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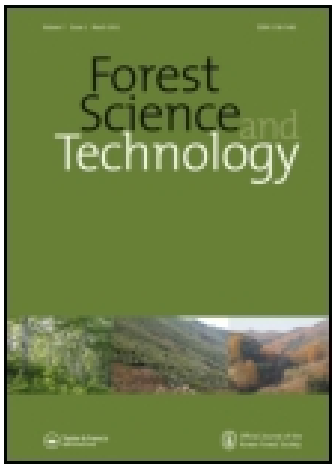

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A study of the role of forest and forest-dependent community in Myanmar

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A study of the role of forest and forest-dependent community in Myanmar

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This study was intended to find out the benefits of forests, especially for non-wood forest products (NWFPs), to forest-dependent local people and the relation to their socio-economic status. Sampling (169 respondents) was chosen to be an equal distribution of household's economic status. The survey was conducted face to face with structural interviews using both open-and closed-ended questions. The results showed that bamboo and bamboo shoot were considered as the most collected NWFPs in the Bago Yoma region. The average consumptions of NWFPs were 302.50 ± 90.12 viss to 501.27 ± 120.65 viss. Furthermore, the research revealed that the collection of NWFPs showed negative correlation with income availability and livestock possession. The study aims to help provide the necessary information for sustainable forest management.

Keywords: socio-economic; income; non-wood forest products (NWFPs); livestock; forest-dependent local people

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Introduction

Forests are an essential component of rural people who are living in and around forest areas, by giving tangible and intangible benefits of providing of wood and non-wood products, recreation, etc (Ministry of Forestry 2010). Among them all, the role of non-wood forest products (NWFPs) to local people is enormous to their livelihoods by supporting basic and economic needs (Ros-Tonen 2000; Lacuna-Richman 2002). In Myanmar, rural people essentially rely on the wealth of forests for their livelihood, such as food, fodder, fuel, and shelter, and cultural survival because of the poverty (Zin 2009; Ministry of Forestry 2010; Ministry of Environmental Conservation and Forestry 2012). Consequently, the socio-economic condition of local people strongly influences sustainable forest management in Myanmar (Oo 2012). It can be clearly seen that social benefits to local people of forest management has become a critical aspect of sustainable development (Poschen 2000). To meet one of the needs of current forest management, our study aimed to investigate the role of NWFPs and their relation to local people.

Materials and methods

The study was performed in 10 villages (20-household village, "6 mile", "9 mile", "7 mile" and Zayepauk village of the eastern aspect of Bago Yoma, and Nyaung-won, Gonmin-gone, Pawlangyi, Sinwine, Sintagone villages of the western aspects of Bago Yoma) in which intensive management efforts have been taken. About 18% of the population in Bago Division is at the poverty level and the overall national finding revealed that rural areas accounted for about 85% of poverty (UNDP 2011). The sampling design was adopted according to the practical guidelines developed by Department of Economic and Social Affairs, United Nations (2005). Additionally, secondary data were collected on background conditions and demographic information of the study site. To get reasonable data, respondents were grouped into poor, medium and better well-off. Twenty percent of the households (169 households) were surveyed among the wealth strata. Face-to-face interviews were undertaken because they avoid the problems of misunderstanding and incomplete questions (Neuman 2006). The survey was carried out as structural interviews with open- and closed-ended questions.

Results and discussions

Most of the households in the villages are engaged in forestry activities. The plantation establishment according to the Taung-ya system supplied the basic food, such as rice, peanut, and sesame, of most respondents. The average fuelwood consumption per household per month was 16.99 bundles (0.34 tons). All respondents depended on forest for fuelwood. Oo et al. (2002) also found that the percentage of fuelwood consumption from forests was high, and usage from natural forests was significantly higher than that of other sources.

