of development and cannot be isolated from the surrounding areas and communities' (Alhassan 2010). Literature reviewed for this study has focused on socio-demographic and economic factors affecting participation. Findings of several empirical studies demonstrate the importance of socio-economic, cultural, political, and institutional policies in developing countries influencing local people participation in managing forests (Maskey et al., 2003). Social indicators turn out to be the main consideration in participation and economic indicators follow as the second most important consideration (Lise, 2000). Among social factors, education has been reported to influence stakeholder's participation in forest management (Lise, 2000; Glendinning et al., 2001; Owubah et al., 2001; Chowdhury, 2004) but Kugonza et al. (2009) reported that voluntary participation is not affected by education. Apart from education, Lise (2000) including Maskey et al. (2003) reported that the level of community participation is determined by the benefits obtained from forests or high dependency on forest or good forest quality. It argues that when people's dependency on forests is high, their interest in forests is likely to be greater, including people to participate in forest management and protection activities.

In another study on factors influencing people's participation in forest management, the influence of age on participation in forestry activities was unclear. Some of the researchers found out that age had no influence on forest management (Thacher et al., 1996; Kugonza et al., 2009). Contrary to this finding, Atmis et al. (2007) reported that age is an important variable in explaining participation. Kugonza et al. (2009) study on community involvement reported that forest-dependent communities' participation in forest resources management is not affected by gender. In another studies by Lise (2000) and Phiri (2009) gender was positively and significant associated with the extent of participation. In a similar study, Maskey et al., (2003) reported that women participate more than men because of advocacy on importance of women participation by many institutions. Several studies done on people's participation including Holmes (2007) and Kugonaza et al. (2009) also reported that proximity of forest-dependent communities to forests has positive association with the participation. Holmes (2007) reported that the further communities are from the forest resource, the less they interact with the resources. Sustainable forest management could not be achieved without the active participation of all relevant stakeholders and that forests can contribute significantly to poverty alleviation among forest-dependent communities (Wily, 2001).

3. METHODS

3.1. Study area

Pale township is located between latitudes 21 48' N and 22 10' N and longitudes 94 25' E and

94 55' E and 454 feet above sea level. The highest mountain is 4378 ft. The total area of Pale Township is 158,757.51 ha and total population is 156,269 for 2 quarters and 58 village tracts. Bamar is the main ethnicity and the others are Chin and Shan ethnic. The average rainfall is 35 inches and the temperature ranges from 15ºC to 44ºC. Forestland is 27.34% of the total township area. Major forest types are moist upper mixed deciduous forest, dry upper mixed deciduous forest, *Deciduous dipterocarp* forest and pine forest. There are five reserved forests and one protected public forest in the study area.