NWFPs were found to be essential things for the respondents. The most collected NWFPs by respondents were bamboo, bamboo shoot, bonma-yaza (*Rauvolfia serpentina*), thekke (*Imperata cylindrica*), "in" (*Dipterocarpus tuberculatus*) and wa-u-pin (*Amorphophallus*

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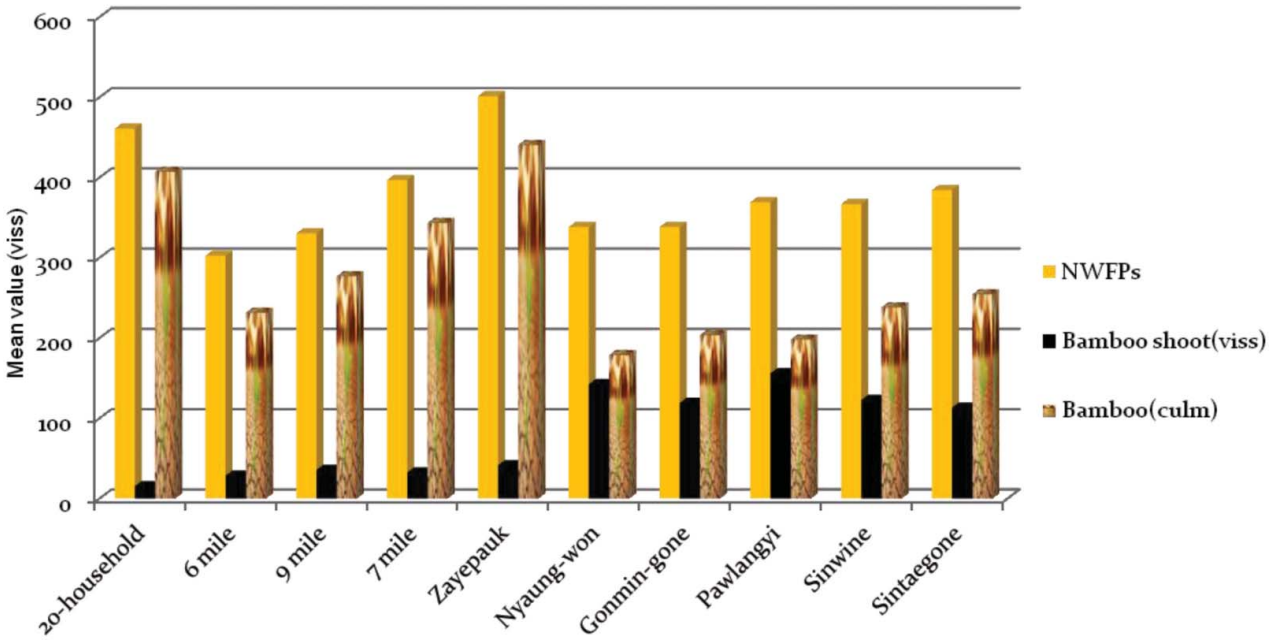

Figure 1. Mean production of non-wood forest products (NWFPs) among investigated villages.

paeoniifolius). The most common collected bamboo species are Kyathaung-wa (*Bambusa polymorpha*), Thaik-wa (*Bambusa tulda*), Tin-wa (*Cephalostachyum pergracile*), Wa-bo (*Dendrocalamus brandisii*) and Myin-wa (*Dendrocalamus strictus*). For bamboo shoot, Wa-bo (*Dendrocalamus brandisii*) and Kyathaung-wa (*Bambusa polymorpha*) species are commonly collected by local people.

Figure 1 shows the mean production of NWFPs by villages. The average consumptions of NWFPs among the 10 villages were not significantly different; the mean value ranged from 302.50 ± 90.12 viss to 501.27 ± 120.65 viss. Among NWFPs production, a vast amount of production was found for bamboo and bamboo shoot and the average consumptions of bamboo shoot showed a significant difference between the 10 villages. The main factors affecting that difference might be the availability of income from other sectors and the favorability of the market for bamboo shoot. Ghorbani et al. (2012) also found a significant difference for collection of bamboo shoots between villages in China. But changing to rubber plantation was pointed out as the main reason for that difference. The maximum consumption of viss of bamboo shoot was found in Pawlangyi village, which has a mean value of 155.93 ± 44.07 viss, followed by Nyaung-won village and Siwine village, whereas the minimum consumption of viss of bamboo shoot was found in the 20-household village, which has a mean value of 15.17 ± 7.68, then followed by 6-mile village. Nevertheless, there is no significant difference between the average consumptions of bamboo among the investigated villages.

The livestock possession showed a significant correlation with the collection of NWFPs (Pearson correlation coefficient $r = -0.38$, $p < 0.0001$). When the possession of livestock increased, the collection of NWFPs tended to decrease. A similar finding was found in another region of Myanmar by Aung et al. (2012). The livestock possessed by respondents comprised chicken, cattle and pig. The cattle are possessed by households that are rich or have average income of rural villages.

The survey also revealed that the time spent for NWFPs collection was different according to the status of the household income. The time spent collecting NWFPs was 1 day to 18 days per month. This result also pointed out that the amount of time spent is obviously related to the poverty of local people. The correlation between household income and the number of days spent collecting products was negative (Pearson correlation coefficient $r = -0.64$, $p < 0.0001$). This result highlighted the dependence on forests for livelihood by local people who have no or little alternative employment and no alternative income opportunities was significantly higher than the rich people. The average income of people who spent over 10 days on collection of NWFPs was US$47.49 (45,925.47 kyats) while the average income of people who spent up to 10 days for collection of NWFPs was US$15.05 (14,557.28 kyats).

The average income of the household per month was US$99.60 (96,317.72 kyats). By clarifying wealth rank, the better-off class earned $185.68 (179,557.2 kyats) per month, the medium class earned $99.65 (96,361.08 kyats) per month and the poor class earned $67.55 (65,319.19 kyats) per month. Among the villages, the high average income was found in Pawlangyi village whereas the low income was found in the 20-household village. The marketing of bamboo and bamboo shoots and processing of these products to valuable products can be considered as the factors that influence the economy of the investigated villages. The average percentage income from NWFPs provides 25.33% of the total household income among the villages. This finding is similar to that of Saha and Sundriyal (2012) in which the income from NWFPs was

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Table 1. Percentage of income distribution by various sources among 10 villages.

Villages	NWFPs (% of total income)	Trucking and trading (% of total income)	Labor (% of total income)	Others (% of total income)
20-household	25.14	32.02	19.82	23.02
6 mile	18.40	29.97	20.07	31.55
9 mile	18.92	35.97	19.93	25.18
7 mile	21.92	24.49	22.86	30.73
Zayepauk	25.89	35.88	14.65	23.58
Nyaung-won	29.43	30.35	12.83	27.39
Gonmin-gone	27.75	37.43	12.78	22.04
Pawlangyi	24.33	56.11	8.34	11.22
Sinwine	28.88	35.10	15.88	20.14
Sintaegone	31.03	35.79	12.31	20.88
Total	25.33	36.25	15.02	23.41

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19−32% of the total income. Gumbo and Shackleton (2010) also found that the economic value of NWFPs is around one-third of the total income. Moreover, the correlation between the NWFPs collection and household income was negative (Pearson correlation coefficient $r = -0.58$, $p < 0.0001$), which meant the higher household income can reduce the gathering of NWFPs. The same finding was found in the Philippines, whereby NWFPs use and household income had negative correlation ($r = -0.436$, $p < 0.05$) (Lacuna-Richman 2002). The percentage income from different sources is shown in Table 1.

Conclusion

There are several types of NWFPs that provide alternative opportunities of livelihood development. In this study, bamboo, bamboo shoot, bonma-yaza (*Rauvolfia serpentina*), thekke (*Imperata cylindrica*), "in" (*Dipterocarpus tuberculatus*) and wa-u-pin (*Amorphophallus paeoniifolius*) are the forest species most collected by local people for their basic and subsidiary needs. In Tanzania, bee products, medical and pharmaceutical products, extractive products, fodder, fiber and thatch grass, and animal and animal products are the major NWFPs for household income (Ministry of Natural Resources and Tourism 2000). For fuelwood consumption, the result showed that the forest-dependent community depended entirely on forests and the same finding was found in India by Saha et al. (2012).

One of the major factors that influence the extraction of forest products is poverty (Aung et al. 2012) and this is strongly affected by the lack of alternative income opportunities for local people. The household income and the education of local people were found to be significantly correlated with gathering of NWFPs (Lacuna-Richman 2002). Our finding also agreed that poverty had an obvious effect on collection of NWFPs. According to this study, it is strongly suggested that income-generating opportunities and value-added products be explored and created in order to support sustainable forest management.

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