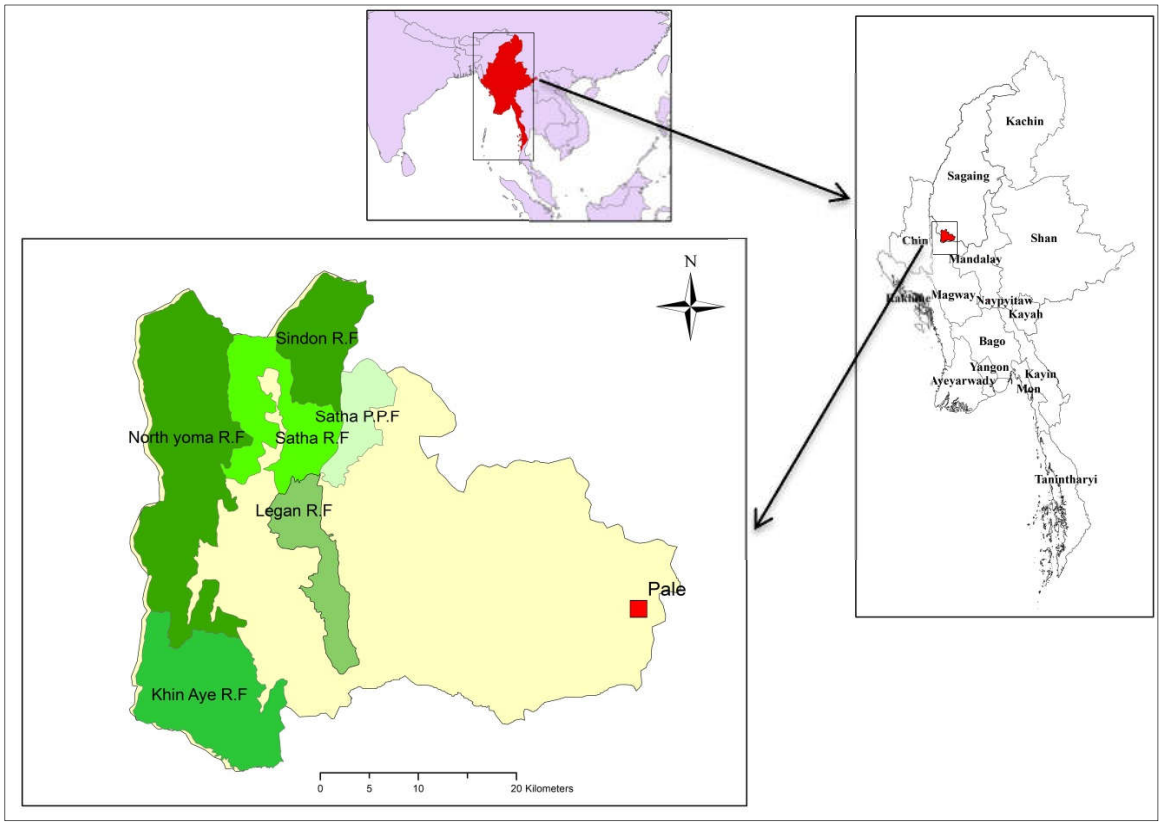

Figure 1. Location of study area

3.2. Data collection methods

Both primary and secondary sources of data were collected for this study. Direct observations, focus group discussions, key informant interviews and household face-to-face interviews were undertaken. Key informant interviews using semi-structured checklists were conducted with three forest staff (one staff officer, two range officers), two village tract leaders and two community forestry user group members. The total number of key persons to be interviewed for this activity is 7. A total of eight villages which are situated in and around the reserved forests with 211 respondents were selected by a simple random sampling method with 10% of total households in each village. The questionnaire mainly consists of three section namely: (1) socio-economic information; (2) forest resources exploitation; and (3) participation and perception of local people on forest management. Focus group discussions were conducted in order to get insight information about the particular topics to deal with some issues after the household level interviews. The secondary data were sourced from journals, articles, and research paper, books, reports and local Forest Department.

3.3. Data analysis methods

Quantitatively, both descriptive and explanatory statistical tools of the Statistical Package for Social Science (SPSS) version 20 and Microsoft offices excel were used.

Frequency table and descriptive statistics were applied, to assess the characteristics of households such as age, sex, household size, education level, occupation, main income source, monthly income, monthly expenditure and forest resources exploitation, Independent sample t-test was used to compare the income from forest products corresponding to location of village, gender. Descriptive statistics frequency tables, Chi-square test (cross-tabulation) were used to identify the association between interested variables. The results are presented in tables and displayed on charts.

4. RESULTS AND DISCUSSION

4.1. Forest management within study area

In 1995 Myanmar Forest Policy has been promulgated within the overall context of the environment and sustainable development, principles of the United Nations Conference on Environment and Development (UNCED), and other international forestry obligations. The policy was formulated in a holistic and balanced manner, and was explicitly linked to the broader national goals and objectives. Primary objective of the Policy is to conserve and manage the forest in a sustainable manner and maintain its important roles in the national economy and preservation of environment stability. In order to achieve broader national goal and objectives, the policy has identified six imperatives, namely protection, sustainability, basic needs, efficiency, participation and public awareness that must be given the highest priority.

The British colonists laid the foundation of Myanmar's forest management system especially of the teak forest in the late 1800s. The Myanmar Selection System (MSS), scientific forestry management method, was initiated. Myanmar is administratively stratified into 7 regions and 7 states, 68 districts, 315 townships and more than 60000 villages. The district level is the forest management unit (FMU) of the country. Sustainable forest management of each district is done in accordance with a 10 - year district forest management plan. Sustainable forest management of each forest management unit is executed through 6 working cycles namely production working cycle, plantation working cycle, local supply/community forests working cycle, watershed working cycle and non-wood forest products production working cycle and protected areas working cycle. The sustainable forest management activities at the district level are coordinated by an assistant director. Each district is further divided into townships under the supervision of the staff officer. Each Township is further sub-divided into beat areas constituting of 5 to 10 villages. The deputy range officer coordinates activities of each beat area. There are 7 beat areas in this study area under the supervision of one staff officer, 2 range officers and 7 deputy range officers.

4.2. Forest exploitation and household income

About the primary categories of forest product collected: According to survey, 78.2% of households in study villages rely on the natural forests at which 39.3% of the households are inside reserved forest and 38.4% of the households are outside reserved. Major forest products collected by local people in the study area are firewood and bamboo followed by other non-timber forest products including edible plants and medicinal plants (Table 1). Fire wood and charcoal are the only energy sources that households use for cooking. Most of the households (93.36%) reported that they had collected dry branches, twigs and small poles for day to day cooking. According to the survey results, fuel-wood collection is one of the drivers of deforestation in the study area. Most of the local people (63.98%) depend on natural forests as the source of fuel-wood. Giri et al. (2008) also said that the deforestation in Myanmar associated with the over exploitation of forests for fuel wood collection and charcoal production. Than (2015) stated that 'the main drivers of deforestation origination from within the forestry sector include overharvesting of wood for fuel-wood and charcoal production'.

The results also show that only very few

percentage (3.32%) of households reported that they had collected some sort of timber such as poles and post for subsistence uses. Beside subsistence uses, about 4 households (1.9% of total interviewed households) admitted that they had earned some amount of money by selling sawn timber and wooden poles. The most commonly used non-timber forest product reported during surveys was bamboo in which one third of the households (77 households/ 36.5% of total households) reported that they had exploited bamboo for subsistence (27 households) and sale (50 households) purposes.

Table 1. Forest resources exploitation of local people

Item	Frequency	Percent	Total (%)
No collection	46	21.8	21.8
Firewood	68	32.2	
Bamboo	10	4.7	
Timber	1	.5	
Firewood & Bamboo	48	22.7	
Firewood, Bamboo and Timber	5	2.4	
Timber & Firewood	3	1.4	78.2
Firewood, Bamboo & other	7	3.3	
Timber & Bamboo	3	1.4	
Firewood & other	9	4.3	
Bamboo & other	4	1.9	
Other	7	3.3	
Total	**211**	**100.0**	**100.0**

(Source: Field survey, 2018)

The results show that only 33 households (15.6%) depend on forest products as a main source of income. Bamboo is the major source of income from forest products and 49 households reported that they had earned cash by selling bamboo and bamboo shoot.

Table 2. Main income source of households inside and outside reserved forest

Major sources of income	Inside	Outside	Total
	Percentage (%)		
Agriculture	0.9	**32.7**	33.6
Forestry	**15.2**	0.4	**15.6**
Casual labor	19.0	8.5	27.5
Government staff	0.5	0.9	1.4
Private	10.0	4.7	14.7
Plantation labor	1.4	2.9	4.3
Other	1.4	1.4	2.8
Total	**48.4%**	**51.5%**	**100.0%**

Chi-square value = 105.812, p-value = 0.000* *(Source: Field survey, 2018)*

The Chi-square statistics results show that there is significant relationship between forest resources exploitation and some household characteristics such as education level, household size and main income sources (Table 3). Local people who have low income and no alternative income opportunities are more dependent on forests for their economies than others (Khaine et al., 2014). Other empirical findings have proved that household characteristics such as household size, age and sex of the household head, education status, asset holdings and other income opportunities are found to have influenced on household's

decision on forest resources uses (McElwee, 2008; Kamanga et al., 2009; Tesfaye et al., 2011; Tumusiime et al., 2011). However, the study posts that there are no significant differences in forest resources exploitation between the different age classes of respondents as well as between households located inside reserved forest and households located outside reserved forests. Furthermore, chi-square statistical analysis confirmed that there is no significant difference in forest resources usage between male and female. This is because men are physically more able to harvest and collect timber, bamboo, honey and to hunt for bush meat such as wild pigs and deer. Women are also involved in collecting fuel-wood and non-wood forest products such as mushroom and bamboo shoots and wild vegetables for their home consumption and sometimes even for extra income based on the availability of the products in their forests.

Table 3. Forest resources exploitation and households characteristics relationship

Household Characteristics	Forest Resources Exploitation (%)		Chi-square Value	P-value
	Yes	No		
Education level				
Illiterate	12.3	1.9		
Monastic	16.1	2.8		
Primary school	35.1	12.8	11.217	0.047*
Middle school	10.4	2.4		
High school	4.3	0.9		
Graduate	0.0	0.9		
Household size				
1-3	15.6	10.9	28.717	0.001*
4-6	47.4	9.0		
7-10	15.2	1.9		
Income sources				
Agriculture	24.6	9.0		
Forestry	**15.6**	0.0		
Casual Labor	25.1	2.4		
Government Staff	0.5	0.9	36.633	0.000*
Private	7.1	7.6		
Plantation Labor	2.8	1.4		
Other	2.6	0.5		
Age Class				
18-22	3.8	0.9		
23-35	22.3	4.3		
36-50	27.0	9.5	2.746	0.601
51-65	19.0	6.2		
66-80	6.2	0.9		
Location of villages				
Inside reserved forest	39.3	9.0	1.166	0.280
Outside reserved forest	38.9	12.8		
Gender				
Male	37.9	11.8	0.495	0.482
Female	40.3	10.0		

*: Means significant at ($p<0.05$) *(Source: Field Survey, 2018)*

4.3. Perceptions of local people on forest management

Many households were able to link forests with values such as climate regulation; rainfall formation and temperature moderation, water conservation, timber and fuel wood source, food and medicine, habitats for wildlife. Local community believes that forests and forest resources are useful to them. Results of focus group discussions, key informant and household interviews (55% of total respondents) revealed that a significantly large proportion of the respondents perceived the forest cover in these areas as declining. Fuel-wood consumption was the main reason for deforestation and forest degradation. Only 28% of the respondents reported that forest areas were increasing because of plantation establishment. Even though majority of respondents were aware that deforestation and forest degradation within the study area, the knowledge for conservation of ecosystem and environment was limited for the people in these areas. 58.29% of the respondents had not heard about any forest regulations. This result suggests that one of the drivers of deforestation is weak enforcement of forest laws and rules and also there is no awareness raising programs about the forest regulation in the study area.

During field survey, 17.5% of respondents reported that forest management actions by Forest Department were not effective at all while 63 % reported that management actions were effective management in the study area. Very few of respondents (17%) did not satisfied forest management actions of forest department because of illegal logging actions, corruption and some conflicts among forest department and encroachment into the reserved forests by local forest dependent people for agricultural land expansion.

4.4. Participation of local people in forest management

According to the survey results, 55% of total respondents involved in forestry operations and 53.6 % of respondents were found having willingness to participate in forest resources management. Chi-square test result shows that there are two variables are significant association with participation of local people in forest management (Table 4). There was a significant association between willingness to participate in forest management and knowledge about sustainable forest management (Chi-square=7.087, p-value=0.008). 53.6% of total respondents had heard about the sustainable forest management and most of them understood the meaning of it as the sustainable use of forest resources, reforestation and protection of forest resources. The result from the household questionnaire indicated that over half of the respondents participate in the forestry operations and have willingness to participate in the management of forest resources. Those who were unwilling to participate said that they did not have sufficient knowledge of forest management. Half of the respondents living outside reserved forest think that they cannot participate because they are not allowed to go to the forest since it is a reserved forest. Respondents who have knowledge about sustainable forest management have more willingness to participate than those who do not know about sustainable forest management. This can also be changed by raising awareness of local community so that they would become aware that the roles they should play.

The Chi-square analysis also show that there was a significant association between gender and participation (Chi-square=8.086, p-value=0.004). In other words, both male and female had unequal level of participation in forestry operations because most of male were participated in timber extraction and plantation establishment operations. In other studies by Lise (2000) and Phiri (2009), gender was positively and significant associated with the extent of participation. This result contradicts the findings of Kugonza et al. (2009) study on community involvement reported that forest-dependent communities' participation in forest resources management is not affected by

gender. Maskey et al., (2003) also reported that women participate more than men because of advocacy on importance of women participation by many institutions.

According to the focus group discussions and key informant interviews, all of the community forestry user group members were male and female were not considered as members. This is because women bear the main responsibility for childcare and housework. Actually, women are mostly involved in the harvesting of NTFPs and are always close to the forest, therefore excluding them from participating in any forest exploitation and management activities will mean neglecting their all important roles in the forest. So, Forest Department should encourage and empower women to participate in forestry operations such as reforestation activities, nursery operations and community forestry programs. Community participation in forest management activities should be the prime focus of the managers in charge of community participation especially for women since they form a greater part of the population and it is these women who collect non timber forest products from the forest for the members of the household.

Table 4. Factors influencing the participation of local people in forest management

Factors	Participation in forestry operations (%)		Chi-square value	p-value
	Yes	No		
Knowledge about SFM				
Yes	37.4	24.2	7.087	0.008*
No	16.1	22.3		
Location of villages				
Inside Reserved Forest	26.5	21.8	0.144	0.704
Outside Reserved Forest	27.0	24.6		
Age Class				
18-22	1.4	3.3		
23-25	13.7	12.8		
36-50	22.3	14.2	6.53	0.163
51-65	13.7	11.4		
66-80	2.4	4.7		
Gender				
Male	30.8	19.0	5.859	0.015*
Female	22.7	27.5		
Education				
Illiterate	6.2	8.1		
Monastic	8.5	10.4		
Primary school	28.9	19.0	6.691	0.245
Middle school	7.1	5.7		
High school	2.8	2.4		
Graduate	0.0	0.9		
Occupation				
Agriculture	18.5	16.1		
Forestry	10.0	7.1		
Casual Labor	13.3	10.9		
Government Staff	0.0	0.5		
Private	5.2	7.6	5.53	0.700
Unemployed	0.9	0.5		
Plantation Labor	3.8	1.9		
Dependent	1.4	1.9		
Other	0.5	0.0		
Total	53.6%	46.4%	100%	

*: Means significant at ($p<0.05$) *(Source: Field Survey, 2018)*

The Chi-square test also indicated no significant association between the age groups and involvement in forestry operations. Implementation of forest projects such as restoration of degraded areas through the taungya system improves the forest cover at the same time provide local people access to forest resources, wages for providing labor and share of benefits accrued from the harvesting of planted trees, hence attract all age group. This result is consistent with several studies that age had no influence on the extent of local peoples' involvement in forest resources management (Thacher et al., 1996; Zhang and Flick, 2001; Kugonza et al., 2009). This is inconsistent with Faham et.al (2008) findings; a significant relationship between age and the level of participation in implementation activities. Among social factors, education has been reported to influence stakeholder's participation in forest management (Lise, 2000; Glendinning et al., 2001; Owubah et al., 2001; Chowdhury, 2004) but voluntary participation is not affected by education (Kugonza et al. 2009). In this study, findings indicated that no significant relationship between education and the involvement in forestry operations.

5. CONCLUSION AND RECOMMENDATION

The study provides the basis for further explorative studies on sustainable forest management and local community livelihood situation. 78.2% of total respondents rely on the forests and extract forest resources mainly fuel wood, bamboo and other NTFPs. Most of them used forest resources for their subsistence needs. Almost all of the households used fuel wood and charcoal for cooking. It verifies that fuel wood collection is one of the major causes of deforestation in this study area. The Chi-square statistics results show that there is significant relationship between forest resources exploitation and some household characteristics such as education level, household size and main income sources. But there is no significant difference in forest resources exploitation across age classes and gender. So, it could be concluded that education level, household size and main sources are the factors that influence the forest resources extraction of local community. In term of participation in forest management, gender and knowledge about the sustainabe forest management are significant differences with the participation of local people in forest management. Households inside the reserved forest more involved in forestry operations. It can be concluded that more dependent on the forests, more participation in forestry operations.

Based on the findings, a number of mitigation measures were suggested such as access to higher education, alternative income generation opportunities and reduction of household size to reduce exploitation of forest resources by local people. The followings are also recommended to the appropriate institutions for consideration:

Firstly, sustainable forest management policies by the Forest Department should include the management of NTFPs to regulate their collection on a sustainable basis. Efforts towards efficient use of fuel wood by introducing improved fuel wood stoves, which may reduce fuel wood consumption, and by promoting other fuel wood substitutes should be undertaken.

Secondly, communities are usually the beneficiaries of forestry initiatives. To promote local interest in forest management means integrating their livelihoods into forest management initiatives. There is a need to promote active involvement of local communities in forest management. The study recommends to the Forest Department for more cooperating with local community to improve community forest model. The community forest model has the prospects for sustainable forest management and income generation in forest regions. This would promote local interest and participation in forest management.

Thirdly, Myanmar is a signatory to some international conventions particularly those of the ITTO and European Union such as Forest Law Enforcement Governance and Trade (FLEGT) and the Reducing Emission from Deforestation and Forest Degradation (REDD+) for sustainable forest management.

However, the findings indicate that the SFM of the Myanmar focus more on sustainable timber harvest rather than forest management. It is therefore recommended to the Forest Department that sustainable forest management should include the management of all forest resources. Training and capacity building programs should be provided for state forestry staff.

Sustainable forest reserve is an integral component of development and cannot be isolated from the surrounding areas and communities. Forest reserve management has to be positioned in the context of development of the area, where the forest reserve is situated. Through participation, the development of the area as a whole will eventually enable the realization of the goal of sustainable forest reserve management.

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KHAI THÁC VÀ QUẢN LÝ TÀI NGUYÊN RỪNG CỦA NGƯỜI DÂN ĐỊA PHƯƠNG Ở MYANMAR: NGHIÊN CỨU ĐIỂM Ở PALE TOWNSHIP, VÙNG SAGAING

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TÓM TẮT

Mục tiêu của nghiên cứu này là đánh giá việc khai thác và quản lý tài nguyên của người dân địa phương ở Pale Township, vùng Sagaing, Myanmar. Số liệu sơ cấp được thu thập thông qua các phương pháp phỏng vấn cấu trúc, thảo luận nhóm và phỏng vấn bán cấu trúc các đối tượng có liên quan, trong đó 211 hộ gia đình đã được lựa chọn ngẫu nhiên từ 08 làng phân bố bên trong và phía ngoài khu rừng bảo tồn để phỏng vấn thông qua bảng hỏi. Số liệu này được phân tích bằng cách sử dụng thống kê mô tả, kiểm định Chi - bình phương. Kết quả cho thấy 78,2% hộ gia đình được phỏng vấn sống dựa vào tài nguyên rừng cho cả nhu cầu tiêu dùng và thương mại, nhưng chỉ có 15,6% phụ thuộc vào tài nguyên rừng như là nguồn thu nhập chính. Các yếu tố như đặc điểm của hộ gia đình như trình độ học vấn, quy mô hộ gia đình và nguồn thu nhập chính ảnh hưởng đến việc khai thác tài nguyên rừng. Các hộ bên trong rừng đặc dụng nhận được thu nhập từ rừng nhiều hơn các hộ bên ngoài rừng đặc dụng. Tuổi tác, trình độ học vấn và quy mô của hộ gia đình không ảnh hưởng đáng kể đến thu nhập từ rừng. Trong khi đó giới và kiến thức về quản lý rừng bền vững là những yếu tố ảnh hưởng đến sự tham gia của người dân địa phương trong quản lý rừng. Các giải pháp như tiếp cận giáo dục đại học, các cơ hội tạo thu nhập, giảm quy mô hộ gia đình, thay thế củi đun, nâng cao nhận thức về sự tham gia và lâm nghiệp cộng đồng nhằm trao quyền cho cộng đồng địa phương trong quản lý rừng được đề xuất để thực hiện mục tiêu quản lý rừng bền vững ở khu vực nghiên cứu.

Từ khoá: khai thác tài nguyên rừng, Myanma, quản lý rừng bền vững, sự tham gia.

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